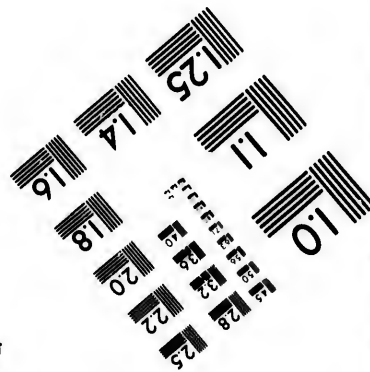
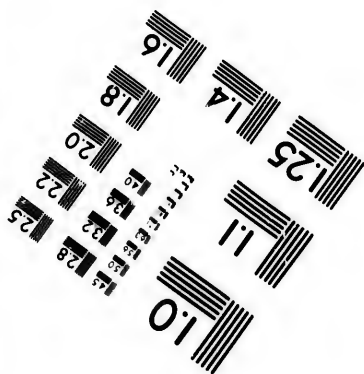
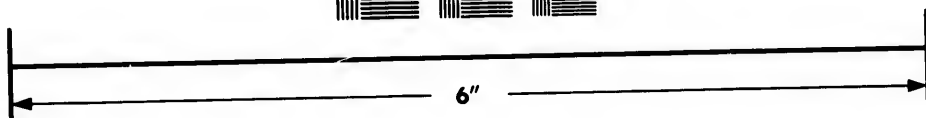
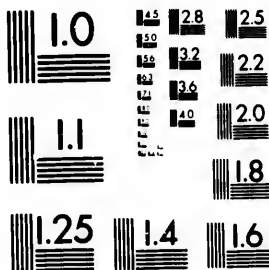


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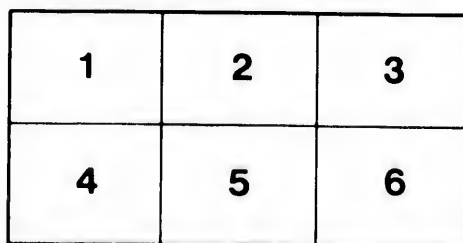
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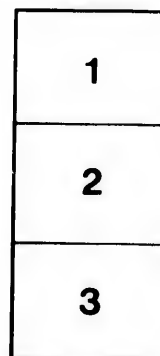
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DOMINION OF CANADA,
PROVINCE OF BRITISH COLUMBIA.

EVIDENCE

OF

Dr. DAWSON,

ASSISTANT DIRECTOR OF THE GEOLOGICAL SURVEY OF CANADA,

BEFORE THE IMMIGRATION AND COLONIZATION
COMMITTEE OF THE HOUSE OF COMMONS.

OTTAWA:

Printed by MACLEAN, ROGER & Co., Wellington Street
1883.

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DR. DAWSON'S EVIDENCE.

COMMITTEE ROOM.

HOUSE OF COMMONS, 13th April, 1883.

GEORGE M DAWSON, D. S., F.G.S., and R.S.M., called and examined:

By the Chairman :—

Q. You are connected with the Geological Survey I believe?—Yes.

Q. In what capacity?—As Assistant Director.

Q. You have some knowledge of British Columbia, I believe?—Yes. I have worked there in connection with the Geological Survey for the greater part of five seasons.

Q. Will you state generally your opinion of the agricultural and pastoral lands of British Columbia, their situation and extent, and also the character of the soils and climate in different districts of that Province?—British Columbia is naturally divided into two very distinct parts agriculturally by the mountains which form the coast range. The interior region has a climate of extremes and in the southern part is very dry. The coast region has a mild, equable climate. British Columbia must, however, be considered throughout as an agricultural and mountainous country, that is the amount of arable land, compared to the whole surface, is comparatively small. I do not say this to the disadvantage of British Columbia, as it must be remembered that other countries, known to be very productive, are similarly situated—in California for instance, it has been estimated that only one-fifteenth of the State is flat land, not mountainous, and only a part of that is cultivable. The southern part of the interior, east of the Fraser River, is the district which has so far attracted most attention agriculturally. The cultivation is restricted as a rule to the valleys, which are wide and trough-like, and cut through the surface of the plateau, and the climate is so dry in summer that irrigation is necessary. This is, however, generally easy on account of the number of streams running from the higher plateaux and mountains, and with irrigation very fine crops are produced. The higher plateaux are not cultivable, owing to their altitude and the fact that summer frosts occur. These higher plateaux, however, are covered largely with bunch grass, and form those renowned stock raising regions which have given the south of British Columbia such importance in that respect. Thus, the mere area of agricultural lands does not give the full measure of the capacity of the country for maintaining an agricultural and stock-raising population. A man with a comparatively small farm in these valleys has large herds of stock which roam over the hills and sustain themselves on the natural grass. The whole area of agricultural lands east of the Fraser River in southern British Columbia I have estimated at something under 1,000 square miles, of which about 500 square miles probably may be easily utilised.

Q. Have you anything to say in reference to the character of the soil and the climate?—The character of the soil is almost uniformly, very fertile in these valleys. The climate in summer is very dry and warm. It is one of extremes. In winter the cold is considerable, but the cattle still winter out very well and live all the year round on the natural grasses.

Q. In the interior portion?—In the interior portion; yes.

Q. The climate, I believe, is very good upon the sea shore?—Yes. In the northern part, then, of the interior plateau, there is another extensive low country, white pine, but producing an equally good wood. As a rule this tree is remote from the sea-coast, so that it has been utilized only to a small extent so far. The hemlock,

again, grows to a much greater size than our hemlock, and produces good, clean lumber, and that tree is found along the whole of the coast and over a considerable part of the interior. The maple, which is rather an inferior wood except for cabinet-making purposes, owing to the curly grain, is only found on the coast. The oak is confined to the southern part of the coast, and is not in sufficient quantity to be looked upon as a commercial wood on a large scale. The yellow cedar or yellow cypress is another wood that has attracted much notice. It is found chiefly on the northern part of the coast, and is an exceedingly fine wood for cabinet-making. It is a close wood, and very lasting, penetrated by resinous substances which protect it from decay to a very great extent, and give it a peculiar odor. In the interior of the Province there is the yellow pine, which inhabits the dry southern part of the plateau, and is locally a tree of great value. In fact, it is the wood most used in the interior, in some districts even in preference to the Douglas fir, where that occurs. I might state, in general, that every part of British Columbia is amply and well provided with excellent wood for construction and other purposes. The coast has the pre-eminence in that respect, owing to the facility of export and to the gigantic size of the forests, due to the mildness of the climate and its humidity.

Q. Point out the northern and eastern limit of the Douglas fir?—The northern limit is on the Skeena, and on Tacla and Babine Lakes. To the east the limit is at the Rocky Mountains. It is abundant even on the eastern slopes of the Rocky Mountains, as far east as the Porcupine Hills, and is now being extensively used for construction in the western part of the prairie region.

Q. Principally on the rivers that may be utilized for bringing it to market?—On the eastern slope of the Rockies, yes; but on the west the timber business is not carried on by floating logs down rivers as it is here, because of the large size of the logs and the rapidity of the streams. Nearly all the timber cut for exportation on the west coast is drawn out, either by teams or on small steam tramways, to the shore, launched into the sea and towed to the mill.

