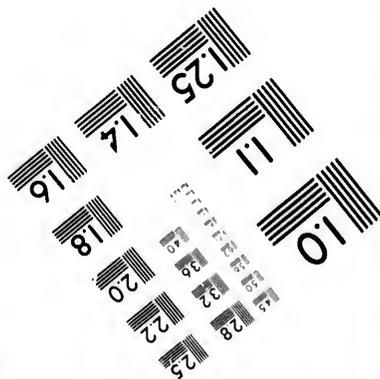
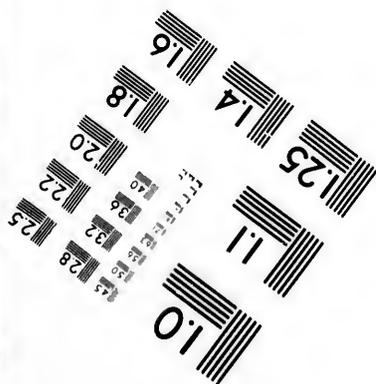
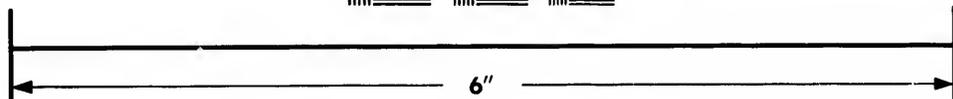
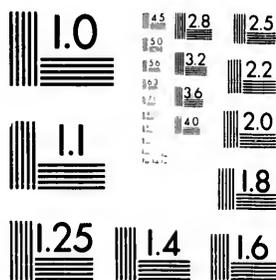


**IMAGE EVALUATION
TEST TARGET (MT-3)**



**Photographic
Sciences
Corporation**

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

15 28 25
32 22
20
8

**CIHM/ICMH
Microfiche
Series.**

**CIHM/ICMH
Collection de
microfiches.**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

10

© 1981

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distortion le long de la marge intérieure
- Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments:/
Commentaires supplémentaires:

- Coloured pages/
Pages de couleur
- Pages damaged/
Pages endommagées
- Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
- Pages detached/
Pages détachées
- Showthrough/
Transparence
- Quality of print varies/
Qualité inégale de l'impression
- Includes supplementary material/
Comprend du matériel supplémentaire
- Only edition available/
Seule édition disponible
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/
Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

The copy filmed here has been reproduced thanks to the generosity of:

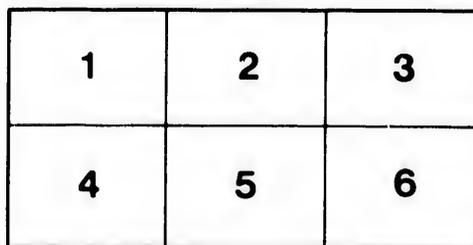
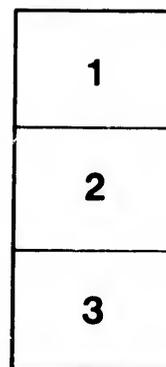
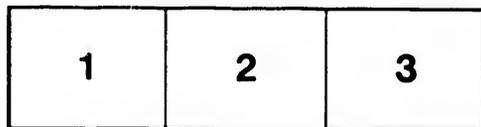
Library Division
Provincial Archives of British Columbia

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

Library Division
Provincial Archives of British Columbia

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

rrata
co

pelure,
n à

map
971.35
D272

JOURNAL
OF THE
ROYAL COLONIAL INSTITUTE.

No. 5. SESSION 1892-93.

APRIL 1893.

For fifteen years or more I have been engaged in the exploration and geological examination of British Columbia in connection with the Geological Survey of Canada, and have thus enjoyed the opportunity of traversing and inspecting a large part of this province of Canada. The information gained has been embodied in a series of official reports, published from year to year, and it is only because it may be assumed that such reports are seldom read that I can venture to hope that what I have to say may possess some interest or novelty at the present time.

British Columbia is the western province of the Dominion of Canada, with a coast-line of over 500 miles in length, from south to north, on the Pacific. It is the largest of the Canadian provinces which has yet been defined, and may be described as possessing truly imperial dimensions. Its length of coast (without counting its extraordinary sinuosities) is nearly equal to the combined length of England and Scotland; while its area of 383,300 square miles is over three times that of the United Kingdom, and greater than that of any country in Europe except Russia.

It is in the main a land of mountains, including nearly 1,000 miles in length of that broken western margin of the American Continent, which, in lieu of any better name, is known as the Rocky Mountain region or Cordilleran Belt. Although it possesses valuable fisheries and remarkable resources in its forests, besides important tracts of arable and pasture land, much of its prosperity must depend on the development of its mineral wealth, which is the com-

ms P
971.
D 2

810 *Banquet to Celebrate the Twenty-fifth Anniversary.*

Clench, Sir D. Cooper, Bart., G.C.M.G., Messrs. A. J. Cotton, A. J. Cunningham, Sir H. S. Cunningham, K.C.I.E., Messrs. O. B. Cuvilje, B. D'Ambrumemil, F. H. Dangar, L. M. Davis, Frank Debenham, Sir A. Dent, K.C.M.G., Rt. Hon. R. W. Duff, Messrs. A. H. F. Duncan, Frank M. Dutton, Frederick Dutton, C. Washington Eves, C.M.G., Thomas Farrow, Dr. C. Fischer, Sir Malcolm Fraser, K.C.M.G., Mr. Arthur Galton, Sir James F. Garrick, K.C.M.G., Messrs. C. T. Gedye, James Gilchrist, H. O'Halloran Giles, J. B. Gill, G. R. Godson, C. S. Goldmann, Henry Grant, Frederick Green, Major-General Sir Henry Green, K.C.S.I., C.B., Messrs. J. Howard Gwyther, T. J. Hanley, C. A. Harris, J. E. L. Harris, Wolf Harris, J. C. Haslam, R. E. Haslam, J. K. Hawthorn, H. L. Hayman, Henry Hayman, J. Henniker Heaton, M.P., Rev. Styleman Herring, Messrs. M. W. Hervey, Sidney Hill, G. B. Hingley, Sir Arthur Hodgson, K.C.M.G., Messrs. R. H. Holman, G. L. Houstoun, J. H. Howard, J. C. Hudson, G. M. Ievers, G. H. Irish, F. C. Jacomb, R. J. Jeffray, Henry Jones, Owen F. Jones, E. A. Judges, Major-General W. Clive Justice, C.M.G., Mr. Henry Kimber, M.P., Lord Kinnaird, Mr. A. Halley Knight, Lord Knutsford, G.C.M.G., Surgeon-Major J. J. Lamprey, Messrs. Robert Landale, William Lindsay, M. Little, W. D. Little, Claude H. Long, A. H. Loring, J. S. Low, Lt.-General R. W. Lowry, C.B., Messrs. W. Robert McComas, W. G. MacGregor, C. E. McKenna, M. Makower, A. J. Malcolm, W. B. Marks, E. Martin, Hon. R. H. Meade, C.B., Sir Charles Mills, K.C.M.G., C.B., Messrs. Thomas Mills, S. V. Morgan, O. V. Morgan, J. R. Mosse, J. Muirhead, Alexander Myers, E. H. Nash, J. C. Nicoll, Robert Nivison, J. S. O'Halloran, Sir M. F. Ommanney, K.C.M.G., Earl of

HA
Fel
" M
to
and
and
at
of
fut
bee
mi
A
the
con
I
and
the
tun
Can
offi
ma
ver
or
I
Ca
to
wh
tru
its
of
ov
of

m
C
M
al
ta
d

ms P
971.35
D272

BP der.
60m

MINERAL WEALTH OF BRITISH COLUMBIA.

