

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

Coloured pages/
Pages de couleur

Covers damaged/
Couverture endommagée

Pages damaged/
Pages endommagées

Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée

Pages restored and/or laminated/
Pages restaurées et/ou pelliculées

Cover title missing/
Le titre de couverture manque

Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées

Coloured maps/
Cartes géographiques en couleur

Pages detached/
Pages détachées

Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)

Showthrough/
Transparence

Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur

Quality of print varies/
Qualité inégale de l'impression

Bound with other material/
Relié avec d'autres documents

Continuous pagination/
Pagination continue

Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure

Includes index(es)/
Comprend un (des) index

Title on header taken from: /
Le titre de l'en-tête provient:

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.

Title page of issue/
Page de titre de la livraison

Caption of issue/
Titre de départ de la livraison

Masthead/
Générique (périodiques) de la livraison

Additional comments: /
Commentaires supplémentaires:

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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X



MINING RECORD

ESTABLISHED 1895

VOL. XIII.

APRIL, 1906.

No. 4

BRITISH COLUMBIA MINING RECORD

E. JACOBS, Managing Editor

Devoted to the Mining Interests of the Pacific Northwest.

PUBLISHED ON THE 15TH OF EACH MONTH BY

THE BRITISH COLUMBIA RECORD, LIMITED

VICTORIA, B. C.

Office—Province Building. Telephone 243. P. O. Drawer 645.

ADVERTISING AGENCIES:

London, England: E. Henderson & Co., Billiter Square Buildings.
 Denver, Colorado: National Advertising Co., Quincey Building.
 San Francisco, California: E. C. Dake's Advertising Agency, 124 Sansome Street.

SUBSCRIPTIONS PAYABLE IN ADVANCE:

Canada and the United States, per year . . . \$2.00
 Great Britain and Foreign, per year . . . \$2.50

Advertising copy should reach Victoria office by 5th of each month
 Rates on application.

Correspondence to be addressed to the Managing Editor.

CONTENTS.

	PAGE.
Notes and Comments	127
New Director of Geological Survey	130
Annual Report of Minister of Mines for 1905	131
Statistics of Mineral Production in 1905	132
Progress of Mining in British Columbia	135
Developments of the Year	140
Bureau of Mines—Work of the Year	142
Northern Interior Plateau of British Columbia.	144
The Overland Telegraph Trail	146
Coal Outcroppings at Fraser Lake	148
Mineral Locations on Telkwa River	149
Cassiar Coal Co's Coal Lands	150
Transcontinental Dev. Syndicate's Coal Lands	153
Summary of Information Gathered	154-157
Northeast Kootenay District	157
Northwest Kootenay District	158
Company Meetings, Reports, Cables, etc.	162
Certificates of Incorporation and Registrations.	163
Trade Notes and Catalogues	164
Machinery and Construction Notes	165
Books Reviewed and Received.	165-166

NOTES AND COMMENTS.

In the Clinton mining division of Lillooet district mining in all its branches, so an official report states, in 1905 reached its lowest point since it has been an industry in that division

The courtesy of the Bureau of Mines in permitting the MINING RECORD to make use of the engraving blocks with which the parts of the Annual Report of the Minister of Mines for 1905 reprinted in this issue are illustrated, is acknowledged with thanks.

The mining recorder for the Lardeau mining division states that the Camborne section is suffering from lack of transportation facilities. The Provincial Government is improving the roads, but the official mentioned thinks wagon roads at best afford only a poor means for transporting heavy minerals.

The following official statement, made by the provincial mineralogist, should be kept prominently in mind by all interested in the progress of mining in British Columbia: In 1905 the tonnage of ore mined in the whole province, exclusive of coal, was 1,706,379 tons, some 245,070 tons, or 16 per cent, greater than in 1904, and 85 per cent greater than was mined in 1901.

The mining recorder for the Trout Lake mining division reports that on the Poplar mineral claim, situated near Gerrard, which is at the lower end of Trout Lake, a large amount of surface work has been done, exposing several seams of asbestos, but so far as he has learned, none of a marketable quality has yet been opened up.

The greatest improvement in the mining industry of Ainsworth mining division in 1905 occurred in the mines on Kootenay Lake. Several of the older mines, which had been unworked for a number of years were operated, the resumption of work having been brought about by the demand and the high price for the zinc ores which predominate in nearly all of these properties, and in the facilities which are being provided by the Canadian Metal Co., for the treatment of such ores.

At the Providence mine, the first and most developed of the high-grade silver-gold mine of this dis-

trict, the vein has been encountered at the 600-ft. level, the incline shaft having been sunk that depth and a crosscut driven to the vein. This is the greatest depth yet reached in sinking in Boundary mines, though diamond drill holes have been bored to 1,000 ft. The Providence has shipped more than 3,000 tons of ore, much of it averaging higher than \$100 per ton, with occasional carload lots of sorted ore running from \$200 to \$246 per ton, gross value.

When *en route* to the Northern Interior Plateau last summer, the provincial mineralogist, Mr. Wm. Fleet Robertson, noted a short distance above Quesnel, in the east bank of the Fraser River, an outcropping of lignite, the seams exposed there, however, not having thickness enough to render them of commercial value. Mr. Robertson observes that this lignite formation—referred to Tertiary age—is probably very extensively distributed over the great interior plateau of Northern British Columbia, since at various points lignite float is met with in the stream wash, and lignite in place was seen at Fraser Lake and on the Bulkley River.

Concerning the Second Relief mine, at Salmo, in the Nelson mining division, the local gold commissioner remarks: The past season was the first in which this mine was worked continuously throughout the winter months, when it was demonstrated that with existing ore reserves, and mine and mill equipment, it was possible to make regular earnings of \$3,000 a month and not deplete the supply of ore. The grade of the ore milled was about the same as that milled heretofore, yielding on an average \$10 to the ton in amalgam and concentrates; but the extraction in the mill has been better and the profit margin per ton over mining, milling and marketing has been increased to \$4.70 per ton.

Tonnage figures compiled by the Phoenix *Pioneer* show the ore output for four months to May 1 to have totalled 430,243 tons. The monthly totals were:

January	104,378 tons.
February	105,429 tons.
March	112,638 tons.
April	107,798 tons.
Total	430,243 tons.

Approximate output of the several shippers was as follows: Granby Co., 285,000 tons; Dominion Copper Co., 77,000 tons; British Columbia Copper Co., 61,000 tons; Oro Denoro, 6,000 tons; sundry small mines, 1,200 tons; total, 430,200 tons.

It is officially reported that fifteen miles of the main Fraser River channel, from Yale down, have been leased for gold-dredging purposes to a New Zealand syndicate, which is stated to intend building a dredge in the vicinity during the ensuing summer. As this syndicate is stated to have been profitably engaged in dredging in New Zealand for some time past, and the machinery for the new dredge will be imported from

that country, it will be interesting to note the results of New Zealand methods and machinery, as compared with past experiments in dredging on Fraser River. There are numerous dry bars and terraces along the river which should pay, if worked on a sufficiently large scale.

On page 163 of this issue will be found information relative to the payment of dividends by the following mining companies: Reco Mining and Milling Co., Canadian Goldfields Syndicate, Granby Consolidated Mining, Smelting and Power Co., Consolidated Mining and Smelting Co. of Canada, and Le Roi No. 2. Among others that have also distributed profits this year are the Le Roi Mining Co., and Crow's Nest Pass Coal Co. There may be still others, but in any case the foregoing make a creditable showing and, taken in conjunction with the companies known to be paying for large additions to plant and machinery out of earned profits, will prove a strong incentive to the further exploitation and utilisation of British Columbia's extensive mineral resources.

Among the illustrations contained in the Annual Report of the Minister of Mines for 1905 are a plan and cross section, respectively, of the 40-stamp mill and cyanide plant of the Daly Reduction Co., Ltd., situated at Hedley, Similkameen. The provincial mineralogist thus makes reference to them: The Yale Mining Co., operating the Nickel Plate mine, and the Daly Reduction Co., operating the mill in conjunction therewith, have proved to be among the most successful organisations operating in the Boundary district, and practically the only one operating with a stamp-mill, concentration and cyanide plant combined. The enterprise is considered to be of sufficient importance to justify the reproductions of the plan and section of the mill at Hedley, which accompany this Report.

Although there was no increase in the shipments of ore from the Slocan City mining division in 1905, in other directions, reports the mining recorder for this division, there is a decided improvement over previous years in the mining situation. More properties are being worked, the average value of the ore shipped is greater, and almost without exception the results of work done have been most encouraging. Probably the most gratifying feature of the year has been the proving of the existence of large bodies of ore at a greater depth than before obtained, together with the fact, as in the case of the Ottawa mine, that these ore bodies carry even higher values than those nearer the surface. Leases are still being sought for, and the operation of properties already under lease has in nearly all cases proved profitable.

The gold commissioner for Nelson mining division thus comments on cyaniding experiments near Nelson: The results from the experiments carried on at the May and Jennie mine were important. Here the adaptability of the Hendryx process has been demon-

strated in connection with the cyaniding of ore of the character found so extensively in the May and Jennie workings. The only disappointing feature brought out in connection with these experiments is that the 50-ton plant which the Reliance Gold M. and M. Co. installed during the year is of insufficient capacity for the profitable working of the property, but with this defect remedied, and the enlarged plant operating on a successful basis, there is every reason to believe that considerable quantities of this character of low-grade ore will be profitably treated.

In February the MINING RECORD drew attention to a wide discrepancy between the quantity (6,847 tons) of ore produced from the Iron Mask mine, as shown in the annual report of the Kamloops Board of Trade, and that (12,000 tons) given in the Kamloops *Inland Sentinel*. A correspondent writes explaining the discrepancy between the two reports, and adds: "These discrepancies would not occur if the management of the mine would give authoritative figures for publication at the end of the year. Perhaps in future these may be available." From the report for 1905 of the local gold commissioner we learn that: "The Iron Mask has been actively worked during the year, with good results. An average of over 73 men has been employed, and the quantity of ore treated at the smelter and shipped was 14,629 tons. The company has bonded the Erin and adjoining claims, on which a large amount of development work has been prosecuted, as well as on the Iron Mask. The outlook is promising, and the year 1906 will see operations conducted on a much larger scale."

More than 20,000 tons of ore were treated at the Dominion Copper Company's smelter at Boundary Falls during April, which was the largest quantity yet reduced in one month at these works. Shipments of ore from the company's Brooklyn, Stenwinder and Rawhide mines, in Phoenix camp, in April totalled 15,671 tons and from its Sunset mine in Deadwood camp 4,331 tons, together 20,002 tons. Some custom ore was also received at its smelter. An extraordinary meeting of shareholders of the company has been called to consider, and if deemed advisable pass, a resolution of the directors approving the issuance and sale of \$300,000 par value of the company's first mortgage bonds (being the balance of an unauthorized issue of \$1,000,000), and 228,000 shares of its stock of the par value of \$10 each. In a circular issued by the directors it is stated that the proceeds of sale of bonds and stock as above, will be devoted to purchase of additional mining property, new equipment, development work, enlargement of smelting plant, making railroad connections, and possibly to construction of a new smelter.

Outside of Texada Island, which is included in this division, but little development other than the annual assessment work was done in 1905 on mineral claims in Nanaimo mining division. There were 463 mineral

claims in good standing on December 31, 1905, and while fewer locations were recorded than in previous years, the outlook for 1906 was reported as very promising. The returns for the year's work at the Tye Copper Co's smelter at Ladysmith, which is in this division, although not as large as in 1904, made a very good showing for the 164 days of 24 hours each the furnace was in blast, as follows: Tye ore smelted, 32,400 tons; custom ore (exclusive of flux ore), 3,860 tons; ore from United States, 2,700 tons; total, 38,960 tons. The value of the ore smelted, less refining charges, was \$506,600. On Texada Island, the Marble Bay mines, belonging to the Tacoma Steel Co., shipped 12,006 tons of ore to the smelter at Tacoma, Puget Sound, Washington; the Van Anda properties were unworked most of the year; at the Cordillero group about 100 tons of ore taken out in doing development work were got ready for shipment; a fine body of ore was opened on the Loyal group; the Puget Sound Iron Co., which did very little development work, made preparations for shipping large quantities of iron ore to Tacoma in 1906; while prospecting on other properties uncovered some fine showings of copper ore.