Q. Will you give us your opinion as to the timber resources of Vancouver and Queen Charlotte Islands respectively?—The chief difference between Vancouver and Queen Charlotte Islands, in regard to timber, is that on a large part of Vancouver Island the Douglas fir is found abundantly, while in the Queen Charlotte Islands it is not found at all. It is replaced there by cedar, hemlock and spruce, and the yellow cypress or yellow cedar. An area of about 1,000 square miles of the flat part of the Queen Charlotte Islands is covered very densely with excellent timber, but as it does not include the Douglas fir and the Islands are rather north of the usual mercantile routes at present, it has not given rise, so far, to the erection of any mills. There are very excellent sites for mills, however, in the Islands, particularly at Naden and Massel Harbors, and other places where streams from the low country reach the sea. The timber of the Queen Charlotte Islands I look upon as one of the most valuable immediate resources of the Islands, and as soon as the demand for timber shall increase a little more, they will, no doubt, be utilized. Another feature with regard to these Islands is that, owing to the humidity of the climate, the woods have been very little affected by forest fires, and even where large quantities of rotten and decayed trunks, of great thickness, have accumulated on the ground, they lie there and go to decay rather than burn.

Q. Speaking of the cedar as a commercial wood, you say sometimes it grows to a diameter of 17 ft.; are the trunks covered with branches, or are they comparatively free from branches for any considerable distance from the ground?—The cedar is apt to give off a number of branches, but when it attains large dimensions, the living branches are generally near the top. These very large trees are more or less hollow generally. The Indians select the largest sound cedars they find for their magnificent canoes, and the dimensions of those canoes show how large such trees may be found when one goes to search for them carefully. I might state, however, in connection with the Queen Charlotte and Vancouver Islands, that, as the total area of which I have estimated the area of at about 1,230 square miles. The soil of this is almost uniformly good, but, being to a great extent covered with trees, it cannot be

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utilized so readily for agricultural purposes, and it lies, besides, off the proposed route of the railway, and is not likely to be opened up for some time. Still, it is a country I have every reason to believe will be eventually occupied by an agricultural population.

Q. You speak of the northern part of the interior—north of what parallel of latitude would that be?—It would be chiefly north of the 51st parallel, and west of the Fraser River in the basin of the Nechaceo and its tributaries. The coast region is of course not liable to any of these difficulties of drought or occasional summer frost that some of the higher regions of the interior are exposed to. The climate is exceedingly mild, and in the aggregate there is a large quantity of agricultural land. On the Island of Vancouver, Mr. T. Hunter, who prepared a report on this subject for the C.P. Railway Report of 1880, estimated that there are 389,000 acres of agricultural land, of which about 300,000 acres are well suited for agriculture. Of this, only about 10,000 are so far cultivated, but a great portion of the flat country which is suitable for agriculture in Vancouver Island is in the same way very densely covered with forests, and, owing to the high price of labor at the present time, and the comparatively small number of people in the country, it is not economically advantageous to clear these forests or bring the lands under cultivation now. On the Queen Charlotte Islands there are some 700,000 acres of low land on the north-east coast, a great part of which may eventually be brought under tillage, but it is also covered densely with forests at present, of very fine trees, and its immediate value is as a timber producing region. At the mouth of the Fraser River, the flat land probably amounts to more than the whole in the Island of Vancouver, and some of it is of very excellent quality. Generally, the soils of British Columbia, where they are cultivable at all, are exceedingly fertile, and the crops produced on the mainland and on Vancouver Island are very large. Wheat, as an example, averages 30 to 40 bushels to an acre on land at all well cultivated.

Q. Will you please inform the Committee as to the timber resources of British Columbia, the country over which the Douglas pine occurs, and other timber trees at present or likely in future to be of value? The Douglas pine, I understand, is of the greatest commercial value just at present?—This map (produced, published in Report of Geological Survey 1879-80) will illustrate some of these points. It shows the range of the Douglas fir and some of the other important timber trees. So far, the Douglas fir or Oregon pine, as it is also called, is the only tree that has attracted much commercial attention. It has been largely cut and exported. It is found on the whole eastern coast of Vancouver Island and on the coast of the mainland opposite to it. It extends northward a little back from the coast as far as the Skeena River, and in the northern part of the interior of the Province as far north as Tula and Babine Lakes. The timber which occurs immediately on the coast is, however, indisputably the best. There are magnificent forests there, composed almost entirely of the Douglas fir, and naturally, on account of the facilities for shipment, they have attracted the most attention. The quality of the timber is excellent and the size of the trees is great. One that was cut down at Burrard Inlet for the Philadelphia Exhibition, of which a section is in the Parliament grounds now, was measured to be 365 ft. in height, had a thickness of 8 ft. 4 in., 20 ft. above the ground, and was perfectly sound throughout. Many of these logs measure as much. Commercially speaking, the medium sized logs are more useful in the mill than these exceedingly large ones. The localities chosen for the mills are selected in regard to facility of shipment, and those now working are chiefly situated on Burrard Inlet. In addition to the Douglas fir, there are a number of other trees in British Columbia which are exceedingly valuable, and which will eventually attract a great deal of attention. There is the cedar, which sometimes attains a diameter of 17 feet, though generally these very large trees are more or less hollow. There is the spruce, which is an excellent wood, not so soft as our spruce on this side of the continent, and a different species; the white pine, not the same as the eastern Vancouver is considerably greater than Queen Charlotte Islands, doubtless the timber

supply of Vancouver is more important than that of the Queen Charlotte Islands, at least, in correspondence with the areas.

2. Can you give any information from your personal knowledge of the fisheries and other resources of the Queen Charlotte Islands and coast generally?—I spent a good part of the summer of 1878 in the Queen Charlotte Islands, and the result of the explorations was the map now upon the table (Report Geological Survey 1878-79). The Queen Charlotte Islands first attracted attention commercially from the trade in sea-otter skins, which was commenced about the end of the last century and carried on very extensively. The sea-otter is now, however, on the west coast nearly extinct, but a considerable number of fur seals are still caught by the Indians on the Queen Charlotte Islands and west coast of Vancouver. The Queen Charlotte Islands are altogether 175 miles in extreme length. The southern part is mountainous, without any flat land worth mentioning, but the north-eastern part of Graham Island contains about 700,000 acres of flat land, most of which is densely wooded, but most or all of which I think, will eventually be brought under cultivation when the population of the west coast is larger, and the demand for agricultural land greater. The climate is very much like that of Vancouver Island, but, on the west coast, if anything, more humid than that of the west coast of Vancouver. It is a very mild climate. In some winters no snow falls. In others a heavy snowfall occurs, but it lies only a few days and disappears. The mildness of the climate is, of course, owing to the fact that the Pacific Gulf Stream strikes the west coast almost exactly at the point where these Islands lie, so that they receive the full benefit of the warmth of its waters. The immediately valuable resources of the Queen Charlotte Islands, I should state in the following order:—Timber, fisheries, and mines. The timber I have already said something about. The fisheries are probably more important than on most other parts of the coast—the deep sea fisheries and the halibut fishery particularly. It is true that the halibut has not been found to be a fish that can be canned or salted and exported with profit; but it is highly probable that before long the experiment will be tried of freezing these fish in the mode now so largely adopted elsewhere, and taking them in that state to the market, when they would command a good price in San Francisco or in any part of the world. The halibut in the Queen Charlotte Islands, and on the west coast of Vancouver has been really the food of the coast Indians. It is their daily bread and their only real staple food. They dry it and keep it for winter consumption. Besides the halibut, there are two species of salmon, similar to those on the coast of other parts of British Columbia. There has been also a factory established of dog-fish oil. The dog-fish are very abundant in the Queen Charlotte Islands. In the vicinity of the Islands there is more shallow water and more extensive banks than on the most parts of the coast. It would be important to have a survey made of these banks, which are probably good fishing grounds. The coast of British Columbia is so far very imperfectly surveyed topographically, and the depth of water, except along certain chosen routes, is unknown. There is a very extensive bank between Queen Charlotte Islands and the mainland and along the northern edge of the Islands, and very probably also on the west coast, though I do not know that anyone has put a sounding lead overboard there up to the present day. As to the fisheries of the coast of the Province generally, of course the salmon canning industry is most important. Of late years it has assumed very great dimensions, and probably it is so well known that it is scarcely worth going into particulars about it. There were, in 1881, twelve canneries in the Province, and over 8,500,000 lbs. of fish was exported. I think there is very little danger of exhausting the salmon in the British Columbia rivers; at least, if there were any prospect of it, they would be easily restocked. No effort has been made in that direction yet, because there has been no cause to do so. I noticed the other day that in the British Columbia Legislature a gentleman brought forward the idea of introducing the oyster—the eastern oyster—and the lobster, in British Columbian waters. The suggestion has been made before, and is a most excellent one. An oyster occurs on the west coast, but it is very small, and is generally considered inferior to that found in