G. M. Dawson

HAD I known in time that it would be my privilege to address the Fellows of the Royal Colonial Institute on the subject of the "Mineral Wealth of British Columbia," I should have taken pains to provide myself with specimens of the ores, and with photographs and maps suitable for illustration. Without these means of enforcing and explaining my remarks, I feel that my endeavour is undertaken at some disadvantages, and this especially because I wish to speak of a country of which the mining importance lies chiefly in its future, and for which, though some substantial progress has already been made, it is not yet possible to refer to the statistics of great mining enterprises.

As it is, I am indebted to the Royal Geographical Society for the use of the map exhibited, upon which I must rely in order to convey some definite ideas on the subject in hand.

For fifteen years or more I have been engaged in the exploration and geological examination of British Columbia in connection with the Geological Survey of Canada, and have thus enjoyed the opportunity of traversing and inspecting a large part of this province of Canada. The information gained has been embodied in a series of official reports, published from year to year, and it is only because it may be assumed that such reports are seldom read that I can venture to hope that what I have to say may possess some interest or novelty at the present time.

British Columbia is the western province of the Dominion of Canada, with a coast-line of over 500 miles in length, from south to north, on the Pacific. It is the largest of the Canadian provinces which has yet been defined, and may be described as possessing truly imperial dimensions. Its length of coast (without counting its extraordinary sinuosities) is nearly equal to the combined length of England and Scotland; while its area of 383,300 square miles is over three times that of the United Kingdom, and greater than that of any country in Europe except Russia.

It is in the main a land of mountains, including nearly 1,000 miles in length of that broken western margin of the American Continent, which, in lieu of any better name, is known as the Rocky Mountain region or Cordilleran Belt. Although it possesses valuable fisheries and remarkable resources in its forests, besides important tracts of arable and pasture land, much of its prosperity must depend on the development of its mineral wealth, which is the com-

penetration afforded by nature for the generally rugged character of a large part of its surface.

Less than one hundred years ago, the region now named British Columbia was wholly unknown. At about that time its coast began to be explored in some detail by Cook, Vancouver, and other navigators, and soon after, this coast became the resort of a certain number of trading vessels in search of furs; but none of these adventurers acquired any knowledge of the interior of the country. Almost simultaneously, however, the explorers and traders of the North-West and Hudson's Bay Companies, pushing on and extending their operations from point to point in the interior of the North American Continent, began to enter the hitherto mysterious region of the Rocky Mountain from its inland side. Mackenzie was the first to reach the Pacific, and following him came Fraser, Thompson, Campbell and others, all Scotchmen in the service of these trading companies, till by degrees several trading posts were established, and "New Caledonia," as the whole region was then named, came to be recognised as an important "fur country."

This era of discovery, with its results, constitutes the first chapter in the known history of British Columbia. It is replete with the achievements and adventures of these pioneers of commerce, who with their limited resources, and without knowing that they had achieved fame—often without even placing their journeys on record—extended the operations of their Companies across a continent. But this chapter, though full of interest, is not that with which we are at present concerned. It must suffice to say that what is now British Columbia remained a "fur country," and that alone, for many years. The existence of coal upon its coast was recognised by Dr. Tolmie, an officer of the Hudson's Bay Company, as early as 1835; but though small quantities of coal were actually obtained from natural outcrops from time to time, for the use of blacksmiths at the Company's posts, no importance appears to have been attached to the discovery. The world was at that time very spacious, and the Pacific Ocean was still regarded rather as a field for the exploration of navigators than as a highway of commerce between America and Asia.

In 1849 gold was discovered in California, and with the resulting influx of miners, the seizure of that Mexican province by the United States, justified, if justifiable at all by its subsequent development, all are familiar. Two years later, a discovery of gold occurred on the Queen Charlotte Islands, now forming part of British Columbia. This constitutes an interesting episode by itself;

but, though some attention was drawn to it for a time, no substantial results followed, and no alteration in the condition of the country as a whole was brought about. The meaning and the worth of this particular discovery yet remain to be determined.

In 1857, however, four or five French Canadians and half-breeds, employés of the ubiquitous Hudson's Bay Company, found gold on the banks of the Thompson, a tributary of the Fraser River, and their discovery becoming known, changed the whole fortunes of the country. California was at this time filled with gold miners, and it required only the rumour of a new discovery of gold to create a new "excitement." In the following year, it is estimated that within three months over 20,000 people arrived at the remote trading post which then stood upon the present site of the city of Victoria, while many more made their way overland to the New El Dorado.

The difficulties in the way of these fortune hunters were great. The country was without roads or other means of communication, save such rough trails and tracks as had served the purposes of the natives and those of the fur traders. The Indians, if not openly hostile, were treacherous, and not a few of the men who actually reached the Fraser Cañons were never again heard of.

The Fraser and Thompson were at this time the objective points, and much of the lengths of these rivers were impracticable torrents. It is not therefore surprising that by far the larger part of those engaged in this sudden migration returned disappointed, many without ever reaching their destination. Some, however, persevered, several thousand miners actually got to work on the auriferous bars of the Fraser, and a new state of affairs was thus fairly inaugurated.

To follow the rapid progress of these miners along the Fraser and Thompson with their tributaries would be full of interest, though the records of their work now existing are scanty, but this again would lead us too far afield. The gold found on the lower reaches of the Fraser was what is known to miners as "fine" gold, or gold in very small scales or dust, minutely divided. Further up "coarser" gold was obtained, and the miners very naturally jumped to the conclusion that somewhere still further up the great stream the source of all the gold should be found. Thus, with restless energy, they pushed on till before long the Cariboo country, some 400 miles from the sea, was reached; and here the richest deposits of alluvial or "placer" gold were found, and for a number of years continued to be worked, with results which, considering the comparatively small number of men engaged, were most remarkable.

163792

Later and more thorough investigations show that the theory so readily adopted by the miners was incorrect; that there is no regular gradation in amount or "coarseness" of gold from the lower part of the Fraser to the head waters in Cariboo, but that the gold found on the bars of the river is of more local origin. Still the theory referred to, as a matter of fact, led the miners to Cariboo, which proved not only to be the richest district so far discovered in British Columbia, but for its area one of the richest placer mining districts ever found.

In this district the valleys of two streams, Lightning and Williams Creeks, have been the most remunerative, and these and their tributaries have actually yielded the greater part of the gold obtained. The work was begun by the washing of the gravels of the streams themselves, but with the experience already gained in California and in Australia, the miners soon began to search deeper. The valleys through which these streams flowed were found to be filled to a considerable depth by loose material, gravel, and boulder-clay due to the glacial period or to inwash from the sides of the bordering mountain ranges; and in sinking beneath all this material the channels of older streams, the predecessors of the present, were found, with their rocky beds smoothed and worn and filled with rounded boulders and gravel. These contained vastly richer deposits of gold, because they represented the concentrated accumulations of great periods of continued work by natural forces of denudation and river action.

