

BRITISH COLUMBIA FINANCIAL TIMES

A Journal of Finance, Commerce, Insurance, Real Estate, Timber and Mining

Vol. II. No. 12—Supplement.

VANCOUVER, JUNE 19, 1915

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**BRITISH COLUMBIA
CANADA
PRODUCTION
IN
1914**

Agriculture	- -	\$27,423,612
Fisheries	- - -	15,000,000
Minerals (est.)	- -	26,189,020
Timber	- - - -	28,680,868
Total	-	\$97,293,500

BRITISH COLUMBIA
IS
CANADA'S LARGEST PROVINCE
CANADA'S FURTHEST WEST PROVINCE
and
CANADA'S GREATEST PROVINCE
in the number and extent of its Natural Resources, and in the variety and beauty of its Natural Scenery.

Special Issue for The American Bankers Association

BRITISH COLUMBIA FINANCIAL TIMES

A Journal of Finance, Commerce, Insurance, Real
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ON THE PACIFIC GREAT EASTERN TO THE NORTH.

To the Members of The American Bankers' Association.
Gentlemen:—

This special supplement of the British Columbia Financial Times is published and forwarded to you as a special invitation to visit the Province of British Columbia on the occasion of your trip to the Pacific Coast to attend your annual convention to be held at Seattle the week of September 6th to 10th, 1915.

The following articles, written and presented for your information, are intended to create a desire in you to visit this Province and see something of its huge undeveloped resources, the progress it has already attained, and its crying need for development in the fields of mining, lumbering,

The services of this journal are offered through an inquiry column, which is open to subscribers and the public generally without charge, for detailed information or opinion as to financial or industrial affairs or institutions throughout the Province of British Columbia. Wherever possible the replies to these inquiries will be made through this column. Where inquiries are not of general interest, they will be handled by letter. We think that we can assure our readers that the opinions expressed will be sane and conservative, and that all statements will be as accurate as possible.

agriculture, fishing, and industry; and also the necessity for an agricultural immigration.

Not the least of its assets are the mild all-year-around climate along the Coast and Vancouver Island, and the rugged and majestic mountain scenery among the Canadian Rockies, and other prominent ranges of mountains in this Province. A trip through British Columbia over the Southern route by way of the Canadian Pacific Railway, or over the Central route by way of the Grand Trunk Pacific Railway, or over the North and South route by way of the Pacific Great Eastern Railway, will add much to the enjoyment and profit of the traveller. A trip up the Coast, to Prince Rupert, and the Granby mining property at Anyox, or to Skagway, Alaska, is equally delightful.

Our principal cities, except for strategic location and charm of their environment, are not dissimilar to those south of the International Boundary Line. We also have grown too fast in urban population. We also need the man on the land to farm intelligently. The vast and varied natural resources of this Province, glimpses of which we present, need capital and labor to open them up to the markets of the world. The careful and intelligent application of both will return many fold the outlay to the individuals or companies that undertake this work. The opportunity for basic and by-product industry is capable of indefinite expansion and development.

A visit to British Columbia will make manifest the future that is in store. We invite you to come and see.

The Province of British Columbia will welcome you; the bank managers of both Victoria, our Capital City, and Vancouver, our Mainland Metropolis, will welcome you, as well as a large number of our representative business men and institutions throughout the Province.

In case there may be any misgivings about travelling in Canada and British Columbia during these troubled times, we beg to point out that conditions are as orderly and practically as free as in the most undisturbed districts in the United States.

Although Canada is fighting loyally by the side of the Mother Country, the visitor would little know, except for the picturesqueness of the soldier in our landscape, that Canada is taking part in a great war.

THE EDITOR.

N.B.—Any banker visiting British Columbia, and wishing information, will be welcome to call on the Editor at his office, or he will be pleased at any and all times to answer communications asking for information or opinion.

The Mineral Wealth of British Columbia

R. W. BROCK,

Formerly Deputy Minister of Mines, Ottawa, Now Dean of College of Applied Science and Professor of Geology, University of British Columbia.

History, Production, Future and Opportunities for Prospecting and Development of Mining in the Province of British Columbia.

Like most other states of the Western Cordillera, the Province of British Columbia owes its existence to mineral discoveries. Mining has been, is, and for a long time is likely to be, its principal industry.

The Cordilleras are unique for the continuity, extent and variety of their mineral resources. In South America, Mexico and the Western States, this belt is recognized as one of the greatest mining regions of the world, particularly noted for the stores of gold, silver, copper and lead imbedded in its rugged mountains. In Canada and Alaska this belt, though for the greater part still unprospected, well maintains its reputation, and gives promise of adding as largely to the world's wealth as its developed portions in the older countries; 382,000 square miles of this region lie within the Province of British Columbia.

In southern British Columbia the various ranges that go to make up the Cordilleras are compressed, so that except for the relatively narrow interior plateau between the Coast Range and the Gold Range, the country is rugged and most of it alpine. Going northward, the ranges open out, and extensive plateaux are found between the mountain masses.

The geological history of the region has been complicated in the extreme. Various formations from pre-Cambrian to recent are widely displayed. Volcanism and mountain building have also been extensive at successive periods, from earliest to recent, furnishing the conditions favorable for mineralization.

The first discovery of mineral in British Columbia appears to have been that of lead on Kootenay Lake, made by David Douglas, a botanist. This was utilized by the Hudson's Bay Company for bullets. In 1835 the Hudson's Bay Company discovered coal on Vancouver Island, and in 1852 began working the rich Nanaimo field. In 1850 gold was found on Vancouver Island, and in 1851 on Queen Charlotte Island. But it was not until 1858, following placer gold discoveries on the Fraser River, that the "rush" commenced, and British Columbia began her career as a mining country, and, incidentally, her political existence.

In ten years, \$33,000,000.00 of placer gold had been produced, and the Cariboo district had secured its place among the great placer regions of the world. Other names which, through the pick and shovel, became household words beyond the Province, are Wild Horse, Big Bend, Telegraph Creek and Atlin.

To date, the gravels of the Province have yielded over \$73,000,000.00 in gold, mostly from individual mining.

Lode mining was naturally much later in development. Its birth followed the construction of the Canadian Pacific Railway and railways in the State of Washington, which gave access to the southern interior of the Province. In 1886, rich silver lead was accidentally discovered on Toad Mountain, behind the present city of Nelson, on Kootenay Lake. As a result of the prospecting subsequent upon this, discovery after discovery was recorded, and the mining districts of Ainsworth, Slocan, Rossland, etc., came into being. Production, however, had to wait upon transportation, and this in turn upon development of the prospects, so that it was not until 1893 that lode mining may be said to have commenced. Since that date the production has been note-

worthy, about \$240,000,000.00 having been won. Of greater importance than the wealth produced is the way in which mining has opened up these districts to agriculture, husbandry, lumbering and other arts and industries.

The influence of mining in building up industrial centres has not been confined to the towns that have sprung up in the mining centres, but Spokane, Wash., and Coast cities owe not a little of their growth and prosperity to the wealth produced and the business created by the mines of British Columbia.

Coal mining has kept pace with and has been regulated by the general industrial development of the Province. From its small beginning in 1851, it had grown to an annual production of 100,000 tons in 1875, and has gradually increased to an annual output of between two and three million tons. The total value of the coal and coke production is about \$150,000,000.00.

The total mineral production to date, and the production for 1913, the last year for which exact figures are available, show the nature and extent of the mining industry in its present state of development.

	Total to end of 1914.	Production for 1913.
Placer gold	\$ 73,228,603.00	\$ 510,000.00
Lode gold	81,590,638.00	5,627,490.00
Silver	37,601,212.00	1,968,606.00
Lead	31,531,451.00	2,175,832.00
Copper	86,663,961.00	7,094,489.00
Zinc and other metals	2,162,112.00	324,421.00
Coal and coke	149,870,779.00	9,197,460.00
Building stones, brick, cement, etc.	23,974,184.00	3,398,100.00
Total	\$486,622,940.00	\$30,296,398.00

The annual mineral production runs about \$80.00 for each man, woman and child in the Province, or about three times the per capita production of Ontario, nearly twice that of California, and greater than that of the mining states of Colorado and Idaho. Undeveloped as the Province still is, the present annual production would place it up in the first division of mining states in the American Union.

Individual districts that have been producing for some years have shown ore to be present in quantity, for instance: Rossland, which probably has more ore in sight than hitherto, has produced over \$62,000,000.00 in gold and copper; Boundary district has produced nearly \$70,000,000.00, largely in copper; the Slocan has produced over \$31,000,000.00, and East Kootenay about \$21,000,000.00 in silver lead.

The present production of placer gold is largely from hydraulicing in the Atlin and Cariboo districts, but some comes from the Stikine and Laird, Quesnel and Omineca. There is also some activity in southern British Columbia, particularly in the Similkameen. Lode gold comes principally from the gold-copper ores of the Rossland mines, the copper and gold ores of the Boundary Creek district, gold ores of Sheep Creek and other camps of the Nelson district, gold ores of Hedley, Similkameen district, the copper ores of the Coast district, gold ores of Lillooet district and gold ores of Atlin.

The bulk of the silver is won from the silver-lead ores of the Slocan, Ainsworth, Nelson, Trout Lake and East Kootenay districts, but considerable amounts are secured

from the gold-copper ores of the Rossland camp, the copper ores of the Coast and Boundary districts. Now that the Grand Trunk Pacific is in operation, silver-lead ores of the Skeena are beginning to be marketed.

