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THIS letter tells what men are doing in making a living and building a civilization in Canada's Northland beyond the rim of dense population, but it is first of all necessary to decide what is North, and how much of the Dominion is to be treated as lying within its bounds. The Montrealer who visits the Laurentians, 50 miles away, is going north; to the Edmontonian, the Peace River is north, and at Akla-vik, 2,200 miles by river from Edmonton, one is only half-way between Canada's southern and northern limits. There is nothing absolute about "north". Arctic exploration started with a Greek navigator who left Marseilles in 33 B.C. to discover the British Isles. Since then men have continued to push into ever higher latitudes, and wherever they settle becomes the beginning of "north". As a matter of fact, not so much of Canada is "north" as is commonly supposed. Even the most southerly part of England is in latitude 500 miles north of Toronto, and London is north of Winnipeg.

Among foremost enthusiasts for Canada's Northland is Dr. Charles Camsell, Deputy Minister of Mines and Resources and Commissioner of the Northwest Territories. Dr. Camsell was born in the Mackenzie District, the son of a Hudson's Bay Company factor, and has spent the greater part of his life in exploration, his research in the North having won him many honours. In his presidential address to the Canadian Geographical Society in 1939, dealing with Yellowknife developments, Dr. Camsell said: "In spite of the idea prevalent in certain quarters that residents of the Northwest Territories are 'God's frozen people' there is nothing in the climate of that region to prevent people carrying on the same activities all the year round as they do in the City of Ottawa." In fact, Canada's Northland is no more inhospitable in these days than Nova Scotia and New Brunswick were to the British Empire Loyalists who moved up from the thirteen colonies around 1783.

Canada's Northland is a big country, sparsely populated. It slopes toward the Arctic Ocean, which explains why travellers speak of going "down" north. Including only what is officially designated the Northwest, there are 1,500,000 square miles with a population of 17,000, of whom 5,000 persons inhabit the quarter-million square miles of the Yukon. In peace time Fort

Smith had about 250 persons, while Leningrad, in the same latitude, had 2½ million. But Leningrad is an ancient city, whereas Canada's Northwest is the most recently explored part of this continent, and is just on the threshold of development.

Canada's north can be divided into Northwest Territories, Yukon, New Quebec and the Hudson Bay district. The N.W.T. include the mainland of Canada and the Arctic islands lying north of the Prairie provinces and east of the Yukon, with an area about two-fifths of the total area of the Dominion. Westward lies the Yukon, for nearly half a century known as one of the world's great gold-producing centres and inspiration of poets and authors. Recent developments, growing out of defence measures and the extension of transportation, promise to open a new era in its development. Ontario extends from the latitude of Rome to that of Moscow. Between Georgian Bay and Hudson Bay it bears rich forest, gradually sloping off to mournful muskeg. Underneath are Precambrian rocks, the oldest known to science, containing startling possibilities in mineral wealth. To the east of Hudson Bay lies New Quebec, formerly Ungava. The ice age seems to have passed this way only yesterday, and nature has not had time to finish building the Laurentian world. There are great watercourses, along whose banks the rock has not yet been ground into soil, and inland there are thousands of acres of muskeg which has not had time to develop into earth. Much of this potentially-rich territory has still to be explored, but minerals of economic value have been discovered at accessible points. South of it, the Abitibi region, between the 48th and 49th parallels, has good quality soils which attracted colonists as far back as 1912, and in 1941 it supported 67,000 settlers. The Department of Colonization believes there is room for 200 new parishes of 200 families each.

Exaggerated ideas of the harshness of a country's climate are given by absence of the shelter and company to which civilization has accustomed people, but those used to the north boast of its clear skies, and the light of the aurora borealis which is sufficient, even in the depths of the northern night, for necessary outdoor occupations.

There is a marked distinction between the climates of the Eastern and Western Arctic regions. Along the Arctic circle the average July temperature ranges from

42° in southern Baffin Island to about 60° on the lower Mackenzie. Some agriculture is possible in the Mackenzie Valley, whereas in corresponding latitudes in the eastern Arctic there is only tundra. No place of record in Canada's Northland, however, can match Yakutsk, Siberia, the cold pole of the world, where there is a population equal to one person in every four square miles, as compared with one person per hundred square miles in Canada's Northwest.

Native inhabitants of the Canadian North are the Eskimos, who have made a living with primitive weapons and implements along the Arctic coast from the Yukon-Alaska boundary eastward. They are honest, intelligent, hard-working people, and Canada is trying to organize affairs in the Northland so that these aborigines and the intrusive white man alike may prosper. Their numbers have increased during the decade between censuses from 6,000 to 7,200, of whom about 1,600 are in Quebec.