This discovery, once made, led to the initiation of more extended mining operations, which often necessitated large expense in labour and the construction of heavy pumping machinery; but the results as a rule repaid the enterprising miners. Thus the old deeply buried channel of Lightning Creek was found to average something like \$200 in gold to each running foot of its length, while considerable lengths of Williams Creek yielded as much as \$1,000 to the same unit of measurement.

Williams Creek affords some notable instances of the extraordinary concentration of "coarse" gold in limited areas:—Thus, from Steele's claim, 80 × 25 feet, over \$100,000 worth of gold was obtained. From the Diller Company's claim, it is stated that in one day 200 lb. weight of gold, valued at \$38,400, was raised; and in 1863, twenty claims were producing from 70 to 400 ounces of gold each per diem. Four hundred miners were at work on Williams Creek in this year, which is still admiringly spoken of as the "golden year."

Though, like Williams Creek, discovered in 1861, the deep channel of Lightning Creek was not successfully reached till 1870, but great developments followed. The Butcher claim at one time yielded 950 ounces of gold a day; the Aurora, 300 to 600 ounces; and the Caledonia, 300 ounces.

It must be remembered that the Cariboo mining district is situated in a high and densely forested mountainous region, which, because of its inaccessible character, had remained almost unknown even to the wandering native hunters. At the time in which these great discoveries in it occurred, it was reached only with extreme difficulty by trails or imperfect tracks, over mountains and across unbridged rivers. Every article required by the miner was obtained at an excessive cost; but all these drawbacks did not prevent the rapid growth of typical mining camps in the centre of this remote wilderness, with their accompanying lavish expenditure and costly if rude pleasures. So long as the golden stream continued to flow in undiminished volume, everything that gold alone could buy was to be obtained in Cariboo.

Perhaps more worthy of note is the fact that the development of these mines was carried out entirely by the miners themselves. No outside capital or backing was asked for or obtained. Money made in one venture was freely and at once embarked in another, and the investors were to be found working with pick and shovel in the shaft or drift.

But the lengths of the rich old channels on both these famous creeks which could be worked in this way proved to be limited to a few miles. Below a certain point in each case, the "bed rock" was found to be at so great a depth, that it was not possible to reach it through the loose and water-saturated materials filling the old valley. Thus the great yield of gold became gradually reduced to comparatively modest proportions, and, at the present time, mining in the Cariboo district is mainly confined to hydraulic workings, by which poorer ground is utilised and a much larger quantity of material requires to be removed to obtain a given amount of gold. But the old valleys of Cariboo have never ceased to produce gold, and in 1892 their product still amounted in value to about \$200,000.

It has been impossible to follow the fortunes of the Cariboo mining district in any detail, and time can only be afforded to name the other placer mining districts of the province. The Omenica district was discovered soon after Cariboo, but little was done there till 1867. This district is situated in latitude 56°, in the drainage basin of the Peace River, and, though so remote, has produced a

considerable quantity of gold. Still further to the north, in latitude 58°, is the Cassiar district, first found to be auriferous in 1872, for some years thereafter resorted to by many miners, and still a mining centre not without importance. This is the northernmost mining region of British Columbia proper, but beyond the 60th parallel (forming the northern boundary of the province) alluvial gold mining has of late years been developed in the Yuken district, embracing the numerous upper tributaries of that great river, and extending to the borders of the United States territory of Alaska.

Neither must it be forgotten to note, that the working of alluvial gold deposits of greater or less importance has occurred at many places in the southern part of the province, to the east of the Fraser River, including Big Bend, Similkameen, and Kootanie districts, from all of which some gold still continues to be produced by the old methods.

The story of the discovery and development, the palmy days and the gradual decline in importance of any one of these mining regions, rightly told and in sufficient detail, would constitute in itself a subject of interest. But without attempting to do more than name the districts here, it is of importance to note how general, throughout the whole extent of the great area of British Columbia, the occurrence of deposits of alluvial gold has been proved to be. The gold thus found in the gravels and riverbeds is merely that collected in those places by natural processes of waste, acting on the rocks, and the concentration of their heavy materials during the long course of time. The gold has been collected in these places by the untiring action of the streams and rivers, and it must in all cases be accepted as an indication of the gold-bearing veins which traverse the rocky substructure of the country, and which await merely the necessary skill and capital to yield to the miner still more abundantly.

Nevertheless, the results of alluvial or placer gold mining alone in British Columbia have not been insignificant, for, since the early years of the discovery, the province has contributed gold to the value of some \$50,000,000 to the world.

One feature in particular requires special mention, and this is a deduction which depends not alone on experience in British Columbia, but which is based as well on that resulting from the study and examination of other regions. The "heavy," or "coarse" gold, meaning by these miners' terms the gold which occurs in pellets or nuggets of some size, never travels far from its place of origin. It is from this point of view that it becomes important to note and

record the localities in which rich alluvial deposits have been found, even when the working of these has been abandoned by the placer miner. Their existence points to that of neighbouring deposits in the rock itself, which may confidently be looked for, and which are likely to constitute a greater and more permanent source of wealth than that afforded by their derived gold.

Reverting for a moment to the Cariboo district, where such notably rich deposits of alluvial gold have been found within a limited area, and where, very often, the gold obtained has been actually mingled with the quartz of the parent veins, it cannot be doubted that these veins will before long be drawn upon to produce a second golden harvest. This district has suffered and still suffers from its great distance from efficient means of communication; but, notwithstanding this, praiseworthy efforts have already been made towards the development of "quartz mining," while much also remains to be done in utilising by operations on a larger scale, and with better appliances, the less accessible placer deposits which have so far baffled the efforts of the local miner.

It is necessary to bear in mind that alluvial gold mining or placer mining requires but a minimum amount of knowledge on the part of the miner, though it may call for much individual enterprise and effort when a new and difficult region is to be entered. Any man of ordinary intelligence may soon become an expert placer miner. It is after all, in the main, a poor man's method of mining; and, as a rule, the placer miner lacks the knowledge as well as the capital necessary to enable him to undertake regular mining operations on veins and lodes. However promising the indications may be for such mining, he either does not appreciate them, or passes them over as being beyond his experience or means. He would rather travel hundreds of miles to test a new reported discovery, than spend a summer in endeavouring to trace out a quartz reef, with the uncertain prospect of being able to dispose of it at some later date.

Thus, though the development of placer mining in British Columbia began a new history for that great region, raising it from the status of a "fur country" to that of an independent colony, and subsequently to that of a province of Canada, there remained a gap to be bridged in order that the province should begin to realise its proper place among the mining regions of the world. It was necessary that railways should be constructed to convey machinery and carry ores, as well as to bring to the metalliferous districts men who would not face the hardships of pioneer travel in the moun-

tains, but who are in a position to embark the necessary capital in promising enterprises.

For a portion of the province, the construction of the Canadian Pacific Railway has afforded these facilities, but by far the larger part still awaits railway communication. Had the Canadian Pacific Railway, in accordance with some of the surveys made for it, traversed, for instance, the Cariboo district, there can be no doubt that we should have already been able to note great developments there. This railway has, however, been constructed across the southern portion of the province, and in its vicinity, and concurrently with its progress, new mining interests have begun to grow up, of which something must now be said.

Before turning to these, however, I must ask to be allowed to say a few words respecting the development of the coal mines of British Columbia, which was meanwhile in progress.