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the eastern waters. Its occurrence shows that in all probability the eastern oyster would thrive well. The lobster does not occur. There are any quantity of crabs, which take its place in regard to the food they consume, and there is every reason to believe that, if the lobster were to be introduced on the rocky part of the northern coast, it would give rise to very important industries, similar to those found in the Eastern Provinces.

Q. What are the prospects of gold-mining; what is the nature of the quartz and the development of metalliferous mines generally in the places in which gold is found in British Columbia?—Mining has really been from the first, and is likely, I think, to continue to be, the main central industry of British Columbia, around which the others will group themselves. In this Province there is about 800 miles in length, with a width of about 400 miles of the same mountainous and plateau region which yields all the ores of the Western States and Territories, and has given them such prominence as metalliferous regions. British Columbia as yet can scarcely be said to have more than begun the development of its mining industries. There are several reasons for this: The country is, to a large extent, covered with forests, which makes it much more difficult to prospect for mines. Then, the present cost of living and the difficulty of getting at all to some of those places which are most promising in their metalliferous deposits, and also, I may add, the fact that many of the efforts made in the first instance have been very injudicious, and have led to the discouragement of the people of the country to prosecute further enterprises of the same kind. Gold, however, is known to be almost universally distributed in the Province of British Columbia. There is scarcely a stream of any size in any part of the Province that one cannot wash a few "colors," as they say, out of, at the very least, and in 105 localities, which I catalogued in 1877, actual mining had been carried on for gold. The main auriferous belt of British Columbia runs from south-east to north-west, just inside the Rocky Mountains, and includes the mining localities which have been called Kootenay, Big Bend, Cariboo, Omenica and Cassiar. From south to north, from 1858 to 1882, the gold produced in British Columbia amounts to \$46,685,334, which is a great return, considering that the average population of the Province, taking the period altogether, would not exceed about 10,000 whites. The average number of miners employed in these placer diggings has been 2,940, and the average yield per man employed, obtained by dividing the total by the number of miners, \$683 per man per annum. It should be also considered that these placer deposits are, as a rule, only to be worked in summer, and that the sum stated was earned in less than half the year of actual work. The greatest yield of any one year was in 1864, when \$3,735,859 was sent out of the country. Last year the total yield was only \$1,013,827. Since 1874, with occasional fluctuations, the yield of gold has shown a general tendency to decline, and the state of the country at present is simply this: The richer placer mines so far discovered having been more or less worked out, the gold yield is falling off. Such placers have been more or less completely exhausted, early in the history of gold-mining countries, as in Australia and California. Then the period comes when the miner goes to work on the quartz lodes, whence the gold in the placer mines has been derived. That period has not arrived yet in British Columbia. There is not a single numerous quartz vein worked there yet, and the present is the interim period between the full development of placer mines and the beginning of the quartz mining, which is a more permanent industry. There is no doubt that before long auriferous quartz mines will be worked.

By Mr. Trow :

Q. There are quartz mines in Cariboo, are there no?—An attempt was made some years ago to work them, but, as far as I know, there is no mine now in operation. The difficulties are very great in some parts of the country owing chiefly to the cost of transport and supplies. Until very lately, it cost from 7½ cts. to 12½ cts. a pound to freight goods and supplies to Cariboo from Yale, according to the season, and such prices are so heavy a tax on expensive mining operations that it renders

it impossible to work any but very high grade ores. In Omineca, still further north, it costs 15 cts. a pound to carry supplies into the district, and thus it is almost impossible for private miners to continue prospecting on their own resources, and unless they have a very rich claim which they can work, they must leave the country. One advantage of the construction of the railway and opening up of the interior will be that the poorer placer deposits will be extensively worked. Naturally, the very rich deposits form a very small part of the whole. Those of medium and poorer quality are more widespread, and when the cost of getting supplies is reduced to half its present price, a large number that do not pay to work at present will become available.

Q. Is Chinese labor employed very much in the mines?—Chinese generally work on their own account in the gold mines. They choose placer mines, very often those which have been abandoned by the whites, who have picked the eyes out of the deposit, and they work for years in such localities in their own way. No one knows what they make, but it is enough no doubt to remunerate them, owing to their perseverance.

By Mr. Baker (Victoria):

Q. And their economical habits?—And economical habits.

By Mr. Hesson:

Q. Can you say anything in reference to silver?—I can say very little from personal knowledge about silver ores. There are several places where silver ores have been found, and the two most promising, so far as known, are—first, a locality at Hope, on Silver Peak, and, second, one at Cherry Creek, in the Okanagan country. Very rich ores have been brought from these, and mining attempted on both of them, but, from various circumstances, the mining has been practically stopped. In the case of the Hope mine, at least, the stoppage has not resulted from any failure of the vein, but was on account of questions regarding the management or sale of the mine. There is reason to hope that, ultimately, these two localities, and probably others, will be developed as productive silver mines. If one silver mine were started and found to pay as a commercial enterprise, probably it would lead to so much examination and prospecting of the country that many would be worked in a few years. I may also mention in this connection that we have received specimens of very rich argentiferous galenas from Omineca, though from the distance of this district they cannot be worked under present circumstances. They assay from \$29 to \$90 of silver to the ton of ore.

Q. The distance inland or up the coast?—Inland. The coast distances are comparatively little, because you have navigation, but the Omineca country lies far inland, near the Peace River.

By Mr. Allen:

Q. Is there a large amount of gold exported by the Chinese from British Columbia and not accounted for?—No, I think not. It is accounted for, in the statement I gave, in this way. I went into it at considerable detail with Mr. Good, who was Deputy Minister of Mines at the time this general statement was first compiled, some years ago. We obtained from all the banks a statement of the gold they had sent out of the country, and from the express offices the same. Then, as a large quantity was known to be carried away by the Chinese and others, privately, without being recorded, one-third was added to the product of each year to represent that; so the statistics are not absolutely correct, but they approximate closely to the truth. I think much of the gold the Chinese get they carry away in that manner, without putting it into the hands of the banks.

By Mr. Fisher:

Q. Do you think the Chinese get one-third of all the gold in the country?—No; but many of the white miners carry their gold away themselves also. If they go to San Francisco, for example, they take the gold with them.

