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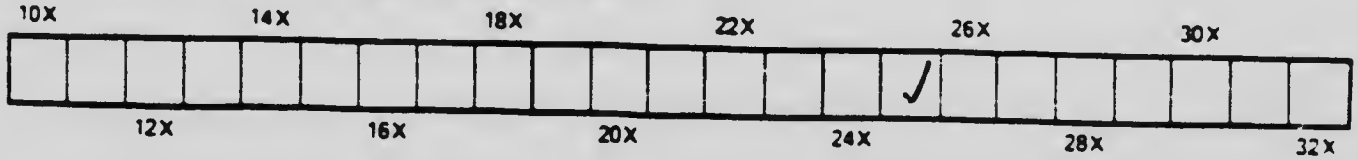

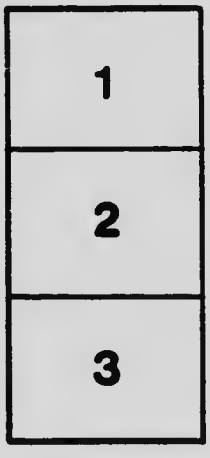

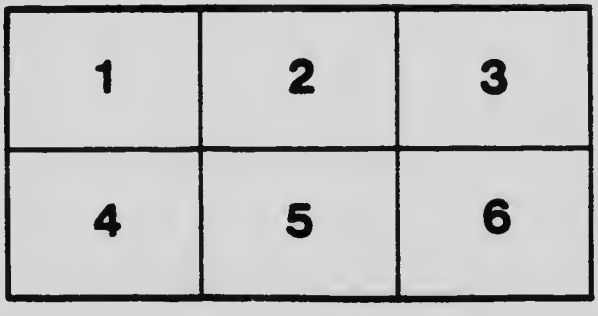

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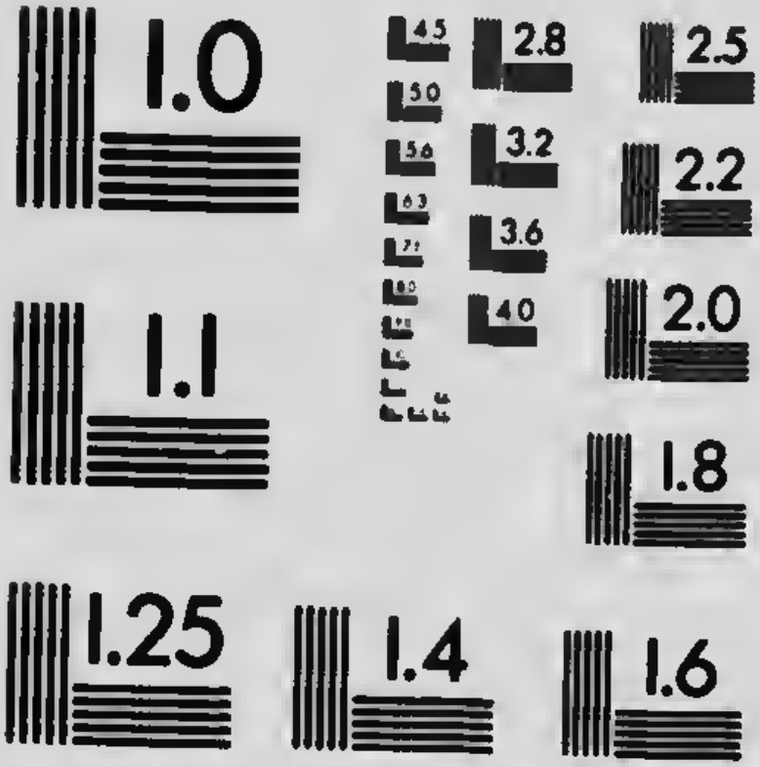

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Trans-Canada Ry.

1903

Trans-Canada Railway.

Engineer's Report of the Physical Features of the Line and of the resources of the Territory tributary to the Railway.

The following is a report of the country from Roberval, Province of Quebec, to Port Simpson, B. C., through which will be located the Trans-Canada Railway. This information is compiled from actual surveys made by the different Provincial Governments, by the Geological Survey of Canada, and by the Engineering parties sent out at various times by the Dominion Government. In each case the source of information is mentioned in the report, so that its accuracy may be easily verified. It will be at once apparent that no difficulties of a serious nature, from a topographical point of view, exist on the location chosen for the main line of the Trans-Canada Railway, and that with branch lines judiciously laid out at various points a great portion of the northern part of the Dominion will be tapped and developed, and the riches of its soil and forests be brought within easy reach of the large population which it is confidently expected the construction of the Trans-Canada Railway will cause to flow into this rich heritage of the Canadian people.

All the resources which tend to make a country rich and prosperous are to be found along the line of the Trans-Canada Railway, and, leaving out the minerals, indications of which are to be seen at various points along the line, the land and forests alone will support millions of people in a prosperous and comfortable state.

Engineering parties of the Trans-Canada Railway are at present in the field, and information as to the short gap of some 200 miles in the territory of Keewatin, which has not yet been thoroughly explored, will soon be known. No difficulty, from a construction point of view, is anticipated on this short distance, as the Geological Survey reports a level country with soil of the same quality as that on the south side of the Albany River.

PROVINCE OF QUEBEC.

From information compiled from Geological Survey reports and explorations made for the Crown Lands Department by H. O'Sullivan, D.L.S., F.R.G.S.

From Roberval to the western limit of the Province of Quebec, a distance of some 375 miles, the line runs through a good farming country, the soil being chiefly clay. The first thirty miles are already settled. At one hundred and thirty miles the summit of 1200 feet between Roberval and James Bay is reached, and from actual surveys taken the maximum west gradient of 1 p.c. can easily be had. From the summit at Lake Chigobiche, the country is a gentle rolling plain in the direction of James Bay, so much so that in places there is not a difference of 100 feet in a distance of 100 miles. The height of land between the St. Lawrence and James Bay waters is scarcely perceptible; the waters interlock and some of the lakes discharge both ways during spring freshets. On the lower part of the Chamouchouan River the country has been overrun by fire, and is now covered with second growth timber, but on the upper part of the river the primitive forest still remains, the timber being chiefly spruce.

The soil in the valley of the Mekiscan is of excellent quality, being chiefly grayish blue clay covered with rich vegetable mould and well coverred with mixed timber, mostly soft wood. There is an abundance of large poplar, which grow like large elms, with clear trunks from 50 to 60 feet high without branches, and from which half a dozen saw-logs may be had from one tree. At Nottaway River near the discharge of Lake Mutagami, all the timber of the Upper Nottaway basin, some ten or fifteen thousand square miles, can be concentrated and manufactured on the spot. There is an abundance of pulpwood all through the country, and immense water powers are to be had on the Nottaway and Rupert Rivers.

SAMPLE OF SPRUCE 12 IN. TO 24 IN. IN DIA., A FEW MILES INTERIOR FROM MOUTH OF MOOSE RIVER.

In the vicinity of James Bay the only mountain to be seen is Mount Sherreh, the highest summit being scarcely 500 feet above sea level, about mid-way between Rupert House and East Main River. In every other direction the

land, which is generally of a clay formation, rises gently from the Bay towards the interior on all sides. The temperature varies very little from that of the St. Lawrence Valley below Quebec. The Meteorological Department report the average temperature for the last three years to be about 6 degrees warmer than that of Rimouski.

MINERALS.

Dr. Bell estimates that the Huronian formation of this region is most promising, as regards minerals, especially gold, copper, iron and nickel. Veins have been found in several localities showing traces of copper and others of gold. Mr. A. P. Low says that at Lake Chibongamin copper has been found and that the granites of Lake Obatagamai most contain gold.

Lignite coal has also been found by Dr. Bell in considerable quantities on several of the islands in Hudson Bay.

PROVINCE OF ONTARIO.

From information derived from surveys made by the Provincial Government in 1900.

From Mile 375 to Mile 417, or from the western boundary of the Province of Quebec to 72 miles westwards.

A large portion of this region is of the same general character and equally well suited for agricultural settlement as the townships around the head of Lake Temiscaming. The land is clay and clay loam. In general the land back from the rivers is low lying and marshy, and the impervious nature of the soil prevents filtration and promotes the growth of moss with which most of the country is covered. Nevertheless the soil is rich and capable of cultivation with proper drainage. The land tributary to the Trans-Canada Railway on this portion, which is, or could be made suitable for farming, is estimated at one million acres. The country along the Blanche River above Lake Temiscaming and extending to Lake Abittibi, is a fine rolling area of clay loam. There are extensive deposits of moss peat, some of the bogs reaching to a depth of ten feet. The peat taken from these bogs, on analysis, shows a high percentage of volatile combustible matter and fixed carbon, no sulphur and only a trace of phosphorus, with a low percentage of moisture and ash, which render it a valuable fuel.

There are two water powers of considerable magnitude on Abittibi River. Conchiching Falls, with about 6,000 H.P. and Iroquois Falls with about half that amount. Upper Abittibi Lake covers an area of 190 square miles, of which about 55 square miles lie in the Province of Quebec. Lower Abittibi Lake has a surface of 145 square miles. A comparatively small expenditure in lowering the level of Conchiching Falls would reduce those lakes to about one half their present area and improve the drainage of an immense tract of country.

There is little pine timber north of the height of land, the trees being scattered and inferior in quality. There are some small areas of red pine and some jack pine, but nearly all the varieties found are south of Lake Abittibi. The best areas for pulp wood are on Low Bush and Circle Rivers between the Upper and Lower Abittibi Lakes. There are also considerable pulp wood areas to the west and north of Lower Abittibi Lake.