The discovery of coal upon the coast, at an early date in the brief history of British Columbia, has already been alluded to. Following this discovery, the Hudson's Bay Company brought out a few coal miners from Scotland, and proceeded to test and open up some of the deposits. Thus, as early as 1853, about 2,000 tons of coal were actually raised at Nanaimo. San Francisco already began to afford a market for this coal, and the amount produced increased from year to year. The principal coal-mining district remained, and still remains, at Nanaimo, on Vancouver Island. At the close of the year 1888, about four and a half million tons in all had been produced, and the output has grown annually, till in 1891 over a million tons were raised in one year. California is still the principal place of sale for the coal, which, by reason of its superior quality, practically controls this market, and is held in greater estimation than any other fuel produced on the Pacific slope of North America. The local consumption in the province itself grows annually, and smaller quantities are also exported to the Hawaiian Islands, and to China, Japan, and other places. In the various ports of the Pacific Ocean, the coal from British Columbia comes into competition with coal from Puget Sound, in the State of Washington, which, because of the high protective duty established by the United States, is enabled to achieve a large sale in California notwithstanding its inferior quality. It also has to compete with shipments from Great Britain, brought out practically as ballast, with the coals of Newcastle in New South Wales, with coal from Japan, and in regard to the Pacific ports of the Russian Empire, with coal raised by convict labour at Duai, on Saghalien Island, in the Okotsk Sea.

It is sufficient guarantee for the quality of the coal of British Columbia that it is able to hold its own as against all these competitors.

Though Nanaimo has been from the first the chief point of production of coal, work has been extended within the last few years to the Comox district, also situated on Vancouver Island; while other promising coal-bearing tracts have been in part explored and examined on this island, and on the Queen Charlotte Islands.

These particular coal regions, bordering upon the Pacific Ocean, have naturally been the first to be employed, but they by no means exhaust the resources of the province in respect to coal. Deposits of good bituminous coal are known also in the inland region, and some of these in the vicinity of the line of railway are now being opened up, while others, still far from any practicable means of transport or convenient market, have been discovered, and lie in reserve. One of the most remarkable of these undeveloped fields is that of the Crow's Nest Pass, in the Rocky Mountains, where a large number of superposed beds of exceptional thickness and quality have been defined.

Besides the bituminous coals, there are also in the interior of the province widely extended deposits of lignite coals, of later geological age, which, though inferior as fuels, possess considerable value for local use.

In the Queen Charlotte Islands anthracite coal is found, but has not yet been successfully worked; and in the Rocky Mountains, on the line of the Canadian Pacific Railway, coal of the same kind again occurs, near Banff and Canmore stations. The places last named lie just beyond the eastern border of British Columbia in the adjacent district of Alberta, but require mention in connection with the mineral resources of the province.

The coals of British Columbia may, in fact, be said to represent, in regard to quality and composition, every stage from hard and smokeless fuels, such as anthracite, to lignites and brown coals like those of Saxony and Bohemia. Many features of interest to the geologist might be mentioned in relation to these coal deposits did time permit, but it must not be forgotten to note one principal fact of this kind—the very recent geological age to which all the coals belong. None of the coals of British Columbia are so old as those worked in Great Britain; they are, in fact, all contained in cretaceous and tertiary rocks.

The very general distribution of coals of various kinds in different parts of the province is of peculiar importance when considered in

connection with the building of railways and the mining and smelting of the metalliferous ores. It insures the most favourable conditions for the development of these ores, to some further examination of which we must now return.

It is especially worthy of note, that wherever in the United States the Rocky Mountain or Cordilleran region has been traversed by railways, mining, and particularly that of the precious metals, has immediately followed. It appears to require only facilities of transport and travel to initiate important mining enterprises in any part of this region. The building of the Canadian Pacific Railway across the southern part of British Columbia, with the construction of other railway lines in the neighbouring States, near the frontier of the province, have already begun to bring about the same result in this new region; which, till these railways were completed, had remained almost inaccessible. It had long before been resorted to by a few placer miners in search of alluvial gold, and their efforts were attended with some success. Silver-bearing lead ores were also found to occur there, but under the circumstances existing at the time these actually possessed no economic value. It was impossible to utilise them.

In 1886, some prospectors, still in search of placer gold only, happened to camp in a high mountainous region which has since become familiarly known as Toad Mountain, and one of them, in seeking for lost horses, stumbled on an outcrop of ore, of which he brought back a specimen. This specimen was afterwards submitted to assay, and the results were such that the prospectors returned and staked out claims on their discovery. The ore, in fact, proved to contain something like \$300 to the ton in silver, with a large percentage of copper and a little gold.

In this manner what is now known as the "Silver King" mine was discovered, and, as a consequence of its discovery, the entire Kootanie district, in which it is situated, began to be overrun with prospectors. Hundreds of these men, with experience gained in the neighbouring states of Montana and Idaho, as well as others from different parts of the world, turned their attention to Kootanie. The result has been that within about five years a very great number of metalliferous deposits, chiefly silver ores, have been discovered, and claims taken out upon them. Several growing mining centres and little towns have been established; roads, trails, and bridges have been made, steamers have been placed on the Kootanie Lake and on the Upper Columbia River, and a short line of railway has been built between the lake and river to connect

their navigable waters. The immediate centre of interest in regard to mining development in British Columbia has, in fact, for the time being, been almost entirely changed from the principal old placer mining districts to the new discoveries of silver-bearing veins.

So far as they have yet been examined or opened up, the metaliferous deposits of the Kootanie district give every evidence of exceptional value. They consist chiefly of argentiferous galena, holding silver to the value of from \$40 or \$50 to several hundred dollars to the ton. Nelson, Hot Springs, Casloslocan, Illecillewaet, and Golden are at present the principal recognised centres in the new district, but it would be rash as yet to attempt to indicate its ultimate limits.

Though much has already been done in this Kootanie district, two principal causes have tended to prevent the more rapid growth of substantial mining up to the present time. The first of these is the difficulty still existing in respect to the local transport of large quantities of ores; the second, the exaggerated values placed by discoverers upon their claims. While it is evidently just that the prospector should receive an ample remuneration for his find, it is to be noted that the laws of British Columbia are so liberal that he (whatever his nationality) may, at a cost scarcely more than nominal, hold and establish his claim, even though he may be practically without means of developing it. Such development in all cases requires the expenditure of considerable sums, and this must always be of a more or less speculative character, while, even if thus fully proved, it becomes further necessary to incur an additional large expenditure in plant and machinery before any property reaches the status of a going concern. Scarcely an instance can be quoted anywhere of a mine which has paid its own way from the "grass" down, but almost every prospector is fully convinced that his claim is precisely of this kind.

Such circumstances, which have unfortunately for the last few years retarded the development of the Kootanie country, are now happily passing away; and there can be no reasonable doubt that in the next year or two this country will establish its place as one of the most important, not only in British Columbia but in North America as a whole.

So far as England is concerned, the actual investment of capital in this district has been small. The investor here would rather pay half a million for some property which, as demonstrated in a prospectus, will produce a good annual rate of interest, than embark a comparatively small sum in a promising venture. But to a man

with some knowledge of mines and mining and the command of even a limited amount of capital, who will visit and live in the district himself for a time, the opportunities for profitable investment are, I believe to-day, excellent.