Many people are curious about the plant life of the North, particularly when they learn that ossified remains prove that great forests once grew in the very shadow of the Pole. In some regions of the Northland today vegetation is dense, and in many places there is a bewildering abundance of wild life. One writer says there are 750 species of flowering plants and ferns west of Hudson Bay. Mrs. George Black tells in her biography of assembling 464 varieties of native wild flowers in the Yukon, which "did much to disperse the too-prevalent idea that Yukon is a barren, frozen land." The "barren lands" are bare of trees not so much because of very cold temperatures as from lack of moisture. Trees eighteen inches in diameter grow 150 miles north of the Arctic Circle at the Mackenzie delta, but at Hudson Bay the line does not run much beyond Churchill. The Mackenzie forests are chiefly valuable as the source of local building and fuel material, and, so far as is known, there is no timber suitable for exploitation on a commercial scale. Owing to the sluggish growth natural under northern circumstances, trees are replaced very slowly, but authorities hope that with reasonable protection a perpetual supply may be assured residents.

Merely to tabulate the ascertained and potential mineral wealth of the Northland and near-north would fill a page of this letter. Ironically, disaster and mishap have done more to open up Canada's Northland than have purely exploratory expeditions. The Franklin catastrophe gave the impetus to more than forty search parties during the time when there was still hope of finding survivors, and many others followed in search of a solution of the mystery. Many pages of the report by the late Major L.T. Burwash on his expeditions of 1925 to 1930 are given over to information and photos regarding Franklin records, but the rest of the account deals with wild life, mineral deposits, natural resources, climate, travel, and the Eskimos. Similarly the disappearance of a Toronto mining man in an airplane in 1929 caused a fine-combing of the Arctic which extended polar flying knowledge, drew attention to the mineral resources

of the far North, and increased public awareness of the developmental possibilities in the area beyond the railway lines.

While no metallic deposits of note are known to exist in the Peace River district east of the Rockies, natural wealth of other kinds begins right at the gateway to the Mackenzie River basin. Here are found 200-foot-thick beds estimated to contain at least 30 million tons of salt. Here, too, are tar sands, coal, gas and gypsum. East of Fort Norman, on the shore of Great Bear Lake, are the pitchblende deposits from which radium is obtained. How these deposits were uncovered makes interesting reading. The first report was made nearly 45 years ago, when the late James Mackintosh Bell and Dr. Camsell surveyed the country. They recorded cobalt bloom stain on lakeside rocks, and thirty years later Gilbert LaBine read the account, associated the stain with his experiences in Ontario, arrived at the conclusion that there was silver in the rock, and in May 1930 made the great discovery. It is surprising to a layman to observe this lag between discovery of signs of mineral wealth and actual exploratory work. Other examples are the Geological Survey publication of 1898 which reported gold at Yellowknife, 40 years before the first ore was produced; and Franklin's record of oil seepages in the Norman area nearly a century before the first well was drilled.

The way we live and travel, and nearly every other phase of modern civilization depends upon the mining of coal, metals and other minerals, and this wealth from minerals is new wealth, creating jobs, products and opportunities. Modern methods are providing assistance in tapping hidden sources of mineral riches. Prospectors are not gypsy-like persons wandering over the rocky hinterland with hammers, knocking off pieces here and there. Electrical determinators are commonplace; those who search for ore are geologists. Advanced methods are necessary, because resources of metals are being rapidly depleted, and if post-war activity is to measure up to hopes then immediate discoveries must be made to stimulate private development. Only new finds can replace exhausted mines, and new mines have been coming in very slowly. A table prepared by a committee of the Canadian Institute of Mining and Metallurgy and presented to the Advisory Committee on Reconstruction last year shows that in 1942 Canada's metal production came from mining areas discovered as follows: 63 per cent prior to 1910; 11 per cent between 1910 and 1920; 21 per cent between 1920 and 1930, and only 5 per cent since 1930. Mining is important business in Canada, from the standpoint of employment, purchase of machinery and supplies, use of transportation systems, and export. In the year before the war broke out, the number of persons directly employed by the mineral industries was 107,000, and these supported an estimated 1,200,000 people, or one-tenth Canada's population.

Under the most difficult and trying conditions the gold mining industry has been trying to maintain its properties in a position to absorb the maximum number of men at the end of the war.

Today, with strategic minerals in fairly adequate supply, attention has been turning again to gold. In this resurgence of exploration more than a dozen areas across Canada have taken the spotlight, boasting discoveries of ore of varying importance. In the first six months of this year, mining claims recorded in Ontario numbered 5,570, an increase of 3,770 over last year.

Canada's biggest real estate boom today is in mining claims in the Yellowknife district of the Northwest, where investors are apparently hailing recent discoveries as heralding one of Canada's premier post-war gold camps. Mines cannot be brought into production just now, but they are being found and prospected, so that they will be ready to go into action at the war's end as great providers of employment.