COTTAGE HOSPITAL FOR SICK AND AGED INDIANS, MOOSE FACTORY.

From Mile 417 to Mile 557, a distance of 100 miles.

75 per cent of the land in this distance is found to be choice farming land, the surface, in places, rolling, and the soil a rich friable clay and clay loam. The good land alternates with marshy land not more than four feet deep with clay at the bottom. If the country were cleared up a large proportion of this low wet land could be made productive as pasturage.

The prevailing timber is spruce and poplar, there being no pine or hard wood. The spruce, especially along the river banks, attains a size which renders it valuable for square timber, and the poplar is large and abundant, particularly on the Mattagami River. Special acres examined would yield 20 cords of spruce, other acres would cut 15 cords of spruce and ten of poplar. Some of them, if all the timber growing on them were made into cord wood, would show 60 to 70 cords to the acre. Much of the tamarac is dead, as this tree appears to frequently die after having obtained a growth of about twenty inches, and owing to the slight hold of its roots on the clay soil it is liable to be blown down. The district is generally flat with a gradual slope towards Hudson Bay.

Rock exposures are few and of limited area, the prevailing formation being the Laurentian with isolated outcrops of the Huronian formation. In some localities iron pyrites are found, which may be utilized in the manufacture of chemical pulp. The country presents excellent facilities for railway construction. On the north side of the height of land no rock cutting is necessary very little cutting and filling would be required and, owing to the level nature of most of the country, the gradient would be easy. Tamarac for ties and sand ballast are to be had in abundance. The rivers and streams, more especially the Mattagami and Kapuskasing Rivers furnish numerous valuable water powers with falls from ten to twenty-five feet, which can be utilized in the development of mechanical industry.

Generally speaking the climate is similar to that of Manitoba, the weather in mid-summer being equally hot. No destructive frosts are experienced until the end of September, and rains are frequent, but not excessive.

Between the Missinaibi and Kabinakagami Rivers, from Mile 557 to Mile 637, a distance of 80 miles, the land, as a whole, is level, rising slightly along the water courses, where it is rolling. The soil is clay and sandy loam, covered in the lower levels with boggy peat and moss, varying from two to four feet in depth. The country can be easily cleared, and for farming purposes the soil will be equal to the best in the older portions of the Province. Much of the area which is at present swampy, will secure natural drainage when the country is cleared

owing to the incline of the land. The mixture of the clay forming the prevailing sub-soil, with the surface soil will prove rich and productive. This district is well watered by numerous rivers and streams, some of which are well stocked with fish. This district is heavily timbered with spruce and tamarac interspersed with other varieties. Owing to their density of growth, the spruce and tamarac are for the most part too small for any other commercial use than pulp wood, not being proportioned to the height they frequently attain. In some places, however, they are of larger dimensions. The spruce will yield in some cases 40, 50 or even 60 cords to the acre, especially in the country along the Kabinakagami River. There is also a heavy growth of spruce along the Mattawishgwani River, which will produce from 20 to 35 cords to the acre. The dense spruce and tamarac forests of the Moose River basin are of great value and cover an immense area.

The rock formations are for the most part Laurentian with some Huronian exposures. Near the Missinaibi River are found boulders of fine grey slate which cleave readily.

The peat found in the lower levels below the moss on the surface is inferior as fuel, owing to the shallowness of the beds and the amount of moisture it contains. Similar soil to these peaty tracts, at Brunswick House and on Missinaibi Lake has been found capable of raising good crops.

From Katinakagami River to the Albany River, a distance of about 50 miles from Mile 637 to Mile 687.

About half of the territory comprised within this distance is good arable soil, not found in large continuous areas, but principally in the neighborhood of streams. In the northern part of this district there is a good deal of muskeg and the flatness of the surface will be unsuitable in the way of drainage. Most of the district has been burned over, so that the timber generally is not of large size. The trees growing along the river banks have usually attained a fair size. The best timber district is between the Kanakasha River and Lake Eskyanagh, where extensive groves of spruce and tamarac up to 36 inches in diameter are found. The poplar which grows everywhere along the river is singularly free from "black heart" which renders it of value for pulp wood. At Pine Lake on the Kenongami River, iron pyrites occur in considerable quantities, though it carries only small traces of gold, nickel and copper. The climate is similar to that of a part of the North West, being in the same latitude. Frost is unusual during the summer season and all the ordinary garden vegetables are raised without difficulty. Barley and oats can also be matured successfully.

The valley of the Ogoki River is a wide level tract of good clay soil interspersed with smaller areas of sand. The upper portion of this valley is the most extensive and promising stretch of agricultural land met with. The lower section down to the Albany River is wet and contains numerous peat bogs, but, as the land lies considerably higher than the river bed, it could be easily drained and rendered suitable for cultivation. The total area of arable land ten miles inland on each side of the Ogoki River, for a distance of 140 miles, is estimated at 1,500,000 acres. There are great quantities of excellent pulp wood throughout the district, the principal varities being spruce and jack pine. From the mouth of the Ombabika River to the Albany River, the land, exclusive of brule, will yield 38 cords to the acre, or a total of 56,316,100 cords. The Ogoki River country will average 44 cords to the acre making a total estimated output of 78,846,000 cords, being 135,194,400 cords in all from the territory tributary to these two water courses.

Silurian limestone overlaid with beds of drift prevails near the Albany River between the Ogoki and Kenongami Rivers. Traces of gold are found in the quartz veins in the Huronian rocks about Cross and Summit Lakes, the samples taken yielding sufficient gold to encourage further prospecting.

VIEW AT YORK FACTORY, LOOKING OUT TO SEA

Extensive water powers exist on the leading rivers and streams, and lakes abound with fish. The climate is much the same as that of the Temiscaming townships. All kinds of vegetables produced in temperate climates flourish at Hudson Bay posts.

We now cross the Albany River at an elevation of about 200 feet above sea level, and pass from the Province of Ontario into the territory of Keewatin. The explorations of this territory have not been so complete as on the remaining portions of the line. The geological maps of the Dominion show the land to be under 1,000 feet in elevation, and the soil is of a rich clay or clayey formation.

There remains a gap of 250 miles between Martin's Falls on the Albany River, and the Snow River about which nothing very definite is known, though the highest level which the Trans-Canada Railway will be called upon to cross is but 960 feet above sea level at Lake Lansdowne. The probability is that the characteristics of the portion will be found similar to those of the territories to the east and west.

From Mile 937, opposite the Severn River, to Mile 1112, opposite Gunisao Lake, the following description is taken from a report made by Dr. Bell in 1879, on the country around God's and Island Lakes:

The land about Island Lake is level and has an average elevation above the water of apparently less than fifty feet. The level of Island Lake itself is 900 feet above the sea. The woods in the neighborhood are mostly green. The proportion of soil to rock is also much greater than in the neighborhood of God's Lake. Large areas of low sandy land occur on Oxford and Hare Lakes, especially on their northern sides. The higher grounds, when not rocky, present usually a stiff light colored clay, and soil of this description, with more or less loam, is found along the valley of the Trout River. Oxford House is situated on a stiff clayey soil which now produces barley and all kinds of garden vegetables in perfection. This locality is remarkable for its abundance of wild gooseberries acres of ground in some places being covered with gooseberry bushes. Around Island Lake, although the action of the water has, in the course of time, washed away the loose materials and earth leaving the underlying rocks exposed along a great part of the immediate banks, yet on going back a short distance a covering of good soil is generally met with. The soil is very good indeed, being generally clay of a light brownish color, mixed in most places with a little fine gravel. In nearly every case where explorations were carried on inland from Island Lake the rock seen along the Lake shore disappeared or was covered with soil, and the trees were of a larger and better

growth than near the water. There is a very good garden at Island Lake Post, and certainly I have never seen potatoes look better than they do here.

GARDEN AT CROSS LAKE, NELSON RIVER.

The other varieties of soil noticed in the district include clay, sand, vegetable loam and sandy and gravelly loam. Spruce is the most abundant wood everywhere in this region. Next in order comes aspen, white birch, tamarac, balsam, poplar and Banksian pine. In many places the spruce attains a very good size and is used in the form of logs and beams for building purposes. It is also sawn into planks and boards for all sorts of carpenter work. The tamarac and Banksian pine sometimes have a diameter of twenty inches. Balsam fir is common and of good size around Island Lake, some of the trees mensuring nearly four feet in circumference. The cowan and mountain ash is to be found at Island Lake, as well as ground maple.

From Mile 1112 to Mile 1237, or fifty miles west of the crossing of Lake Winnipeg, the information is derived from a report of Dr. Bell's on the country between Lake Winnipeg and Hudson Bay, in 1878.

"The outlet of Lake Winnipeg is situated about fifty miles southeastwards from the northern extremity of the Lake. After flowing for four miles through a channel averaging over a mile in width, its waters enter Great Playgreen Lake, the main body of which is four miles in length, and is separated from Lake Winnipeg by a level peninsula of clay and sand four miles in width, called Mossy Point (this is where the Trans-Canada Railway will cross Lake Winnipeg).

OXFORD HOUSE—LOOKING SOUTH-EAST.

Lake Winnipeg is 710 feet above the sea. The banks of the rivers about Norway House, and in fact the surrounding country, consist of a light colored clay. The timber in this district is generally spruce, tamarac, Banksian pine, white birch, aspen, Balm of Gilead and willow with a little balsam fir.