No doubt the omission was inadvertent, but no mention was made in the report on the Lardeau mining division sent to the Bureau of Mines for inclusion in the Annual Report of the Minister of Mines for 1905 of the fact that in the course of its development the Eva mine, near Camborne, last year produced an appreciably large quantity of ore from which gold to the value of between \$40,000 and \$50,000 was recovered. It is but fair to the Eva Gold Mines, Ltd., to call attention to its successful operation of the Eva mine last year, more particularly under the circumstances, that it was the only gold mine in that camp profitably operated in 1905. In this connection we have pleasure in quoting from the annual report of the Imperial Development Syndicate, Ltd. (which holds a large stock interest in the Eva Gold Mines, Ltd.), as follows: "At the Eva mine during 1905 and up to the end of January of 1906, development to the extent of 1,200 ft. has been added to previous work. During the same period of thirteen months 12,300 tons of ore were mined and milled, the largest portion of which was ore produced from development work. The following summary will show the results:

Bullion produced.	\$45,084.66	Per ton \$3.661½
Concentrates (estimated)..	7,150.00	Per ton 0.581½
Total.....	\$52,234.66	\$4.25

The gross value of the ore has averaged about \$5 per ton. The costs, including development, mining, aerial tramming, milling, maintenance, management and general expense at Camborne, exclusive of the 2% mineral tax, were \$3.94 per ton." Unfortunately this information was not available at the time the mining recorder sent in his official report for the year; had it been it would doubtless have been made use of by him.

THE NEW DIRECTOR OF THE GEOLOGICAL SURVEY.

THE appointment of Mr. A. P. Low, B.A.Sc., F. R.G.S., to the directorship of the Geological Survey of Canada has been generally approved by the leading newspapers and journals of the Dominion. The *Mining Record* heartily joins in the general approbation of this appointment and cordially wishes the new director a long and successful career as the official head of a most important department. The following is from an Eastern exchange:

Mr. Low is a native of Montreal and was educated at the Montreal High School and McGill University. From the latter institution he received the degree of Bachelor of Applied Science in the year 1882, graduating with first rank honours. He was appointed to the staff of the Canadian Geological Survey in 1882, and was promoted to the rank of geologist in 1891. After making several surveys in Eastern and Northern Quebec, Mr. Low was engaged for more than six years in exploring the Labrador Peninsula, on the resources of which he is the recognised authority. In 1896 he received the McGill Memorial Prize from the Royal Geographical Society, in acknowledgment of the far reaching value of his services. In 1897 he accompanied the "Diana" scientific expedition to Hudson's Bay, and in 1903 and 1904 commanded the "Neptune" on a similar expedition to Baffin's Land and other parts of the far north. He is a Fellow of the Geological Society of America, and of the Royal Geological Society of England and a member of many other learned societies. Mr. Low, in addition to his high attainments as a geologist, is marked by a strong sense of the practical utility of his profession, and he is quite *au fait* with mining interests of the day. His splendid personality, as well as the qualifications already mentioned, augurs well for his directorship.

DISINGENUOUSNESS OR MENDACITY ?

LAST month the *Mining Record* gave several notorious instances of what it truthfully characterised as the "deliberate misrepresentation or worse" indulged in by Wm. Blakemore. Mr. Blakemore published no denial of these. How could he when the evidence is all in favour of the position we took, and against him? He did however, publish the following:

"ANTHRACITE GALORE.

"The *B. C. Mining Record's* unreliability was never better illustrated than when it undertook to 'knock' the coal deposits of Queen Charlotte Island on April 28th, and on May 1st it was announced that the Western Fuel Co., of Nanaimo, 'had taken an option on one group of claims for the substantial figure of \$700,000. This comes of entrusting the conduct of a mining journal to a novice, who is either unscrupulous or ignorant, or both."

Now, apart from quoting three lines referring to the

Graham Island coal from an article contributed by Mr. Blakemore in October, 1904, to *The Engineering and Mining Journal* of New York, the only reference we then made to "the coal deposits of Queen Charlotte Island" was contained in the following: "But then, in 1904 it suited him (Blakemore) to 'boost' undeveloped coal measures on one of the Queen Charlotte Islands and depreciate the productive coal mines of Vancouver Island." We now ask: Were not the coal measures of the Queen Charlotte Islands correctly described as "undeveloped?" Undoubtedly they were, as is well and widely known.

Further—on Sunday, April 29, the *Nanaimo Herald* reprinted, under the caption: "IF IT WERE ONLY TRUE WHAT A STORY IT WOULD BE," an article to which it referred as follows: "Appended is an article that appeared in the *Vancouver World* on Friday last, on the front page of that truthful (?) journal, under headlines stretched across three columns, thus:

"ANTHRACITE FOUND IN QUEEN CHARLOTTE IS.
"Western Fuel Co., of Nanaimo, Secures Claims
"for \$700,000—General Manager to go North to
"Initiate Development Work."

Then followed the article, which was simply a "fairy" tale, as was conclusively shown in the *Herald's* closing paragraph: "Superintendent Stockett, of the Western Fuel Co., on being shown the article by the *Herald* last evening said: 'It reads well, but there is not a shadow of truth in the story. The party who wrote it must possess a very vivid imagination.'"

And yet, days after this emphatic denial had been published Mr. Blakemore made use of the *World's* "yellow" story in a silly endeavour to show the *Mining Record* to be unreliable. So we ask: Is this another instance of brazen mendacity, or simply more low craft, similar to that we exposed last month in connection with Mr. Blakemore's falsity in bolstering up his own theories in contradistinction to the conclusions of Dr. R. W. Ells, a geologist of note and one whose reputation does *not* require to be supported by trickery. Mr. Blakemore, who certainly is "unscrupulous," and, as regards current mining events, decidedly "ignorant," may take his choice—either alternative is disgraceful, particularly in one who claims to be a civil and mining engineer of more than thirty years' standing. Perhaps the next time he shall undertake to assail the *Mining Record* he will avoid making his duplicity so self-evident by practising less transparent artifice than in this, his latest, futile attempt to discredit a journal which has earned and maintains its good name by honest and persistent endeavour to present only the truth to its wide circle of readers.

It has been officially reported by the mining recorder for Sloacan mining division that the majority of the mining properties in that division were fairly active during 1905, and that leasing had increased in favour with a number of miners and prospectors. There were at the close of the year no less than twelve properties in the district operating successfully under the leasing system.

ANNUAL REPORT OF THE MINISTER OF
MINES FOR THE YEAR 1905.

WITH customary promptitude the Annual Report of the Minister of Mines has been published and distributed. Few, if any, of the more important official reports, whether Dominion or Provincial, are made available for the information of the public as early as is that of the British Columbia Bureau of Mines. Carping critics who know little or nothing of the large amount of labour involved in the gathering together of reliable information and statistics concerning the mineral industry of the widely scattered mining districts of British Columbia, and of the care necessary in supervising their publication, are in the habit of finding fault with the Department for not issuing its Annual Report earlier, but, this notwithstanding, the fact remains that among the more important official reports dealing with mining and allied industries published on this continent that of the Minister of Mines for British Columbia is the first placed at the disposal of the public. Last October the *Mining Record* had the pleasure of publishing the voluntary testimony of Mr. Horace J. Stevens, compiler and publisher of *The Copper Handbook*, as follows: "In my work on *The Copper Handbook* I have to keep in touch with the mining bureaus of the entire globe, and I wish to go on record as stating that for some years past, without exception, the Annual Report of the British Columbia Bureau of Mines has been the first to reach me from any official bureau, division, or department dealing with mining matters." Attention is again directed to this matter so that the provincial mineralogist may be given due credit for promptness which compares very favourably with the delay usually characterising the issue of similar official publications of other provinces of the Dominion and elsewhere.

As several of the statistical tables, with the official comments thereon, and the greater part of the "Progress of Mining," "Developments of the Year," and "Bureau of Mines" reports, respectively, are reprinted on following pages, it is unnecessary to here do more than commend them to the careful attention of all interested in mining in British Columbia, in order that an adequate idea of the progress made in 1905 may be obtained.

Prominent among the remaining features of the Report is the provincial mineralogist's account of his trip to the Northern Interior Plateau of British Columbia. The comprehensive particulars given of this new country, the opening up of which for settlement may ere long be looked for, will be most acceptable to many seeking information concerning the part of the Province through which the Grand Trunk Pacific railway will probably be built; while the excellent views of points of particular interest will also prove useful. This publication of information relative to a

section of the Province of which little is generally known is especially timely and will doubtless be widely appreciated.

Other trips made by the provincial mineralogist were to Princess Royal and Gribbell Islands in Northern British Columbia; to West Kootenay and Boundary districts, with the American Institute of Mining Engineers' excursion party which visited the Province last summer; and to the Windy Arm district, which includes part of the Atlin district, in British Columbia, and of the Southern Yukon. The provincial assayer also spent part of the summer in the field, visiting the Big Bend district, north of Revelstoke, his report upon which is included in the Annual Report under notice. This report, as well as that of the provincial mineralogist on Windy Arm, was published several months ago in bulletin form and reprinted in the *Mining Record*, and so received prompt distribution among the public.

An innovation noticeable in the 1905 Report is the inclusion of the "Questions Asked at the Coal Mine Managers' Examinations." In acceding to the request of the Board of Examiners for Coal Mine Officials for the publication of a copy of previous questions the Bureau of Mines has adopted an effective means for informing future candidates of the nature of the examination they will be required to pass.

The reports of gold commissioners, mining recorders and mining inspectors, those of the larger producing districts especially, are generally excellent, considering the difficulty some of these officials of necessity experience in obtaining information that need not be supplied to them if mine managers or others concerned be not disposed to supply it. Other parts of the Report also contribute to its value as a record of the year's mining operations and of matters associated with the mining industry of the Province. A Table of Contents and a detailed Index add greatly to the convenience of those who have to frequently refer to the Report.

The good work done in illustrating this Report calls for favourable notice. The clearness of the photographs taken by the provincial mineralogist; the care taken by Mr. H. Carmichael in bringing out details in printing from the negatives; the skill of the engraver (most of the blocks having been made by the British Columbia Engraving Co., of Victoria, B.C.), and the excellent effects in printing the half-tones secured by Mr. W. H. Clark, foreman of the press room of the Government printing office—these have combined to produce illustrations which are artistic and well-finished, a credit to both the Bureau of Mines and the Government printing office.

A few words in conclusion as to the wide area over which this Annual Report is distributed. From the provincial mineralogist it has been ascertained that the first distribution on the issue of the Report—which of course leaves out of account numbers for which applications have been, and will continue to be, received—was as follows: In Canada 750, United States 580, South America 5, Great Britain 185, France 19, Germany 9, Belgium 5, Austria 5, Russia 2, South Africa 5, India 2, Australia 21, miscellaneous 5, total 1,593.

STATISTICS OF MINERAL PRODUCTION OF
BRITISH COLUMBIA IN 1905.

REFERRING to the statistical tables of the mineral production of British Columbia in 1905, the provincial mineralogist, in the Annual Report of the Minister of Mines, briefly summarises their contents. Some of the tables and the official comments thereon follow:

TABLE I.—TOTAL PRODUCTION FOR ALL YEARS UP TO AND INCLUDING 1905.