Lead and zinc are produced with silver from the above-mentioned silver-lead ores.

The large copper output is the product of the Boundary district mines, the Coast mines on Howe Sound, Observatory Inlet and Texada Island, although some comes from the gold ores of Rossland, and a little from the Nelson district.

The Vancouver Island collieries are the heaviest coal producers, but are closely followed by those of the Crow's Nest Pass, to which is to be credited the coke production. Some coal is also mined in the southern interior of the Province, in the Nicola and Similkameen districts.

Structural materials include Portland cement (manufactured on Vancouver Island, near Victoria), building stones, lime, brick, fire-brick, pipe, tile, etc., marble and similar materials whose production is conditioned upon and has expanded with the general development of the Province.

The Trail smelter of the Consolidated Mining and Smelting Company treats practically all of the gold, copper, silver and lead ores mined in the Kootenays, the value of metals produced annually being over \$6,000,000.00. The refinery in connection with the smelter turns out gold, silver and lead, 995,999 and 999 points fine, respectively.

The Granby Company's smelter at Grand Forks is said to be the largest copper reduction works in the British Empire and among the biggest in the world. It has a treatment capacity of 4,000 to 4,500 tons per diem, reducing the product to blister copper.

The British Columbia Copper Company's smelter at Greenwood has a capacity of 2,600 tons per diem.

The Granby Company is enlarging its smelter at Anyox, Observatory Inlet, to 4,000 tons per diem.

The Tyee Copper, Company, Limited, has a smelter at Ladysmith.

A few British Columbia ores go to Tacoma for treatment, and the zinc ores have still to be exported, though it seems probable that the zinc production will soon warrant a local zinc plant.

More interesting than past production or present development are the latent possibilities of the mineral industry in the Province. Large areas of British Columbia have still to be explored. Probably not one-fifth of the Province has been prospected at all; not one-twentieth prospected in detail, and not a section, however small, completely tested. Drift and vegetation conceal the outcrops in many places, so that discoveries will continue, even in the developed camps.

There are sound grounds for believing that British Columbia is mineralized throughout. The whole Cordillera belt from Alaska to Mexico forms a single great geological province. The nature and mode of occurrence of the minerals are in general similar throughout. Its great wealth of mineral has been demonstrated in Mexico, the Western States, and, where prospected, in Alaska and British Columbia as well.

Vegetation and difficulties in transportation have prevented a more rapid discovery and development in Alaska and British Columbia, but these difficulties are being gradually overcome. They have preserved for the present and succeeding generations, opportunities for mineral discovery and mining in the last great west.

Colors of gold may be found in practically all streams west of the Rocky Mountain Range, from one end of the Province to the other. Some areas have proved to be exceedingly profitable, even when worked by hand. It is extremely probable that other placer fields suited to individual mining will be found.

The present production is largely from large scale hydraulic operations. The new railways in the central interior of the Province will stimulate such operations. It seems probable that at many points dredging might be suc-

cessful if the ground is carefully selected and the local conditions receive proper consideration in designing the dredge.

Lode ores occur in all the ranges west of the Rocky Range proper. In the interior plateau some areas of Cretaceous and Tertiary rocks (often coal-bearing) occur, that are not metal bearing, but the older rocks, when exposed, are worthy of prospecting. At various points, great masses of intrusive rocks are found, near whose contacts mineral is apt to occur. The greatest of these is the Coast Range batholith that extends throughout the whole length of the Province. While in places on the Coast side of this batholith the older rocks now exposed were too deeply buried at the time of intrusion to be mineralized, in general it may be said that these invaded older rocks should be prospected. Recent work on the Britannia Mine on Howe Sound has warranted preparation for an output of 2,000 tons per day. Little prospecting has been done along the eastern edge of the batholith, on account of its inaccessibility, but near the head of Observatory Inlet, which dissects the batholith, the Granby Mine will soon be producing 4,000 tons per day. These results will arouse increased interest in mining on the Coast, which so far has received very little attention.

The railways just completed or now under construction afford new opportunities for prospecting and developing in the Interior.

Even in the more or less developed districts in the southern interior there are opportunities, as instanced by the success of the recently developed Standard Mine in the Slocan, which, during the past three years, has averaged over \$500,000 annually in dividends.

The mineral wealth of the Cordilleras is not confined to gold, silver, lead, zinc and copper. Most of the minerals useful in the arts are known to occur.

In a number of places, conditions are favorable for the occurrence of tin, and at several points it has been recognized. Some mercury ore has been produced in the Kamloops district and it has been reported from several other points.

Molybdenite is likely to be found in commercial quantity and possibly some of the wolfram ores.

Platinum has been produced from the Similkameen placers and has been found in place at several points.

Mica occurs at Tete Jaune Cache, and now that transportation is available, is likely to receive some development.

Iron has been found in considerable quantity at the Coast, and there is no question but that when there is a demand for such ores a supply can be found.

Indications of oil are found in the Flathead Valley and on Queen Charlotte Islands, and possibly may be met with in the central and northern interior.

Clays suitable for fire-brick, pipe, tile and pottery are being utilized.

Materials suitable for lime and Portland cement are not uncommon.

Of no present commercial significance but of interest are occurrences of microscopic diamonds at several points.

The extent to which natural raw materials may be developed and utilized, the number and magnitude of the industries that may be created, and consequently the density of population that can be supported, depend upon the availability of power. All the centres of population and industry of the world are found to be grouped at, or convenient to, the coal fields. In the future, as in the past, coal will be the determining factor in the location of these centres. It is true that water power can to a certain extent replace coal and that oil is at present able to compete with it at certain points, but oil is limited in quantity and can last only a comparatively short time. Long before it is exhausted, it will be conserved for uses for which there is no good substitute. Furthermore, improvements in the methods of using coal, whereby there will be saved and utilized the large store of energy lost under present processes, will enable coal to at least hold its own with other sources of power.

COAL RESOURCES OF BRITISH COLUMBIA.

GROUP ONE

Including seams of one foot or over to a depth of 4,000 feet:

District	Actual Reserve		
	Area Sq. Miles	Class of Coal	Metric Tons
Southern Interior	230	B2	22,586,342,000
Central Interior			
Northern Interior			
Vancouver Island	185	B2	1,060,000,000
		B3	118,000,000
Queen Charlotte Islands..	22	A2	6,900,000
		B2	
	2	D2	60,000,000
Totals	439		23,831,242,000

District	Probable Reserve		
	Area Sq. Miles	Class of Coal	Metric Tons
Southern Interior	216	B2	32,491,000,000
		B3	296,000,000
		C	1,800,000,000
		D	286,000,000
Central Interior	25¾	B	34,700,000
		B2	432,000,000
		B3	20,000,000
Northern Interior	5,114	A2	1,200,000,000
		B2	1,550,000,000
		B3	1,600,000,000
		D	3,850,000,000
Vancouver Island	645	B2	4,807,000,000
		B3	384,000,000
Queen Charlotte Islands	59	A2	293,000,000
		B2	
	136	D2	1,000,000,000
Total	6,195¾		50,043,700,000
			23,831,242,000

Total Coal, Group 1 73,874,942,000
 Total Coal, Group 2 2,160,000,000

Total for British Columbia to 6,000 ft. 76,034,942,000

A great deal of the central and eastern belts have not been prospected as yet, and it is unquestionable that further prospecting will greatly increase the present known reserves.

The prospective mineral resources of British Columbia may, therefore, be considered enormous. Though mostly unprospected, the Cordilleras in Canada have already been proved to contain several of the really great copper mines, several of the great silver-lead mines, several of the great gold mines, several of the greatest placer camps and the greatest coal fields, in Western America, a region noted for its extraordinary mineral wealth.

British Columbia is well supplied with water power. Its coal supply, in quality, quantity and distribution, makes possible not only a full and complete development of the mineral resources but also of all other industries.

Coal occurs in three belts: In the eastern portion of the Province, along the Rocky Mountains proper, either within British Columbia, or in Alberta, immediately adjoining, or in both Provinces; in the central portion of the Province in the interior plateaux; and in the western, along the Coast. On the eastern slope of the Rockies, coal will probably be found to be almost, if not quite continuous, from the International Boundary to the northern boundary of the Province; the central belt is known to be coal-bearing at intervals, throughout the length of the Province, and exploration will tend to reduce these intervals; the Coast belt has workable coal at a number of points on Vancouver Island and on Queen Charlotte Island. There is, therefore, no place in the Province that is far distant from a possible coal field.

The coals vary from anthracite to lignite, anthracite having been found in all three belts; lignite occurs in the central but the bulk of the coal in all three is bituminous, coking and steam. The grade is first class, in fact, except for some Alaskan coals, there is nothing in the west to compare with them. Coal is being mined in all three belts but only in the extreme south of the Province.

The following table from the "Coal Resources of the World," published by the International Geological Congress in 1913, gives the tonnages of the various coals in the areas in British Columbia that have been explored.

In the table the coals are divided into classes as follows:

CLASS		Volatile Combustible Matter %	Carbon %	Fuel Ratio*	REMARKS
A	1	3 to 5	93 to 95	12 or over	
	2	7 to 12	90 to 93	7 to 12	
B	1	12 to 15	80 to 90	4 to 7	
	2	12 to 26	75 to 90	1.2 to 7	Generally cokes
	3	Up to 35	70 to 80		Porous tender coke.
C		30 to 40			
D	1		60 to 75		Disintegrates on drying. Moisture over 6 p. c. and up to 20 p. c. Streak brown or yellow.
	2		45 to 65		Same, but moisture over 20 p. c.