The forests and the flora generally of the Nelson River region indicate a milder climate than that of the corresponding tract on the open seaside of Hudson Bay. This appears to be at least partly due to the southerly winds which prevail in summer, bringing the warm air probably from the valley of the Mississippi down that of the Red River and over the whole length of Lake Winnipeg, which has a high and even temperature during the summer months. This condition of things also prevents the occurrence of summer frosts in the Norway House region, which appears to enjoy a climate fully as good as that of the Province of Manitoba. Small fruits, cucumbers, musk, melons and vegetables of all kinds come to maturity at Norway House. Barley is a sure crop. Hitherto, as there has been no object to be gained in attempting the cultivation of wheat, the experiment does not appear to have been tried in this region, but there is every probability that it would succeed, as this cereal is known to come to great perfection in the Athabasca and Pine River region, in localities more than a thousand miles to the northwestward. Nelson River carries with it towards the sea the high temperature of Lake Winnipeg, derived partly from the rivers of the south and west. The effect of this is to induce a rank growth of reeds, rushes and a variety of water plants in the clayey soil along its banks. The climate of this region is pleasant in summer without an excess of rain, and in winter the weather, although cold, is said to be bright and uniform with only a moderate amount of snow. The land would be easy to clear of timber, and considering the unlimited supply of wood for building purposes, fuel, etc., the prevalence of good water in which a variety of food fishes abound, as well as the greater proximity of this region to Europe, it offers some inducements to immigrants which are not to be met with in the greater part of the prairie country to the westwards. At Oxford House, barley, peas, root crops vegetables and hay thrive well, and the surrounding district might make a good dairy and stock farming country; even as far as York Factory potatoes and some kinds of vegetables may be successfully cultivated.

From a geological point of view the east coast of Lake Winnipeg from the outlet southward does not present much of interest or importance. The shore is low and sandy. A light gray clay like that of the Nelson River region was frequently noticed and is said to occupy a good deal of the surface from the Lake shore inland.

I am informed that towards the height of land a good deal of clayey land of fair quality extends southwards along the Burns River. But for some miles inland the country east of Lake Winnipeg from one extremity to the other as far as it has been explored, is reported to consist mainly of rock and swamps. It is, however, very imperfectly known."

(The Trans-Canada Railway Engineers are now surveying east and west of Lake Winnipeg and definite information of this portion will soon be available.)

From Lake Winnipeg to Lesser Slave Lake, Mile 1237 to Mile 1899) the information is derived from reports made by Government Surveyors to the Chief Engineer and Director of the Geological Surveys, and are to be found in the Government reports of 1879 and 1896.

The country, as a whole, is of a level character and is cut up by a great many lakes and streams. The granite and gneiss rocks which form the western coast of Lake Winnipeg widen out at the northern extremity of the Lake passing to the mouth of Spider Lake in the direction of Beaver Lake. A short distance west of the general trend of these rocks, the Saskatchewan River passes through a level country cut up by numerous lakes. On the Sturgeon

River the lower levels are sandy and a considerable deposit of light soil covers the chalky formation of the river bed, and the vegetation is very vigorous.

At Pine Island Lake at 1362 miles on expansion of the Saskatchewan River (elevation 870 feet above the sea) the chalk cliffs are in places thirty feet above the surrounding waters. The soil is clayey and very compact and the vegetation is similar to that of Kamiuistiquia, where the same formation occurs. The timber is pine, aspen and balsam poplar.

The country adjoining the Beaver River at the 1587 Mile is most favourable to colonization. The banks of the river are covered with willows, poplar and alder bushes. The soil is of excellent quality. Along Green Lake which flows into the Beaver River the soil is of first class quality and altogether dry. Excellent potatoes are grown and barley and wheat mature well. Along the Churchill River to the north of this portion of the Trans-Canada, the country is rather hilly, and at a few miles back from the river the summits attain 400 to 500 feet above the surrounding plain. Proceeding up the Churchill River and opposite Mile 1487 the character of the country changes and series of plateaus occur. The trees along the river are almost exclusively poplar and Banksian Pine, while spruce grows on the adjoining heights.

At Isle a la Crosse Lake, opposite Mile 1587, whose elevation is 1330 feet above sea level, and on Deep River the Aspen tree predominates, which prove conclusively that the soil is of good quality. The rain fall here is more considerable than on the Peace River, and the summer heat less. Consequently the crops are later than on the Peace River, but vegetables grow very well and are of good size. Wheat, barley and oats succeed very well, though the first named is not a sure crop. Winter wheat should prove successful for the snow covers the ground well on into the April thaws.

At Clear Lake north of Lacrosse Lake, elevation 1330 feet above sea level, the country is much better and the surrounding forests are mostly composed of Aspen trees. Potatoes grow very well. Between the Athabasca River and the Lesser Slave Lake the country is completely wooded, rather swampy and in some places hilly.

Lac la Biche is about fifteen miles in length and from four to five in breadth. There is a Roman Catholic Mission there, and patches of land are fenced in, amounting to a considerable area in the aggregate. From the stubble seen Dr. Dawson judged that the crops must have been very good. The land, though not equal to that of Edmonton, is estimated by Dr. Dawson to be very good, and he states that it will, no doubt, some day be largely settled.

Of Wuskwatin Lake, forming part of Burntwood River and situated about 691 miles to the north-west of Lake Winnipeg, J. Burr Tyrrell, M.A.B. Sc., reporting to the Geological Survey in 1902, says :—

"Wuskwatin is a very pretty sheet of slightly murky water seven miles long and three miles wide, surrounded by sloping clay-covered hills wooded with white spruce and poplar. Its surface is varied by a few islands, composed of clay overlying a floor of gneiss. The two falls at or near its outlet would furnish a large amount of power for driving mills and machinery of any kind, while a supply of timber for building and fuel could be obtained from the surrounding country, and the soil would grow any of the ordinary roots or more hardy cereals, so that it is not improbable that before long when this fertile country is made accessible by the advent of a railroad from the south, one of the most prosperous towns of the district may grow up on the shores of this now secluded lake.

As Lesser Slave Lake is neared the soil becomes much richer. The basin surrounding the Lake is covered with forests of pine, white spruce and poplar. Coal similar to that of Edmonton has been found on Swan River, a small stream emptying into Lesser Slave Lake. The soil is of good quality. All kinds of vegetables grow well and the potato land for miles around are remarkable, though the soil is rather wet. Between Lesser Slave Lake and Lac la Biche to the south-east, the country is wooded and not hilly. Lesser Slave Lake (elevation 1540 feet above sea level) is about seventy five miles long and six miles wide. The south-east side of the Lake is low and level and is covered with a remarkable growth of grass, principally "blue joint" higher than a man's waist. Dr. Dawson in 1879 reported as follows, as to a railway route between Slave Lake and Athabasca Landing :

LA SALINE, ATHABASCA RIVER,
SHOWING DEPOSIT FROM MINERAL SPRING.

"The Lesser Slave Lake appears to present every facility for the passage of a railway along either shore. The best line would pass not in the immediate valley but on the edge of the plateau bordering it. At the mouth of the river the Athabasca might be crossed by a bridge 700 feet long and about forty feet high with excellent approaches. From this point it would probably be best to follow the right side of the Athabasca valley notwithstanding its somewhat sinuous course to the Landing where the summit of the plateau could be gained without difficulty by the valley of the Tow-ti-mow-si-pi which enters there. The bank of the Athabasca is favourable and no heavy slides occur on this portion of its length. A line taking the north bank of the river would have to cross the Lesser Slave River near its mouth with a bridge of 150 feet to 200 feet long, and might cross to the south side of the Athabasca at the Landing with a bridge of 912 feet with good approaches. Owing to the uniform character of the banks of the valley it would also be possible to gain the level of the plateau without necessitating very heavy work at several intermediate points. The character of the plateau lying immediately south of the Athabasca is probably favourable and there are few streams of any size joining the river in this part of its course. An extensive view from the highest point of the plateau above the Landing shows a nearly level horizon in every direction, its uniformity being broken only by a few low ridges many miles distant." The Trans-Canada Railway, would, however, follow a line more to the north of Athabasca Landing, crossing the Athabasca River above the junction of Calling River and follow up this River to Moose Lake. The intervening country is all comparatively low and the Moose River, which is a sluggish stream about 80 feet wide, could be easily crossed.

From Lesser Slave Lake to Hudson Hope, or Mile 1509 to Mile 2129, a distance of two hundred and thirty miles, the information is derived from reports made by the Geological Survey and the Government Railway Engineers.

SUMMIT LAKE, PINE PASS, LOOKING SOUTH DOWN MUNATCHE VALLEY

The country between these points is generally level, the soil of excellent quality and partly wooded with poplar and white and red fir. The valley of the Peace River is at least two miles in width and about 750 feet in depth. There are slight undulations on the plateaus but no hills. Vegetation is similar to that around Edmonton. Looking south and southeast from the Peace River opposite the Hudson Bay Post at the junction of the Smoky and Peace Rivers the country does not differ in contour and elevation from that to the north of Peace River, but instead of grazing plains and of valleys slightly timbered, the level is uniform, heavily timbered and that as far as the eye can reach.