I have been unable to say anything in detail in regard to the actual modes of occurrence of the ores now being brought to light in the Kootanie district and their geological relations. Neither is it practicable, on the present occasion, to pursue in further detail the history or description of other districts of the province in which more or less good work of a preliminary kind has been done in the development of metalliferous deposits of various kinds. Okanagan, Rock Creek, Nicola, Similkameen, the North Thompson, and Cayoosh Creek can only be named. It has been possible merely to endeavour to indicate in broad lines what has already been done and what must soon follow. Within a few years this province of Canada will undoubtedly hold an important place in the list of quotations of mining stocks in London and elsewhere, and then the further development of its mines will become a subject of common interest from day to day.

In conclusion, I wish to draw attention to one or two ruling features of the actual situation which are too important to be left without mention :—

The Cordilleran belt, or Rocky Mountain region of North America, forming the wide western rim of the continent, has, whenever it has been adequately examined, proved to be rich in the precious metals as well as in other ores. This has been the case in Mexico and in the western states of the American union. Though some parts of this ore-bearing region are undoubtedly richer than others, generally speaking it is throughout a metalliferous country. The mining of placer or alluvial gold deposits has in a few cases occurred in advance of railway construction; but this industry has always proved to be more or less transitory in its character, and has almost invariably been an indication of future and more permanent developments of a different kind. Placer gold-mining has, in fact, often been continued for years and then abandoned, long before the gold- and silver-bearing veins in the same tract of country have been discovered and opened up. This later and more permanent phase of mining has followed the construction of railways and roads, and the series of conditions thus outlined are repeating themselves in British Columbia to-day.

There is no reason whatever to believe that the particular portions of British Columbia now for the first time opened to mining by

means of the Canadian Pacific Railway, are richer in ores than other parts of the province. On the contrary, what has already been said of the Cariboo district affords *prima facie* evidence of an opposite character. The province of British Columbia alone, from south-east to north-west, includes a length of over 800 miles of the Cordilleran region; and, adding to this the further extension of the same region comprised within the boundaries of the Dominion of Canada as a whole, its entire length in Canada is between 1,200 and 1,300 miles. This is almost identical with the whole length of the same region contained within the United States, from the southern boundary with Mexico to the northern with Canada.

Circumstances have favoured the development of the mines of the Western States of the Union, but it is, as nearly as may be, certain, that the northern half of the similar region will eventually prove equal in richness to the southern, and that when the mines of these Western States may have passed their zenith of productiveness, those of the north will be still increasing in this respect. The explorations of the Geological Survey of Canada have already resulted in placing on record the occurrence of rich ores of gold and silver in various places scattered along the entire length of the Cordilleran region in Canada, and though so far we have to chronicle only an awakening of interest in the southern part of British Columbia, these discoveries stand as indications and incentives to further enterprise to the north.

While the remote and impracticable character of much of this northern country places certain obstacles in the way of its development, on the other hand the local abundance of timber and water-power in it afford facilities unknown in the south, which will be of importance whenever mining operations have actually been set on foot.

No attempt has been made in this brief sketch of the mineral wealth of British Columbia to enumerate the various ores and minerals which have so far been found within the limits of the province in any systematic manner. Nothing has been said of the large deposits of iron, from some of which a certain amount of ore has already been produced, and which wait to realise their true importance, merely the circumstances which would render their working on a large scale remunerative. Copper ores have also been discovered in many places. Mercury, in the form of cinnabar, promises to be of value in the near future, and iron pyrites, plumbago, mica, asbestos, and other useful minerals are also known to occur. In late years platinum has been obtained in alluvial mines in

British Columbia in such considerable quantity as to exceed the product of this metal from any other part of North America.

While, therefore, the more important products of this western mountain region of Canada are, and seem likely to be, gold, silver, and coal; its known minerals are already so varied, that, as it becomes more fully explored, it seems probable that few minerals or ores of value will be found to be altogether wanting.

Respecting the immediate future of mining, which is the point to which attention is particularly called at the present time, it may be stated that coal-mining rests already on a substantial basis of continued and increasing prosperity; while the work now actually in progress, particularly in the southern part of the province, appears to indicate that, following the large output of placer gold, and exceeding this in amount and in permanence, will be the development of silver mines, with lead and copper as accessory products. The development of these mining industries will undoubtedly be followed by that of auriferous quartz reefs, in various parts of the province, while all these mining enterprises must react upon and stimulate agriculture and trade in their various branches.

Because a mountainous country, and till of late a very remote one, the development of the resources of British Columbia has heretofore been slow, but the preliminary difficulties having been overcome, it is now, there is every reason to believe, on the verge of an era of prosperity and expansion of which it is yet difficult to foresee the amount or the end.

DISCUSSION.

The CHAIRMAN: I will first call upon Sir Joseph W. Trutch, a former Governor of British Columbia, than whom I know no greater authority on that province of Canada.

Sir Joseph W. TRUTCH, K.C.M.G.: I have listened, in common, I am sure, with all present, with the greatest pleasure to Dr. Dawson's address. The subject is of great general interest to all—but of special importance to those who, like myself, are connected with British Columbia by bonds of sentiment and material interest. Like everything else of a similar character that has emanated from Dr. Dawson, that address bears the stamp of careful consideration and of the great practical ability of its author. British Columbians well understand and very gratefully acknowledge the obligations they are already under to him for many similar reports of his explorations and opinions in reference to their country, and I am

sure I express their sentiments in anticipation in thanking him as I do for his further very valuable paper to-night. In it he has shown how we might confidently have anticipated from the geological point of view that British Columbia would be found a rich mineral country; and he has told us, from the results of his own explorations and experiences, to what extent those anticipations have been realised by him, and has given us a carefully-drawn opinion as to the ultimate value of that mineral district. I do not think that any remarks of mine, detailing the observations and experiences and conclusions of a cursory character of an inexperienced person like myself, would be useful or acceptable after this able and exhaustive address; I will only say that certainly all my experience in that country, extending now over thirty-five years, and the experience of all those more immediately engaged in mining pursuits, fully confirm all that he has told you of the particular features of that country; and, further, that the opinions and expectations entertained in that country with reference to the future development of that mineral district are of the most hopeful—I might, perhaps, almost say, in some cases, of a sanguine character. They have been so indeed for years past, and since I have been away from the province now some twelve months, I continue to receive from my correspondents there reports of discoveries and developments in that country, particularly in the Kootanie district, which fully maintain and strengthen all previous anticipations. I should like to say also, in confirmation of Dr. Dawson's address upon the more general topics of the country, that the conditions under which its mineral wealth, whatever it may be found to be, are to be developed, are surely of a most favourable character—favourable from considerations of climatic conditions, of conditions of location, and of conditions of a more general character. As regards climatic conditions, you will allow me to say, in a word or two only, as this is one of the subjects on which British Columbians are apt to “enthuse” a great deal, that whether in the more equable temperature prevailing along the sea coast and in the valleys leading up into the mountains, or in the interior districts, with greater cold in winter and greater heat in summer, everywhere free from those malarial influences so common in most new countries, you have a climate under which, more truly, I believe, than of any part of the world, it may be said that labour itself is pleasure. Then as regards conditions of location, the times are past, not so long ago, however, when British Columbia was isolated by intervening tracts of mountain and uninhabited prairie, which cut her off