Quebec has been supplying a great deal of ore news and many drills are at work. Development has been steady since the spectacular discoveries of gold and copper in the western part of the province in the years around 1923. Latest gold ore excitement has broken out at Val d'Or, where an extension of the Porcupine break was discovered at the end of July. The mining recorder's office at Amos was overworked as prospectors applied for licenses and registered their claims.

The Northwest has been in the news these last few years for other than metallic mineral discoveries. When Alexander Mackenzie, the young Scottish fur trader, travelled down the river that now bears his name in 1789 he got his shoes blackened with mineral tar, where today there are producing oil wells. Just about the only thing for which Canada can thank the Japanese is the opening up of this territory by road, air and pipeline. The Minister of Mines said in the House of Commons this summer: "If Japan and the United States had not gone to war, these resources would have been lying there just as they have been lying for a hundred thousand years." But the Japanese broke loose, and the Canol project is complete, supplying oil for military needs. There is hope for further discovery, and the territory is opened up to all oil seekers who care to stake their knowledge and capital.

Hundreds of miles to the south are the Athabaska tar sands, now the subject of research looking to a feasible means of extracting oil. They cover 10,000 to 30,000 square miles, and the United States Bureau of Mines has estimated that they contain 250 billion barrels of oil.

Still more fascinating than the story of mineral discovery is the account of development of agriculture in the North, because mining seems to fit better into the northern scene.

Agriculture is actually the biggest of the far North's unknowns. In the Upper Peace there are 11,000 farmers cultivating over a million acres of land, but the Peace River territory is not the farthest north limit of agriculture. Experimental sub-stations have been maintained in the Yukon and the Mackenzie basin by the Experimental Farms System for more than 20 years, and an extension is planned in the near future.

With regard to expansion of experimental work, it is interesting to have a report from Dr. E. S. Archibald, Director of the Experimental Farms Service of the Dominion Department of Agriculture. Dr. Archibald, a Nova Scotian with degrees from a half-dozen universities, is enthusiastic about the possibilities of farming in Canada's Northland, and has been directing surveys covering northern British Columbia, Alberta, Yukon, and the Mackenzie River basin. While the vastness and the relative inaccessibility of this territory preclude rapid examination or intensive experimental developments, much has been accomplished. In 1943, Dr. Alfred Leahey, soil specialist of the Experimental Farms, made an exploratory survey of soil conditions and agricultural possibilities along the Alaska Highway and on the Whitehorse-Dawson City route. As a result of this survey, and a flying trip into the southern Yukon by Dr. Archibald himself, an article dealing with agricultural possibilities appeared in the Canadian Geographical Journal in July. This summer, Dr. Leahey is again in the Yukon, to complete his survey of the highway territory and then swing eastward to the Liard and Mackenzie River areas. Among his assignments is the selection of sites for two agricultural experimental sub-stations, where full-fledged work will be established as quickly as possible to determine the agricultural possibilities of the regions and promote as much development as local conditions permit. "It is evident", says Dr. Archibald, "that the agricultural possibilities of the north country are well worth investigating. I cannot emphasize too strongly, however, that the Mackenzie Valley does not and may not for some time, offer a field for extensive agricultural settlement. Distances are too great, the environment too rugged, and potential markets too small, to justify more than agricultural production subsidiary to other enterprises — fur trade, oil and mining."

Climate alone is not a bar to agricultural production, as witness the yields of certain crops even within the Arctic Circle in Canada, and far north in Russia. At Beaverlodge, in latitude 55° north, tests have been made of various crops over a period of from 10 to 15 years, with these average yields: Marquis wheat 36 bushels, Victory oats 86 bushels, O.A.C. No. 1 barley 40 bushels, and winter rye 40 bushels. Horses thrive on the range along the 60th parallel; crabapples ripen beside Great Slave Lake; vegetables and green feed grow at the Thelon sanctuary, at 63°. W. C. Bethune reports common wild fruits occurring almost to Arctic tidewater, and vegetables at Coppermine and Bernard Harbour on the Arctic coast. At Good Hope, close to the Arctic Circle, potatoes have been grown for two generations, and vines were 20 inches tall on July 13th, with a yield of 393 bushels per acre.

All of this romantic Northland calls aloud to tourists. Practically every family in Canada and the United States is on tiptoe to explore the Northwest just as soon as it can get gasoline and tires. It would be difficult to find another region in the world with equal appeal in beauty of mountains, rivers, glaciers, lakes, and alpine valleys abloom with myriad flowers, while the wealth of game and fish will attract

thousands. This development, however, must await the return of peace, and many improvements must be made to the Alaska Highway before it can satisfy the demands of tourists. Extensions will be required, to reach lakes and settlements. Rest houses and hotels must be provided. But all of these will be worthwhile investments if they bring to Canada a steady flow of tourists, both because of the business gain and the friendship value of such visits.