Of Fort Vermillion, on the Peace River, Mr. R. G. McConnell says in 1893 in his report to the Geological Survey:—

"Fort Vermillion, one of the establishments of the Hudson Bay Company, is 152 miles below Battle River, and 160 miles north of Peace River Landing. The country surrounding it consists of partially wooded and fertile prairie. Vermillion Falls are caused by the River falling over a low limestone ridge. The height of the Falls varies according to the volume of water. At low water they are from 15 to 20 feet, while at high water they become greatly reduced. Peace River at this point is nearly a mile wide. Buffalo Lake, a small sheet of water from two to three miles long and about a mile wide, is bordered by extensive meadow lands covered with luxuriant grass. Between Vermillion Falls and Buffalo Head Hills, the greater part of the land is well fitted for settlement. (In 1901 several thousand dollars worth of mill machinery for grinding wheat was carried in to Vermillion Falls and the Settlement is now lighted by electricity derived from the Falls.)

VERMILLION FALLS, PEACE RIVER.

At the above mentioned Forks the principal channel of the river has a width of from 400 feet to 500 feet, and the elevation above sea level is 1524 feet. In August the thermometer reached 92 to 94 deg. F. in the shade. Ascending Smoky River from the Forks the plateau is about 600 feet above the River and on all sides the country is perfectly level and wooded. Smoky River is not deep at low water and its valley is about two miles in width. Between Smoky River and Dunvegan the country is level and praidie like, extending to a great distance northward and cut up by numerous streams. On little Smoky River opposite Dunvegan the country is similar in appearance, but to the west of this point the country becomes wooded and somewhat rougher. Dunvegan is situated on the northern side of Peace River on a terrace thirty feet higher than the main elevation of the river, and is 1305 feet above sea level. The surrounding country is generally about 700 feet above the river, which is itself about 900 feet above sea level.

From the Rocky Mountain Portage to Smoky River, a distance of 250 miles, the Peace River flows through a depression varying in depth from 700 to 900 feet. The underlying formation is chalk and the whole country seems to be an immense layer of clay deposit and alluvial soil. Sandstone is found in large quantities, and excellent grindstones are often met with in the river bed. The climate of this region resembles that of the Red River, but the extremes of heat and cold are not so pronounced. The climate is dry and salubrious and is tempered by the warm western winds. The snow fall rarely exceeds two feet and there are no drifts.

At Fort St. John, whose elevation is 1462 feet above sea level, the soil is rich and vegetation is early and far advanced in July. The wild grasses grow to a height of three feet and the pasturage is excellent. On the north side of Fort St. John the plateau is level or gently sloping. As far as the eye can see the country is covered with most luxuriant vegetation. Potatoes of large size come to maturity in August as well as barley and oats. At Hudson's Hope the general aspect of the valley is uniform, and the elevation above sea level is 1522 feet. To the south the slopes are well timbered, and to the north the country is alternate prairie and forest. On the north of Pine River the country offers beautiful pasturage and the land is of exceeding richness, far excelling anything in the Saskatchewan Valley. The soil and climate are better, the former consisting of rich marl overlying gravel and sand. The same character of country extends for miles along the river. At Hudson's Hope the valley is about 700 feet below the plateau level. The northern slopes are covered with rich forests of white fir of great height, which as a higher elevation is reached, are replaced by forests of Aspen trees and which in time give away to prairie lands. The vegetable growth is extremely rapid due partly to the length of the days, and to the high temperature during the twenty-four hours.

From a report made by R. G. McConnell, B.A., of the Geological Survey in 1893, we take the following:

The agricultural capabilities of portions of the Peace-Athabasca district are promising, but have not yet been thoroughly tested. Vegetables of various kinds are grown yearly without difficulty, at Fort Vermillion, Lesser Slave Lake, Whitefish Lake and Trout Lake, while potatoes are grown by the Indians even on the summit of Birch Mountain, at a height of 2,300 feet above the sea. Wheat and other cereals have been fairly successful at Lesser Slave Lake and at Fort Vermillion, the only places where they have been tried. The prairie country around Fort Vermillion equals in fertility the famous Edmonton district and appears to enjoy an equally good climate, its higher latitude being compensated by its more western situation, and by its lower elevation. This district is about 1,000 feet above the sea. In the interior, narrow strips of aspen-covered, but excellent land are usually found along the main rivers, and surrounding many of the lakes; and

numerous areas, often equal in size to eastern counties, might be selected, which appear well adapted for cultivation, but the numerous swamps, muskegs and marshes, which separate these areas, detract greatly from their value. The western and especially the north-western portion of this district contains the most promising of agricultural lands.

LOOKING UP PEACE RIVER VALLEY FROM HILL BEHIND DUNVEGAN.

The Engineers sent out by the Dominion Government in 1899 to locate a line from Edmonton to the Yukon, report on this stretch of country as follows:

On the south side of Lesser Slave Lake there is a wild meadow 30 to 40 miles in extent, that would cut 2½ tons to the acre, while the land on the opposite side is adapted for mixed farming, consisting of open prairie interspersed with small tracts of cotton wood timber. In fact poplar and cotton wood grow on the best land in this country and to see this growth is to be sure of good land. The land generally rises to a high table land which keeps up until the Peace River is reached. This river up to Hudson's Hope is in a deep narrow valley with a high table land on both sides. Between these two places the country consists of magnificent grazing lands for at least nine-tenths of the distance. Dr. Dawson estimates the Peace River country to contain 15,140,000 acres of good fertile soil.

After joining the Peace River, the line may follow it to the Junction of the Finlay and Parsnip Rivers. From this point (elevation 2,000 feet) there

LOOKING DOWN UPPER PINE RIVER VALLEY FROM "THE PRECIPICE."

are two alternative routes to the Skeena River; one by way of the Omenica and Osilinca Rivers to Sestoot Lake, (elevation 2,900 feet) thence following the Sestoot River to its junction with the Skeena River, and thence down the Skeena to the head of Wark Inlet, following the shore of this inlet to Port Simpson. The alternative route would follow the Omenica River to its junction with the Fall River, thence follow this river to Hogem Pass (Elevation 3,438 feet.) From this point the line will fall to Buckley House at the north end of Tacla Lake, and join the Babine River, following down this River to its junction with the Skeena River. The line would then be the same as that above described. Another route would follow the Pine River, crossing Pine River Pass at an elevation of 2,800 feet, thence descending to McLeod's Lake and Stewart's Lake, and following Watsonquah River to the Skeena River. The fact that good lines can be had by following either the Peace or Pine Rivers is fully established, and the only decision to arrive at, is as to which line presents the most advantages.

The valleys of all the rivers emptying into the Peace and Pine Rivers offer good pasturage and the hills are covered with valuable timber. The Omenica gold fields would be tapped by the Trans-Canada Railway, as well as the Cassiar coal fields and immediate traffic returns would thus be assured which would facilitate the beginning of construction work from the Pacific terminus of the line.

SUMMIT LAKE AND LIMESTONE MOUNTAINS, PINE PASS.

A line of railway has been located along the Skeena River from Wark Inlet to near Hazleton, and our Engineers are now at work locating from Port Simpson to Wark Inlet. From the reports of this line, the work will be fairly heavy in places, but not as much so as along the Canadian Pacific Railway location on the Fraser. The climate on the Skeena River is in general much like that of Quebec or Manitoba, with the exception of the winter which, though rather shorter, is more severe. In the valley of the Babino and Sestoot Lakes the summer season is sufficiently long and the amount of heat great enough to bring all ordinary crops, including wheat, to maturity.

The grades in the mountains will in no place exceed 1 per cent. and the cost of operation will thus compare most favourably with that of the Canadian Pacific Railway, where 4 per cent. grades are used. There will be no trouble experienced from snow slides which are a source of such great expense on the latter line.

Port Simpson has been described as the best port north of San Francisco. This harbour has been accurately surveyed. It is over three miles in length with an aver-

age breadth exceeding one mile, and is well sheltered and is easy of access, lying at the eastern end of Dixon entrance. There is a considerable area of level and gentle sloping ground, well adapted for the erection of buildings.

From this report it will be seen that the country through which the Trans-Canada Railway will be located, is sufficiently well known to state definitely :

1. That no obstacles of a serious nature, as regards construction, exist throughout the whole route.

2. That the amount of rock work is inconsiderable.

3. That the gradients will be easy as the country is so level.

4. That the soil, composed mostly of clay or of clay formation, is fit for agriculture for the greater part of the distance.