Gold, placer	\$67,772,703
Gold, lode	36,385,058
Silver	23,688,688
Lead	14,958,161
Copper	27,258,013
Coal and coke	73,786,754
Building stone, bricks, etc.	4,560,800
Other metals	252,990
Total	\$248,663,176

Table I. shows the total gross value of each mineral product that has been mined in the Province up to the end of 1905. From this it will be seen that coal mining has produced more than any other separate class of mining—a total of \$73,786,754—followed next in importance by placer gold at \$67,772,703, and third by lode gold at \$36,385,058. The metal gold, derived from both placer and lode mining, amounts to \$104,157,761, the greatest amount derived from any one metal or mineral, the next most important being copper, of a total gross value of \$27,258,013, followed by silver at \$23,688,688, and lead at \$14,958,161.

TABLE II.—PRODUCTION FOR EACH YEAR FROM 1890 TO 1905 (INCLUSIVE.)

1852 to 1889 (inclusive)	\$71,981,634
1890	2,608,803
1891	3,521,102
1892	2,978,550
1893	3,588,413
1894	4,225,717
1895	5,643,042
1896	7,507,956
1897	10,455,268
1898	10,906,861
1899	12,393,131
1900	16,344,751
1901	20,086,780
1902	17,486,550
1903	17,495,954
1904	18,977,359
1905	22,461,325
Total	\$248,663,176

Table II. shows the values of the total production of the mines of the Province for each year from 1890 to 1905, during which period the output has increased nearly ten-fold, and has now reached a production for the past year valued at \$22,461,325, or more than double what it was in 1898.

Table IV. gives the amounts, in the customary units of measure, and the values of the various metals or minerals which go to make up the grand total of the mineral production of the Province, and also, for purposes of comparison, similar data for the two preceding years.

The table shows that there has been a decrease in the production of placer gold of some \$146,000, but at the same time an increase in the output of lode gold of \$343,494, thus leaving for this metal a balance on the right side of nearly \$200,000.

The amount of silver produced in 1905 was 3,439,747 oz., having a gross value of \$1,971,818, an increase over the preceding year of \$252,302, due to the greatly increased output of the Boundary and East Kootenay districts.

The table shows an output of lead amounting to 56,580,703 lb., valued at \$2,399,022, the greatest production of lead ever made by the Province except in the phenomenal year 1900, and is in quantity an increase over the preceding year of 19,934,459 lb., or 54 per cent, which is due unquestionably to the effect of the Dominion Government's lead bounty upon two large mines in East Kootenay, which are very low-grade in both lead and silver. The bounty has, however, apparently had no stimulating effect upon the production of lead in the Slocan district, as the amount of lead produced by this district in 1905 is only about half that produced in 1904 and one-quarter that produced in 1900.

As it has been impossible as yet to collect accurate statistics regarding building stone, lime, bricks, tiles, etc., these are estimated.

Table V. shows the proportions of the total mineral productions made in each of the various districts into which the Province is divided.

It will be noted that this year, for the first time, the Boundary district has wrested from West Kootenay the honour of first place on the list, and leads in the value of its production by over a million dollars, followed in order of output by the West Kootenay, East Kootenay and Coast districts. The latter two districts owe more than half their output to the coal mines situated within their limits, whereas the production of the two former is entirely from lode mining. The Boundary produces over 42 per cent of the total output of the Province derived from lode mining.

Table VII. relates entirely to the lode mines of the Province, and shows the amounts and values of the various metals produced each year since 1887—the beginning of such mining in the Province. The gross value of the product of these mines to date is \$102,289,920. The production in 1905 was \$15,180,164, an increase over the preceding year of \$2,871,129, or about 23 per cent.

Other statistical tables, the reproduction of which in the MINING RECORD is prevented by space limitations, are the following:

Table III., presenting in graphical form the facts shown by figures in the several tables, and demonstrating to the eye the rapid growth of lode mining in

TABLE IV.—AMOUNT AND VALUE OF MINERAL PRODUCTS FOR 1903, 1904 AND 1905

	Customary Measure	1903		1904		1905	
		Quantity	Value	Quantity	Value	Quantity	Value
Gold, placer	Ounces	53,021	\$1,000,420	55,765	\$ 1,115,300	48,405	\$ 999,300
Gold, lode	Ounces	232,831	4,812,616	222,042	4,589,608	238,660	4,933,102
Silver	Ounces	2,996,204	1,521,472	3,222,481	1,719,510	3,439,417	1,971,818
Lead	Pounds	18,089,283	689,744	36,646,244	1,421,874	56,580,703	2,399,022
Copper	Pounds	34,359,921	4,547,535	35,710,128	4,578,037	37,092,251	5,876,222
Coal	Tons, 2,240 lb.	1,168,194	3,504,582	1,253,628	3,760,884	1,384,312	4,152,936
Coke	Tons, 2,240 lb.	165,543	827,715	238,428	1,192,140	271,785	1,358,925
Other materials			531,870		600,000		800,000
			\$17,495,954		\$18,977,359		\$22,461,325

TABLE V.—PRODUCTION OF MINERAL BY DISTRICTS AND DIVISIONS.

Name.	Divisions.			Districts.		
	1903.	1904.	1905	1903.	1904.	1905.
Cariboo District				\$ 475,200	\$ 474,600	\$ 406,000
Cariboo mining division	\$ 314,400	\$ 313,000	\$ 300,000			
Quesnel mining division	132,000	150,000	96,000			
Omineca mining division	28,800	11,600	10,000			
Cassiar District				480,368	558,573	504,372
Kootenay, East District				1,951,128	3,210,573	5,339,154
Kootenay, West District				6,603,981	5,806,070	5,421,859
Ainsworth division	219,818	168,023	100,273			
Nelson division	653,457	466,683	532,564			
Slocan division	1,126,986	1,236,858	970,544			
Trail Creek division	4,308,158	3,760,866	3,672,828			
Other parts	295,262	173,640	145,650			
Lillooet District				31,283	34,583	32,584
Yale District				3,714,422	4,190,281	6,483,508
Osoyos, Grand Forks & Greenwood divisions	3,654,234	4,110,366	6,356,410			
Similkameen division	2,000	2,500	1,533			
Yale division	58,188	77,415	125,561			
Coast Districts (Nanaimo, Alberni, W. Coast V. I., Victoria)				4,239,572	4,702,679	4,273,852
				\$17,495,954	\$18,977,359	\$22,461,325

TABLE VII.—PRODUCTION OF LODE MINES.*

Year.	Gold.		Silver		Lead.		Copper.		Total Values.
	Oz.	Value.	Oz.	Value.	Lb.	Value.	Lb.	Value.	
1887		\$	17,690	17,331	204,800	9,216			26,547
1888			79,780	75,000	674,500	29,813			104,813
1889			53,192	47,873	165,100	6,498			54,371
1890			70,427	73,948	Nil.	Nil.			73,948
1891			4,500	4,000	Nil.	Nil.			4,000
1892			77,160	66,935	808,420	33,064			99,999
1893	1,170	23,404	227,000	195,000	2,135,023	78,996			297,400
1894	6,252	125,014	746,379	470,219	5,662,523	169,875	324,680	10,234	781,342
1895	39,264	785,271	1,496,522	977,229	16,475,464	532,255	952,840	47,642	2,342,397
1896	62,259	1,244,180	3,135,343	2,100,689	24,199,977	721,384	3,818,556	190,926	4,257,179
1897	106,141	2,122,820	5,472,971	3,272,836	38,841,135	1,390,517	5,325,180	266,258	7,052,431
1898	110,061	2,201,217	4,292,401	2,375,841	31,093,559	1,077,581	7,271,678	874,781	6,529,420
1899	138,315	2,857,573	2,939,413	1,663,768	21,862,436	878,870	7,722,591	1,351,453	6,751,604
1900	167,153	3,453,381	3,958,175	2,309,200	63,358,621	2,691,887	9,997,680	1,615,289	10,069,757
1901	210,384	4,348,603	5,151,333	2,884,745	51,582,906	2,002,733	27,603,746	4,446,963	13,683,044
1902	236,491	4,888,269	3,917,917	1,941,328	22,536,381	824,832	29,636,057	3,446,073	11,101,102
1903	232,831	4,812,616	2,996,204	1,521,472	18,089,283	689,744	34,359,921	4,547,535	11,571,367
1904	222,042	4,589,608	3,222,481	1,719,516	36,646,244	1,421,874	35,710,128	4,578,037	12,309,035
1905	238,660	4,933,102	3,439,417	1,971,818	56,580,703	2,399,022	37,692,251	5,876,222	15,180,164
Total	1,771,023	36,385,053	41,298,305	23,688,688	392,517,075	14,958,161	200,414,780	27,258,013	102,289,920

*Not included in above is 9,413 tons of zinc ore—worth \$139,200.

*The information as to production in the earlier years is obtained from the "Mineral Statistics and Mines" for 1896, Geological Survey of Canada.

the Province and also the fluctuations to which it has been subject.

Table VI., giving the statistical record of the placer mines of the Province from 1858 to 1905, and showing a total production of \$67,772,703. The output for 1905 was \$600,300—a decrease of about 10 per cent as compared with the previous year, and due to a dry season with a shortage of water for hydraulic mining.

Table VIII., containing the statistics of production of the coal mines of the Province. The total amount of coal mined to the end of 1905 is 22,627,330 tons (2,240 lb.), worth \$68,203,514. Of this there was produced in 1905 some 1,384,312 tons, valued at \$4,152,936, a larger amount than has been produced in any year since 1902. In these figures of coal production is not included the coal used in making coke, as such coal is accounted for in figures of output of coke. The making of coke began only in 1895-6, and in the ten years since this period the output has increased from 1,565 tons to 271,785 tons (2,240 lb.), of a value of \$1,358,925 produced in 1905, an increase over the preceding year of 33,357 tons, or 14 per cent. The total output of coke to the end of 1905 was 1,104,648 tons, valued at \$5,523,240.

Table IX., detailing productions of the mines of the Province (excepting coal mines) for the years 1902, 1903, 1904 and 1905, and the districts in which such productions were made, showing the tonnage of ore mined in each district, with its metallic contents, and market value. The total tonnage of ore mined in the Province during 1905 was 1,706,679 tons, having a gross value of \$16,949,464. The percentages of such tonnage and values derived from the various districts of the Province were:—

	Per cent of Tonnage.	Per cent of Values.
Boundary district	56.8	37.2
Trail Creek mining division	19.5	21.7
Fort Steele mining division	10.0	16.0
Slocan district	5.2	4.9
Coast district	3.6	4.6
Miscellaneous and other dis- tricts	4.9	15.6
	100.0	100.0

Table X., comparing graphically the output of mineral products in British Columbia with that of similar products in all the other Provinces of the Dominion, and showing that in 1905 British Columbia produced of the metals and coal an amount nearly as great as did all the other Canadian Provinces combined.

The labour employed to the ton of ore mined, remarks the provincial mineralogist, forms some criterion of the total cost of mining in a camp, since the cost of labour is in a more or less constant proportion to such total cost. In this respect it is interesting to note in the various districts the number of tons of ore mined to each man employed. An analysis of a

table published in the Annual Report of the Minister of Mines for 1905 shows, approximately, that, taking the province as a whole, there were 474 tons of ore mined for each man employed about the mines. In this respect, however, the districts vary very materially, since in the Slocan district the figures show 193 tons mined to the man in the year, in the Nelson district 127 tons, in the Trail Creek (Rossland) district 396 tons, and in the Boundary 950 tons. Such generalisation, of course, does not apply to any one mine, but only to the district, and in the first two districts mentioned the mines vary in character so greatly, some having high grade shipping ores and others low grade concentrating ores, that care must be taken not to carry these averages too far.