*Fuel Ratio = $\frac{\text{Fixed Carbon}}{\text{Volatile Combustible Matter}}$

Timber Resources and Lumber Industry in B. C.

HON. W. R. ROSS,

Minister of Lands, British Columbia.

(An Interview.)

Four Hundred Billion Feet in This Province — Varieties of Lumber Timber — Timber Tenure — Fixing of Rentals and Sliding Scale on Royalty — Lack of Deep Sea Transportation Being Attacked With Energy.

"I would willingly have contributed a short article for your special issue," said Mr. Ross, when I succeeded in in-

terviewing him at the Government Buildings last week, "but there are a good many claims upon my time, and the campaign on behalf of the lumber industry that we are now pushing has added to them considerably, as you can easily recognize. It is most encouraging work, however. I would ask for none better."

"If not an article, may I ask you to give me a verbal

outline of your views concerning the timber problems of this Province? Many bankers attending the conference at Seattle would be interested by a plain-spoken statement concerning our timber resources, their present development, and the prospects ahead."

"Such a simple matter to dispose of in a ten minute interview," said the Minister of Lands, smiling pleasantly. Here follows as much as I can remember of the analysis of the timber situation, clearly and succinctly given me.

"What bankers want to know," began Mr. Ross, "are facts, not fancies. Take the first point—the extent of British Columbia's forests. Many vague estimates have been put forward in past years. Because we need reliable information in order to manage our forests intelligently, I began a forestry survey in 1912. As you will see from that map on the wall behind you, a very considerable area has already been covered by the cruisers engaged in this survey. The figures obtained give us something definite to go upon. Besides the eight and one-third million acres under timber license, a million acres under old timber leases, a million acres of deeded timber land, three-quarters of a million acres held under railway grants—besides these alienations we find that the Crown timber reserve, created in 1907, is very considerable. For instance, in entering the results of various forest surveys on the maps last year, there were one million acres of reserve timber land dealt with, apart from very large areas containing lesser stands of timber and pulpwood. Hence the estimate of three hundred and fifty billion feet of merchantable timber now awaiting cutting in the Province, is being called into question, as it becomes more and more probable that the effective total will reach four hundred billion."

"How about species, Mr. Ross?"

"Take the Coast forests—say, a solid third is Douglas fir, which, taken all around, is the finest soft wood in the world; over one-fifth is cedar—British Columbia is pre-eminently the cedar region of America, thanks to the Coast rainfall. Then think of our immense stand of western hemlock. The world is now beginning to realize what western hemlock is. Our pulp and paper mills have done great things with it already, but the big uses of this wood are only just beginning. Western hemlock is destined to take the place of eastern pine for very many purposes, and at no distant date. Then take our fine Interior forests. Seven thousand out of 13,600 square miles of timber licenses are east of the Cascade Mountains, so you see our Interior country is pretty strongly represented in the timber asset."

"The Bankers' Association naturally takes a particular interest in the question of tenure," I observed. "Would you mind running over the main features of the various tenures?"

"Crown grant timber, of course, is just deeded timber—there is nothing to explain about that," Mr. Ross replied. "Then the old leases are simple enough—rentals of 10 or 15c per acre per annum, and a royalty on cut logs of 50c, are the terms in most cases up to the years 1921 to 1925, during which period the bulk of these leases will come up for renewal for 21 years ahead, obtaining whatever rates of rental and royalty as are then provided by statute. The timber license tenure is rather more complicated, however."

"I think it is somewhat imperfectly understood outside the Province, except among those who are directly concerned, Mr. Ross."

"The original problem was extremely complicated," said the Minister reflectively. "In fact, some of the hardest thinking I have been called upon to do in the whole course of my official experience was called for by the knotted complexities of license tenure. But we've straightened all that out now, thank goodness, and I believe that I may claim that the result is a thoroughly sound piece of constructive legislation. It was this way: An immense timber resource was idle and unproductive, contributing next to nothing to the development of the Province. We needed revenue, but we were firmly determined not to sacrifice one jot or tittle

of the people's heritage. So we permitted the staking of timber lands—anyone could stake cutting rights over a square mile of timber by paying \$140 a year rental and paying a certain stumpage (we call it royalty) on such logs as he might actually cut. That was a good proposition for the lumbermen who wanted timber for a mill and did not want to sink capital in buying stumpage ahead. But there were strings on this concession—in the public interest. Neither the annual rental (which is a sort of interest charge) nor the royalty on cut logs was fixed. They could be changed at any time to meet any rise in timber values that might occur. So the public was well protected. On the other hand, it was left to the changing opinion of successive legislatures (ours are elected every four years) to decide what rental or royalty should be charged. That uncertainty gave British Columbia timber licenses a weak standing as securities, and made the financing of the lumber business difficult in consequence.

"For a time no solution of this problem could be found. In the end, with the co-operation of the parties effected, a basic principle was worked out, and then we passed the Timber Royalty Act of 1914. That gave security of tenure to the licensee—fixed a rental of 45 years ahead, and a royalty on a sliding scale. If the average wholesale selling price of lumber throughout the Province goes up above a certain figure, the royalty goes up. If it goes below that figure, there is a definite royalty change to correspond. The people of this Province and the lumbering industry are, therefore, partners in the timber. The terms of the partnership are strictly defined. There is no more room for uncertainty, as is the case with timber or timber lands in the Western States, for example, where taxation may increase several hundred per cent. in a few short years. The timber license of British Columbia is henceforth an absolute safe security."

"With regard to the development of the lumber business, Mr. Ross—what have you to say concerning that?"

"Just a matter of transportation. You know my views; I have been making a series of speeches on the matter recently. The Province has developed a fine system of railway transportation inland; so far we have not done the same seawards. There has been chronic congestion at the Coast, a lack of sea-going tonnage that has been stifling our export lumber trade. Remove that and the rest follows—expansion in the lumbering business, foreign markets, activity in every form of commerce."

"The older established American brokerage firms and the shipping organizations that deal in lumber as well as carrying it from the Western States have controlled tonnage?"

"Yes," said Mr. Ross, smiling amiably. "They have been doing so—have been—but perhaps you noticed that order for ten million feet of lumber for the British Admiralty that we secured recently. We obtained shipping for that. Our mills will be no longer forced to bid on British Government orders through San Francisco. My department here will handle such matters—this British Dominion will supply the British Government direct. And then we have plans in hand which will do away, once and for all, with this inability of our export mills to get shipping. The Americans have no kick coming—there is plenty of room for us all in the world's markets. Only I make it plain that British Columbia must have her share, absolutely!"

"A few figures to show the present stage of the lumbering industry in the Province?" I said, feeling that my interview was drawing to its close.

"A mill capacity of two and a half billion feet—we shall soon increase that when we have ocean transportation to take up the business offerings from all over the world that we are obliged to turn down today. An actual output, in these hard war times, valued at twenty-nine million dollars; a thousand million shingles shipped to market in the year; the new pulp and paper industry producing three million dollars a year already; some of the largest plants in the world for saw and paper, mills—these are a few points that

show our lumbermen's activity. Let us once secure ocean transportation, and, make no mistake, there will be doings in the lumbering business, and a rise in the value of British Columbia stumpage. And this Government is running an advertising campaign directed at the Prairie, Eastern and

foreign consumer of lumber that is going to make an appreciable difference to the demand for our forest products. We are out to do our level best to secure prosperity through a prosperous lumbering industry based on a wealth of timber resources."

Agricultural Conditions in British Columbia

WILLIAM E. SCOTT,

Deputy Minister of Agriculture, British Columbia.

A Farming Survey of the Province With Statement of Conditions of Markets, Transportation, Etc. — Imports of \$25,000,000 of Foodstuffs Show Necessity of and Opportunities for Agricultural Development.

British Columbia has an area of approximately 252,000,000 acres, with a wide variation in climatic conditions in different districts.

For the sake of convenience, the Province may be classified under five different headings, the climatic conditions in each having their bearings on the phase of agriculture for which it is particularly suited.

(1) VANCOUVER ISLAND AND ADJACENT GULF ISLANDS.

This section enjoys a mild and equable climate the year round, extremes of temperature being the exception.

The average rainfall for the southern part of Vancouver Island is approximately 40 inches. The spring, summer and autumn seasons are fine with plenty of sunshine. The greater part of the annual rainfall occurs during the winter months.

This district, for the most part, is covered with a growth of timber varying in density and composed principally of red cedar, Douglas fir and spruce. The land, when cleared, is highly productive. The district is pre-eminently adapted to mixed farming purposes, poultry raising, dairying, hog raising, sheep raising, and also to the growing of vegetables, tree fruits and small fruits.

The cost of clearing timber lands is the chief obstacle to rapid settlement. The cost may be estimated to range anywhere from \$50 to \$250 per acre.

Probably no part of the American continent is better adapted to poultry raising and the growing of vegetables and small fruits. Clovers, fodder plants and roots grow luxuriantly; hay and grain also yield heavy crops.

(2) LOWER MAINLAND, COMPRISING THE DELTA AND THE FRASER RIVER.

The climate of this district, like Vancouver Island, is mild and equable. The rainfall, however, is considerably heavier, averaging about sixty inches. As in District No. 1, the greater part of the rainfall in this section occurs during the winter months.

The soil is very rich alluvial soil and is highly productive. Very heavy growths of grain, grasses, fodder plants, roots, etc., are produced thereon. Pasturage is luxuriant, thus affording ideal conditions for the most profitable and economic raising of stock. It is par excellence a dairying district.