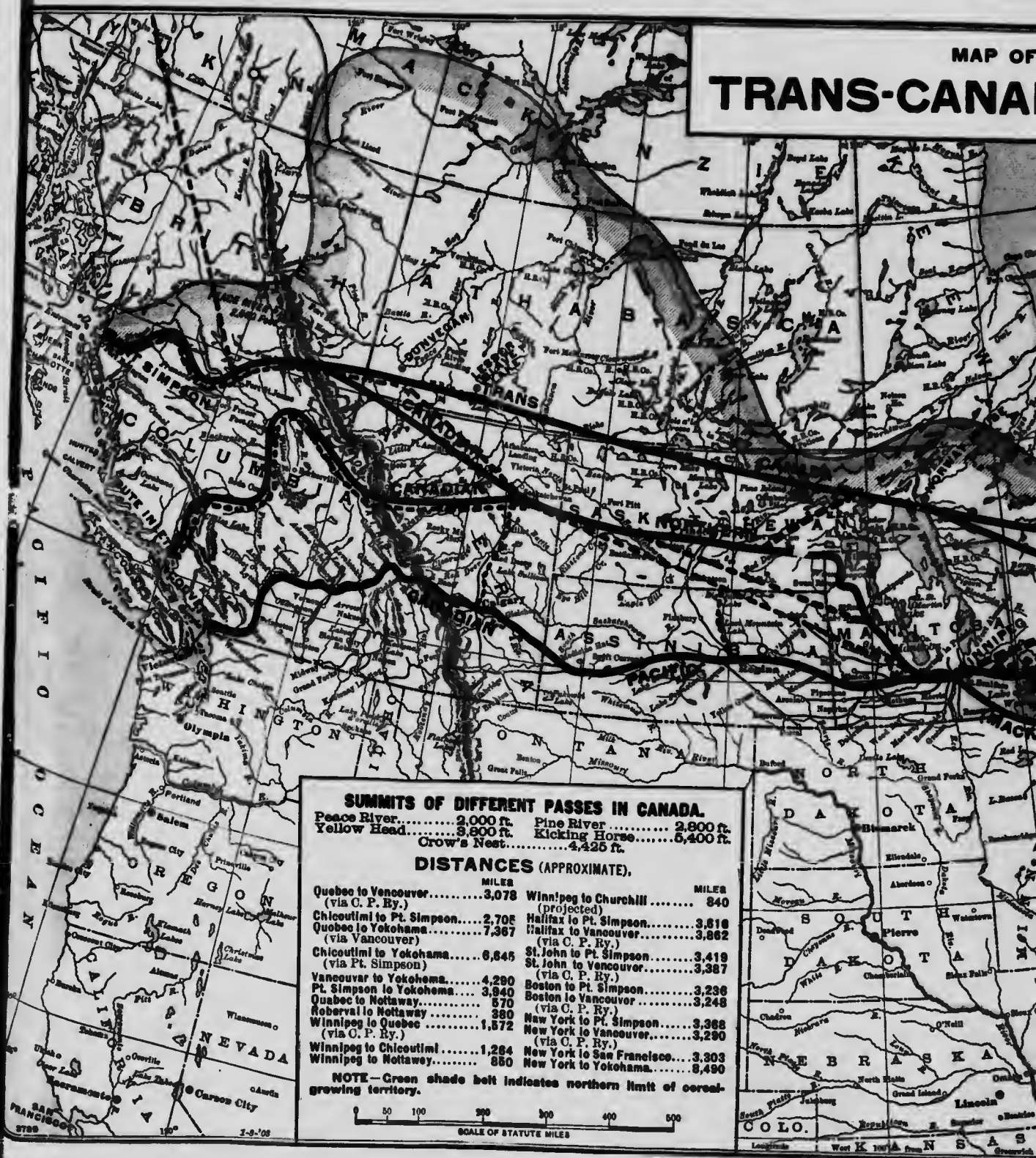
5. That there are valuable areas of timber lands on the route.

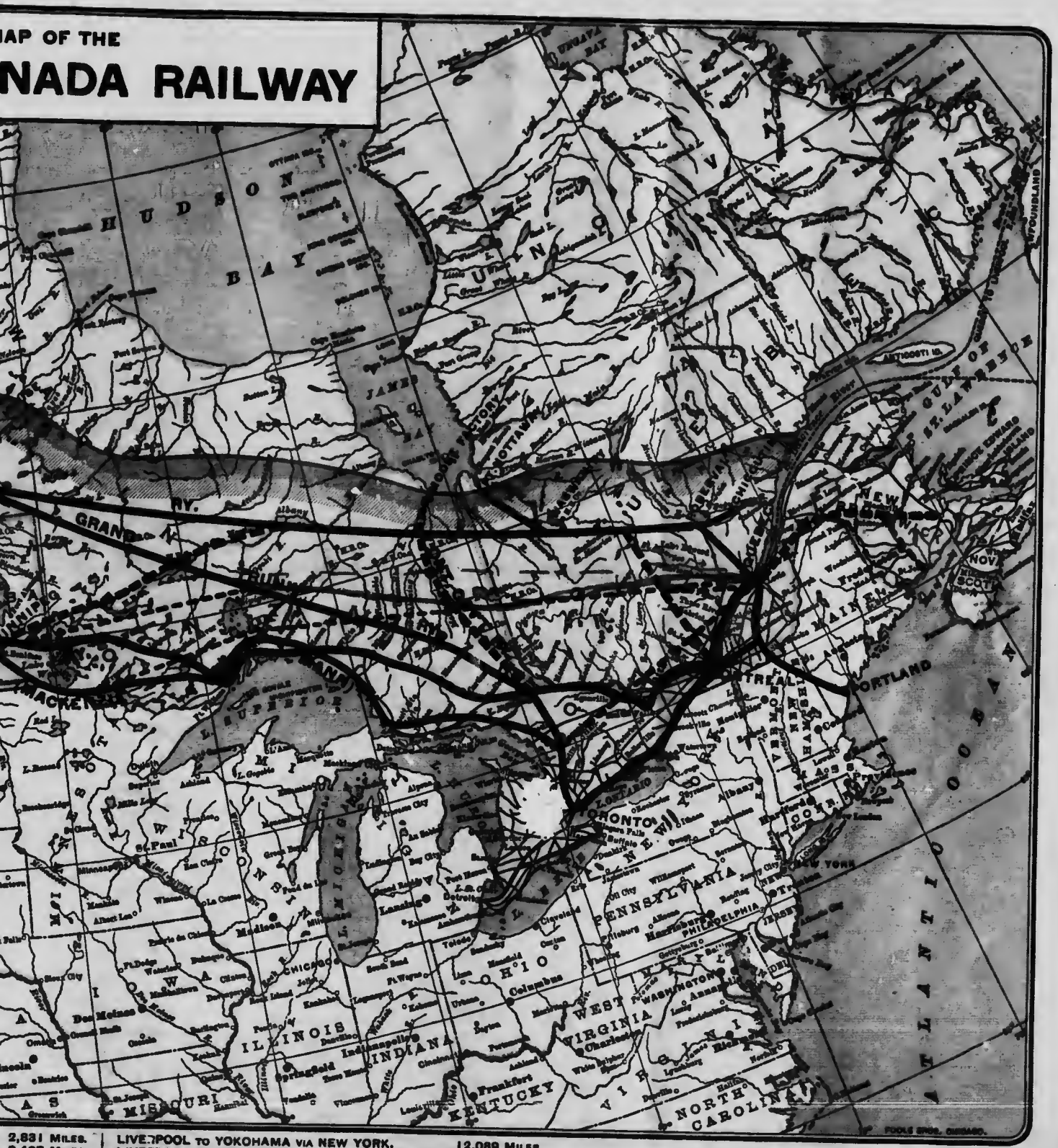
6. That the lands and the timber will assure to the railway an immediate return in produce lumber and minerals.

A. E. DOUCET,
Chief Engineer.

Quebec, 28th February, 1903.


PACIFIC OCEAN


MAP OF
TRANS-CANA
SUMMITS OF DIFFERENT PASSES IN CANADA.
Peace River.....2,000 ft.
Yellow Head.....3,800 ft.
Crow's Nest.....4,425 ft.
Pine River.....2,800 ft.
Kicking Horse.....5,400 ft.
DISTANCES (APPROXIMATE).
Quebec to Vancouver (via C. P. Ry.) 3,078 MILES
Chicoutimi to Pt. Simpson 2,705
Quebec to Yokohama (via Vancouver) 7,367
Chicoutimi to Yokohama (via Pt. Simpson) 6,645
Vancouver to Yokohama 4,290
Pt. Simpson to Yokohama 3,940
Quebec to Nottaway 570
Roberval to Nottaway 380
Winnipeg to Quebec (via C. P. Ry.) 1,572
Winnipeg to Chicoutimi 1,284
Winnipeg to Nottawey 850
Winnipeg to Churchill (projected) 840
Halifax to Pt. Simpson 3,616
Halifax to Vancouver (via C. P. Ry.) 3,862
St. John to Pt. Simpson 3,419
St. John to Vancouver (via C. P. Ry.) 3,387
Boston to Pt. Simpson 3,236
Boston to Vancouver (via C. P. Ry.) 3,248
New York to Pt. Simpson 3,368
New York to Vancouver (via C. P. Ry.) 3,290
New York to San Francisco 3,303
New York to Yokohama 8,490
NOTE—Green shade belt indicates northern limit of cereal-growing territory.
0 50 100 200 300 400 500
SCALE OF STATUTE MILES
DISTANCES: QUEBEC TO PORT SIMPSON VIA TRANS-CANADA RY. 2,831 Mi
QUEBEC TO PORT SIMPSON VIA GRAND TRUNK RY. 3,407 Mi
PORTLAND TO PORT SIMPSON VIA GRAND TRUNK RY. 3,603 Mi



2,831 MILES.
3,407 MILES.
3,603 MILES.

LIVERPOOL TO YOKOHAMA VIA NEW YORK. 12,089 MILES.
LIVERPOOL TO YOKOHAMA VIA TRANS-CANADA RY. 9,831 MILES.
LIVERPOOL TO YOKOHAMA VIA GRAND TRUNK RY. (PORTLAND.) 10,944 MILES.

POOLE BROS. CHICAGO.