By the Chairman :

Q. Will you state your knowledge of the coal and lignite deposits of Vancouver Island, Queen Charlotte Islands, and the mainland?—Coal and lignite deposits are very widely spread in the Pacific Province. In this little publication to which I have referred several times as giving an account of the mining up to the date when it was issued (" Mines and Minerals of British Columbia—Report Geological Survey, 1876-77 "), thirty-two different localities in which coal and lignites are known to occur are catalogued, and some of these are extensive and important districts. Many of them will eventually be utilized as sources of fuel supply, either generally or locally. The Queen Charlotte Islands are prominent from this point of view on account of the fact that a seam of anthracite has been discovered there. This is the only workable seam of anthracite on the Pacific coast, either of America or Asia. The seam was about 6 feet thick, and was worked for some distance, but was found to thin out. I believe, however, that the main trouble was that the Company had expended all their money on providing facilities for shipping the coal before doing much prospecting, and since it has not been much tested, and has fallen through. I examined the vicinity of the mine very carefully in 1878, and have a map showing the locality of the coal. I think the locality is a very promising one still, and deserves more attention; but nothing more precise can be said at present, because no work has been carried on for some years. The Comox and Nanaimo districts of Vancouver Island have been more thoroughly tested, and the latter has been the principal source of supply for some years. These have been mapped by Mr. Richardson of the Geological Survey. The map is on a scale of four miles to the inch, and is somewhat detailed, showing the actual area of known coal-bearing rocks in these two places, and all other necessary facts of structure. The coal seams at Comox and Nanaimo vary from 4 feet to 6 feet and 10 feet in average thickness. They are occasionally much thicker, but this is the average. The quality of the coal I should mention particularly. It is not a lignite. It is true bituminous coal of very excellent quality. It was tested by the War Department of the United States, some years ago, to find out which fuels gave the best results for steam-raising purposes on the western coast, and it was found that, to produce a given quantity of steam, it took 1,800 lbs. of Nanaimo coal to 2,400 lbs. of Seattle coal, 2,600 lbs. of Coos Bay coal, Oregon, and 2,600 lbs. of Mount Diablo coal, California, showing that, as far as the Pacific coast is concerned, the coal of Nanaimo has a marked superiority over all the others. In 1882 the coal raised from the Nanaimo mines was 282,139 tons, which is equal to about one-fifth the coal product of Nova Scotia, though that Province has been so much longer a coal-producing region. Of this 151,800 tons were sold in San Francisco, the retail price being about \$12 a ton. Nearly one-fifth of the coal used in San Francisco was mined at Nanaimo, and a much larger proportion would be brought from British Columbia, but for two circumstances. One is that there is a considerable duty on coal which has been sufficient almost to kill the coal trade between Nova Scotia and the Eastern States; but, owing to the higher price on the Pacific coast, has not had the same effect there; and the other, that a large quantity of coal is brought out from England, in ballast, by vessels coming for grain, which would not be commercially profitable if carried in any other way.

By Mr. Baker (Victoria) :

Q. And from Australia also?—Yes, chiefly from Newcastle and New South Wales as ballast.

By Mr. Hesson :

Q. Is that ballast put on the market and sold, or stored for the use of ships?—I think it is put on the market and sold. A large portion of the coal supply of San Francisco is delivered in that way.

By Mr. Baker (Victoria):

Q. It is sold for what it will fetch? It is a small coal generally speaking?—A number of vessels come from Australia with coal ballast to San Francisco, and go back to England with grain.

By the Chairman:

Q. You say the price is \$12 a ton in San Francisco. What is the average cost of transport from Nanaimo?—I cannot say.

By Mr. Baker (Victoria):

Q. \$3.25 a ton. It is now \$2.25 a ton?—I believe coal is sold in Nanaimo for \$4 a ton.

Q. At the Chutes?—Yes, and the remainder goes for transport and middlemen and losses.

Q. The market price for any coal in San Francisco is lower than that which you stated, which was in vogue some years ago?—This is from a circular from San Francisco, I dare say it may average \$8 a ton now.

By Mr. Homer:

Q. What was the date of that?—1882.

Q. That was the case for two months; the average price now is \$9?—Very probably.

By Mr. Trow:

Q. You stated that the coal of Nanaimo had been compared with American coal—what about the Nova Scotia coal?—It is about equal to the best qualities of Nova Scotia coal. Of course, those coals that come into direct comparison with it on the Pacific coast, are all inferior to the Nova Scotia coals. It might be also stated in connection with the mines, that a considerable number, not only of the Chinamen, but of the Indians, are employed in the underground works and gain very good wages, and it is hopeful that a number of these West Coast Indians take to hard work kindly and support themselves in that way.

By the Chairman:

Q. They are also employed in the fisheries to a considerable extent?—Yes; and in the interior a number have taken to agriculture in a small way, and own stock, and I think will look after themselves very well in a few years.

Q. You have been speaking up to the present of the coal deposits on the islands. How about the deposits on the mainland?—It is very probable that the coal deposits found in Vancouver Island will be found also underlying a part of the flat country about the mouth of the Fraser, below Yale, but so far, no workable seams have been found there, though specimens of very excellent coal have been got. But in the interior, within the Coast Mountains, there are many localities at which both coal and lignite occur. Most of these—that country being at present really undeveloped—owing to the isolation of the localities, have not been worked. In the Nicola Valley an excellent coal has been found, 5 feet to 6 feet thick, and on the North Thompson another coal of very excellent quality is known to occur. Those two are of the nature of true bituminous coals, more or less perfect. The remainder of the coals of the interior, so far as known, are, strictly speaking, lignite coals, and one of these I have visited on Hat Creek is over 40 feet in thickness. The deposits on the Similkameen and others are of local value, and, I have no doubt, will be utilized for local fuel supply. The country is amply supplied in all parts of the interior with fuels for the purposes of the settler.

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Q. Can you give information as to the agricultural, mineral and other resources of the Peace River country, part of which is included by the eastern boundary of British Columbia?—The eastern boundary of British Columbia follows the 120th meridian from the 60th parallel southward till that meridian strikes the Rocky Mountains, and a large triangular portion of British Columbia thus lies east of the Rocky Mountains. The part of the Peace River basin that is of some considerable agricultural value, and is included in British Columbia, I estimate at between 5,000 and 6,000 square miles. The remainder of the Upper Peace River country lies in the North-West Territories. The part of the Peace River country, of which I am able, from personal knowledge, to speak, is that lying south of the 57th parallel of latitude from and reaching to the Athabasca River, and has an approximate area of 31,550 square miles. The Peace River country, I should state, is naturally separated from the Upper Saskatchewan country by a band of poor land along the Athabasca. The average elevation of this region is about 2,000 feet above the sea, or a little more than that. The soil is a very fine silt, which, where it is best, very much resembles that of the Red River Valley, and is quite different from most of the soil intervening between the Red River and the Peace River country. The fertility of the soil, owing to the small attempts yet made at cultivation in that district, is chiefly evidenced by the extraordinary luxuriance of the natural vegetation found upon it. In general the Peace River country is more or less densely wooded, but there are considerable areas of prairie land also. West of the Smoky River I have estimated that the areas aggregate 3,000 square miles, or 1,920,000 acres. One of the largest prairies—Grand Prairie, south of Dunvegan—has an area of 230,000 acres, nearly all prairie, with a few scattered groves of trees. The soil is magnificent; it is watered by beautiful streams, and is altogether one of the most attractive countries in a state of nature I have ever seen. The rest of the tract of 31,550 square miles which, from its flat character and low elevation, constitutes the arable region, is, as a rule, wooded, and for the most part with second growth wood, which consist of poplar, birch and spruce. Taking this area again, and deducting all the known districts which contain poor soil, and 20 per cent. besides to cover other areas which could not be cultivated, it leaves an area of the Peace River Valley, with soil suited to agriculture, of 23,500 square miles.