The district is also well adapted to general mixed farming purposes. It is a very common thing to see crops of oats running over one hundred bushels an acre. The country is very well adapted to successful stock raising, dairying, poultry, sheep and hog raising. Vegetables and small fruits do extremely well.

The timber on the land is the same as in District No. 1, and the cost of clearing will probably range a little higher.

(3) INTERIOR VALLEYS OF SOUTHERN BRITISH COLUMBIA, WHERE IRRIGATION IS PRACTISED.

This district comprises Lillooet, Chilcotin, Cariboo, Thompson Valley, Nicola Valley, Okanagan, Similkameen, Boundary, Kettle and the Columbia Valleys.

The spring, summer and autumn seasons are fine with plenty of sunshine, and growth is very rapid. The winters are short in duration, cold, dry and bracing. Rainfall occurs from eight to twenty inches.

All these sections are well suited for stock raising, grain growing and mixed farming, the indigenous bunch grass of the range lands making them ideal for cattle and horses.

The Lillooet, Thompson Valley, Okanagan, Similkameen and Kettle Valley sections are well suited for fruit growing, though care needs to be exercised in the planting of varieties which will successfully resist occasional low winter temperatures.

Stock raising was the main occupation in these valleys until their suitability for fruit growing became evident. Since then cattle ranges have been subdivided and sold in small lots for fruit growing and mixed farming purposes, with a consequent closer settlement of the district.

Soil conditions vary, the predominating feature being volcanic ash and other soils allied in formation and composition. These soils are very rich and yield heavy crops under irrigation.

The districts named give abundant crops of alfalfa and three cuttings are generally made of this lucrative crop. Fodder corn may also be grown to very good advantage, if care is exercised in planting the early maturing varieties.

(4) INTERIOR VALLEYS OF SOUTHERN BRITISH COLUMBIA WHERE CROPS MAY BE GROWN WITHOUT IRRIGATION.

This district comprises Shuswap, Arrow Lakes, Slocan Valley and West Kootenay.

The annual precipitation varies from twenty to forty inches. Spring, summer and autumn weather is all that could be desired, with plenty of sunshine. The winters are short, dry, cold and bracing.

The districts enumerated in this section are very well adapted to the growing of fruits and vegetables, and considerable development has been made along these lines. They are also well adapted to mixed farming purposes, dairying and poultry raising being followed to advantage.

(5) CENTRAL BRITISH COLUMBIA.

This district comprises the Naas and adjoining valleys and the country lying between Hazelton and Tete Jaune Cache, along the line of the recently constructed Grand Trunk Pacific Railway.

This section, now that the line has been completed, is being settled rapidly, and many thousands of acres of good soil are awaiting the hand of the cultivator.

This part of the Province is not very well adapted to the growing of tree fruits on a commercial basis, though the

hardier varieties may be grown successfully in some parts. The country is far better suited for grain growing, stock raising and for general mixed farming.

There is a considerable variation in rainfall, ranging from twenty to sixty inches. Spring, summer and autumn are fine, the winters a little longer in duration than in the case of southern British Columbia, and with, as a rule, considerably lower temperatures.

The timber growing in this part of the Province is much lighter than in the Coast sections, composed principally of a light growth of poplar and spruce.

The cost of clearing land is consequently much less than at the Coast. The estimated cost of clearing land will range from \$25 to \$100 per acre.

Summer frosts are prevalent in some localities, but as settlement proceeds and clearing of the land and cultivation are consequently effected, these summer frosts will largely disappear. This has been the experience in other parts of the Province.

A very large acreage of suitable farming lands is available for settlement through this large territory, and the completion of the Grand Trunk Pacific has thrown open for settlement by the land seeker thousands of acres of virgin soil well suited for general mixed farming purposes.

PAST AND FUTURE PROSPECTS.—Let us review shortly the conditions which have obtained in this Province during the last few years, as affecting agricultural development. It is often asked how it is, with the unique conditions which we enjoy in this Province, that agriculture has not made more rapid progress. The four essentials for success in agriculture are present in very marked proportion in British Columbia. These are soil, climate, transportation and markets.

Where favorable conditions exist in these respects, agriculture, if conducted along right lines, must be eminently successful. Why, then, has there not been a more rapid development in the past?

The answer is not far to seek. The unprecedented wave of prosperity which has swept over the West during the past few years has very much retarded agricultural development. The get-rich-quick mania has pervaded all classes of the community, and farming has been looked upon as too slow a method of acquiring wealth.

A condition of affairs such as has existed during the past few years, must come to an end, and it is indeed cause for congratulation that this period of real estate speculation and consequent inflated values has ended.

Rural development should, of course, precede urban development, but the reverse has been the case in this Province. Our cities have been building up at a very rapid rate, and there has not been a corresponding increase in rural development. Now that hard times have come upon us, the inevitable result has happened—many stores and offices in our cities are vacant, and building operations have consequently come to a standstill. It is up to us now to develop and make productive our lands before our cities can go further ahead.

The talk now on all hands is "back to the land," and in the press of the Province, and in general conversation, this topic is discussed in all its phases. A "back to the land" movement we must undoubtedly have, but let it be conducted along sane lines. Many people seem to think that farming is becoming more and more of a science, and that only the man who understands the underlying principles of agriculture and their proper application, can hope to obtain the best results from agriculture.

It is hopeless to expect that a man who has led a city life can suddenly altogether change his mode of living and engage in a business which is decidedly a scientific one, and obtain the best results without having acquired the necessary knowledge. The class of men we want to get on to our land to produce are those who are accustomed to farm life, who have the practical knowledge as well as the theoretical.

These men will produce successfully the best crops from the soil, and make a success of the business.

Why is it that farm life in the past has been so unpopular? The answer, I think, is that there is too much drudgery on the farm, that the hours of labor are too long and the opportunities for recreation and social intercourse are limited. Our efforts, therefore, should be directed towards popularizing work on the farm, and how can this be effected?

Undoubtedly a great improvement would be brought about and life in our rural districts would be made much more popular and pleasant if settlement were effected in so far as possible, in communities. Community settlements bring facilities such as water laid on to the farm, telephones, rural mail delivery and a better opportunity for social enjoyment and recreation.

You cannot expect to keep the young man on the farm, if you work him day in and day out, without any holidays, from daylight till dark, and it is a very common thing to see men on our farms working as long as daylight lasts. There is no necessity for this. A man can do all the work of which he is capable in ten hours, and will not accomplish any more if you keep him at it fifteen hours.

Youth is gregarious and craves excitement, and unless we can provide for them a certain amount of healthful recreation with their farm life, we will not keep our young men on the farms.

Of late years, many railway lines have been constructed, and some are in course of construction at the present time. These lines have rendered, and will render available, many thousands of acres of good fertile soil in different districts of this Province, well suited for the different phases of agriculture. The three transcontinental lines which are completed through to the Pacific Coast—the Canadian Pacific, the Grand Trunk Pacific and the Canadian Northern—open up many fertile tracts of country in which there are undoubtedly good opportunities for successful farming, and which will provide homes for many thousands of settlers.

In many parts of the North, in the country traversed by the Grand Trunk Pacific Railway, stock raising on a large scale may be successfully prosecuted. Large areas of land are also well suited for grain growing purposes, and the country generally is eminently adapted to mixed farming. Rapid settlement is being effected in this part of the Province, and this undoubtedly will increase in the immediate future.

The Canadian Northern Railway is also opening for settlement fertile tracts of country up the North Thompson River and in other districts.

The most important essential of success in farming undoubtedly is good markets, and in this British Columbia is very fortunate. We are not at the present time growing the produce which we should. Last year, the value of the home-grown products of British Columbia totalled \$30,184,000. The imports amounted to \$25,199,125, most of which can be produced in the Province to the best advantage.

A great economic waste is consequently taking place in the sending out of British Columbia to foreign countries large sums of money for produce which can be raised to the very best advantage in the Province, and as long as this large importation continues, farmers, with the protection which is afforded them, must have a good chance to make good out of their farming operations.

Our Coast and Interior cities, logging camps, mining camps, canneries, steamships and railways have to be supplied, and we have a very large demand in these markets for the products of our soils. The northwestern provinces of Canada look to British Columbia to supply them with fruits and vegetables, and a large quantity are now being shipped out of the Province to these markets. This market is rapidly increasing, and will take all that we can produce, at remunerative prices, for many years to come.

In addition, markets are being developed in Australia, New Zealand, South Africa, China and Japan, and no doubt

will be extended when produce is available with which to supply them. The outlook, therefore, is bright in so far as markets are concerned, and it is up to us to produce so that we may supply these markets.

With the unique climatic conditions which obtain in different parts of the Province, and our rich soils, we can produce the goods. The soil only needs to be "tickled with the hoe" to yield bounteous crops. The marketing end of the business is where we must effect a remedy. There is a great necessity for combined co-operative effort on the part of producers throughout the length and breadth of the Province, and never will the farmer obtain the price for his products, to which he is justly entitled, till this is effected.

It is, therefore, very gratifying to note that a decided movement has been made in this direction during the last year or two. Co-operation in farming is the keynote of success, as is plainly evidenced by the experience of other countries.

I would instance what has been accomplished in Denmark, New Zealand, Australia and other countries, by co-operative effort, directed along well thought out and progressive lines. There is too big a gap between the price paid the producer and that paid by the consumer, and the only way to bridge this gap is by co-operative effort, not only amongst farmers, but also amongst the consumers.