from Canada, and rendered the sea the only means, practically speaking, of approach to that country; when, as Dr. Dawson has told us, access into the interior districts could only be had at the price of great endurance and at the peril of life. In those days, so difficult were the means of transport into the interior and the mining districts, such as Cariboo, that it was commonly said that a pound of salt was worth as much there as a pound of tea, or of any other commodity the intrinsic value of which was infinitely greater. Those days have happily passed away. Since the construction of that great transcontinental railway—thanks to the enterprise and courage of the gentlemen who formed the Canadian Pacific Railway Company, thanks to their enterprise in initiating and constructing that line under the auspices of the patriotic Government of Canada, and under your immediate able direction, Mr. Chairman, we now have railway communication through our country, and from our country through Canada to the Atlantic Ocean: a railway second to none on the continent, nor indeed, under all the circumstances, to any railway in any part of the world. That railway has already afforded the means of introducing machinery into some of our mining districts. The same enterprise—the enterprise of the same company and of other kindred railway corporations—has extended, or is extending, branch railways into the Kootanie country; and, as Dr. Dawson has said, nowadays you have no longer the same great difficulties to contend with. Machinery can now be introduced, and food obtained, at reasonable prices. And then, as to conditions of a more general character, bear in mind that nowhere else is British law more effectively maintained and administered, and consequently life more secure, and the rights of property more fully assured, and in particular, that the Mining Laws and Regulations, based on years of experience, have been framed with the special aim to encourage and promote the development of the minerals in the country, and to protect mining rights and property. I only desire, in conclusion, to express the hope and wish that, however many may be induced to embark their capital, and time, and energy in British Columbia in the pursuit of fortune from its mineral wealth or its many other resources, I trust they may all realise this result, at least: a result which, happily for me, I stand here prepared to profess and maintain, that British Columbia, if not the richest, is, at all events, the happiest country in the world.

Mr. H. C. BEETON (Agent-General for British Columbia): In the first place, I beg to congratulate the Fellows of the Royal Colonial Institute on securing the valuable services of Dr. Dawson on this

occasion, notwithstanding the very important duties which brought him to this country, in connection with the Foreign Office; and on behalf of the province, I wish to express my hearty thanks for his very able and interesting paper. It is quite certain we could not have had a higher authority on this subject. He knows the province most intimately, having travelled over the greater part of it, and from his knowledge as an expert he has given to the world in his works an exhaustive geological account of it. He has traversed familiar ground this evening, and he has reassured my mind, if indeed I ever had a doubt, about the brilliant future of the province. Dr. Dawson pointed out that, having passed through the placer period of mining, we have entered the deep-sinking and the quartz-mining period, which will naturally require a great deal of capital, machinery, and, of course, skill. The difficulty is to attract foreign capital to distant enterprises of a speculative character, which mining must always be. Consequently, the Americans have an advantage over the English, being nearer the spot, and they have also the advantage of experience in their own country, and, as we see, they are now working their way north and developing this rich Kootanie district. At the same time we are indebted to the Canadian Pacific Railway for the present development very much. British Columbia has been kept back mainly owing to the want of such communication, but I have no hesitation in saying that we are now on the eve, in this Kootanie district of the South-East province, of very important and most valuable mineral developments; and though one speaks with bated breath about paying mines after what I have listened to this evening, I have no hesitation in saying that this summer will demonstrate to the world that the Kootanie district will not only prove valuable but be a good paying district. Dr. Dawson has referred to the Cordilleran belt, which, as geologists know, exists not only in British Columbia and Montana and California, but further south; and so confident are our American cousins of the mineral wealth of this formation, of which we have over a thousand miles in our province, that I have myself seen a project on paper, which I should not be astonished to see one day carried out, for a railway running north and developing this rich mineral belt. The railway will extend to Alaska, and then, crossing the Behring Straits, will connect with the railway which I believe is about to be commenced in Russia, connecting finally with the European system; so that it is on the cards that our posterity will be able to go overland from British Columbia to the city of London. This will give you some idea of the opinion of our American cousins

as regards this belt. Although I should be the very last to depreciate the importance of mineral wealth, there is no doubt it plays a very important part in the development of our Colonies, as witness Australia and the Cape; but experience tells us that for permanent sources of wealth we must look further than minerals. So British Columbia must look to the permanent sources of wealth she possesses in her fisheries, forests, and coal mines; and I think that in the near future we shall, like our neighbours to the south, have another industry—a most important one—the fruit industry. For years, California has sent to our markets enormous quantities of preserved fruits. There is no reason in the world why British Columbia should not add fruit to her export list; we are on the eve of that business, and I hope to have the good fortune of exhibiting what we can do in that respect in our court at the Imperial Institute. I beg to thank Dr. Dawson for the valuable assistance he has rendered me at the Imperial Institute in the arrangement of the mineral cases, and I hope, and am sure, that I shall in the future have his continued assistance in carrying out what we have so much at heart—viz. that the public may know what we are doing and have done in regard to minerals, and that those mineral cases will contain a permanent representation of our mineral resources.

Dr. JOHN RAE, F.R.S. : I have gone over part of the country in British Columbia described by Dr. Dawson, namely, the Cariboo district, when the gold mining was in full swing; my object in going there was not to look after gold, but to search out the safest and easiest route by which to take a telegraph line across the continent, which the Hudson's Bay Company were desirous of carrying out—as there was a very promising-looking valley leading from Cariboo to the head waters of the Fraser River. My hopes in that direction were disappointed, nor could I examine the place closely, the ground at the time being covered with snow. It was altogether a rather rough journey, as we had to run down the dangerous Fraser River in very small "dug-outs," a thing never previously done by strangers, I was told, without guides, the Shushwapp Indians being unable to accompany us. I did a little gold-washing in the streams we passed by both east and west of the Rocky Mountains, and found colour of gold more or less developed almost everywhere. At one small stream east of the Rocky Mountains I stumbled upon what appeared to be a fine outcrop of coal at least eleven feet thick, which was found to burn well, and boiled our kettle very nicely, but a sample I brought home and took to Jermyn Street Geological Museum was pronounced by Sir Andrew Ramsay to be

only lignite. I have no doubt I showed my ignorance in expressing an opinion that *possibly*, as this outcrop had been exposed for hundreds of years to the changes of the weather, perhaps when mined deeper it would be different. It looked so very pretty and clean to handle. If I may wander away a little northward and eastward from British Columbia, I would say a word or two about the abundant indications of copper at and near the Coppermine River on the Arctic Coast, where we picked up some lumps of six or eight pounds' weight that appeared perfectly pure; in fact so pure that all the weapons and tools of the Eskimos are manufactured of this metal. The Indians, also, when they run short of lead, hammer lumps of copper into a substitute for balls for their guns. From my description of the rock formation, Dr. Dawson is of opinion that it is similar to or part of the copper-bearing rock stratum of Lake Superior. My object in getting on my legs was most surely not to say anything about myself, but on a more agreeable subject: to say a word about my friend, the reader of to-night's paper; whom I knew and saw a good deal of at home, when as a lad he was a student of geology in London, and how we were delighted with his intelligence and capacity—an opinion fully confirmed by a very high authority, Sir Andrew Ramsay, at that time at the head of the Geological Survey of Great Britain, who said he never had a student who showed more application and quickness in acquiring knowledge of his subject than Dr. Dawson—and thus the boy was father to the man. Dr. Dawson has done me the favour to send me from time to time many of the interesting papers he has published, not always geological, and I can testify to the immense amount of work they display, sometimes performed in very difficult and trying circumstances. They are full of important facts, and one can rely upon every word in them. He has shown what he can do, and I venture to express a belief that there is a great future before him.