Q. You are speaking of the whole district, or only of that in British Columbia?—I have spoken of the whole district, because that part in British Columbia—between 5,000 and 6,000 square miles of agricultural land—is similar—I speak only of that part of the Peace River country south of the 59th parallel. I do not refer to that to the north, because I have never been there myself and could only speak of it from report. To give some idea of the value of this region as an agricultural country, taking the area I have given, and supposing as a measure of its capacity—namely, of course, as an empirical supposition for the purpose of estimating its yield, that the whole were sown in wheat, at twenty bushels to the acre, it would yield over 470,000,000 bushels of wheat annually. I believe that the whole of this area will eventually be cultivated. I am not quite sure that over every part of it wheat will ripen and be a sure crop, but, as far as we can judge of the climate, it is as good as, or better than, that of Edmonton on the Saskatchewan River, and where wheat has been tried in the Peace River district, as a matter of fact, it succeeds, as well as other crops such as oats and barley. We have, therefore, every reason to believe that over the greater part of this area wheat will be a satisfactory and a sure crop. If only the estimated prairie area be taken as immediately susceptible of cultivation, its yield, at the rate above annexed, would be 38,400,000 bushels.

By Mr. Trow:

Q. Do you think it is subject to summer frosts?—Summer frosts occur but I do not think they are of sufficient severity to affect wheat as a rule over the country; my personal experience is that of one season. The early frosts in the autumn cut down the potato tops before they were quite dead in the later part of August in that year,

but the wheat and other grain were not affected. In fact they would have been cut but for a week of rain which delayed the complete ripening.

Q. Whose report are you referring to?—To my own. I did not bring the map of the Peace River country, by the Geological Survey in the report of 1879-80, because it is a very large one.

Q. In a country of such extent, passing through once or twice, is it possible for any one person to know much except in general terms?—Of course one's knowledge is of a general character. I travelled over a great portion of the district. I did not merely pass through it once, but spent six weeks examining different portions, and my assistant travelled through other parts of it and reported on them. Of course, a great part, as has been stated, is wooded, and, therefore, difficult to investigate thoroughly. I know the character of the soil from the parts I have examined, and there is every reason to believe that the remainder of the district with similar elevation, and forming part of the same old lake basin in which the rich silty soils were laid down, possesses the same character. From some of the higher points you can see almost over the whole country. Of course, a more detailed exploration is to be desired, and particularly experiments with various crops of a crucial kind in certain localities, especially those at considerable elevations, for the purpose of defining the limit in altitude of cultivation.

By Mr. McCraney:

Q. Do the warm winds from the Pacific coast reach that part of Peace River Valley in British Columbia?—Yes; the so-called Chinook winds have an effect south of the 49th parallel for some distance, and thence along the mountains to the Peace River and northward. Their greatest effect is within 100 miles from the foot of the Rocky Mountains. East of that they lose their character. Their occurrence in the Peace River country is well marked. When they set in in winter an immediate thaw occurs and the snow goes. The snow fall is deeper, however, in this country than in the Bow River and Belly River district to the west. The southern country is dry, and therefore a prairie country. The northern is, to a large extent, wooded and the natural precipitation of moisture is ample for agricultural purposes.

By Mr. McNeill:

Q. Have you any reason to suppose the summer frost, the year you were there, was any less severe than usual?—No; as far as I could gather it was unusually severe, yet it did not affect the wheat crop. I collected excellent specimens of wheat from the Hudson Bay post. In fact the crops of that year were later than usual on account of this period of a week or ten days of wet weather just before harvest, which delayed the complete ripening of the grain.

By Mr. Trow:

Q. At what station of the Hudson's Bay post was that wheat grown?—I spoke especially of Dunvegan, but besides that we know that wheat thrives at Lesser Slave Lake post. I saw barley, ripe and with fine heads, grown by the Cree Indians at Sturgeon Lake on the Plateau and at Fort St. John, further up the Peace River and considerably nearer the mountains, barley and oats are known to have been ripe on August 12th, in 1875, though at the same place, in 1879, wheat was a failure. Fort St. John is near the western edge of the country I consider of agricultural value. Of course, I quite agree in the statement that it is very desirable to have further experiments in a few chosen localities—chosen as being the most unfavorable—to show the best and worst that can be said of the country.

By the Chairman:

Q. Can you say anything in regard to the mineral resources of that particular portion of the country?—The mineral resources of the Peace River country may be treated of comparatively briefly. They consist in gold and coal. Gold is found in

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the principal streams but chiefly in the Peace River, and no very rich deposits have been discovered here, though sufficient to attract a few miners who have made good wages out of it. I do not think that, except in the Rocky Mountains, west of the Peace River country proper, there is a chance of very extensive gold mining here.

Q. Have the gold deposits you speak of been brought down from the Rocky Mountains?—Partly so and partly from the east, I believe. I think Dr. Selwyn spoke before of the fact that the gold deposits of the great plains to the south have been derived from the east. In the Peace River country it is not quite the same, because the Peace River flows right through the Rocky Mountains, and the gold bearing schist on its head waters is the northern extension of that of Cariboo. The result is that the Peace River carries with it through its whole course a considerable quantity of, comparatively fine gold, and how much has come in that way and how much with the glacial drift from the east, it is difficult or indeed impossible to determine in this district. The coal resources give every promise of being very extensive. So far they have been examined only in a few places, and most of the seams observed have been thin, but the quality of some of them, particularly in the neighborhood of the mountains, in a zone extending 50 or 60 miles east of the mountains, is excellent. On the Athabaska River some seams of lignite coal are known. There is one 10 feet in thickness of good quality, and another of 3 feet of even better character. There is every reason to believe, from the wide spread of the cretaceous formation in which the coals occur, that the Peace River country will be found amply supplied with mineral fuels.

By Mr. Cochrane :

Q. Is this in the North-West Territories or in British Columbia?—Partly in each. I stated that probably about 5,000 square miles of the agricultural part of the Peace River country lie within British Columbia. A large part of the coal bearing rocks is also within this Province.

By the Chairman :

Q. Have you any information respecting the probable value of the iron and copper deposits on Texada Island, Howe Sound and other parts of British Columbia, where such could be worked advantageously?—The Texada iron deposit is one of the most accessible deposits of iron discovered so far in British Columbia. It is a very rich magnetic iron ore, assaying 68.4 of iron, and a very low percentage of phosphorus and other impurities of an objectionable character. The largest exposure of it is on the west side of Texada Island, where it has a thickness of 20 ft. to 25 ft. near the water's edge, and it has been traced for more than a mile to the north-westward, the vein being at times as thin as 2 ft., but generally thicker. The ore being on the coast, is easy of shipment, and within twenty miles of the harbor at Comox, from which the Comox coals are shipped. Those circumstances give it a peculiar advantage, and I believe it will be one of the first developed iron deposits of the west coast. In fact, I am informed mining is going on there now to some extent, but the ore is being sent to the United States for smelting.

By Mr. Trow :

Q. Is it near coal?—There are only twenty miles of the navigable waters of the Strait of Georgia between it and the Comox coal field, and both the iron and the coal are close to the water's edge—the Comox coal perhaps about two miles back. As to the Texada copper deposits, I believe there are copper deposits in Texada Island, but I have never seen them, and we have not received any specimens of them.

By Mr. Hesson :

Q. Did you say they were not working this iron mine?—I believe they have been to a small extent lately.

By Mr. Baker (Victoria):

Q. Some three or four tons were sent to San Francisco?—For several years iron smelting has been carried on in Oregon. I thought possibly it had gone to those smelting works.