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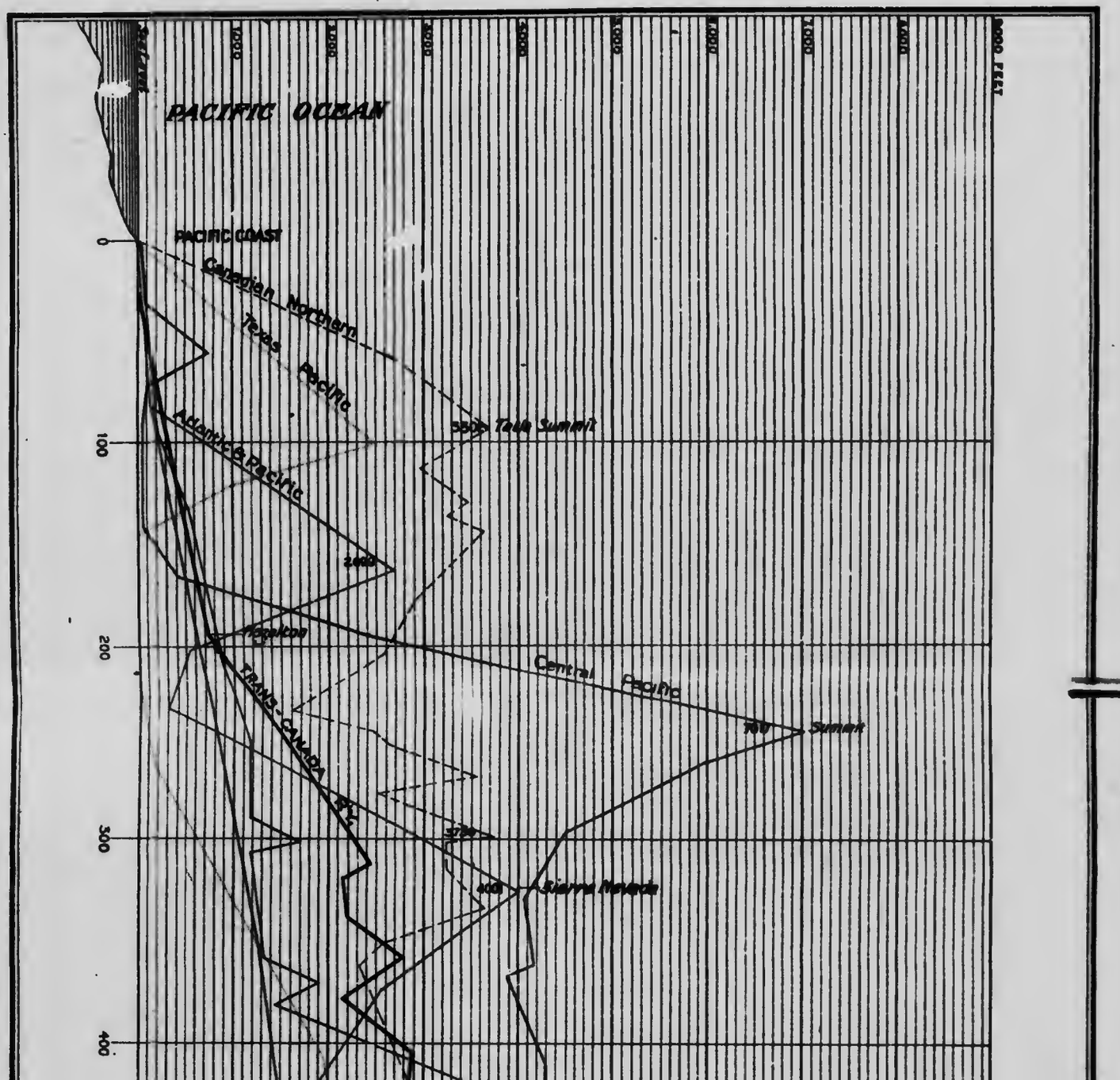
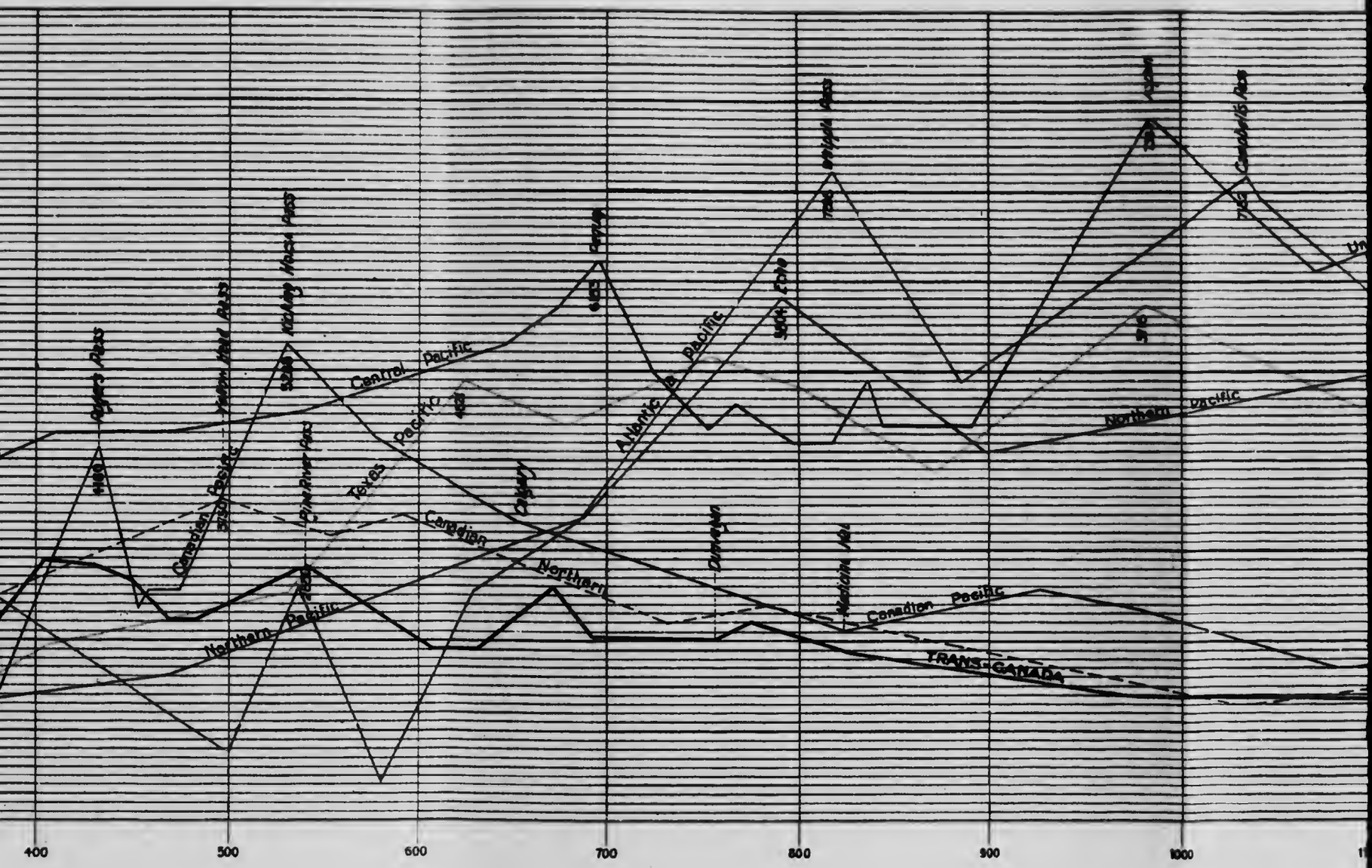
sloping ground,
From this
through which
is sufficiently we
1. That no
construction, exi
2. That the
3. That the
so level.

Quebec, 2

PACIFIC COAST TERMINI.

		Line shown thus
Port Simpson	Trans-Canada Ry.	———
Bute Inlet	Canadian Northern Ry.	— — —
Vancouver	Canadian Pacific Ry.	———
Astoria	Northern Pacific Rd.	———
San Francisco	U. & C. Pacific Rd.	———
do	Atlantic & Pacific Rd.	———
San Diego	Texas Pacific Rd.	———




Central Pacific
Texas Pacific
Atlantic & Pacific
Canadian Pacific
Northern Pacific
TRANS-CANADA
400
500
600
700
800
900
1000