Official returns published recently show the gold recovered during 1905 in the Atlin district, Cassiar, to have been 22,832 oz. valued at \$358,478.60. Of this quantity individual miners recovered 9,493 oz. and companies 13,339 oz. The total of the royalty on this gold collected on behalf of the Provincial Government was \$5,177.55. The several creeks from which the gold was obtained and the respective quantities were as follows: Pine Creek, 5,894 oz.; Birch Creek, 199 oz.; Boulder Creek, 8,575 oz.; Wright Creek, 250 oz.; Spruce Creek, 6,191 oz.; McKee Creek, 1,723 oz. More than half the gold recovered by individual mines came from Spruce Creek, which yielded them 5,943 oz.; with Boulder Creek next, 1,743 oz., and then Pine Creek, 1,210 oz. Of the recoveries made by companies, the Societe Miniere de la Colombie Britannique, of Paris, France, made returns for royalty purposes of a recovery of about 6,450 oz. valued at \$103,000. The Pine Creek Power Co. and the North Columbia Gold Mining Co., jointly operating on Pine Creek under the management of Mr. J. M. Ruffner, made an output aggregating more than \$50,000 in value, while the Atlin and Willow Creek Gold Mining Co. recovered about \$14,000. The gold commissioner at Atlin reported that the British American Dredging Co. met with but indifferent success on Gold Run Creek last season for "notwithstanding the use of the Keystone drill and dynamite, which certainly assisted very much, the cemented material with which the dredge had to cope proved too hard for that style and weight of boat and machinery, and did not meet the expectations of the management in the amount of material moved, although very fair returns were realised from this material." The same company's dredge on Blue Canyon appeared to work "smoothly and efficiently." Regarding the "initial venture with a steam shovel" in Atlin district, viz., that of the Northern Mines, Ltd., the commissioner said: "Notwithstanding the embarrassments and losses that almost invariably attend initial and experimental ventures, this steam shovel worked very satisfactorily and convinced the management that, with some additional equipment and changes in methods of operation, this style of plant can be made to pay handsome profits."

PROGRESS OF MINING
IN BRITISH COLUMBIA.

THE gross value of the mineral production of the Province during the year 1905 was \$22,461,325, the largest output ever made by the mines of the Province, and an increase over the preceding year of \$3,483,966, or 18.4 per cent, while it is an increase over the year 1903 of over 28 per cent. An analysis of the returns shows, however, that this increase has been confined to certain districts, South-east Kootenay, the Boundary district, Nelson mining division and Yale mining division, the remaining districts showing a more or less marked decrease. The greater part of the increase is in the two former of

following table shows the percentages of such tonnage and values derived from the various districts of the Province:—

	Per cent of tonnage.	Per cent of values.
Boundary district	56.8	37.2
Trail Creek mining division .. .	19.5	21.7
Fort Steele mining division .. .	10.0	16.0
Slocan district.. . . .	5.2	4.9
Coast district	3.6	4.6
Miscellaneous and other districts.	4.9	15.6
	100.0	100.0

The number of mines from which shipments of ore



Looking up Nechaco River from Mouth of Stony Creek.

these districts. In South-east Kootenay the tonnage of ore mined increased 121 per cent and the value of the product 135 per cent over the preceding year, while in the Boundary the tonnage has increased 20 per cent and the value of the output 53.6 per cent.

The Slocan district shows the most marked decrease this year, its output being little better than half of what it was in the preceding year.

The Rossland camp just about held its own this past year. The tonnage of ore mined increased about 5 per cent, but the values per ton diminished somewhat on the average, owing to the working of low grade ores by concentration methods.

The tonnage of ore mined in the whole Province, exclusive of coal, was this past year 1,706,679 tons, some 245,070 tons, or 16 per cent, greater than in 1904, and 85 per cent greater than was mined in 1901. This ore had a gross value of \$16,949,464. The

were made in 1905 was 146, and of these only 79 properties shipped over 100 tons during the year, practically no change from the preceding year. Some 38 mines each shipped in excess of 1,000 tons, of which seven were in the Nelson division, four in the Slocan, seven in Trail (Rossland), and eleven in the Boundary.

The number of men employed in 146 metalliferous shipping mines was 3,590—2,394 below and 1,202 above ground—and in 24 non-shipping mines, 114—76 below and 38 above,—making a total of 3,710.

COAL.

The collieries actually producing coal in the Province during this past year are the same as in the previous year, and are located either on the eastern side of Vancouver Island or on the western slope of the Rocky Mountains, near the Crow's Nest Pass, in the south-eastern portion of the Province.

The Vancouver Island collieries are operated by two companies, the Western Fuel Co., at Nanaimo, and the Wellington Colliery Co., at Ladysmith and Comox; while the collieries in South-east Kootenay, at present some three in number, at Michel, Fernie and Carbonado, are all owned and operated by the same company—the Crow's Nest Pass Coal Co.

The gross output of the coal mines of the Province for the year was 1,825,832 tons (2,240 lb.), which, with 314 tons taken from stock, makes a total production of 1,826,146 tons. Of this total amount, 1,202,971 tons were sold as coal, 441,520 tons were used in making coke, and 181,655 tons were consumed under the companies' boilers and sold locally.

The coke produced amounted to 271,785 tons, of which some 268,091 tons were sold and 3,694 tons were added to stock.

The following table indicates the markets in which the coal and coke output of the Province was sold:—

	Coast.	Crow's Nest Pass.	Total.
Coal.	Tons.	Tons.	Tons.
Sold in Canada	380,332	148,939	529,271
Exported to U. S. . . .	427,698	246,002	673,700
	<u>808,030</u>	<u>394,941</u>	<u>1,202,971</u>
Coke.			
Sold in Canada.	5,410	145,044	150,454
Exported to U. S.	4,300	113,337	117,637
	<u>9,710</u>	<u>258,381</u>	<u>268,091</u>

Note—The ton used above is of 2,240 lb.

The Vancouver Island collieries mined in 1905 some 993,899 tons of coal, which, with 314 tons taken from stock piles, makes the total of coal disposed of 994,213 tons, distributed as follows:—

	Tons.	Tons.
Sold as coal in Canada.	380,332	
Sold as coal in United States.	427,698	
	<u>808,030</u>	
Used under companies' boilers, etc.		142,491
Used in making coke		43,692
		<u>994,213</u>

The amount of coke produced was 15,661 tons, of which 5,410 tons were sold in Canada and 4,300 in the United States (including Alaska), while some 5,950 tons were added to stock.

The coal sales of the Coast collieries show this year an increase of about 24,000 tons, or about 3 per cent over the preceding year. The coal sales to the United States this year amount to 53 per cent of the total, exactly the same as in 1904, most of which coal was disposed of in the California market, the remainder going to Alaska, where the recent developments in metalliferous mining seem destined to produce a constantly increasing market for the product of our Coast collieries.

The local consumption of coal on the coast of British Columbia also shows an increase this year of 11,568

tons, being 380,332 tons, as against 368,764 tons in 1904.

The coke production this year was some 3,710 tons less than in 1904, and the coke sales also were lower by 3,214 tons, the production being still much greater than the demand, as is evidenced by the fact that in 1904 some 6,647 tons of coke were added to stock, followed in 1905 by a further addition of 5,950 tons, a total of 12,597 tons in two years.

The local coke consumption has dropped from 10,333 tons in 1904 to 5,410 tons in 1905, due to the decreased amount of copper smelting being done on the Coast, while the distance from the Coast to the smelters in the interior of the Province is so great as to prevent that market being available.

The resumption of smelting operations at Crofton about the beginning of 1906 will better materially the local market this coming year.

The coke sold in the United States this past year by the Coast collieries amounted to 4,300 tons, an increase of 1,709 tons, occasioned by the "blowing in" of two smelting plants on Prince of Wales Island, in Alaska, which increase promises to continue.

The Nanaimo collieries were closed down for a number of months during the year, on account of labour disputes; but whether this decreased the coal sales, or whether the market was kept fully supplied by the other colliery company, it is impossible to say, as the two companies have "pooled" their California sales under one selling agent.

The Crow's Nest Pass collieries at Michel, Coal Creek (Fernie) and Carbonado (Morrissey)—three in number—operated by the Crow's Nest Pass Coal Co., mined, during the year 1905, 831,933 tons of coal, an increase over the preceding year of 169,248 tons, or 25½ per cent.

The following table shows the disposition made of the combined output of the company's collieries:—

	Tons.	Tons.
Sold as coal in Canada	148,939	
Sold as coal in United States.	246,002	
	<u>394,941</u>	
Used in making coke by company		397,828
Used under company's boilers, etc.		35,843
Sold at retail, locally.		3,321
		<u>831,933</u>

The amount of coke produced from the coal noted above was 256,125 tons, and with 2,256 tons taken from stock, makes the total coke sales 358,381 tons, of which 145,044 tons were sold for consumption in Canada (British Columbia), and 113,337 tons were exported to the United States.

The coal sales of the Crow's Nest Pass Co. increased this past year 107,773 tons, or 37½ per cent, due entirely to the increased exportation of coal to the United States, for the consumption of Crow's Nest coal in British Columbia this past year decreased 20,041 tons, or 12 per cent, as compared with 1904, while the exportation of coal to the United States increased by 127,814 tons, or about 168 per cent.



Wilson's Bay Co's Post at Fort St. James, on Stuart Lake—
Established 1866.

The sales of coke from Crow's Nest collieries were increased this year by 41,687 tons, or 19.2 per cent, the increase being due to consumption both in British Columbia and in the United States, the former increasing some 26,040 tons, or 13½ per cent, and the latter 15,647 tons, or 16 per cent. The increased consumption in British Columbia was due to the constantly increasing demand for coke in the Boundary district to smelt the increased tonnage of ore there mined.

GOLD.

Placer Gold.—The production of placer gold this past year is valued at \$969,300, a decrease of some \$146,000, or 13 per cent, as compared with that of 1904, and is the smallest output made any year since 1901. This falling off in production is attributable to a very dry summer, preceded by a winter with little snow, with a resulting decreased supply of water for hydraulicking, in which class of mining the output seems to be in direct proportion to the water available for use, since the deposits of gravel appear to be fairly regular in their tenure of gold, and the output is measured by the amount of gravel washed.

In the Atlin district the output was about \$475,000, considerably less than in 1904. In this district the drought was not so severely felt, as about 40 per cent of the gold is mined by "individual" methods, in which a large amount of water is not necessary.

In the Dease Lake section of Cassiar, mining is carried on largely by hydraulic methods, and between the dryness of the season and the obstacles presented in getting plant in over a long pack trail, the season was not successful.

The Cariboo mining division of the Cariboo district about held its own this past season, but the production of the Quesnel division was some 40 per cent less, owing to the very short run made by the largest producing property—the Consolidated Cariboo—due to an unprecedentedly low water supply, a trouble which the company has set about remedying by bringing in water from another water-shed to supplement the present supply, at the expenditure of a large amount of money.

In the Fraser River district the dry season should not have had so much effect, but individual mining on the bars appears to have been replaced by dredging, and the dredges have not met the expectations of the operators, for the reason, it is claimed, that the dredges built have proved to be of too weak construction, and were so constantly under repair as to reduce the actual working time below the margin of profit.

Steam shovels have not as yet been fully proven, and the one formerly operated in South-east Kootenay has been, at least temporarily, abandoned. The Atlin shovel apparently worked very well, but the appliances for handling the tailings and for washing the gravel proved quite inadequate, so much so that the capacity of the shovel was never fully demonstrated. Enough was learned, however, to indicate that for our conditions in the North the steam shovel is apt to prove much more effective than the dredge.

Gold from Lode Mining.—The value of the output of gold of this Province from lode mining for the year 1905 was \$4,933,102, an increase over the preceding year of some \$343,494, or about 7½ per cent, due entirely to the increased tonnage of gold-bearing copper ore smelted in the Boundary district.

The greater part of the lode gold produced is found in combination with copper; in fact, only 11 per cent of the total gold is produced from stamp-mills, and even in these mills about half the values are obtained in concentrates, which are afterwards smelted.

SILVER.

About 70 per cent of the silver produced in the Province was found associated with lead, in argentiferous galena, the remainder being chiefly in conjunction with copper ores.

The total silver production was 3,439,417 oz., valued at \$1,071,818, the largest output the Province has made since 1901, despite the fact of a decrease in the Slocan of 494,000 oz.