Q. At Puget Sound?—That is recent, but for some years a little smelting has been going on in Oregon in a small way, showing it can be made to pay with poor ores and perhaps Chinese labor, on the western coast. As to the Howe Sound copper ore, referred to by the Chairman, I have no personal knowledge. It is between Howe Sound and Jarvis Inlet, at a considerable altitude in the mountains. We have had fine specimens assaying 44½ per cent. of copper, constituting a very valuable ore. I cannot, however, state any facts as to the continuity and width of the vein, which, as far as I have learned, has not been fully developed. This appears to be, however, one of the most promising copper localities in British Columbia, and from its vicinity to the coast, should be easily worked.

Q. Were there any indications of silver in the assay?—It was not tested for silver.

By Mr. Homer:

Q. With regard to the cedar, you stated that the trees were 17 feet in diameter and hollow, and the impression conveyed was, that they were not very valuable for timber. That class of trees is considered the very best we have there. The shell is generally from 1 to 3 feet in thickness, and 20 feet to 50 feet in height. It is very fine wood for sashes, doors, cases and so on, and the other is for heavier work—walls and sills and so on?—Yes; being clean and clear wood. I perhaps gave a wrong impression, and did not mean to say that hollow cedar trees were not valuable.

By Mr. Trow:

Q. What class of immigrants would be most acceptable in British Columbia?—I think, when the railway is opened through to British Columbia that the expansion of industries will be such as to give employment to all classes of immigrants. So far the development of the Province has been slow. The great trouble has been the cost of getting there. Again, the people who have gone there, have, in many cases, been connected with placer gold mining. These enterprises do not form a good basis for an agricultural population. I believe the railway will lead to the introduction of a class of agricultural immigrants who will build up the country to a great extent. I think, however, as I have said, that mining will take the lead among the industries of the Province.

By Mr. Baker (Victoria):

Q. Please state any facts upon the subject of the coal and lignite deposits of Vancouver Island, Queen Charlotte Islands and the mainland of British Columbia, as to additional localities not covered possibly by Dr. Selwyn's evidence?—I have mentioned the Nanaimo and Comox basins, which are the main deposits on Vancouver. There is a large extent of coal country about Sugwash, and north to Beaver Harbor on the east coast. This was the first worked in the Province, but afterwards abandoned for Nanaimo, where the seams were thicker. I think by boring in the Sugwash region there would be a very fair prospect of striking valuable seams. At Quatsino Sound, on the west coast, there is an extensive coal district, with coal of extra quality. The seams so far found are not, however, very thick, but owing to the position of Quatsino, out of the ordinary routes of traffic, and also to the fact that Nanaimo has been able to supply all the coal that could be sold on the coast, these localities have not been developed. At the head of Alberni Canal, again, coal is known to occur. I think it is not very extensive, but it might yield coals of economic value if it were explored. Lignite occurs at Sooke, Vancouver Island, but

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lowing to the proximity of good coal, it is not of any value. At Burrard Inlet ignites again occur, but the same remark applies to these as to the last. The mines at Bollingham Bay, in Washington Territory, just south of the line on the mainland, were worked originally pretty extensively, but as the fuel obtained resembled a lignite, when other mines became worked, they were abandoned.

Q. State also any additional facts on the coals and the character generally of the prairie region east of the mountains between Lake of the Woods and the Rocky Mountains as far north as Peace River?—I believe Dr. Selwyn has presented already to the Committee most of the facts bearing on this great region. I have travelled over the greater part of it, and, in 1881, was engaged in the Geological Survey of the Bow and Belly River districts, where some of the best coals of that region occur, and a short preliminary report has been published on them. I may state that the whole of the great prairie country, west of the edge of the third prairie plateau, is amply provided with fuels. There is scarcely any district which is at a great distance from some bed of coal or lignite which is, at least, of local value. The fuels near the Rocky Mountains are generally the best, and are, in some cases, indistinguishable from those of the true carboniferous period.

Q. How does the interior plateau country of British Columbia compare with that of Utah and Nevada?—It is much less in general altitude. The climate is not so dry. It is better suited for agriculture and stock-raising, as far as the agricultural land exists, and instead of a country almost bare of forests, it is largely—the higher elevations in the south and the whole of the northern part—covered with timber of more or less value. The only point in which the comparison is in favor of Utah and Nevada is that, owing to the timber and the glacial drift, it has been more difficult to prospect the country for minerals, although the same rocks run north from Utah, Nevada, and Idaho, and there is reason to believe that they may hold similar valuable metalliferous deposits that have not yet been developed.

By Mr. Fisher :

Q. You say the northern part of the plateau, and the coast line, is covered with timber. What proportion of the other portion of British Columbia would not be required to be cleared for agricultural purposes?—Almost the whole of the land in the southern part of the interior, which is really suitable for agriculture, lies in the river valleys, and of that, nearly all is now in a state of prairie or very lightly wooded.

Q. Chiefly bottom land?—Chiefly bottom lands in the valleys.

By Mr. Trow :

Q. What grass is there?—Bunch grass is the most abundant and valued.

By Mr. Fisher :

Q. It is suitable for pasturage naturally?—Yes.

By Mr. Baker, (Victoria) :

Q. Would you please inform me what are the circumstances, in your opinion, having a tendency to retard the development of British Columbia as a mining country?—I think the greatest have been its remoteness from other districts where mining is actively prosecuted, the small population, the cost of getting there, and the cost of supplies and living generally; also, as I have stated before, the forest covering a great part of the country. The covering of drift material further renders it a difficult country to prospect. I have no hesitation in saying that the railway, opening up a section across the entire width of the Province, and in communication with navigable rivers and lakes, will give a great impetus to the mining industries.

Q. Please give me your opinion as to the distribution of gold in British Columbia, the total, actual and estimated yield of gold from 1858 to 1875, the average number of miners employed yearly, and their average earnings per man per year for that

period?—I have given in answer to a previous question, these facts in a summarised form, up to 1882. I have not here the statistics in detail.

Q. Where are the principal areas of gold-bearing rocks, and is there any reason to believe them to be the geological equivalents of the richest auriferous rocks of California?—I think there is very little reason to doubt that the gold-bearing schists are the geological equivalent of the gold-bearing rocks of California. The region in a small area which has yielded the greatest portion of gold is the Cariboo country. There are also the Omenica, Cassiar, Kootenay, and Big Bend districts, together with the Fraser River which in 1858 was the first to attract the attention of miners. On Vancouver Island the Leech River district has yielded altogether about \$100,000 worth of gold, and it is not improbable that auriferous veins may be discovered there from which that yield has been derived.

Q. During your visit to the Cariboo region, what were the wages paid to mechanics, laborers, Chinamen and Indians, and the prices of provisions at that time?—Ordinary laborers—that was in 1876—received \$5 a day, mechanics \$5 to \$7, Chinamen and Indians generally \$3 a day. These prices were considered a great reduction on those prevailing formerly. A man who could not make \$8 a day out of a gold claim did not think it worth working, in the earlier days of Cariboo, and a great deal of ground was then passed over hurriedly that will pay to work again. The cost of living was high also. Flour was 3 cts. a pound, beans 15 cts., bacon 35 cts., grain for horse feed 7 cts., and hay 5 cts. a pound.

Q. Do you think the quartz in the region of Cariboo could be crushed to advantage if greater facilities for getting in machinery and supplies were offered?—That is still an open question, in so far as the veins at present known are concerned. Most of the specimens we have received have not proved rich though the veins are very wide. If the facilities were great, for instance, if it were situated on the coast, I daresay even the lodes now known might be worked, but I doubt if any of the discovered veins would pay to work in the Cariboo district. It is probable, however, that we have not yet found in that district the sources of the heavy alluvial gold, because most of what is found in the placers is coarse gold in nuggets or pellets of considerable size, and in the quartz the gold so far discovered has been for the most part distributed in a very high state in iron pyrites.