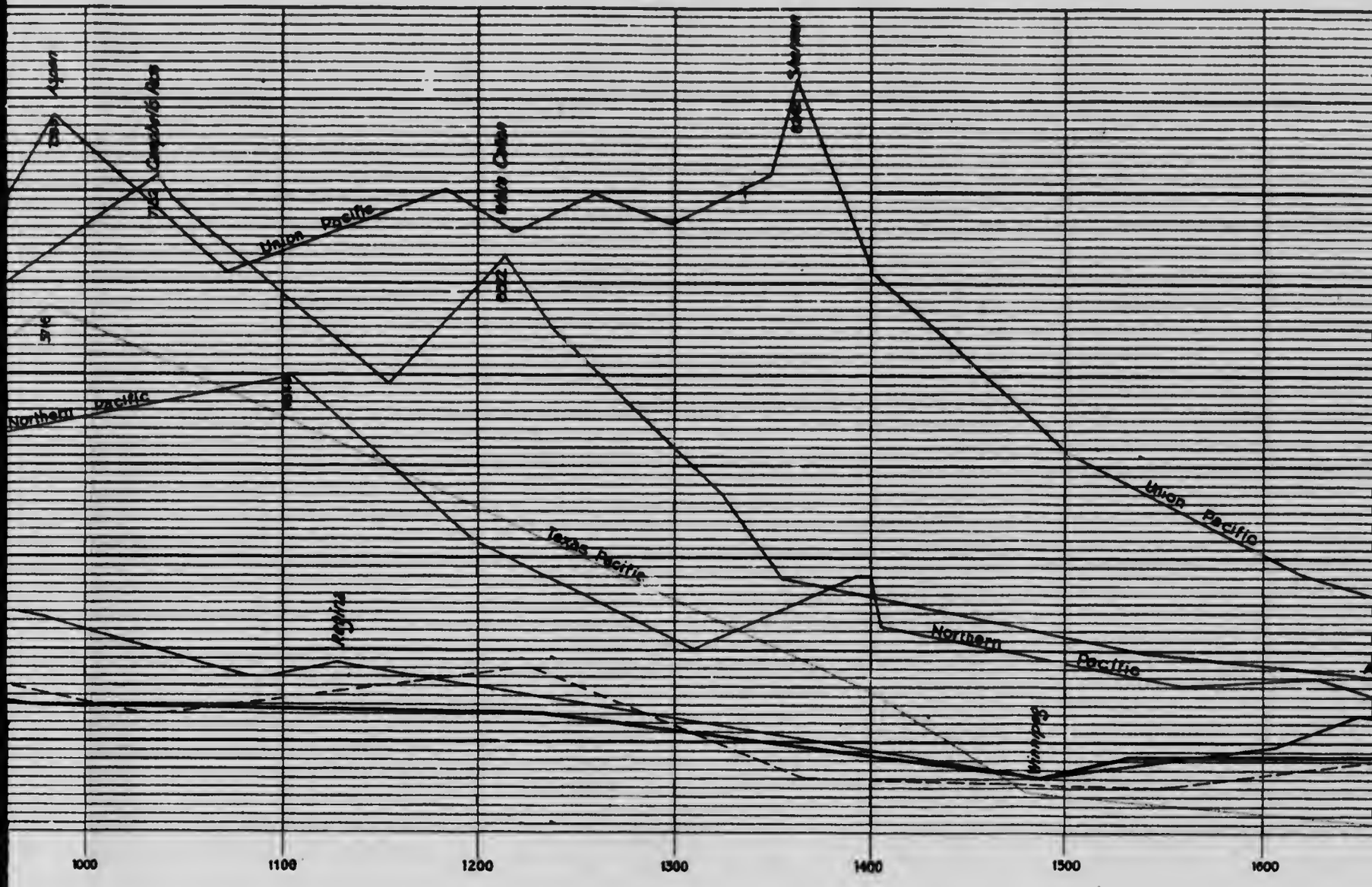

Union Pacific
Northern Pacific
Texas Pacific
Union Pacific
Northern Pacific
1000
1100
1200
1300
1400
1500
1600

DIAGRAM OF PROFILES

COMPARING THE

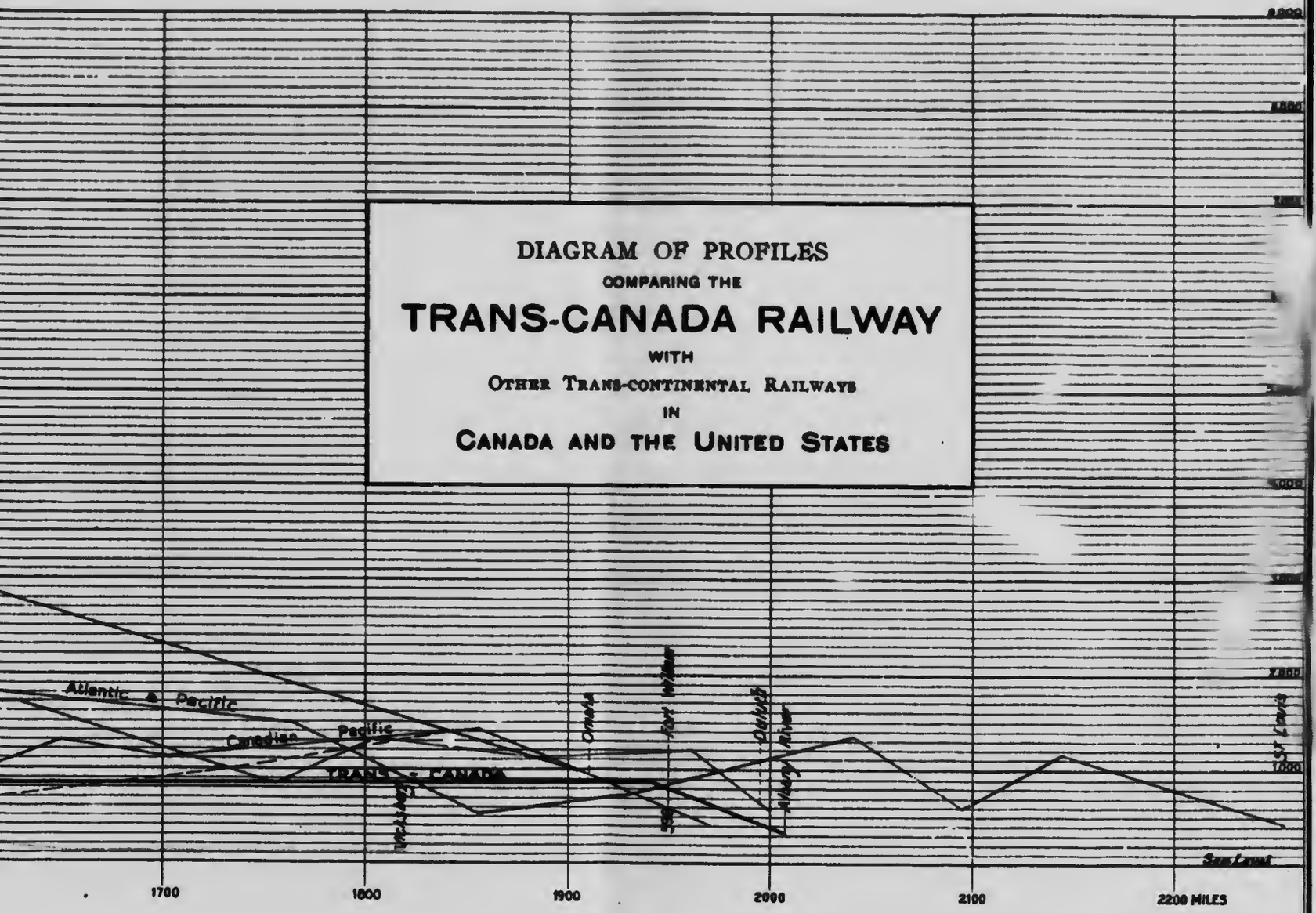
TRANS-CANADA RAILWAY

WITH

OTHER TRANS-CONTINENTAL RAILWAYS

IN

CANADA AND THE UNITED STATES



OFFICE OF THE CHIEF ENGINEER

ƮRANS-CANADA RAILWAY.

TABLE OF COMPARATIVE DISTANCES.

		Lineal Miles
TRANS-CANADA (projected) :—		
Quebec to North end of Lake Winnipeg	1,400	
Lake Winnipeg to Port Simpson	1,430	
Total Quebec to Port Simpson	——	2,830
Chicoutimi to Port Simpson		2,700

Quebec to City of Winnipeg, viâ Canadian Pacific		1,572

Quebec to City of Winnipeg, viâ Trans-Canada and projected Branch ...	1,400	
Winnipeg to Rugby Junction on the Great Northern Railway of the United States (projected)	180	
Rugby Junction to Seattle	1,355	
Total Quebec to Seattle, viâ Trans-Canada	——	2,935

Quebec to Boston	394
Quebec to Portland, Mai .e, viâ Grand Trunk Railway	316
Halifa Quebec (It colonial Railway)	675
Halifax to Port Simpson, viâ Trans-Canada	3,505
Halifax to Vancouver, viâ Canadian Pacific	3,753
Quebec to Vancouver, viâ Canadian Pacific	3,078
Montreal to Vancouver, viâ Canadian Pacific	2,905