MR. W. S. SEBRIGHT GREEN: As an old British Columbian, I have listened with great pleasure to Dr. Dawson's able address. The only fault I have to find is with the map on the wall, which makes the country look so rocky, lifeless, and inhospitable. Now, it is a glorious country. For climate and a happy life there is no country equal to it. The future of British Columbia no doubt is a great future. Its gold and other mineral resources must be developed. I have washed a pan or two out there in the days Dr. Dawson speaks about—the golden year 1863. It was a hard country, the Cariboo country, in those days, for there was no railway and travelling was

very rough work. I walked through the snow from Lightning Creek to Williams Creek, and when I got to my journey's end I had to lie on the bare boards and was glad to get a sheepskin to cover me. But the Canadian Pacific Railway has changed all that. British Columbia is not so far off as it was. It can be reached now from London in little over a fortnight. In the sixties it took you about six weeks. Irrespective of gold, there is a future before British Columbia, for, notwithstanding that there are so many mountains, there is a great deal of really good land. I have ridden over miles of rolling prairie among those mountains, and beyond that there is no doubt a vast quantity of mineral wealth yet undiscovered. Speaking of the Kootanie district, I myself, in 1864 or 1865, had several specimens of the richest silver ore I ever saw in my life. The prospector who gave them to me told me he would divulge the secret of its whereabouts to me some day, but he wanted to see a little more of it; and the secret, I believe, died with him. As to the gold, I have been told of a prospector who goes regularly every year to Victoria with gold dug by himself. He has kept the secret, but it is to be hoped it won't die with him. I should have been glad if Dr. Dawson had told us what he thought of the gold of Vancouver Island itself. There was a quantity of gold taken out of Leach River in 1865, but mining was not continued there beyond a few months, although there must be still gold there. I may say, in conclusion, that those who have any idea of investing money in gold or coal mines, in my opinion could not do better than go to British Columbia.

Major WILLIAM CLARK: I have not had Dr. Dawson's experience of British Columbia, neither have I his scientific knowledge; I have not lived so long in that province as my friend Sir Joseph Trutch, and have not at any time held the position of Agent-General which Mr. Beeton so worthily occupies; but I do not yield to any of these gentlemen in the faith I have in the future of British Columbia. I have to thank Dr. Dawson for the paper which he has just read: it strengthens my faith in what I myself believe, and one is always ready to take hold of evidence in support of his own conclusions. We must remember that Dr. Dawson occupies an official position, and must, therefore, be extremely guarded in his statements. Were he free to "boom" British Columbia he would, no doubt, have let his tongue loose, and have said things which would have been more suitable for the promotion of mining companies; but it is right, and all the more valuable, that so high an authority should keep well within the mark. We have

Lightning
rney's end I
sheepskin to
nged all that.
reached now
s it took you
before British
y mountains,
over miles of
at there is no
ed. Speaking
several speci-
he prospector
secret of its
little more of
e gold, I have
ar to Victoria
out it is to be
n glad if Dr.
of Vancouver
out of Leach
beyond a few
ay say, in con-
ney in gold or
go to British
vson's experi-
e knowledge;
nd Sir Joseph
on of Agent-
I do not yield
the future of
or the paper
what I myself
nce in support
Dr. Dawson
be extremely
pom" British
ose, and have
the promotion
valuable, that
rk. We have

read somewhere that the Queen of Sheba, when she came to see the glory of Solomon, exclaimed that "the half had not been told" her; and I dare say, if any of this audience not personally acquainted with British Columbia were to go out and examine into matters as carefully as Dr. Dawson has done, the Queen of Sheba's certificate would be the most applicable. We have been recently informed that Her Majesty belonged to a highly mineralised country, and it may have been that the Assistant Director of the Geological Survey of her dominions was her cautious informant. Joking apart, I feel sure that this contribution to our knowledge of British Columbia comes at an opportune time. We have lately heard a great deal about South Africa and of the sums invested in the development of that portion of the Empire, but I firmly believe that it will well repay those who are pinning their faith on South Africa to follow up the lead which Dr. Dawson has given us to-night. I have nothing to say against South Africa, but investors will be quite safe to go on the information Dr. Dawson supplies; and, considering the nearness of British Columbia, I would strongly recommend it as another basket into which part of the investors' eggs could with safety be deposited. Dr. Dawson has only had time to-night to indicate what possibilities lie in that province, and to touch on some of its leading features as a mineral country. He has passed over the question of placer mining with a few remarks regarding the early days of the placers, but it would be a mistake to infer that he considers these as by any means exhausted. I think Sir Matthew Begbie is authority for the statement regarding the "flour" or "scale" gold, that there is not a spadeful of soil on the benches of the Fraser and Thompson Rivers that isn't auriferous; and I believe that when proper appliances are brought to bear upon these benches and on the channels of the upper country, the results will outweigh those realised by the crude methods of the past. Working with shovel and cradle for the most part, and with no capital but the result of their daily toil, the miners had to be content with the products of the upper gravels. In many cases, where they were able to break through and reach the older deposits, as in Lightning Creek, the miners were "drowned out" when the pay was at its best. These claims remain to this day, and there are hundreds of miles of gravels within the province capable of returning large dividends on capital judiciously applied to working by more modern and scientific methods. It must be gratifying to everyone present—remembering that British Columbia is an integral part of the British Empire—to be made aware of Dr. Dawson's estimate of the country

from the forty-ninth parallel to the Alaskan frontier. His words are in the highest degree encouraging, and indicate that when mining results have passed their zenith, in that equal stretch on the American side of the boundary line, British Columbia will be mounting upwards to greater prosperity, enriching the province and the Empire. The province, as has been remarked, is Imperial in its dimensions. It is about one-third larger than the German Empire. It stands on four pillars as regards its future, for besides its wealth of minerals, it has its forests, its fisheries, and its agriculture to support its population. This province, with its enormous extent and its equally enormous resources, contains only about 100,000 people, and the value of its resources can best be realised from the fact that this handful of people—less than half the population of an ordinary English town—were able to export last year surplus products to the value of over six and a half millions of dollars. Results so remarkable surely serve to indicate that there is room for the application of capital, and especially of British capital, for the development of these varied resources. Ever alive to what will pay, our American friends are steadily gaining a foothold. They cannot be blamed, but we will be liable to blame if we do not step in and do the work which it is peculiarly England's duty and England's privilege to accomplish; and for my own part I would rejoice to see some really practical outcome in that direction as the result of to-night's meeting. There are unique opportunities for the investment of capital in the mines and forests, and in the industries to which their products lead. These will eventually give employment to a large population, which will be the best guarantee for a home market for those engaged in agricultural pursuits. The wants of the present population are inadequately supplied, and each year large quantities of every kind of farm, orchard, and garden product have to be imported. It will readily be understood that the prospect of a permanent home market will attract agriculturists, as against other districts which have to rely on export prices for their returns. The range of land suitable for the farmer of small means is limited, but large areas exist which would form the basis for profitable returns on capital employed in converting these into manageable holdings, to the benefit alike of the capitalist and the country. I will not venture to say anything of the fishery wealth of British Columbia, or the bearing which this resource has on the future importance of the province. I am afraid I would get too enthusiastic, but it is without doubt that these fisheries will constitute one of its most permanent sources of revenue. In the depart-

ments of fishing and agriculture there are opportunities for colonisation which, if prudently carried out, will be productive of the happiest results; and I am sure that patriotism, philanthropy, and cold capital, with an eye to dividends, can safely join hands in furthering these truly Imperial interests. It has been my good fortune, under the guidance of our Chairman, the High Commissioner for Canada, to follow closely in recent years matters relating to the colonisation and development of the Dominion, and in working out these interesting and important problems, and I am proud to recall the fact that it has been my privilege to serve under such a master.