A move in the right direction has been effected lately by the establishment of public markets in our cities, many of which are run along very good lines, and are proving of the greatest benefit to both producer and consumer, and naturally helping towards reducing the price of living.

Very good work has been accomplished by co-operative associations in different parts of the Province in securing supplies at wholesale for the use of members, thus materially lessening the cost of production.

In talking of co-operation, I would like to refer to the Agricultural Bill, which passed the last session of the Provincial Legislature. This bill was the result of the report of the Royal Commission on Agriculture, and is a carefully thought out and well devised bill, modelled largely on the lines of the New Zealand Credit Bill, which has proved such a success and has revolutionized agriculture in that country.

When this bill becomes operative, a great stimulus will be given to agriculture in this Province.

In conclusion, I would just say a few words about the work of the Provincial Department of Agriculture. There has been, during the past few years, a very large increase

in appropriations granted by the Provincial Government for agriculture, with a consequent extension of the staff of expert officials and of the work carried out by the department.

We have at the present time a large staff of expert officials who are constantly visiting farmers and fruit growers throughout the Province, discussing with them the problems with which they have to contend, and endeavoring to help them towards a satisfactory solution of same. By the medium of our Farmers' and Women's Institutes in different parts of the Province, good educative work is done. Many demonstration plots are operated by the department in different parts of the Province, the object of these plots being to show the farmer how he can, by using correct methods, increase crop production.

Many demonstration orchards have been started in different fruit growing districts of the Province, the object of these being to show how the fruit grower, by choosing his site carefully, by the selection of good commercial varieties, by the adoption of correct and scientific cultural methods, may secure the highest production from his orchard and generally the cumulative effect of proper treatment and the practising of correct cultural methods from the start.

Seed selection and distribution work is carried out throughout the Province, cow-testing associations have been formed in the principal dairying districts, short course lecture and demonstration work, stock judging contests, fruit packing and pruning schools, and various other lines of educational activity are carried out by the officials of the different branches of this department.

The duties of any department of agriculture may be primarily educational, and the object of the department is to help the farmer to help himself.

The dawn of a brighter day is at hand, and agriculture will come into its own. Our Province has indeed been richly endowed by a bountiful Providence. We have not here the rigorous climatic conditions which are experienced in other parts of the Dominion. Life here is pleasant and healthful, and we may look forward with confidence to our beautiful fertile valleys becoming rapidly settled by a happy and contented people, engaged in the noblest pursuit of all—that of producing the fruits of the earth, to feed the teeming population of the world.

No country can enjoy lasting prosperity if it neglects its agricultural opportunities. Let all of our efforts, therefore, be directed towards encouraging by all means in our power the legitimate development of agriculture, our basic industry.

The Fishing Industry in British Columbia

D. N. McINTYRE,

Deputy Commissioner of Fisheries, British Columbia.

Tremendous Coastline of British Columbia Affords Protection and Feeding Ground of Incalculable Extent—Variety of Fish and Annual Output.

The sinuosities of the coastline of British Columbia, comprised between the 49th and 55th parallels, have been reckoned of over 20,000 miles in extent, the main indentations alone more than total 7,000 miles. The mainland is deeply indented with hundreds of fiords of great length; the waters of these fiords are deep, and to them nature has offered effective shelter in opposing to the winds and storms of the Pacific a barrier in the series of archipelagoes included in the Vancouver Island and Queen Charlotte Island groups. The area of waters so enclosed, comprising the great gulfs, straits, fiords, inlets and canals, termed by mariners the Inner Passage, embraces the most extensive

spawning and feeding grounds in the world for halibut, herring and numerous other food fishes.

From fifty to one hundred miles west of the main islands of these archipelagoes the continental shelf drops off to extreme depths, but from that margin inward and eastward the ocean bed forms a plateau at from twenty to two hundred fathoms; this plateau forms the great feeding and spawning banks for many varieties of fish.

Ocean currents and tidal drifts have an important influence upon fish and the food of fish. The North Pacific or Japanese Current, striking in easterly along the 50th parallel, divides as it reaches the continental shelf, one branch sweeping north, to be turned due west again where that shelf runs out once more into the Aleutian Archipelago; the other branch flows south as the California current, and forms a settled drift about fifty-five miles west of

the Vancouver Island shore. These currents play to the coastal waters of British Columbia a part exactly similar to that of the Gulf Stream in its relation to the North Sea, whose limited waters have proved so rich in fish life as to feed for centuries a large portion of the population of Northwestern Europe.

While nature has formed an ideal spawning and feeding ground for fish in these central waters, another notable fact is that the chief rivers of the Pacific take their rise in the watersheds of the Province—the Fraser, the Skeena and the Naas flowing entirely through Canadian territory; the Columbia and the Stikine taking their rise within, while they debouch beyond, its boundaries. This is, of course, closely correlated with the fact that the network of lakes which form the sources of these great rivers are, with the exception of the Great Lakes, the largest on the continent.

The importance of these latter facts in their relation to estuary fishing must be regarded. It has been largely the richness of the estuary fishing that has prevented or delayed the exploitation of the equally rich waters that wash the coasts of the Province. It was the ease with which the salmon were taken in these straitened passes that diverted attention from the fisheries of the ocean.

While British Columbia is beginning to recognize the value of its fisheries, it is true also that the earliest industry, the fur trade, was largely possible because the rivers of the territory afforded abundant food for the Indians, half-breeds and whites who pursued the fur-bearing animals. A glance at the journals of any post of the Hudson's Bay Company will reveal the extent to which dried salmon were relied on to sustain the employees during the year. Thus, chiefly because the salmon or estuary fishing was the most accessible, the history of British Columbia fisheries has been largely that of the salmon fisheries.

The total value of the fisheries of the Province nearly equals fifty per cent. of that of the entire fisheries of Canada. In 1913 they totalled approximately fourteen and one-half millions of dollars; 1914 showed a slight falling-off, while it is expected that the present year will more than exceed either of the two preceding. The salmon pack, as before stated, constitutes the chief factor of the total. In 1913 it was valued at nine and one-half million dollars, in 1914, approximately nine million dollars. Halibut comes next in order with an annual production ranging from two to two and one-half million dollars in value.

A matter perhaps of interest to visitors is the fact that the fish which now is the salmon of commerce, whose rich red meat is so well known throughout the world in the canned article, was misnamed the salmon in the first place, and was not really a salmon at all. When settlers came to the Pacific Coast they noticed great quantities of a fish approximating in form the *Salmo salar* of Scotland and the eastern Canadian coasts, and they named it salmon with the development of the canning industry. When the canned article found its way to every corner of the globe the supplanter retained the name and is now undoubtedly the salmon of commerce. It is radically different in its habits and characteristics from the eastern salmon, its chief difference being in the fact that when it reaches maturity it spawns and dies. No Pacific Coast salmon spawns twice. A fish more nearly alike to the Atlantic *Salmo salar* is our Steelhead trout, and many confuse it with the Pacific salmon.

There are five varieties of this great food-fish on the coast, the quinnat or spring salmon, which spawns normally in the fourth, fifth, sixth or seventh year; sockeye, the chief canning fish, which spawns normally in its third year; the pink salmon or humpback, which reaches an age of two years when it spawns and dies; and the dog or chum salmon, which may spawn at the third, fourth or fifth year.

Municipal Administration and Finance

ROBERT BAIRD, M.A.,
Inspector of Municipalities, British Columbia.

Safeguards to the Investor in Provincial Municipal Securities That Are Imposed by Municipal Act of 1914—Regulation of City Finances by Inspector and His Certification of Municipal Indebtedness.

Since the coming into force of the Municipal Act of 1914 of British Columbia, matters of municipal finance in this Province, especially with reference to bond issues, have been subjected to a scrutiny which should contribute very materially to more carefulness in undertakings and increased efforts to place municipal finances in a position to inspire the best confidence by the investing public.

The statutory provisions now in force and applying to this subject are, most particularly: the approval of municipal undertakings by the Lieutenant-Governor in Council; the submission by any municipality of money by-laws, local improvement by-laws, debentures, stock and treasury certificates to the Inspector of Municipalities for his approval, and the granting by him of certificates approving of the same; the preparation and submission to the Inspector of Municipalities of a financial statement in such form and at such time as may be required by him; the supervision of the investment and management of the sinking funds of any municipality, so as to insure the keeping intact of such funds and the investing thereof only in securities authorized by statute; the inspection at any time of the books, accounts and assessments of any municipality by the Inspector of Municipalities, or by any person under his direction.

The power of approval or disapproval by the Lieutenant-Governor in Council in municipal undertakings does not apply to the more ordinary works carried on by the municipality, such as construction and improvement of streets, construction of ditches and drains, and fire protection, but it applies to all such undertakings as works for supplying electric light or power or gas, irrigation systems, tramway, street railway, ferry, telephone systems, and waterworks systems. This provision is designed as a check upon the expenditure of money in cities or districts whose future may be considered to be problematical, or where it does not appear that the circumstances will warrant the proposed undertaking. Consideration is also given to the existing debt of the municipality, as well as to its record in discharging its obligations.

Of the provisions which have been made for general supervision of municipal finance, perhaps the most important relates to the supervision and control, if necessary, of municipal sinking funds. In the matter of the proper investment of sinking funds the municipalities of British Columbia cannot be said to have very grievously erred, but there are still some slight irregularities which are being rapidly straightened out. The municipal councils, as trustees of the sinking funds, are authorized to invest in Provincial or Dominion securities, in municipal securities guaranteed by the Government, or by depositing in a chartered bank. Until very recently they had also the power to invest in mortgages on land held and used for farm purposes, but this privilege has now been taken away.