The increase is due primarily to the extensive working this year of the galenas, low grade in silver, of the Fort Steele district, which district shows an increased production of nearly 550,000 oz., and secondly to the increased tonnage of the large copper mines in the Boundary and the working of certain smaller but higher grade properties in that district, resulting in an increased silver production in the Boundary of about 385,000 oz.

LEAD.

There has been produced in the Province in 1905 some 56,580,703 lb. of lead, valued at \$2,309,022, an increase over the preceding year of 19,934,459 lb., or about 54 per cent. This year's lead production, with the exception of that made in 1900, is the greatest ever made by the Province.

It is noticeable that almost our entire output of lead is now from the Fort Steele district, while the production of the Slocan is only about half what it was the previous year, and one-third of the amount produced in 1901.

The following table shows the percentage of the total output obtained in the various districts:—

	Per cent.
Fort Steele mining division	86.1
Slocan mining division	9.2
Nelson mining division	2.5
Ainsworth mining division	1.8
Other divisions4
	100.0

The bounty on lead offered by the Dominion Government is certainly responsible for the production of lead in East Kootenay, for, as was pointed out in last year's report, these mines could scarcely be operated without its aid, but the bounty has apparently had no effect in stimulating greater production in the Slocan district.

COPPER.

There is again this year a material increase in the

output of copper, the production being 37,692,251 lb., valued at \$5,876,222, an increase over the preceding year of 1,982,123 lb., or about 5½ per cent, while the increase in value is \$1,298,182. This is the greatest output of copper ever made by the Province. The increase is due entirely to the increased tonnage of the Boundary district, as all the other important districts show a falling off in production.

The following table shows the production of the various districts for the years 1904 and 1905:—

	1904. Lb.	1905. Lb.
Boundary district	22,066,407	27,670,644
Rossland district	7,119,876	5,800,294
Coast district	5,960,593	3,437,236
Yale-Kamloops district	328,380	680,808
Nelson district	220,500	92,663
Various districts	14,372	10,606
	35,710,128	37,692,251

The average assays of the copper ores of the various camps, based upon copper recovered, were as follows: Boundary, 1.52 per cent copper; Rossland, .90 per cent, and Coast district, 2.81 per cent.

OTHER MINERALS.

Iron Ore.—There has been no iron ore mined in the Province this past year, since there is no market as yet available. For the small quantity formerly used as a flux in lead smelting, an impure iron ore, carrying values in the precious metals, has been substituted.

Zinc Ore.—This year, for the first time, have any important sales of zinc ore to be recorded. Plants for the "enrichment" of zinc ores have been started at Kaslo, Rosebery and Pilot Bay. These plants are merely concentrators, in which ores, or ordinary zinc concentrates, are more carefully separated, with the elimination of minerals undesirable in the smelting of zinc ore, such as iron pyrite or carbonate, galena and gangue matter.

The resulting "enriched" zinc concentrates, thus rendered saleable, have found a ready market, at prices varying according to the zinc contents and freedom from impurities, from about \$25 a ton for 53 per cent zinc in a pure ore, to about \$10 a ton for a 40 per cent zinc ore not so free from impurities.

Approximately 9,413 tons of zinc ore or zinc concentrates were sold this past year, having a value at point of shipment of about \$139,277. Almost all of this zinc ore comes from the Slocan district, but has not been all mined this past year, as the sales include zinc concentrates which had accumulated and for which only this year has a market been found.

As yet, most of the zinc ore sold has gone to the United States, but a zinc smelting plant having been this year erected at Frank, in Alberta, just east of the British Columbia boundary, in all probability the larger part of the British Columbia output will in future be treated there.

A Commission appointed by the Dominion Government, and including Mr. W. R. Ingalls, of New York,

and Mr. Philip Argall, of Colorado, spent the season of 1905 in investigating the possibilities of zinc ore mining in British Columbia and methods of treating the ore. The report of this Commission has not as yet been published.

Practical demonstrations of smelting zinc-lead ores by electricity were upon two occasions attempted at Vancouver, to witness which the Provincial Government was invited to send a representative. Mr. H. Carmichael, provincial assayer, who was present, reports that the demonstrations did not succeed, for reasons which, he hopes, may yet be overcome.

Of the undeveloped properties carrying strictly zinc ore, those on Pingston Creek, in the Arrow Lake mining division, present the greatest surface showing.

Platinum.—The actual production of platinum is very small, although its occurrence in the placer gravels is so widespread throughout the Province. About

the gold, and not as a separate mineral associated therewith.

Building Stone.—The quarrying of building stone as an industry is as yet confined to the Coast, such stone as is used in the interior being obtained from some of the numerous rock exposures to be found in almost all parts of the Province.

On the Coast, the cities of Vancouver and Victoria, particularly the former, have used an increased amount, in building, of granite, andesite and sandstone.

While no exact statistics are available, it is estimated by a leading architect that four times as much brick and stone were used in Vancouver in 1905 as during the preceding year.

Brick.—Victoria brick-yards turned out in 1905 some 7,500,000 brick, while about the same quantity was made in the vicinity of Vancouver. Grand Forks made 2,500,000, while a number of smaller yards scat-



Stuart Lake, Looking West From Fort St. James.

\$500 worth was obtained from gravels near Granite Creek, Similkameen, while the Consolidated Cariboo Hydraulic Mining Co., of Cariboo, and the Berry Creek Mining Co., of Thibert Creek, Cassiar, each recovered small quantities in an experimental way, as mentioned in the reports on these districts.

A number of finds of platinum "in place" have been reported. Some of these were assayed by Baker & Sons, platinum refiners, of Newark, N.J., who reported finding considerable amounts of platinum, but upon close examination by this Bureau, confirmed by the laboratory of the Canadian Geological Survey, of the identical ore assayed by Baker & Sons, no platinum could be found. As this has happened two or three times before, the conclusion is forced that assays made in a platinum refinery are apt to get contaminated by the dust produced by processes of manufacture.

Attention is drawn to the mention in the report of the provincial assayer of the finding of appreciable quantities of platinum in a number of samples of Yukon and Cassiar gold, the platinum being actually in-

tered over the Province, together contributed some 10,000,000 more.

The manufacture of drain pipe at Victoria by the B. C. Pottery Co. amounted in value to between \$80,000 and \$90,000.

Cement.—The product of the Vancouver Portland Cement Co., at Tod Inlet, Vancouver Island, during the past year, is estimated at \$150,000, which production will be about doubled next year, by the increased capacity of the plant.

Oil and Oilshales.—Indications of oil have been found in various parts of the Province in the form of oil seepages or of shales carrying oil, but to date no oil in commercial quantity has actually been struck. In the Flathead district, on the oil seepages of which a report has already been made by the provincial mineralogist, some further prospecting has been done, and it is reported that a boring plant has been brought in from just across the United States boundary, where it has been lying for some years, but, from the best in-

formation obtainable, no drilling to any depth has yet been done.

As mentioned in last year's report, black carbonaceous shales carrying a small percentage of oil have been known to exist in the Beaver Valley, Cariboo, and this past year these shales have been taken up by a company which proposes next season to put down bore holes to test the existence of oil under the shales.

Nothing has as yet been done on the Queen Charlotte Islands towards testing for oil in the vicinity of the seepages which exist there.

The bore hole put down at Steveston, near Vancouver, has been, at least temporarily, abandoned, no oil having been struck.

DEVELOPMENTS OF THE YEAR.

IT cannot be said that the year 1905 has witnessed any new departures or developments in mining in the Province. The increased production in metaliferous mining is due entirely to the increased tonnage of low grade ores treated in the East Kootenay and Boundary districts, while the other districts—Slocan, Nelson, Rossland and the Coast—each shows this year a decreased production.

In the Fort Steele mining division of East Kootenay the St. Eugene mine has this year more than doubled its output of the previous year, despite the fact that several months were lost at its most important opening, through the head works being completely destroyed by fire. The property is a large low grade concentrating proposition, galena, low in silver, in a silicious gangue. This year's output was nearly 150,000 tons of ore, producing about 900,000 oz. of silver and 36,500,000 lb. of lead, the largest lead production of any property in British Columbia, and about 65 per cent of the total production of the Province. The North Star, which has been for many years one of our largest and steadiest producers of silver-lead ore, has been worked out and practically abandoned, as development on an extensive scale failed to disclose further ore bodies, and the small shipments made this year are only the results of the cleaning out of the old workings.

With the passing of the North Star, an adjacent property, the Sullivan, has taken its place, and is today the second largest lead producer in the Province, producing nearly 11,500,000 lb. of lead, or 20 per cent of the production of the Province.

Fort Steele district this year produced over 86 per cent of the total lead production, 33 per cent of the silver and 50 per cent of the coal and coke sold by the Province, but no copper nor lode gold.

In the Nelson division the tonnage of ore mined has decreased about 33 per cent as compared with the previous year, but the gold produced has decreased only some 12 per cent, indicating that there is a proportionately larger amount of higher grade gold ore being mined. The copper production of this division has decreased more than 50 per cent, a result of the inactivity of the Silver King mine, but the lead output has increased 50 per cent, owing to the resumption of

work at the Mollie Gibson (La Plata Mines) and the operating of the Alice near Creston. At the Ymir mine, although the tonnage of ore treated is less, the amount of gold produced is greater than in 1904. Some of the smaller mines in the district have done exceedingly well in a small way. The plant erected at the May and Jennie has been found upon trial to require some adjustment and enlargement, and has in consequence not as yet accomplished the results which were expected, and which will, in all probability, be eventually accomplished.

In Slocan district there was a greater number of mines shipping this past year than in 1904, but the production of lead has decreased 50 per cent and of silver 30 per cent, due to the shutting down of some of the larger mines, such as the Payne and Ivanhoe, and the decreased production of other large properties, such as the Rambler, Slocan Star, Idaho, Wakefield and others. Many of the mines formerly operated under company management are now worked in a smaller way under lease or "tribute." The market obtained for zinc ore or concentrates has been of some assistance, some 9,413 tons having brought \$139,200. The "Lead Bounty" does not seem to have had the same stimulating effect upon the lead output of the Slocan that it has had upon that of East Kootenay.

In Rossland camp there has been about 5 per cent more ore mined this year than last, and while there has been but a slight depreciation in the gold and silver contents, there has been a very considerable falling off in the copper contents of the ore. The average assay of the ores of the camp were this past year: Gold, 0.39 oz.; silver, 0.44 oz.; copper, 0.9 per cent.

In the Boundary district the tonnage of ore mined has increased about 20 per cent over the preceding year, and now amounts to 965,628 tons, being over 50 per cent of the total tonnage of the Province. This increase is due to the constantly increasing operations of the Granby Co., the other large companies about holding their own. The number of smaller high grade properties being operated, while not contributing any appreciable percentage to the tonnage, have helped to keep up the average grade of the ores. The costs of mining and smelting have been gradually reduced in this section, thanks to as fine equipments as money could buy, in the hands of intelligent and scientific men, until they are now reported to be about the lowest in the world. To quote from a recent editorial in the leading American scientific journal: "Ten years ago the idea of smelting for a dollar a ton and mining for \$1.10 a ton would have been scouted as impossible. Yet this has been done at the Granby mines, with an exceptionally favourable ore and exceptionally well applied skill. In Tennessee, with low priced labour and fuel, they smelt a copper-bearing pyrrhotite for \$1.30 per ton."

On Texada Island the Marble Bay mine has sustained regular shipments, but the Copper Queen and Van Anda properties have only been prospected for further ore bodies, with little shipping. The iron mines have not been operated.

In the New Westminster district the only property

working to any extent is the Britannia, at Howe Sound. This company, reported on last year, has finished equipping its tramway and concentrating plant, and in December, 1905, began the shipping of crude

the superintendency of Mr. Thos. Kiddie, to meet the requirements of the mine.

In the Atlin district the placer mines held their own exceedingly well, considering the dryness of the season. No lode mines have as yet developed in this district, although on Windy Arm, just north of the boundary and in the Yukon Territory, several most promising prospects have developed, the details of which are contained in a special report thereon. From the location of these discoveries it seems probable that the mineral belt will be found to extend south into British Columbia.