DR. RANKINE DAWSON: I fear that I am not qualified to add anything of value to what has been already so well said, as regards the mineral wealth of British Columbia. As, however, the discussion has not been confined to this point, I may perhaps be allowed to say something of another characteristic of this great province for which, I venture to think, it will in future be as famous as it will undoubtedly be for its mineral wealth—I refer to its scenery. We have been told, as regards its mineral wealth, that much of it is at present inaccessible. The same is true of its scenery. Two sections of the country are, however, easily reached at the present time by the ordinary traveller, and of these only I shall speak. One is the line of the Canadian Pacific Railroad, which crosses at right angles three distinct mountain ranges on its way to the coast: the other is the coast itself, which extends some 500 miles from the international boundary on the south to Alaska. The mountain scenery is as fine as any to be found on the continent of America, and, so far as I know, is excelled only in grandeur and impressiveness by that of the Himalayas as seen from the neighbourhood of Darjeeling. The Canadian Pacific, with the foresight and enterprise for which that company is justly famous, has provided hotels at different points of exceptional beauty or interest, where artists, tourists, or sportsmen can obtain comfortable accommodation. Such are to be found at Banff and at Field in the Rocky Mountains, at Glacier, at the summit of the Selkirks, and at North Bend in the Coast Range. The scenery along the coast is of a different kind; there, long fjords and inlets cut up the coast-line in the most fantastic way, whilst innumerable islands extend along its length, and form in many places natural channels, through which the traveller can pass for many miles without catching any glimpse of the open sea, whilst on either hand pine-covered mountains rise, almost precipitously, to a great height. In two other parts of the

world only, so far as I know, will similar scenery be found—viz. in Norway, and on the Western Coast of New Zealand. This voyage along the coast is already becoming a very popular one with tourists, and comfortable steamers ply at regular intervals throughout the summer season. Few things, perhaps, are more difficult to describe adequately than mountain scenery. It is not difficult to heap up adjectives, or to gradually advance from positive to comparative and superlative; but it is difficult indeed to convey real or definite conceptions to the mind of the listener. I shall make no such attempt to-night. This whole region well deserves the name which, in writing to the *Times* some two years ago, I ventured to give it: that of the Canadian Alps. In conclusion, I can confidently advise anyone who appreciates nature in its grandest and most impressive moods to take the earliest opportunity of visiting this great province for himself, and can promise him that he will not come away disappointed.

Mr. JOSEPH NELSON: I made my first visit to British Columbia in the autumn of 1856. I worked the cradle on the Fraser River for the purpose of discovering gold, and I made the acquaintance of Sir James Douglas and Captain Cooper. The evidence I obtained I laid before Lord Taunton, then Secretary of State for the Colonies; a committee of the House of Commons having at that time been formed for the purpose of inquiring into the possibility and feasibility of colonising the great North-West and British Columbia and Vancouver. I never formed a more favourable opinion of any country than I did of Vancouver and British Columbia during my short visit, and when I came back I wrote a handbook on the subject. At that time the discovery of gold was only beginning, and the result of the information which I had personally collected or received from various correspondents, and which I published, was that there was a considerable emigration to these parts. But the time came when the alluvial deposits were exhausted, and then they had to resort to more expensive methods. Gold was discovered up in Cariboo, but it was far removed from any means of communication, and the consequence was, the miners suffered great hardships. But that there was enormous mineral wealth there cannot be denied. I am speaking on the authority of one of the most successful miners of the present day—Mr. Mylchrest, who afterwards went to California and Australia, and then to South Africa, and who is now known as the great Diamond King. He was one of the pioneers, and had to undergo all these privations in consequence of the difficulties of getting provisions and the like. I was talking to him a

few days ago on his visit to London—he is now one of the principal landowners in the Isle of Man—and he said: “I shall never forget the days I spent there; they were days of great privation; but there is a great future for that country when communication by rail is really opened up, and I have no doubt it will become one of the great gold-producing countries of the north-west coast of America.” On my return after my visit in 1856 I wrote a handbook, as I have already stated, and I said, “What is this distant country? The first thing to be done is to have steam communication with San Francisco,” and I got up a company and spent a considerable sum of money, but did not succeed. The next thing I said was, “We will start a bank,” and I obtained a Royal Charter. That is the Bank of British Columbia. I also proposed the construction of a railway, and that now forms part of the Canadian Pacific. Being a modest man, I will say no more on these matters, but this I must say—that I have read Dr. Dawson’s contributions to geological knowledge with infinite pleasure. I may add that the present Lieutenant-Governor of British Columbia is practically experienced in mining matters, and when I heard of his appointment I felt that the right man had been put in the right place. Under him, I believe that there is a great future before British Columbia. At the same time, we must always remember that mining is ephemeral, while the fisheries are perennial; still, as I have said, I believe that the mining industry will be developed, and that in this as in other respects the country will go on and prosper.

The CHAIRMAN: A very agreeable duty now devolves upon me. It is to move a vote of thanks to Dr. Dawson for the very able and interesting paper he has presented to us this evening. I may mention that more than twenty years ago the Government of which I had the honour to be a member appointed Dr. Dawson a member of the Commission for the survey of the international boundary, and we were not disappointed in the result. On the completion of that important work, he presented the world with a most valuable volume on the scientific points which had presented themselves in connection with the flora and natural history and other important matters connected with the survey. From that time he has steadily ascended, step by step, until he has attained very nearly if not the same rank as his distinguished father, Sir William Dawson. I have no hesitation in saying that he has done most valuable work for Canada and for British Columbia, and for every person interested in that important part of Her Majesty’s dominions on which the paper has treated. As a man of science he has been cautious, and

has not over-coloured his picture ; but although I am not a prophet, I venture to say that the mineral resources of British Columbia will continue to attract more and more attention until the world is astounded at the developments in that direction. I have great pleasure in moving a vote of thanks to Dr. Dawson.

The motion was cordially passed.

Dr. DAWSON : I have to thank you for the attention with which my paper has been received this evening, and to express also to gentlemen who have joined in the discussion my appreciation of the terms in which they have spoken of such work as I have been able to do in British Columbia. It has been particularly gratifying to find how many friends of British Columbia are present. Had we a longer time to discuss the prospects and resources of that province, many additional points of interest upon which it has been impossible to touch would occur. My difficulty has been, in endeavouring to speak on so large and important a subject as that of the mineral wealth of British Columbia, to know where to stop, for in a general sketch such as that attempted to-night it is not possible to include details which must always be more interesting than the mere skeleton of the subject. It is now my pleasing duty to ask you to join in a vote of thanks to the Chairman. Sir Charles Tupper's work in connection with Canada is so well known, his interest in this Institute, as well as in all other matters connected with the welfare of the Empire at large, is so fully recognised, that it would be presumption on my part to say more in submitting this motion.

The Chairman thanked the meeting, and the proceedings terminated.