There are, however, a few mortgages still held on account of sinking funds, but they are being liquidated as rapidly as possible.

Provision has been made since the coming into force of the Statutes of 1914 for the examination by the Inspector of Municipalities of municipal money by-laws or debentures or stock or treasury certificates, and the certification of these when they are found to be in order. This certification applies equally to those passed or issued under the Municipal Act and under the Local Improvement Act, and is a guarantee to the investor: First, that the municipality is, in terms of the Municipal Act, an eligible borrower to the amount designated in the by-law; second, that the municipality has complied with all statutory requirements with reference to the passing of the by-law and the issuance of debentures or stock or treasury certificates; third, that the by-law itself is entirely regular; fourth, that the validity of the by-law or the debentures or stock or treasury certi-

icates is not open to be questioned on any ground whatever in any of the Courts of British Columbia.

This provision for the certification of debentures is designed to provide the investor with a bond which is guaranteed by the Government to be an absolutely binding obligation of the municipality.

By-laws for raising money upon the credit of the municipality are subject to the restrictions that the aggregate of such debts, except for works of local improvement and for school purposes, shall not exceed 20 % of the assessed value of the land and improvements or the real property of the municipality, according to the last revised assessment roll; and the whole of the debt or the obligations to be issued therefor shall be made payable on or before fifty years from the date on which such by-law takes effect. In the case of local improvements the obligations issued for the repayment of the debt must not extend beyond the lifetime of the work.

The Development of Water Power in B.C.

G. PORTER,

Assistant Chief Engineer,

British Columbia Electric Railway Company, Ltd.

Huge Available Supply—Present Extent of Hydro-electric Developments—Present Large Output Already Developed Available for Industry, and Capable of Great Expansion When Demanded.

Probably the most obvious sources of energy in the world surrounding us are the vast volumes of water flowing in the rivers with which this Province is so lavishly provided. The rivers and lakes of British Columbia are among the most valuable of its natural resources, and so far comparatively few of the available powers have been developed; the quantity of energy running to waste in this Province alone may be reckoned in millions of horse-power, and unquestionably much of this power will be developed and made available for useful purposes in the not distant future.

Nearly all of the hydro-electric enterprises undertaken in British Columbia have been a source of gratification to the promoters of these plants, but no class of commercial investment has in the past been altogether free from financial disappointments, and water-power developments are not exempt from examples of financial failures. The development of this natural resource is not by any means particularly uncertain from the investors' standpoint; water-power engineering has long since left the experimental stage, and any failures which have occurred have been due to commercial rather than to technical or engineering blunders. There is a common belief that because hydro-electric power developments are exempt from charges for fuel, such plants must of necessity prove profitable to the owners, and it is principally on account of this fallacy that failures in the field of water-power development have occurred.

The history of water-power development on a large scale in British Columbia dates from the year 1897, when preliminary work was commenced in connection with the Goldstream development of the British Columbia Electric Railway Co., Ltd.

The Goldstream plant is situated about 12 miles from the city of Victoria, and, together with the more modern plants of the company, provides light and power service for the southern portion of Vancouver Island.

About this time, also, construction work was commenced on the Bonnington Falls plant of the West Kootenay Power & Light Company, which has done much for the development of the mining industry in the Boundary country.

Since these plants were installed, water-powers have been developed for providing energy for all the principal

industries of the Province, and for light and power service in the larger cities and towns.

The largest development installed in connection with a particular industry is at the paper factory of the Powell River Company, Limited. The present capacity of the plant is about 24,000 horse-power, and future extensions are provided for.

Isolated hydro-electric plants have also been installed in connection with the coal mining industry and for the mining and smelting of copper and other ores with which the Province abounds. The salmon canning industry also claims one development.

The principal water-power schemes of the Province, however, are those owned by the British Columbia Electric Railway Company, Limited, and its subsidiaries on Vancouver Island and on the Mainland. The city of Victoria is served with light and power by the company's new 25,000 horse-power plant at Jordan River over a 40 mile transmission line, by the Goldstream plant above referred to, and by an oil-burning auxiliary steam turbine plant of the most modern construction at Brentwood Bay.

The territory surrounding the city of Vancouver on the Mainland is served by the British Columbia Electric Railway Company's Lake Buntzen hydro-electric plant and by its steam plant in Vancouver, and also by the Stave Falls plant of the Western Canada Power Company, Limited. The latter company owns and operates a fine modern water-power plant situated on the Stave River; the capacity of the units at present installed aggregates 26,000 horse-power, and construction work for 26,000 additional is partly completed. When load conditions warrant further extensions beyond 52,000 horse-power, the water emerging from the tail races of the present power-house may be utilized again at a power-house to be built a few miles downstream.

The largest and most important developed water-power in the Province, however, is that known as the Coquitlam-Buntzen Development of the British Columbia Electric Railway Company, Limited, which from the original 9,000 horse-power plant, installed in 1903, has been extended to its present capacity of 84,500 horse-power, and shows in a vivid manner the general rate of growth of Vancouver in the past twelve years and the advances which have been made in hydro-electric work.

It will be readily understood that with the facilities which the British Columbia Electric Railway Company, Limited, enjoys, it is able to give efficient service unsurpassed as regards reliability, and at very reasonable rates. It is quite certain that many new industries will be estab-

lished in the vicinity of Vancouver within the next few years, and the British Columbia Electric Railway Company, together with the Western Canada Power Company, are fully prepared for large increases. Investigations by the British Columbia Electric Railway Company, Limited, of two new water-power schemes have been in progress for several years, and these projects, which are located at Alouette Lake (formerly named Lillooet Lake) and at Jones

Lake, have been approved. Active construction work on these schemes will be commenced as soon as the load conditions on the system warrant capital expenditure in excess of the existing \$40,000,000 now invested in the hydro-electric and railway system of this company. From the commencement of the operation period, the financial success of the British Columbia Electric Railway Company, Limited, has been uniformly satisfactory.

Vancouver Island and the City of Victoria

Natural Resources of Great Wealth With Delightful Climate and Noble Scenery.

Vancouver Island, the farthest west of North America, counting the Alaskan coast as northwest, presents the unusual characteristics of the highest civilization and No-Man's-Land. Two hundred and eighty-five miles long, from ten to ninety miles wide, with an area of fifteen thousand square miles and ten million acres of ground, Vancouver Island forms nearly one half of the entire western frontier of Canada, and ranks foremost among Great Britain's frontiers. Much of it is in a wilderness today. Yet Victoria, its chief city and the capital of British Columbia, is, in scenic charm and the culture of its representative people, one of the most advanced and delightful cities on the continent.

Salmon swarm in the estuaries and straits around Vancouver Island, but in place of red man catching them with his clumsy appliances, we now have the salmon nets and canneries of the white men, who send the salmon from these waters to practically every big market in the world. We have, too, steam fishing craft plying the Pacific over the vast halibut grounds of the west coast, where the commercial possibilities have been barely scratched. And the herring fisheries employ hundreds of men and have an output worth hundreds of thousands of dollars a year.

There are immense beds of iron ore at Campbell River and other parts of the island. This iron lies undeveloped, mainly because of a lack of transportation. Thousands of tons are in sight. Coal is in touch with a number of the deposits, and this is taken to mean future steel mills, factories and shipyards on the island.

It is the opinion of experienced geologists that there are large copper deposits on Vancouver Island. From one group of claims 208,000 pounds were taken in six months, but the copper, like the iron, is awaiting better facilities for transportation. Many districts are literally inlaid with enormous coal beds, and the chimneys and shafts of many mines now tell the story of coal production here. At Nanaimo, Cumberland, Extension, South Wellington and other points, thousands of tons are mined daily. One group of mines changed hands for \$11,000,000. There are numerous coal measures which have never been touched by pick or drill.

Timber is one of Vancouver Island's greatest natural resources. Giant Douglas firs, hemlocks, red and yellow cedar, spruce, white pine, tamarack, balsam, cottonwood, aspen, red elder and maple grow in such profusion in the valleys and along the slopes, that the island can furnish, on a conservative estimate, one billion feet of merchantable timber a year for the next hundred years, exclusive of all

reforestation. Sawmills and lumbering constitute a leading industry.

In the southern section of Vancouver Island agriculture has advanced rapidly. The climate has no extremes of heat or cold. The snowfall is very light. Cattle graze in the open all the year. The soil is extremely fertile, and there is much activity in mixed farming, dairying, poultry raising and fruit growing. The Vancouver and Victoria markets are within easy reach, and absorb all that is produced, with insistent demands for more. In all parts of the island the climate and soil are highly favorable to agriculture, but in numerous sections the clearing of the land is made difficult by the heavy timber.

Scenically, Vancouver Island is a wonderland of majestic beauty. Only a little of it has been touched by civilization. Elk, the black bear, the cougar, wolverine, the black-tailed deer, the wolf and many of the smaller fur-bearing animals inhabit in large numbers the deep woods among the mountain ranges, and trout leap continually in the flashing streams. Strathcona Park, set aside for all time by the Provincial Government, is a marvel of noble scenery.