One of the strange uses of the land they opened up Reindeer Ranching which would surprise the spirits of early fur factors is the grazing of reindeer on a commercial basis. It has been found that the Arctic lichen prairies serve well as pasture land, and reindeer have the advantage of not requiring shelter or much human attention. The Dominion Government took the first steps in 1919 with a view to broadening the basis of subsistence of the natives, when it appointed a Royal Commission to explore the possibilities of developing a reindeer and musk-ox industry. In 1935 a herd of semi-domesticated reindeer from Alaska was delivered on the Mackenzie, and by 1942 the original 2,370 deer had grown to more than 9,000. Headquarters for this unique ranch is in latitude 68° on the right bank of the Mackenzie River, 40 air-miles from Aklavik.

These, briefly, are some of the resources of Canada's Problems of Development Northland. Old problems of development remain, but will be conquered by sufficiency of capital applied to equipping enterprising people to meet northern conditions. The measures taken as a defence against Japanese aggression will turn to advantage of a peace-loving Canada, in co-operation with her neighbours.

Just recently, the Vice-President of the United States suggested that Canada, the United States and Russia should confer on Arctic matters of mutual interest. International co-operation is particularly important in the Northland, to pool the findings of scientific experiments and trial-and-error test. Recognizing this, the Canadian and United States governments have integrated a program of basic geographic and resource surveys. In the Northwest there is a big programme under the U. S. — Canadian North Pacific Planning Project, designed to assess the potentialities of the country in preparation for post-war economic growth. This international study of the comparatively unknown spaces of Alaska, Yukon, Northern British Columbia and part of the Northwest Territories was inaugurated in January 1943. Canada's own Advisory Committee on Reconstruction recommended last September in connection with immediate post-war employment: (1) that provision be made for training thousands of prospectors; (2) that adjustments be made in respect to taxation that would stimulate prospecting and mine development and mineral recovery; (3) that extensive aerial surveying be undertaken; (4) that steps be taken toward provision or improvement of transportation; (5) that the provinces be invited to confer with the Dominion in a review of "Blue Sky Laws" with particular reference to their effect on prospecting and mine development; (6) that a body, on which the mining

industry should be adequately represented, be set up to investigate the general effect of high taxation on mines and more particularly the possible permanent loss of resources.

Transportation presents merely a handicap to be overcome. Every schoolboy recalls the romantic adventurers who sought the will-o'-the-wisp Northwest Passage. Tomorrow's Northwest Passage seems to be an aerial one, because people in a hurry to get from continent to continent of the northern hemisphere will find their shortest route over the top of the world. Today there is the Northwest Staging Route, the Alaska Skyway, over which men and freight are carried from airport to airport through the wilderness from Edmonton to Alaska. It has meteorological services and radio beacons, installed by Canada and in operation before the United States came into the war. Over it were flown men and aircraft to Alaska and the Aleutians when the Japanese were threatening this continent. The Northeast Staging Route has opened up the Hudson Bay territory, over which great airplanes beat an air path to Europe.

Completion of the Alaska Highway fired the imaginations of people all over the continent. Today there is a joint Canada-United States Traffic Control Board to deal with applications for travel, which is at present confined to persons on official business, and to bonafide prospectors seeking minerals of strategic importance. All traffic for the highway is channelled through Edmonton, which calls itself the "crossroads of the world — where the Alaska Highway begins." This city now holds the unique record of being one of the greatest military air-freight centres of the world, as it was the greatest commercial air-freight centre before the war.

The days of Service's sourdough are retreating in Call of the North the face of innovators who are boldly and rationally transforming nature to their needs, but still there must be kept in mind the traditions which move, or at least influence, human beings. Today's problem is not merely a matter of conquering the North. The way to do that has been shown. What is needed now is to domesticate it. The Canadian Arctic has had its great names, like Frobisher, Davis, Hudson, Franklin, Ross and McClintock, but it was the Smiths and the Joneses who discovered that the "icy fastnesses" could be tamed. They were ordinary people, traders, miners and farmers, who pursued their fortune northward, and made their homes there. The future of the region will depend upon people who have initiative, a desire to succeed, and pioneer courage. Many will come from the ranks of returned service men, who, with adventure still unsatisfied, will join the great army of explorers seeking to unlock the treasure chest of the North. It is not a venture for weaklings. The Arctic climate may be kindly to those who go prepared for it, but no one must be careless when it shows its teeth. Scientific study now being conducted by the Canadian Department of Mines and Resources and the Experimental Farms Service will lay the groundwork for a rational increase in population throughout the Northland, but, aside from mining, any large shift of population will have to await economic developments which cannot yet be foreseen.