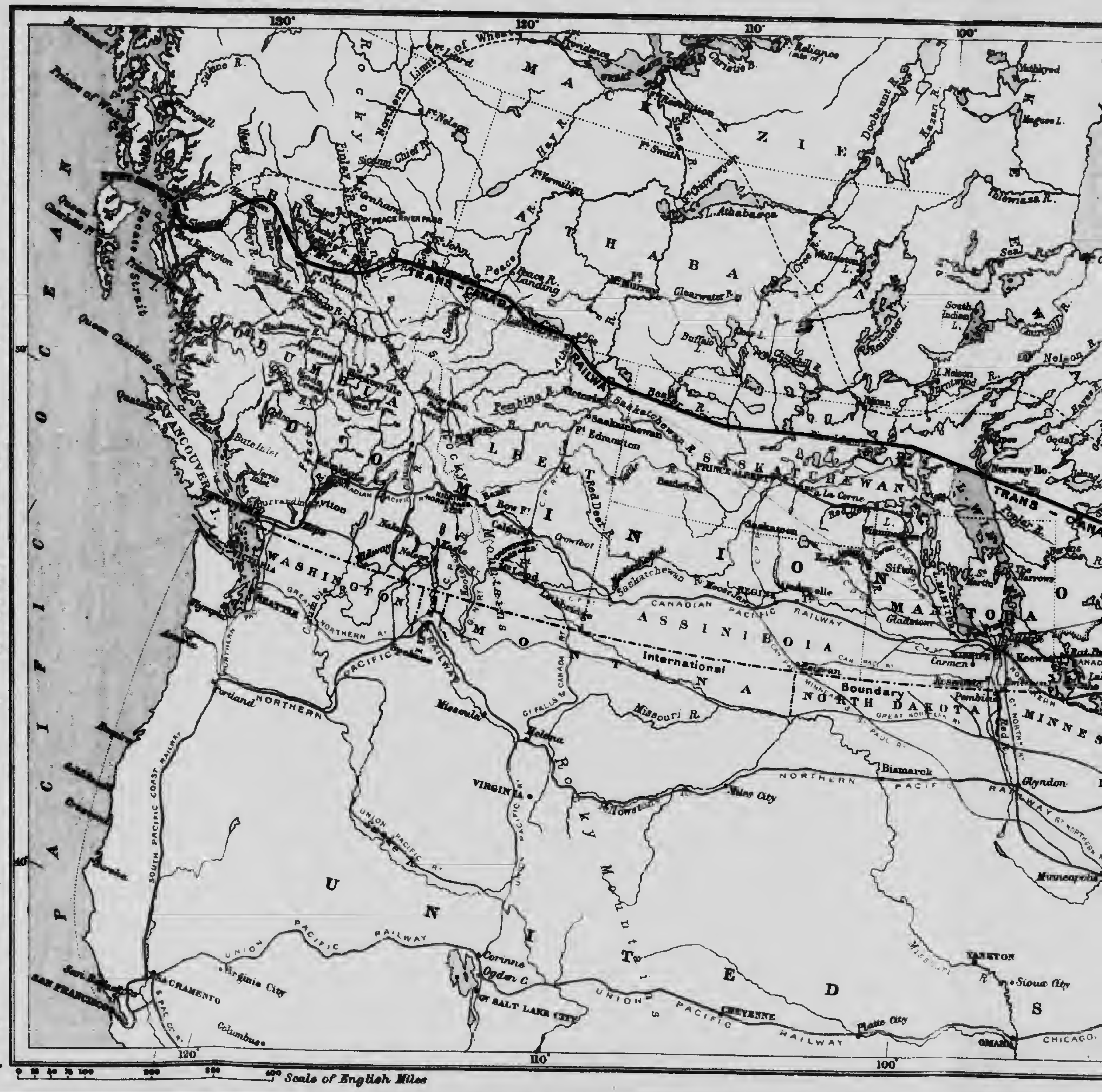
Montreal to Port Simpson, viâ Trans-Canada and projected Branch	2,900
Montreal to City of Winnipeg, viâ Canadian Pacific	1,399
New York to City of Winnipeg, viâ Chicago	1,779
New York to Seattle, viâ Northern Pacific	3,254
New York to Seattle, viâ Great Northern	3,146
New York to San Francisco, viâ Chicago	3,349
New York to San Francisco, viâ Kansas City	3,467
New York to Port Simpson, viâ Trans-Canada	3,327
Winnipeg to St. Paul	482

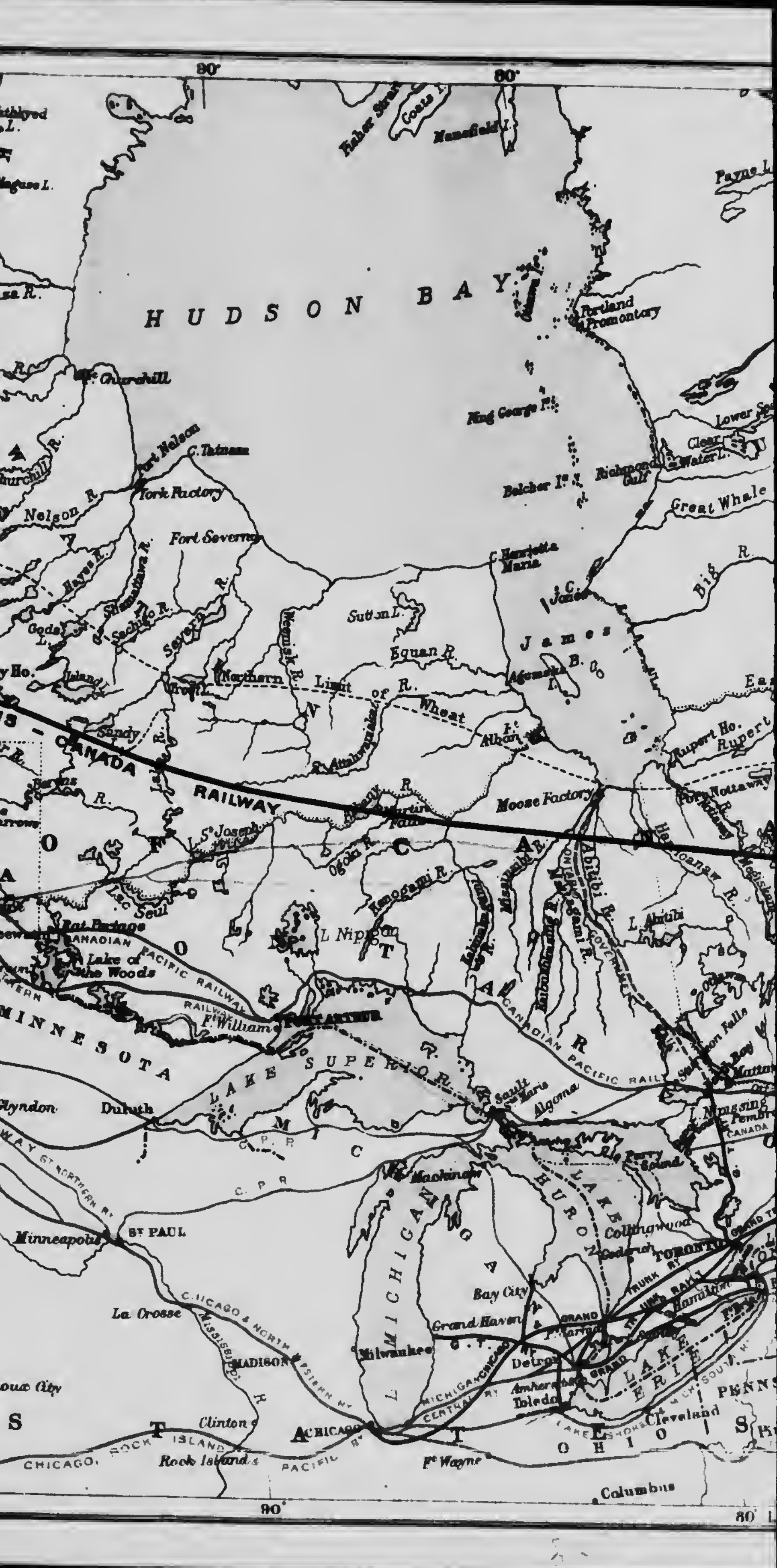
	Yokohama	Shanghai	Hong Kong	
Port Simpson to	3,810 ...	4,830 ...	5,400	Sea miles
Vancouver ,, ...	4,240 ...	5,260 ...	5,940	,,
San Francisco ,, ...	4,530 ...	5,640 ...	6,180	,,

Quebec to Plymouth	2.620	,,
Halifax to Plymouth	2.430	,,
New York to Plymouth	2.990	,,
New York to Halifax	580	,,

PACIFIC RAILWAYS.

Name.	From	To	Distance.	Point of maximum elevation.	Max. elevation.
Trans-Canada	Quebec ...	Port Simpson ...	2830	Pine River Pass	2800
Canadian Pacific ...	Montreal ...	Vancouver ...	2904·8	Stephen ...	5288
Great Northern ...	St. Paul ...	Everett... ...	1782·5	Summit ...	5202
Northern Pacific ...	St. Paul ...	Tacoma ...	1909·0	Blossburg ...	5550
Northern Pacific ...	Chicago ...	Tacoma ...	2370·6	Blossburg ...	5550
Union Pacific & Oregon Ry. & Nav. Co. ...	Omaha ...	Portland ...	1821·6	Sherman ...	8247
Union Pacific & Central Pacific...	Omaha ...	San Francisco...	1905·0	Summit ...	7017
Atch. Topeka and Santa Fé ...	Chicago ...	National City...	2394·0	Raton	7623
Southern Pacific ...	New Orleans	San Francisco...	2496·0	Paisano ...	5062
Denver and Rio Grande	Denver ...	Grand Junction	455·9	Near Leadville	10433
Southern Pacific ...	San Francisco	Portland ...	771·0	Siskiyou ...	4125




HUDSON BAY
TRANS - CANADA RAILWAY
LAKE SUPERIOR
MINNESOTA
L. MICHIGAN
LAKE HURON
LAKE ERIE
CANADIAN PACIFIC RAILWAY
Moose Factory
Minneapolis
St. Paul
Duluth
Chicago
Toronto
Columbus
90°
80°


HUDSON BAY
James B.
Ungava B.
LABRADOR
NEWFOUNDLAND
Gulf of St. Lawrence
Anticosti I.
Cabot Strait
NEW BRUNSWICK
NOVA SCOTIA
MAINE
VERMONT
NEW YORK
PENNSYLVANIA
OHIO
LAKE ONTARIO
LAKE ERIE
ATLANTIC OCEAN
Quebec to Liverpool 2661 Nautical Miles
St. John's, Newfoundland to Liverpool 1952 Nautical Miles
Halifax to Liverpool 2942 Nautical Miles via Moville
Portland to Liverpool 2770 Nautical Miles
New York to Queenstown 2796 Nautical Miles to Liverpool 3130
80° Longitude West of Greenwich
70°
MAP SHOWING THE PROJECTED
TRANS-CANADA RAILWAY
1903
G.E.C.
Stanford's Geog! Estab! London