The city of Victoria began as a trading post of the Hudson's Bay Company. A fort was built and trading with the Indians and trappers was the chief occupation until gold miners began to work their way up the coast from California, and to stop at Victoria to be provisioned for the long trek into the Cariboo country, in central British Columbia, which was beckoning with promises of gold. Victoria grew. It attracted the attention of the British Government, which fortified the harbor of Esquimalt, said to be the second best harbor in existence. Victoria became a garrison town. The Esquimalt and Nanaimo Railway was built in 1886. This extends from Victoria to Courtenay, a distance of 139 miles, and branches westward to Alberni and Cowichan Lake. The Canadian Northern Railway opened in 1914 a line from Victoria to Alberni.

Victoria has a population of about 60,000, and a future of notable promise. At its doors are brick clay, fire clay, sand and gravel, coal, iron, timber and other raw materials for manufacturing and shipping activities of great scope. Shipbuilding at Esquimalt harbor is often mentioned as one of the important probabilities. There is every reason to believe that Victoria will be among the foremost in the advance of Pacific cities in the new epoch of ocean commerce which is opening for this coast, and that Vancouver Island will yield wealth in degree merely hinted at by the present production.

Through Southern B.C. on the Canadian Pacific

Scenery of Canadian Rockies Dims the Glory of the Alps —
Banff, Laggan and Field Are Among the Choicest
Spots in the World.

It is the boast of the Canadian that the Rocky Mountains north of the International Boundary Line contain the most beautiful scenery on the North American continent, if not in the entire world.

Many travellers who have made the trip from Calgary, Alberta, through Banff, Laggan, Field and points along the Canadian Pacific Railway to the Pacific Coast, declare that even the glory of the Alps is dimmed by the grandeur of the Canadian Rockies. Switzerland's mountain scenery, say these travellers, in comparison with the lofty peaks of the Canadian Rockies, is toy-like. Several Switzerlands could

be placed in the Rocky Mountains of Canada and still not deprive that country of many of its chief points of interest.

Lack of space will admit only of touches of description of scenes along the railway in British Columbia which stay in the memory of the traveller.

West of Calgary the country rapidly changes from prairie to mountainous, and winding upward and westward each mile shows scenery more rugged and impressive than the last.

At Banff, an altitude of 4,521 feet, situated in the Canadian National Park, are located the Hot Springs. This park is a national reservation of 5,732 square miles, embracing parts of the valley of the Bow, Spray and Cascade Rivers, Lake Minniwanka and several noble mountain ranges. Beyond are the Divide and the Yoho Valley. This National Park is the largest in the world, being nearly half as large again as the Yellowstone Park of the United States. No part of the Rockies exhibits a greater variety of sublime scenery, and nowhere are good points of view and features of interest so accessible, since many excellent roads and bridle paths have been recently constructed. Banff is in the midst of many impressive mountains. Northward is Cascade Mountain, 9,825 feet; eastward is Mount Inglismalde and the Height of Fairholme of the Fairholme sub-range, beyond which lies Lake Minnewanka.

On leaving Banff the traveller skirts the Vermillion Lakes to Vermillion Pass. West of the entrance into Vermillion Pass, towering up tier after tier, is a chaotic sea of mountains, and beyond, standing supreme over this part of the range, is a prodigious isolated, helmet-shaped mountain named Temple, 11,626 feet—the loftiest and grandest in this noble panorama. This great snowbound mountain, whose crest exhibits precipitous walls of ice flashing blue in the sunlight, becomes visible at Sawback Station and from Eldon; almost to the summit its white covered precipice is the most conspicuous and admirable feature of the wonderful valley. Lake Louise, Stephen and Hector are the three highest points on the main line of the Canadian Pacific. Lake Louise is the station for the Lakes in the Clouds, which are perched on the mountain sides amongst the most romantic environment. They are rare gems whose loveliness and charm surpass all description.

Lake Louise is 5,670 feet above the sea level. From the chateau built on Lake Louise there is a bridle path to Mirror Lake 6,665 feet up the mountain and a still further ascent to Lake Agnes, from which a magnificent view of the Bow valley and surrounding mountains is obtained. Both the lakes lie literally above the clouds, nestled in the rocky cirques among the peaks of the Beehive, Saint Piron, Niblock and White. Innumerable bridle paths and excellent roads lead to beauty spots of surpassing charm in this district. Among the mountains in this vicinity are Mount Victoria and Mount Lefroy.

Mount Stephen is named in honor of the first president of the Canadian Pacific Railway, Lord Mount Stephen.

Here is the Great Divide where the sparkling stream separates into two, the waters of one flowing to the Pacific and those of the other to Hudson Bay.

From here the traveller rapidly descends, crossing the deep gorge of the Kicking Horse River, bringing him to Field, where, in addition to scenery, trout, mountain goat and sheep abound. West from Field, the traveller passes through Ottertail, Leonchail, Palliser, Golden and Moberley. At Golden the Columbia and Kicking Horse Rivers meet, and south along the Columbia a branch line runs down to Windermere at the head of the lake. Here the Selkirks come into view, only less impressive than the Rockies at Lake Louise and Banff.

Again the traveller ascends from Oberly through Donald, Beaver Mouth, Six Mile Creek, Cedar and Bear Creek to Rogers Pass, which has an altitude of 4,302 feet. This pass was named after Major A. B. Rogers, by whose tremendous energy it was discovered in 1881, previous to which no human foot had penetrated to the summit of this great central range. The pass lies between two lines of huge snowbound peaks. That on the north forms a prodigious amphitheatre under whose parapet 5,000 or 6,000 feet above the valley a half dozen glaciers may be seen at once and so near that their shining gleam fissures are distinctly visible. In this direction, at the head of the largest glacier, may be seen a group of sharp serrated peaks clear cut against the sky. The tallest is Swiss Peak, so-called in honor of the members of the Swiss Alpine Club, who first stood upon its highest pinnacle. The changing effects of light and shadow in this brotherhood of peaks, of which Tupper and Macdonald are among the chief, can never be forgotten by the fortunate traveller who has seen the sunset or sunrise tinting their battlements, or who has looked up from the green valley of the Snowstorm, trailing its curtain along their crests with perchance a white peak or two standing serene above the charming clouds.

Beyond Rogers Pass is Selkirk Summit and Selkirk Pass, which opens up the valley of the Illecillewaet, west of which is the Illecillewaet Glacier. Here the traveller rapidly descends through Revelstoke, Clanwilliam and Three Valley to Craigellachie, where the last spike was driven by the late Lord Strathcona, November 7, 1885, completing the transcontinental.

The traveller follows for a greater part of the way the canyon of the Fraser River, through a section far famed for its surpassing scenery and individuality. The Fraser River is noted for its wonderful salmon, and one can see the Siwash Indians from the nearby reservations spearing fish and hanging them out on improvised hangers to dry in the sun. This dried fish forms the major portion of the Indians' food during the winter. Game abounds in this country.

At Vancouver, British Columbia, the terminus, the traveller finds himself in a city of over 100,000 persons, with a harbor which has no equal on the Pacific Coast and which is justly a source of pride to every true Canadian.

Central B. C. over the Grand Trunk Pacific

Delightful Sail North to Prince Rupert — Large Agricultural Opportunities East of the Skeena River — Scenery of the Northern Canadian Rockies.

One of the last great areas of rich virgin territory in North America was opened to trade and civilization in 1914 when the Grand Trunk Pacific Railway completed its line across British Columbia from the Province of Alberta to the Pacific port of Prince Rupert.

The extension from the Canadian prairies to the Pacific seaboard has made the Grand Trunk a transcontinental system, and has brought the British Columbia regions which it taps into rail communication with all the cities on the continent to the east and south, as well as into communication by the Pacific Ocean with the markets of the world.

The line across British Columbia is 700 miles long, and the practically virgin territory directly tributary to it comprises some 20,000,000 acres. Much of this land is notably rich in mineral, agricultural and timber resources.

For the sake of convenience in presenting a brief outline of the regions opened up by the Grand Trunk Pacific, it may be well to trace the line through British Columbia, beginning at Prince Rupert, since many travellers returning from the Panama Exposition will make the trip over this railway from west to east.

Prince Rupert is reached by fast, thoroughly modern steamers sailing from Seattle and from Victoria and Vancouver, British Columbia. The distance from Seattle is 726 miles, and from Vancouver 550 miles. The time from the former city is 40 hours, and from the latter 30 hours. With

the exception of about 30 miles of open ocean just north of Vancouver Island, the entire route is landlocked or sheltered, and presents a panorama of mountain and island scenery excelled in beauty and impressiveness by that of no other waterway in the world.

Prince Rupert has a population of about 5,000. The city is a new one, having been created by the fact that the Grand Trunk terminates at the harbor here, which is one of the finest on the Pacific, being amply large enough for a great volume of shipping, and nearly landlocked, with deep water and no shoals nor strong tidal currents. The climate is much like that of other Pacific Coast cities, with considerable rainfall but little snow, and a temperature ranging from 10 to 80 degrees above zero. The latitude is the same as that of London.

The city is on the shortest trade route around the world. It is a day and a half nearer the Orient than any other North American port, and nearly two days nearer Alaska and the Yukon than the next nearest port. The expectation is that Prince Rupert will be the shipping point not alone for the products of the immense territory which constitutes its back territory, but also for great quantities of grain en route from the northern prairies to Japan and China. Big elevators will be built for the handling of wheat at this port. The largest floating drydock on the Pacific Coast, costing over \$2,000,000, is located at Prince Rupert.

The making this spring of a free port of Prince Rupert, by which act the fishermen are enabled to sell their catches in Prince Rupert for shipment in bond over the Grand Trunk to the great markets of the United States, has materially stimulated the fishing industry in these waters. The month immediately following the passage of this act saw the output increased by \$80,000.