Q. What silver and copper indications are there on the Mainland, where situate, and is there reason to believe any of the lodes to be true fissure veins of much value if properly worked and with adequate machinery?—The Hope and Cherry Creek localities are both on the Mainland, and these are the two most promising localities for silver I know. As I have not personally visited the Hope mine, I cannot state whether it is a true fissure vein or not. In Cherry Creek mine there was some interruption met with in the vein, and all one can say of it at present is, that very rich ore has been derived from it, and it appears well worth fuller investigation. There are a great number of places where copper has been discovered, not only inland but on the coast. I do not know any more promising locality than the Howe Sound one, from which we have had specimens. In the publication already referred to, I have catalogued seventeen copper localities.

Q. Other than Leech River, is gold to be found in Vancouver Island?—Some years ago the Vancouver Island Government, at that time separate from British Columbia, sent out an exploring expedition, which examined a large part of the Island. They discovered the Leech River diggings and they found also small quantities of gold in several other rivers, and from time to time prospects have been got in other parts. One may even get colors on the sea beach where magnetic iron sand is found; but no deposits have been found up to the present rich enough to work, besides the Leech River ones.

Q. What are the known fuel producing formations in British Columbia of economic value?—The formation which produces the most valuable fuel of British Columbia, that of Queen Charlotte Islands, almost all of Vancouver Island and some on the mainland, is the cretaceous, of the same age as the chalk of England and much newer than the coal rocks of Nova Scotia. Most of the lignites occur in the Tertiary

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formation which is the newest form in the country and covers a large area of the interior of the Province. Very excellent lignite occurs in its lower layers.

Q. Do you think anthracite coal exists in Queen Charlotte Islands in sufficient quantity to be remunerative if properly worked?—The total quantity got from the known seam was about 800 tons before work was suspended. I examined the place carefully and consider it well worthy of further investigation, but one cannot give an opinion as to its actual value, till more prospecting work has been done.

Q. Apart from Nanaimo and Comox, what other places on Vancouver Island are possessed of good coal indications?—I believe I have already given all the available information on this point.

Q. What is the general thickness of the seams in Nanaimo, Wellington, Comox and Quatsino, their quality and character, and does coal exist in Barclay Sound at the head of Alberni Canal?—Coal has been found in Barclay Sound, but we are unacquainted with its thickness or extent. The region has never been thoroughly examined. The thickness of the thickest seams in Quatsino Sound is between four and five feet, as far as I know, but it has been imperfectly explored as yet. The quality of the coal there is excellent, and there is a considerable extent of coal measures, stretching probably across the Island from Quatsino to Fort Rupert. There is, however, up to the present time, no settlement there and no traffic, and consequently it has not been considered a paying matter to open the place up.

Q. Is lead, cinnabar, mercury and platinum to be found in any part of British Columbia in any quantity?—Lead occurs in a number of localities, I believe in considerable quantities. Some I have mentioned in connection with silver, silver being generally found associated with galena. It is also said to occur on Kootenay Lake. Cinnabar has been found only in small quantities, none to warrant actual mining. The most promising I have heard of is on the Homathco River, above Bute Inlet. Platinum is found in small quantities in connection with gold washings. It is the only part of the Dominion I believe in which platinum has been found.

Q. What building and ornamental stones are to be found in British Columbia, their location, extent and probable value?—British Columbia is very richly endowed with all kinds of building and some varieties of ornamental stones. There are the sandstones of the cretaceous period in connection with the coals of Vancouver Island, sandstones and free-stones, some of them of excellent quality, and judiciously chosen—some of them have been proved to be not enduring—they make excellent building stone. Granites and other crystalline rocks of that kind exist in great abundance along the whole coast, and might be used to any extent and exported. There is a lack of suitable stone, for building, in the vicinity of San Francisco. There are also a number of places where marble quarries have been opened out, but no extensive quarrying has yet been inaugurated.

Q. What is the diameter of the largest tree you have seen in British Columbia, and are there very many of that size or nearly approaching it? I cannot state precisely the diameter of the largest Douglas fir I have ever seen; when a specimen was selected to send to the Philadelphia Exhibition, one was chosen which was sure to be sound throughout, and there were larger trees that we were not sure about. This tree had a diameter of 8 ft. 4 in., and a height of 105 ft., and there were a great many in the vicinity of Burrard Inlet approaching to this size. In fact, whole areas of forest are composed of trees of similar size.

Q. What is the average size of logs sawn in the mills at Burrard Inlet? I should say the average size must be between 4 ft. and 5 ft.

Q. In diameter?—Yes, in diameter.

Q. What class of spars can be got out, *i.e.*, their length and diameter?—Spars and masts of any size desirable for shipping can be easily got in British Columbia and are unsurpassed for straightness and strength. I believe masts have been usually shipped hewn to octagonal form from 20 to 30 inches in diameter and 60 to 120 feet long. They have been shipped to special orders as large as 42 inches in diameter and 120 feet long. Yards are generally from 12 to 24 inches in diameter and 50 to 102 feet long.

Q. How does the timber at Burrard Inlet compare with that at Puget Sound, as to size, quality and market prices?—It is probably about the same in both places; or Burrard Inlet, not being so much cut into as Puget Sound, probably contains in proportion to its area more valuable timber at the present time.

Q. Are there any places on Vancouver Island adapted for the erection of saw-mills?—A great number of localities. For instance, in the vicinity of Cowichan and north-west towards Comox, where there is a large area of flat country covered with fine timber, besides Alborni Canal and other places on the coast.

Q. Have you any means of knowing the principal markets to which British Columbia lumber and spars are shipped, the prices obtainable in those markets, and the general opinion of its quality?—I cannot state the prices obtained in the markets. It has been shipped to a small extent to San Francisco—not in large quantity because of the duty. A good deal has been sent to South America, and to Australia, some occasionally to China, and masts and spars have been exported to England and France. Its quality, tested by strength and in other ways, is excellent, particularly for masts and spars. The only respect in which the Douglas fir compares unfavorably with white pine is its somewhat coarser grain, and that is connected of course with its greater strength.

Q. What amount of good farming land is there in the districts of Victoria, Cowichan, Esquimalt, Maltehosin, Sook and Saanich respectively?—I cannot state the exact areas in these districts. They are included in the general estimate of the lands of Vancouver Island given before. The districts above-mentioned are in fact the principal farming tracts of the Island.

Q. Of how many acres does an average farm consist in those localities, what cereals are they capable of producing, and what is the average yield per acre?—The farms on the coast and on Vancouver Island are capable of producing all ordinary cereals successfully. The average yield per acre is invariably very high. The average yield of wheat I have stated is 30 to 40 bushels per acre, as far as can be ascertained, on Vancouver Island. I have not here the statistics of the other grains and root crops.

By Mr. Hesson :

Q. You said you considered the mining industry would always be the prominent industry of the country. Did you take into consideration the value of the farm products, in consequence of the smaller population involved in mining?—I think the value of the agricultural lands, especially in the interior, where they are isolated by mountains, depends upon the development of the mining to a large extent. That is what has provoked farming in the vicinity of Cariboo and other mining districts. The interior of British Columbia has been practically cut off from the coast in the past, and whereas, in the interior, a farmer may produce more wheat in one year than he can sell in three, he has not been able to send it to the coast because of the mountain barrier, and Vancouver Island is actually drawing its grain to a large extent from Washington Territory and Oregon.