Of the northern districts, the vicinity of the Portland Canal seems to promise the greatest likelihood of becoming a producing camp in the immediate future, as it is near deep water transportation.

There have been a number of discoveries in the vicinity of the Telkwa River of mineral deposits, which, if transportation was provided, might have considerable promise, but which at present, and until such facilities are provided, must remain unworked.

On the Queen Charlotte Islands a little prospecting has been done, and an examination made of the coal fields by the Dominion Geological Survey, which, it is reported, is to be followed by active exploration of the properties by a private syndicate, but as yet no definite work has been attempted.

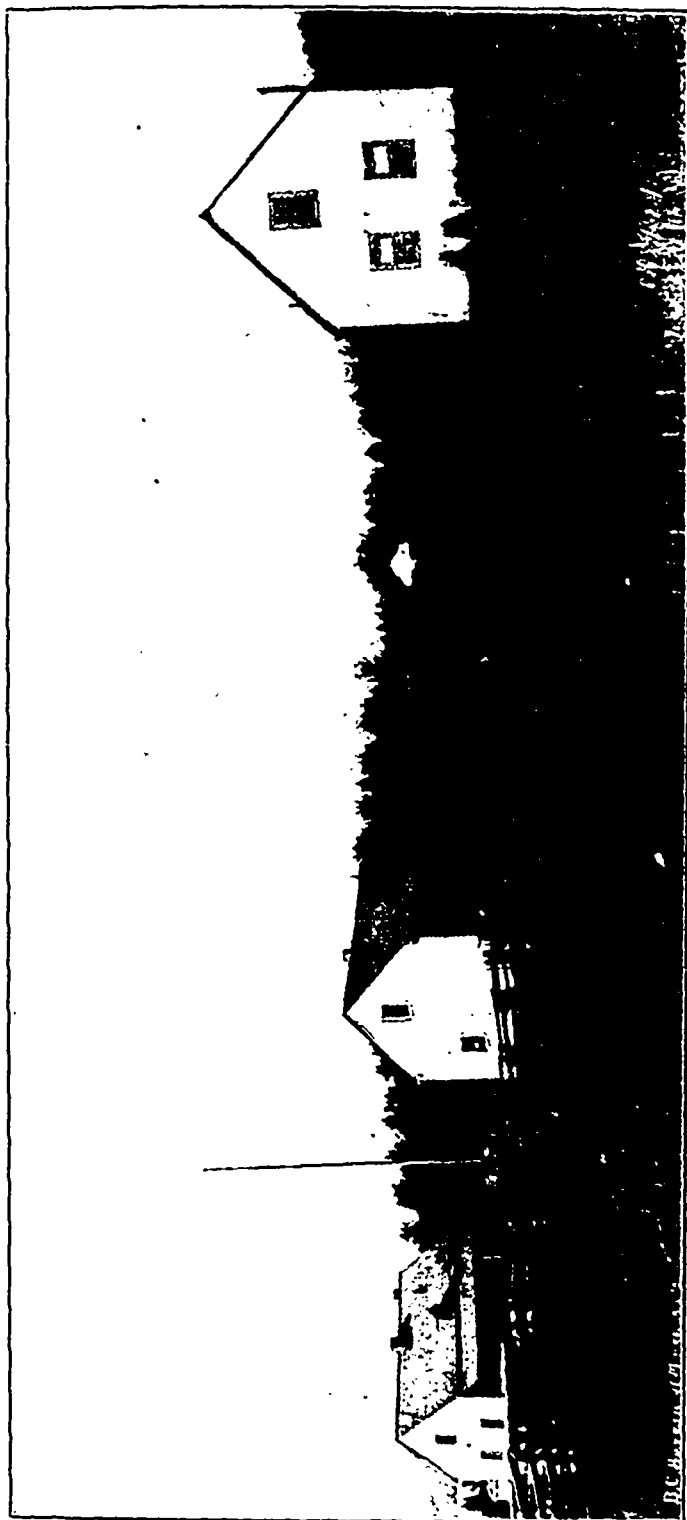
Mining on the West Coast of Vancouver Island has been at a standstill; a little prospecting has been going on, but little more. The only two properties shipping were the Hetty Green, about 200 tons of 7 per cent copper ore, and the Cascade, 30 tons of 15 per cent copper ore.

In the Mount Sicker district of the Victoria mining division the Tyece mine has maintained average monthly shipments of between 2,500 and 3,000 tons of ore, which has been smelted with some custom ores in the company's smelter at Ladysmith. The development of this property has been carried to a depth of over 1,000 ft., but has as yet not proved up any commercial body of ore below the 300-ft. level, although, since the close of the year, an exposure of ore was made on the 1,000-ft. level, carrying a high percentage of barytes, the gangue of the upper ore bodies, which gave much encouragement, but which there has not as yet been time to develop. Some development has been carried on, on other properties in the neighbourhood of the Tyece, but as yet no ore bodies have been encountered.

The King Solomon mine, at Koksilah, has made a small shipment of 40 tons of 8 per cent copper ore, and some other properties in the vicinity are being prospected.

At Hedley, in the Osoyoos mining division, the Nickel Plate mine, owned by the Yale Mining Co., has been successfully operated, and there has been treated in the mill of an allied company, the Daly Reduction Co., over 30,000 tons of ore, which yielded between \$12 and \$14 to the ton, chiefly in gold.

In the Nicola district active prospecting operations have been carried on in the coal areas, with, it is reported, gratifying results.



Hudson's Bay Co's Post Near Fraser Lake.

ore and concentrates to the company's smelter at Crofton, formerly owned and built by the Northwestern Smelting Co. This plant is being remodelled, under

BUREAU OF MINES.

Work of the Year.

THE work of the Bureau of Mines increases, of necessity, year by year, and this growing activity is due to the following causes:—The extension of the mining area of the Province, with the proportional increase in the number of mines; the increasing desire of the outside public for the free information which the Bureau applies with regard to the various mining districts and camps; and the appreciation by the prospector of the fact that he may obtain, gratis, a determination of any rock or mineral which he may send to the Bureau.

The routine work of the office, and the preparation and publication of the report for the year just ended, followed by the examination in the field of as many of the mines and mining districts as the season would permit, together with the work of the Laboratory and instruction of students, fully occupied the staff for the year. The staff of the Bureau consists of the provincial mineralogist, the provincial assayer, and a junior assistant in the Laboratory, with a clerk as temporary assistant during the publication of the report. In connection with inquiries for information and the collection of statistics, about 1,700 letters were sent out, with, approximately, the same number received.

Provincial Mineralogist.—The provincial mineralogist began his summer field work on June 1, by a trip up the mainland coast to Princess Royal and Gribbell islands, returning to Victoria on June 13 to make preparations for the reception of the American Institute of Mining Engineers, it having been previously arranged that the Institute should hold its annual meeting in Victoria, to be followed by an excursion to Alaska and the Yukon.

On June 24 the provincial mineralogist, acting under instructions from the Hon. the Minister of Mines, and on his behalf, proceeded to Spokane, Wash., to meet the members of the Institute, to accompany them to Nelson, Rossland, Trail and the Boundary, and finally to Victoria, to welcome them officially to the Province, and to offer such facilities and information as was possible.

The visiting members of the Institute and guests, numbering about 100, arrived at Nelson on June 27, visited the power plant at Bonnington Falls and other points of interest, including an excursion on Kootenay Lake in the steamer Kaslo, all provided by the citizens of Nelson.

From Nelson the party proceeded *via* Northport to Rossland, arriving there at 9.45 a.m. on June 28, and was received by the local committee. The War Eagle, Centre Star and Le Roi mines and the Le Roi No. 2 oil concentrating plant were visited in the forenoon, and after lunch a special train conducted the party to the Canadian Smelting Co's works at Trail, where the copper and lead smelting plants and the electrolytic lead-refining plant were inspected, after which, on returning to Rossland, a banquet was given in the evening by the local committee.

During the night the party, travelling in its own special train, moved to Grand Forks, the International boundary having been repeatedly crossed, and through the courtesy of the respective governments all Customs formalities were dispensed with.

On June 29 the smelting works of the Granby Consolidated Mining, Smelting and Power Co., at Grand Forks, was visited. This is the largest establishment of its kind in Canada, the plant having smelted some 660,000 tons of ore this past year.

In the afternoon the special train over the Great Northern railway conveyed the party to the Granby mines at Phoenix, where the extensive underground works and "glory holes," together with all the magnificent plant, were duly inspected.

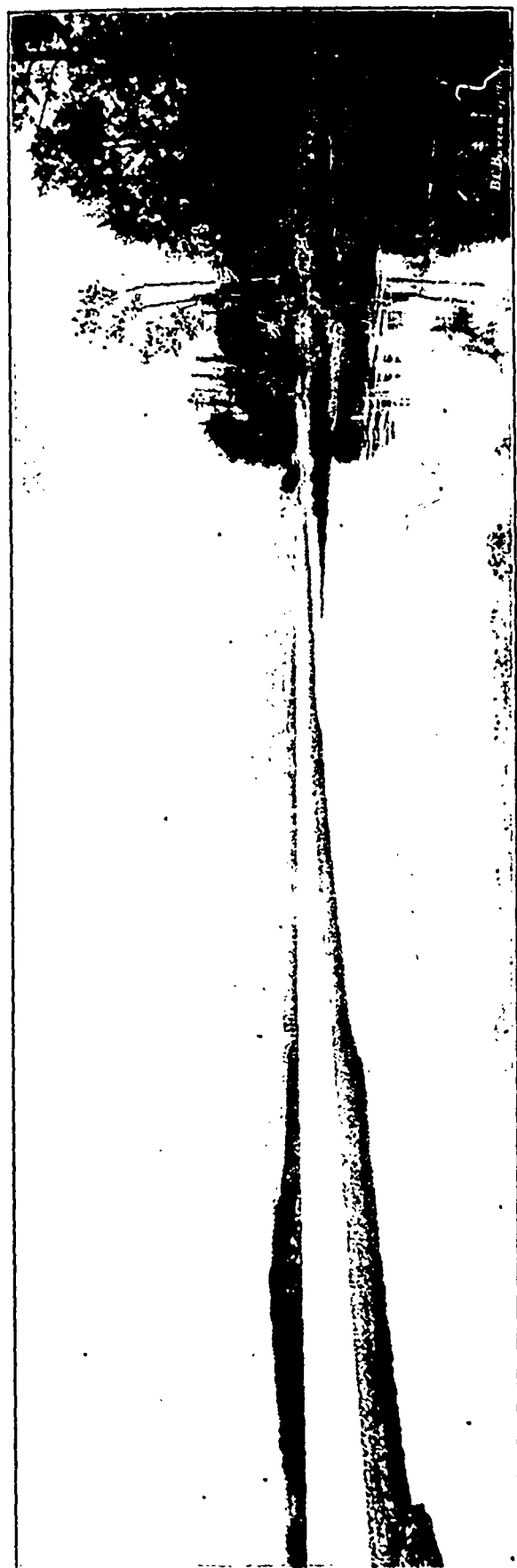
Victoria was reached at 7 a.m. on July 1, Dominion Day and Canada's national holiday. The first regular session of the Institute was held in the Ministers' room in the Parliament Buildings, provided for the purpose by the Government, at 3 p.m. of the same day, and was presided over by Past President Robert W. Hunt. His Honour the Lieutenant-Governor and the Hon. Richard McBride, Premier and Minister of Mines, were introduced, and in brief and appropriate terms welcomed the visiting members of the Institute and guests to the City and Province. In the evening a public reception was given by the Government to the Institute in the Legislative chamber.