Before describing the country which the Grand Trunk Pacific traverses to the east of Prince Rupert, it is desirable to say a few words concerning the Queen Charlotte Islands, across about 40 miles of water to the west. The Queen Charlotte group, of which Graham Island is the chief member, offers numerous large areas of natural meadow and mixed farming lands. The country is comparatively level, and, because of the absence of high mountains, the climate is much dryer than on the mainland.

The soil is a rich vegetable and leaf mould, with a subsoil of clay. This, combined with the mild climate and long hours of sunshine in summer, due to the high latitude, induces rapid growth and early ripening. The remarkable luxuriant pea-vine and other wild grasses indicate on Graham Island a particularly fine country for mixed farming, dairying and cattle ranching. In the Queen Charlotte group much coal and oil land has been staked, and these resources are now being developed.

Three trains a week leave Prince Rupert for the east. The route is first along the Skeena River, fed by melting glaciers, and one of the largest streams in British Columbia. The mountain scenery here is highly impressive. There are no large agricultural areas in this section, but numerous stretches of bench lands offer excellent opportunities for the growing of apples, berries, vegetables and dairy products, with the Prince Rupert market within easy reach.

From the Skeena River section the railway passes into the Bulkley Valley, famous for its agricultural promise. Throughout a belt between 15 and 20 miles wide, reaching for a distance of about 80 miles, the country is level and open, with only a little light timber, and a soil of great depth and fertility. The climate is like that of northern New York State. For the growing of cereals, vegetables and hardy fruits, for mixed farming and dairying, this region has been very highly commended by government authorities and farming experts, and the agricultural beginnings which have been made here indicate that it will become a section of notable production.

The railway extends to the east from the Bulkley Valley into the country of the Fraser and other lakes and then into the Nechako Valley. The climate is still comparatively mild and the soil unusually fertile, with much open meadow land. There is somewhat more timber here than in the Bulkley Valley, though the lightness of the growths makes clearing easy. The agricultural areas are not as extensive as farther west, but are ample for many farming communities. The conditions are exceptionally good for vegetables and small fruits, with the slopes on the sides of the hills supplying pasturage so abundant as to make this a remarkably fine stock raising and dairying country. Horses and cattle graze in the open all winter.

The valleys become narrower and the country more heavily wooded towards the east, although there are bench lands eminently well adapted to mixed farming. After Prince George and the Fraser River are reached on the eastward journey, the great natural resources to the west are forgotten for the time in the contemplation of the scenic wonders of the Canadian Rockies, which are as striking here as in the southern sections of British Columbia. Mount Robson Park, set aside as a forest reserve by the Provincial Government, and which has as its central feature Mount Robson, 13,700 feet in height, is no less marvelous scenically than the Alpine wonderlands, and most of this section is an untracked wilderness where grizzlies, mountain sheep and other creatures of the forests roam as undisturbed by man as before the continent was discovered by Columbus. Despite the height and ruggedness of the mountains here, the Yellowhead or "Tete Jaune" Pass has the easiest grade of any across the Rockies, and through this to the Canadian prairies the Grand Trunk train speeds from a virgin land which waits with beauty and opportunities for coming millions.

On the Pacific Great Eastern to the North

From Vancouver to Squamish by Steamer, Thence by Railway to the Old Mining Town of Lillooet—Districts North of Lillooet Through the Cariboo to Fort George.

Railroads serving British Columbia are all east and west roads, with the exception of the Pacific Great Eastern. The Canadian Pacific enters the Province west of Calgary, going through the middle southern section of B. C. to Ashcroft, then sweeps south to Chilliwack, then west again through the delta formation of the Fraser to Vancouver on Burrard Inlet- and tide-water.

The Boundary section is served by the new Kettle Valley, just completed, a subsidiary of the Canadian Pacific, and commences at Penticton, keeping close to the International Boundary to Hope, where it connects with the Canadian Pacific to Vancouver.

The Canadian Northern Pacific enters the Province west of Edmonton and then follows the Fraser River to the North Thompson River to Kamloops, thence west and south along the Canadian Pacific to Port Mann, its present terminus opposite New Westminster. This road is still in process of construction.

The Grand Trunk Pacific enters the Province also at Yellowhead Pass, thence follows the Fraser River to Fort George, thence west to the Coast at Prince Rupert, thus serving the entire central section of the Province.

But the Pacific Great Eastern Railway is the north and south railway of the Province. This railway is projected to enter Vancouver by bridge across Burrard Inlet from North Vancouver, thence follows along the shore to Point Atkinson, where it leaves the Gulf of Georgia to Howe Sound, following the west bank through the famous Britannia Mine

to Squamish, an old Indian town and now the present terminus of the railway. Although the railway serves the suburban cities of North Vancouver and West Vancouver on the north shore, the link to Squamish is not yet completed and consequently the traveller must be taken from Vancouver to Squamish by steamer, a beautiful trip of forty-five miles.

From Squamish the road follows the Cheakamus River. Off to the left is mighty Garibaldi peak, a favorite resort of Alpine clubs. Following the river, the rise is rapid through the Cheakamus canyon, which is rugged and severe in its beauty, and in the spring of the year the melting snows and the Chinook rains swell the stream to a raging torrent. The road continues the grade until the Cheakamus becomes a small stream where the railway reaches Alta Lake, the top of the divide; follows through heavy wooded sections to Green Lake, thence commences the down grade until the train comes out on the Pemberton Meadows, which is the first strip of agricultural land north of Squamish. Here are about fifty thousand acres available to agricultural development.

Crossing Pemberton Meadows, the train winds between majestic mountains following the Birkenhead River, thence mountain ridges and mountain-locked valleys to Anderson Lake. For twenty-two miles the railroad is carved out of the solid mountain side, following the contour of this beautiful lake. On either side are majestic mountains, rising 5,500 to 6,000 feet above its level. The clear, limpid waters of the lake abound in the choicest game fishing in North America. Rainbow trout are caught weighing 18 to 20 pounds, and Dolly Vardens and Steelheads will weigh heavier.

Through a short distance of gorge and mountain, and again the train bursts out on Seaton Lake with the same majestic mountains and the same limpid waters abounding in trout. Leaving Seaton Lake, the descent is rapid to the plains of Lillooet.

Snuggled among the hills about three miles from the railroad is the old mining town of Lillooet. Settled in 1860 as a result of the great Cariboo rush from California and still the prospectors' meeting place, it is for the first time in its history with rail transportation to the outside world. Here also gather the big game hunter, the fisherman, the old-time rancher. Local color also abounds. Here basking in the sunlight is an old Indian chief who caused trouble to the North West Mounted Police in the early days and was feared and hated, or the friend of the gold prospector. The Chinaman, or "Chink," is a familiar scene on the streets or behind the counter of some general store. He, too, came with the prospector from the south and prospected like the white man. Sometimes he struck it rich and returned to San Francisco or his old Oriental home to live as a Croesus. Failing to strike he stayed and prospected further or drifted into Lillooet or other old settlements in this Cariboo country, to run a store, a restaurant or farm, and he has grown rich by his industry. The backwoodsman, the

rancher, the cattle man, are all here, and red man, yellow man and white man all meet here on terms of practical equality.

The traveller after getting off the train quickly notes the change in climate. The Coast is the so-called wet country with its giant forests. At Pemberton Meadows, while drier, the same qualities of climate obtain. But breaking through from Seaton Lake to the plains and benches of Lillooet the air seems more balmy and soft. The Chinook winds that blow in from the Pacific have lost their moisture but keep its quality of softness and balm. This is the beginning of the dry belt and for the best agricultural success, irrigation must be used. Lillooet is famous for its fruit and its vegetables, particularly its potatoes, which are endangering the fame of the Ashcroft.

Lillooet is now coming into its own. As a health resort, a mining centre, and fruit district, it will grow in popularity and wealth.

This is the present terminus for passenger and freight transportation. Construction service is nearly advanced to Clinton, and "rail-head" is approaching Lac La Hache, about 120 miles north, which is expected to be open to transportation about September 1st next. This is as far as the railway will be pushed for the year 1915.

West from Lillooet is the Bridge River country and the Fraser River district, capable of indefinite expansion for cattle and sheep raising and mixed farming. Further west still, it enters the Chilcotin country, which will grow in importance as a cattle district. The railway follows to the east and north from Lillooet the old Cariboo trail. Here again the land is bench and plain.

Continuing north from Lac La Hache, the railway passes through the mining centre of 150-Mile House, following northwest to the Fraser River to Soda Creek, where navigation again commences clear north to Fort George.

The railway follows the river north to Quesnel, where the old trail leads east to the old mining town of Barkerville. The whole country south and east of Barkerville was famous for its placer gold deposits. Vast amounts of gold were taken out of this district in the old Cariboo days, and now that it will be served by the railway, a new stimulus to mining will manifest itself. Quesnel Forks, Hydraulic, Bullion and other camps will again be producers of large extent. On account of lack of transportation and playing out of rich pay-streaks, placer mining had to stop.

North of Quesnel the railway follows the Fraser through Fort George canyon to the present city of Fort George, where it connects with the Grand Trunk Pacific from Edmonton, Alberta, to Prince Rupert on the Pacific.

In the not distant future, the Pacific Great Eastern will be pushed north to the Peace River country, the last great wheat district to be opened up to civilization on the continent of North America. The daring mind of Sir Richard McBride, Premier of British Columbia, conceives the idea of pushing it northwest and tapping the Yukon, there to unite with the American railway now building in Alaska.

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