Q. I understood from the prices you quoted that there was a scarcity of those articles?—The cause of the prices in Cariboo is the remoteness. Cariboo is 5,000 feet above the sea, and farming is quite impossible at the mines.

By Mr. Fisher :

Q. Do the average prices of farm products in Victoria, Nanaimo, and about there, compare favorably with the prices in the Eastern Provinces?—They are much higher in all cases. I cannot, however, give the exact figures.

By Mr. McNeill :

Q. Is it a good quality of wheat that is raised there?—Very excellent. That in the interior of British Columbia resembles that from Oregon. The kernel is very hard and it makes excellent flour.

By Mr. Fisher :

Q. The agricultural produce is not equal to the demand of the inhabitants?—That of the coast is not equal to the demand of the coast region. In the southern portion of the interior it has been more than sufficient, and there is no external market. But when the railway is completed, it will work a revolution in that part of the country, because it will be possible to send grain to the coast. It is the same in regard to stock. The cattle have so far had to be driven by narrow and often very hilly and difficult trails across the range of the Cascade Mountains and down to Hope. They suffer in condition and in every way, and are less valuable than if they were brought directly down by rail.

By Mr. Baker (Victoria) :

Q. What is the extent and nature of the farming land in and about Nanaimo, Comox, and the east coast of Vancouver?—I cannot give you the statistics for those districts severally. In fact I hardly think any surveys have been made so accurate as to yield this information, but there is a large quantity of flat land now wooded for the most part, which will be ultimately valuable in the vicinity of Nanaimo and Comox. In fact a large portion of that which is marked on the map as belonging to the coal bearing region is flat land susceptible of cultivation either in the proximate or further future.

Q. What is your opinion as to the probable acreage of farming land in other parts of Vancouver Island?—Apart from the district enumerated in previous questions, I think the farming lands are not large. There are limited tracts elsewhere at the head of the inlets and harbours on the coast.

By Mr. Cochrane :

Q. Do you think there would be any difficulty in clearing the lands by burning the timber?—I believe, by watching the right season, it can be done by felling and being ready to clear up when it is dry enough to burn. The size of the trees and the experience of labor are deterrents. It will be done eventually, no doubt. This land, especially when the valuable timber has been removed, will be brought into use as agricultural land.

By Mr. Fisher :

Q. Is there a great deal of small growth in that part of the country?—It is not usual in the dense forests. Limited tracts are covered with scrub.

Q. The stumps of these large trees must be some distance apart?—Yes, but such large stumps take many years to decay, though time will overcome this.

By Mr. McNeill :

Q. How does the climate compare with Great Britain, so far as humidity is concerned?—The climate of some parts of the coast, particularly the west part of Vancouver and the Queen Charlotte Islands, is more humid than that of Great Britain, and even than the west of Ireland, but inside the islands where it is sheltered by the mountain ranges, the climate is not near so humid. There is a great difference.

By Mr. Baker (Victoria) :

Q. Describe respectively the nature and extent of the farm lands of the Fraser River, Kootenay and Okanagan?—I do not know that any precise estimate has been made of the farming land about the estuary of the Fraser, but there is a great deal of flat land there, partly prairie land, which has to be dyked to prevent the overflows of the river, and make it useful for agriculture. In 1877 Mr. Dowdney informed me that about 400,000 acres had already been surveyed in

townships, of which he estimated about 230,000 as prairie or lightly wooded. To this may be added 10,000 to 15,000 acres, representing good land near the Fraser, between Chilakweyak and Hope. Included the Okanagan and Kootenay country, the general estimate for the southern interior. There is a beautiful tract on Okanagan Lake, about the Mission, which is already pretty nearly settled, and has many good farms. Then, on the Spallumcheen, between Okanagan and Shuswap Lake, there is much fine land in a very wide valley, and irrigation is here not necessary. It is easily accessible by water from Kamloops.

Q. What is the average acreage of farms in those localities, nature of soil, products, yield per acre, and the adaptability of such lands for grazing purposes?—I am not in a position to state the average acreage held by the farmers, but owing to the small demand for cereals, and stock being the only product which it has been possible to sell to advantage, the cultivated area is, as a rule, comparatively small. Each farmer cultivates only such grain as he can dispose of, while he may have a large herd of cattle feeding on the natural grasses, and derive his income chiefly from the sale of these. I cannot speak too highly of the grasses and grazing land of the southern part of British Columbia. It is not excelled, or perhaps equalled, by any grazing land I know. The only danger is the overstocking of certain districts, and I think measures should be taken to prevent this in time.

Q. At what price per acre could any of the farms in British Columbia be purchased, and what facilities are there in British Columbia for acquiring land generally, including timber leases?—The British Columbian Government is liberal in granting lands to settlers. Wild lands are sold at the rate of \$1 per acre, and claims of 160 acres west of the Cascades, of 320 acres east of the Cascades, are given, the title being secured by four years' residence and payment not exceeding \$1 per acre.

Q. What facilities are there for sending stock from British Columbia into Manitoba and the North-West Territories?—Of late years, some stock—particularly a number of horses—has been taken across the Mountains into the North-West Territories. Last year the British Columbian Government very wisely spent a sum of money in cutting out a trail by the Crow's Nest Pass, and that is the easiest route to take cattle from British Columbia into the North-West at present. There is a very fair trail all the way now by the Crow's Nest Pass leading from the Kootenay country. Then cattle have also been driven across by the South Kootenay Pass. Some have preferred the South Kootenay Pass on account of it being a somewhat shorter route, but I think on the whole the Crow's Nest is the most favorable. Horses have also been driven across into the Peace River country, but the demand is so small that it is not likely to be repeated at present. They were sold to the Hudson's Bay Company for trade with the Indians.

By Mr. McNeill :

Q. What is the area of arable land in Vancouver?—383,000 acres estimated.

By Mr. Baker (Victoria) :

Q. As to the manufacture of dogfish oil, do you apprehend it will be a commodity of any value in the near future?—Its value is becoming better understood. It is used largely for lubricating machinery and other purposes. I think it is likely to be a very important branch of the fishing industry on some parts of the west coast, and the more it is prosecuted the better for the other fisheries, because the dogfish are so voracious that if they were exterminated the other fish would have a better chance of increasing or prolonging their existence.

Q. Is there not a tolerable quantity of red and yellow cedar in British Columbia?—There is a very large quantity of red cedar, which is found not only on the coast, but in the interior, where a humid climate prevails, in the Selkirk and other ranges, and even as far as the western slopes of the Rocky Mountains. The yellow cedar is more limited. It is confined to the coast, and a good deal is in tracts difficult to get at, but owing to its superior quality as a fine wood for cabinet making purposes, it is likely to be sought after.

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By the Chairman:

I inferred, but I do not know if I was correct in the inference, from your statement, that in the interior of British Columbia the lack of rain would be some drawback to the agricultural development of the country?—Over a great part of the southern part of the Province, where agricultural land exists, the rainfall is insufficient for the growth of crops, and irrigation is resorted to, but in most districts abundance of brooks are available for that purpose, and, although to an eastern farmer it may seem to be a disadvantage to have to irrigate his land, a western farmer, his irrigating ditches once made, prefers it, as he has not to pray for rain, but merely cuts a hole in the ditch.

Q. Are the facilities for irrigation equal or superior to those in Colorado?—Generally much superior, because the rainfall on the hills is considerable and the valleys comparatively narrow. There are only some portions of Colorado which can be irrigated. There are large tracts permanently barren from want of water.