On Monday, July 3, a steamer excursion among the islands of the Gulf of Georgia was given by the Victoria Board of Trade. On Tuesday, July 4, the Tyee Copper Co., through the courtesy of its general manager, Mr. Clermont Livingston, provided a special train over the E. & N. railway to Mt. Sicker and Ladysmith, where the company's mine and smelter were visited. On July 5 a business session of the Institute was held in the morning, and in the afternoon a reception was given by His Honour the Lieutenant-Governor at Government House.

The Institute and guests left Victoria the same evening, spending the next day, July 6, in Vancouver as guests of the Board of Trade and the Provincial Mining Association, leaving that evening for the North by the C. P. R. Co's steamer Princess May.

The opportunity thus given of showing to the representative men of the most influential body of mining engineers on the continent the material and mining development and possibilities of the Province was taken advantage of as fully as the limited time permitted, and it is felt that the visit of the Institute will result in much good to the Province.

On July 12 the provincial mineralogist left Victoria for a trip through the northern interior of the Province, along the proposed route of the Grand Trunk Pacific railway, proceeding to Ashcroft by Canadian Pacific railway, thence by stage to the 150-Mile House, on the Cariboo road, and from this point by saddle-horse and pack-train, *via* Quesnel, across country to Hazelton, on the Skeena River, thence by steamer to Victoria, arriving there on October 10. The approximate distances travelled were: by railway, 200 miles;



Ootsa Lake, Looking West—Showing Spit Formed from Outcrop of Silicious Beds by Waves.

by stage, 150; 720 by pack-train and canoe; and 800 by steamer; total, 1,870.

From October 10 to 16 the provincial mineralogist was at his office in Victoria, leaving again on the latter date for the North to examine the recent mineral discoveries on Windy Arm, on the boundary between the Atlin district of British Columbia and Yukon Territory, and returning to Victoria November 2, 1905, having travelled 2,000 miles on this trip. With the exception of a week between trips, preparing for the next, the provincial mineralogist was travelling from June 1 until November 2, covering in that time about 3,500 miles.

In December a meeting of the Board of Examiners for Assayers' Certificates of Competency, composed of the provincial mineralogist, the provincial assayer, and Mr. Thos. Kiddie, of Crofton, was held in the Government Laboratory.

The remainder of the year was occupied in the preparation of the notes taken in the field, the collection and preparation of statistics for the year, and the regular routine work of the office.

ASSAY OFFICE.

The following is a summary of the work of the Assay Office of the Bureau for the year 1905, as reported by the provincial assayer, Mr. Herbert Carmichael:—

During the year 1905 there were made by the staff in the Government Assay Office 1,176 assays or quantitative determinations, which is an increase over the number made during the previous year. Of these, a number were for the Bureau of Mines, or for the Department, for which no fees were received. The fees collected by the office were as follows:—

Fees from assays and chemical determinations	\$ 340
Fees from melting and assaying gold dust and bullion	752
Fees from assayers' examinations	520

Total cash receipts	\$1,612
Determinations and examinations made for other Government departments for which no fees were collected	300

Value of assaying done	\$1,912
----------------------------------	---------

The amount of gold melted during the year was \$90,631, in 142 lots, as against \$103,693, in 171 lots, in 1904.

Free Determinations.—In addition to the above quantitative work, a large number of qualitative determinations or tests were made in connection with the identification and classification of rocks or minerals sent to the Bureau for a report. Of these no count was kept, nor were fees charged therefor, as it is the established custom of the Bureau to examine and test qualitatively without charge samples of mineral sent in from any part of the Province, and to give a report on the same. This has been done for the purpose of encouraging the search for new or rare minerals and ores, and to assist prospectors and others in the dis-

covering of new mining districts, by enabling them to have determined free of cost, the nature and probable value of any rock they may find. In making these free determinations, the Bureau asks that the locality from which the sample was obtained be given by the sender, so that the distribution of mineral over the Province may be put on record.

In addition to the ordinary work of the office, a large amount of analytical work was done during the year, including complete analyses of coals and soils from the northern interior of British Columbia, and of samples of clay, marble and magnesia.

A large number of water analyses were made, especially of samples sent from the Boundary district. These were of material aid in locating the source of the typhoid which has been epidemic in that district.

Analyses of spraying materials were made for the fruit inspector.

During the past year the Mineral Museum has been renovated and re-arranged and considerable additions of ore and rock samples have been received, notably from Portland Canal, Skeena and Revelstoke districts.

Exhibits of mineral were sent to the Portland and New Westminster exhibitions, the exhibit at the Dominion exhibition at New Westminster being a large and representative one.

In addition to his usual duties, the provincial assayer visited the Big Bend district, in Revelstoke mining division, and also arranged the mineral exhibit at the Dominion fair.

In the report of this Bureau for 1903 mention was made of the finding of an appreciable amount of the metals of the platinum group in a sample of gold from near Dawson, in the Yukon. Since that time a number of samples of gold from different localities in the Yukon and Cassiar have been refined in this laboratory, and in almost every case platinum and allied metals have been separated, to an amount which has a commercial significance.

This platinum appears to be directly combined with the gold and is not visible as a separate mineral in the gold dust, and for this reason, in the ordinary melting down and refining of such gold dust at the mint, is apt to have been overlooked.

Further experiments are being made in this connection, but it is considered advisable to draw the attention of the public to the matter, that other assay offices also may further investigate the subject.

From the report for 1905 of the secretary of the Board of Examiners for Certificates of Competency and Licence to Practise Assaying in British Columbia it is learned that at Nelson eight Candidates presented themselves at the examination beginning on May 1. Of this number five passed and the issue of certificates was duly recommended to the Minister of Mines. During the year the board also recommended the granting of three certificates to assayers who had qualified outside the Province.

The report of the secretary of the Board of Examiners for Coal Mine Officials shows that three series of examinations were held during 1905 at Fernie, Nanaimo and Cumberland.

THE NORTHERN INTERIOR PLATEAU LYING BETWEEN THE FRASER AND SKEENA RIVERS.

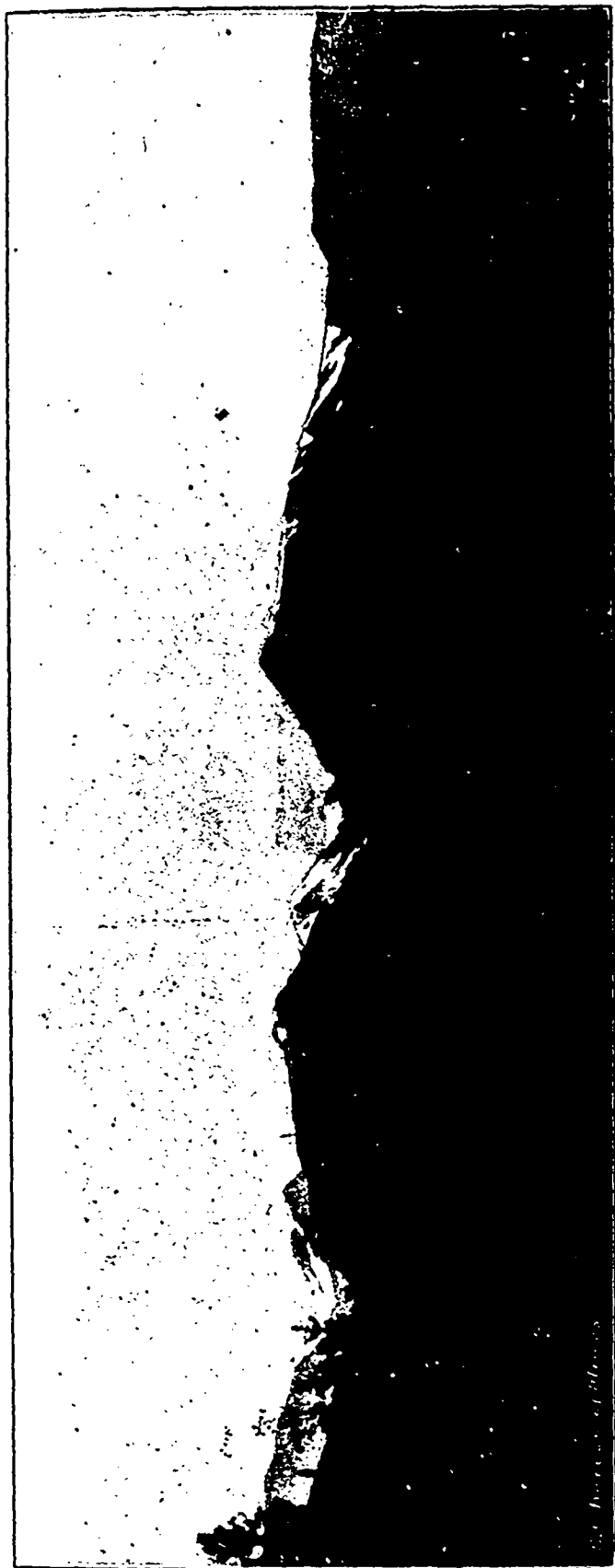
From Report of W. F. Robertson, Provincial
Mineralogist.

ONE of the most prominent features of the Annual Report of the Minister of Mines for 1905 is the report of the provincial mineralogist on the Northern Interior Plateau of British Columbia, through which he made a trip last summer. The account of this journey fills 51 pages of the Report, so is of course too long to be reprinted in full in the MINING RECORD. As, however, the country thus described is attracting widespread attention and there are indications that in parts of it there occur mineral deposits that may yet prove to be of considerable extent and value, extracts, have been made, these including an interesting account of the "Overland Telegraph," construction of which was undertaken more than forty years ago, excerpts relating to coal and other mineral prospects, and the provincial mineralogist's brief and useful summary of information respecting the districts traversed. Further, some of the blocks illustrative of his report have been courteously lent to the MINING RECORD by the provincial mineralogist, representing the Bureau of Mines, so that it has thus been made practicable for many who will not see the Annual Report to obtain a better impression of some of the places visited and referred to than would otherwise have been the case.

The provincial mineralogist, accompanied by Mr. John Kiddie, eldest son of Mr. Thos. Kiddie, metallurgist, then of Ladysmith, Vancouver Island, left Victoria on July 12 and proceeded *via* Vancouver and Ashcroft to the 150-Mile House, on the Cariboo road, whence Mr. Geo. Watson had preceded them to procure riding and pack horses for the journey. The route taken was to Quesnel, on the Fraser River, and thence across country to the Skeena—by the "old telegraph trail" north-west to the Hudson's Bay Co's posts at Fort St. James and Fort Fraser, and from there by Cheslatta, Ootsa and Francois Lakes to the Bulkley Valley and Telkwa country. Hazelton, at the head of navigation on the Skeena River, was eventually reached, on September 27, and on October 1, the party left by the river steamer for Port Essington, at the mouth of the Skeena, whence, on 6th idem, passage was taken for Victoria, which was reached on the evening of October 9, after a journey by railway, stage, pack-train, canoe and steamer of approximately 1,870 miles.

The first part of Mr. Robertson's report is as follows:—

"The general scheme of the topography of British Columbia consists of parallel mountain ranges running N. W. and S. E., with intervening valleys and waterways. Of these ranges, the Rocky Mountains, on the eastern boundary of the Province, and the Coast range, following the seaboard on the west, are



Goat Creek, Telkwa, Looking South—Hunter's Basin on Right; Hankin's Basin on Left.

the strongest and most persistent, but the altitude above sea-level of these ranges diminishes with northing and, as the general level of the intervening valleys and plateaux is higher in northern than in southern British Columbia, the height of the ranges above the surrounding country is thus still further diminished.

"In the southern part of the Province, between these bounding ranges of mountains, we have intermediate and parallel ranges of less importance, although often quite as high, of which the most important, the East Kootenay, Selkirk and Gold ranges are distinctly defined mountain ranges. As these intermediate ranges proceed north they gradually diminish, until at about 53 degrees North latitude they are replaced by rolling hills and plateaux.

"This great northern plateau is the source and feeder of most of our larger rivers, the Fraser flowing south, the Peace to the Arctic Ocean, and the Skeena to the Northern Pacific, in fact, only in this comparatively level lake country do the streams have the opportunity of uniting and forming rivers of any great size.

"In the southern part of the Province the mountain ranges, while admitting of railways and roads being easily built along the intervening valleys, viz.:—in a N.W. or S.E. direction, offer serious barriers to roads running east or west; a fact which has greatly retarded the development of that section. In this northern interior plateau no such obstacles exist, and roads may be run in any direction with easy grades, deflected only sufficiently to avoid the lakes which form such a large part of the country.

"The course, therefore, which a railway may take across this part of the Province is regulated only by the portal through which it penetrates the eastern barrier, the Rockies, and that by which it goes out through the Coast range. Whatever route may eventually be selected for a railway across this portion of the Province must of necessity run very near several of the large lakes of the district, and as these lakes are all navigable, and often connected by navigable streams, this system of waterways will prove valuable as feeders to the railway, and at the same time bring under the influence of railway transportation an area of country much larger than would be possible by a road unassisted by water communications.

"The main summer trip of the provincial mineralogist in 1905 was through this northern interior plateau, and extended from the Fraser River at Quesnel, westward to the Skeena River at Hazelton. With the trail along the old "overland telegraph" route between the two points as a base, trips were made to the north and south, so covering a belt of country which seems to offer the best and probably the most direct route from the Rockies to the Coast range at the latitude of Fort Simpson. It may, consequently, be assumed as probable that within this belt will be the eventual location of the Grand Trunk Pacific railway.

"At present this section of the Province is remote from all modes of cheap transportation, and, consequently, any substantial development, whether agricul-

tural or mining, can not be expected; in fact, only the probability of an early relief from this state of isolation has given that encouragement necessary to induce prospecting in both these branches of industry.

"In view of these facts, this trip, taken at the request of the Government, has of necessity been mainly exploratory, and in the absence of development, the facts noted serve only to suggest the possibilities of the section traversed, and may be said to have the same bearing on these possibilities as have surface croppings on the development of a mine.

"This section of British Columbia is of the greatest historical interest, as it was that part of the Province, certainly of the mainland, first visited or explored by white men, for in 1793, Sir Alex. Mackenzie, a partner in the North-West Fur Co., made his way up the Peace River, and thence to the Fraser, and following up the Blackwater crossed a low divide and reached an arm of the Pacific Ocean; a trip which he has described in his "Voyages through the Continent of North America," published in London in 1801.

"Mackenzie's explorations were followed up by Simon Fraser, another partner of the company, who established, in 1805, a trading post at Fort McLeod, and another in 1806 at Fort St. James, on Stuart Lake, the establishment of Fort George, at the junction of the Nechaco with the Fraser, following in 1807. The North-West Co. was afterwards absorbed by or amalgamated with the Hudson's Bay Co., and these interior posts have continued to be since that date, and are to-day, the only centres of white civilization in the district.

"Until about 1860 the district was entirely in the hands of the fur trading companies, the very nature of whose business and whose monopoly thereof caused them to discourage all white settlement or even exploration. In 1860 the discovery of placer gold on the Fraser carried civilization and exploration through to Cariboo and Quesne'mouth, and this being followed in a few years by the explorations for and the construction of the Collins Overland Telegraph Co's line, to a great extent opened up the whole district. The trail along the right-of-way of this, our first telegraph line, is even to-day the chief thoroughfare through the district, and has had such a marked influence on this section of the country as to deserve special notice.

THE OVERLAND TELEGRAPH LINE.

"The 'old telegraph trail' stands to-day as a monument to one of the boldest, most enterprising, and promptly executed projects, until it was given up, of private origin, that this continent has witnessed, and yet here in British Columbia on the scene of its execution and in the country which has derived the most lasting benefits from its operations, its memory has become so obscured by the short period of 40 years that such data as have been obtainable regarding it have had to be gleaned from brief notices in a dozen books, written by aliens or gathered from the recollections of the few 'old timers' still alive, who happened to know of its history. Among these may be mentioned Mr. R. B. McMicking, now manager of the

telephone system of Victoria, who was in 1866 the telegraph operator on the line at Quesnel.

"That 'nothing succeeds like success' is thus amply verified. This grandly conceived project failed to achieve commercial success, through no fault within itself, and it was buried and forgotten, only to be brought back to memory by a few of those who, having seen its monument, could read the inscription therein.

"In 1864, although land telegraph lines were accomplished facts, subaqueous telegraph cables were still considered impracticable, save for comparatively short lines, and there was no telegraph communication between Europe and America. The lack of these facilities was the more keenly appreciated as, on both sides of the Atlantic, land telegraph lines were in successful operation, extending, in America, across the continent.

"It is true that the Field Atlantic cable was even then under construction, but that it was destined to failure was predicted by many of the eminent electricians of that day. That such was the fact is demonstrated by the financing of the 'Overland Telegraph' line, now under discussion, by the directors of the Western Union Telegraph Co., then the greatest telegraph corporation in existence.

"In 1858 the first Atlantic cable was attempted, but although it was laid successfully, it never worked, owing to defective insulation, and it very soon broke.

"A brief history of the great Overland Telegraph line is as follows:

"In 1864 a company, formed largely of the directors of the Western Union Telegraph Co., undertook to connect America and Europe by telegraph. The original idea was due mainly to Mr. Percy McD. Collins, who had been formerly the U. S. Consular Agent at the mouth of the Amur River in Russia. The scheme contemplated a line of telegraph from San Francisco, up the Coast to British Columbia; through that Crown Colony, as it was in those days, to the Yukon; then through Russian America, now Alaska, to Bering Sea, which was to be crossed by a comparatively short cable, connecting in Siberia with a line of telegraph to be constructed to the mouth of the Amur River, where it would connect with the Russian Government telegraph line already constructed, and so continue throughout Europe.

"For a proper conception of the immensity of this undertaking, it must be remembered that in 1864 the United States had just concluded the Civil War, the Pacific tier of Territories was unsettled and almost unexplored, while British Columbia, the Yukon, Russian America and Siberia were entirely unexplored, save by the fur trading companies, and in British Columbia by the gold miners who had just penetrated as far as Cariboo. All supplies had to come from Europe or from the Atlantic free-board States, 'around the Horn,' costing three times what they would to-day, and local labour was very scarce and high-priced.

"The necessary charters and rights of way having been obtained from the British and Russian Govern-

ments, the command of the expedition for the necessary explorations, etc., was entrusted to Col. Charles S. Bulkley (on leave from the U. S. Army Telegraph Corps), as engineer-in-chief. The expedition was organised by Col. Bulkley on a military basis, with Major Wright as adjutant, and was divided into several sections, to each of which was entrusted a certain portion of the route. The British Columbia section was under the command of Major Frank L. Pope, assistant engineer, whose party, including Dr. J. T. Rothrock, and Edward Scoville as astronomer, left San Francisco for British Columbia on May 17, 1865.

"The route adopted in British Columbia was from New Westminster, following up the Fraser River by

ing British Columbia from the south in 1864, in longitude 122 degrees W., being carried thence to New Westminster, from which point it followed the valley of the Fraser River and the Cariboo wagon road northward to Quesnel, a distance of about 450 miles, which point was reached in 1865. Offices were established along the way, and from Quesnel southward the line was soon opened for commercial business. The enterprise proved a great boon to the early colonists, both by reason of the large expenditure of money necessary in its construction and operation, as well as by the facilities it offered for speedy communication between the widely separated settlements.

"In 1865, also, a branch line was run across the



Coal Outcrop, Kitimat Coal Co., Telkwa River.

the Cariboo wagon road as far as Quesnel. At Quesnel the Fraser River was crossed and the line was surveyed in a general N.W. direction to Fraser and Francois Lakes, and eventually on to Hazelton, on the Skeena River, by way of the Bulkley Valley, so called, as was the river flowing through it, after the chief of the expedition, Col. Bulkley, in which valley the horses of the party were wintered during the winter 1865-6. During 1866 the survey was carried through to Telegraph Creek, on the Stikine River. Along the survey line the right of way was cut out 50 ft. wide through the timber, and an excellent trail was constructed."

"In a written account of the undertaking, kindly supplied by Mr. R. B. McMicking, an active participator in the events, he says:—

"With marvellous energy and enterprise the work of construction was commenced in 1863, the line enter-

San Juan archipelago to Vancouver Island, connecting Victoria, the capital of British Columbia, with the main line at Swinomish, Wash. This branch was about 74 miles in length, and included five sub-marine cables of a combined length of 16 miles.

"From Quesnel the main line crossed the Fraser River to the westward, and had reached the Naas River, about 400 miles distant from Quesnel, when the second Atlantic cable was successfully laid and operated, July 29, 1866.

"The construction party of about 250 men, on receiving news of the completion of the cable, remained in camp two or three days awaiting developments, and at the end of that time, finding the cable continuing to work well, they set out for civilization, leaving their tools, stores and materials to the tender mercies of the Hudson Bay trapper and the native red man.

"In addition to the work done in British Columbia,

350 miles of wire had been strung in Siberia and 300 in Russian-America (Alaska), and a cable 60 miles long was on the spot ready to be laid across Bering Straits. The original expenditure of the construction of the British Columbia section of the inter-continental line reached the large sum of, roundly, three million dollars.

"When the project was abandoned, the line from New Westminster to Quesnel and Barkerville was continued in operation by the Western Union Telegraph Co. until purchased in 1870 by the British Columbia Government, which in turn handed it over to the Dominion Government, upon British Columbia's entering Confederation in 1871.

"On the line from Quesnel northward things were left as they stood; the line, as far as constructed, was never used and gradually fell; and to-day only one or two poles can be seen standing, while miles of wire have been trodden into the ground by pack animals and can be seen sticking out of the mud at intervals, still perfectly sound and not at all rusted. The greater part of the wire has, however, been taken by the Indians for various uses. With it their houses are tied together; they made it into nails, fish spears, traps, etc., and even constructed most ingenious suspension bridges with it. A cut of a bridge so constructed at Ahwillgate accompanies this report, showing a structure that proves the Indians to have considerable knowledge of the principles of bridge building.

"The present Dominion Government telegraph line to the Yukon follows the old line as far as the latter went, utilising the old right-of-way cutting, but having to replace the poles and wire.

"The 'old telegraph trail' has ever since been the main thoroughfare through this northern interior, and from it trails branch off to various districts, that for the Omineca leaving it at Fraser Lake.

"There can be little doubt but that the explorations caused by this telegraph enterprise had an influence on the territory investigated, indirect perhaps, but none the less effective and lasting. It is a noteworthy fact that the negotiations for the purchase of Alaska from Russia by the United States were begun in 1866, just about the time when the reports of these surveys would reach the United States, and that these negotiations emanated from Washington.

"It is notable, with regard to British Columbia also, that the placer gold discoveries in the Omineca district began in about 1867, and in Northern Cassiar, about Dease Lake, in 1872 and that both these districts were adjacent to the line of the surveys. The transportation of telegraph material to Hazelton and Telegraph Creek brought to notice the possibilities of navigation on the Skeena and Stikine Rivers, and undoubtedly had much to do with the settlement of these two towns.

"How much the remainder of the Province benefited from the preliminary surveys and subsequent construction, and by the attention drawn to it through-

out the world as the route of the telegraph line from America to Europe, it is impossible to say, but enough has been said to show that it ill becomes British Columbia to allow this enterprise to go unremembered and unhonored."

COAL OUTCROPPINGS AT FRASER LAKE.

Three weeks after Quesnel was left, the provincial mineralogist crossed from Fort Fraser to the southern shore of Fraser Lake, about two or three miles from its outlet, to examine certain coal croppings there being prospected. Of these he says: "On the shore there are outcroppings of carbonaceous shales, with small seams of coal of a thickness of a few inches. A few yards from the shore a shaft down about 20 ft., and a drift of about the same length, exposed a small and much-disturbed seam of coal.

"To the south-east of these outcrops and back about two miles from the lake, and some 500 ft. higher, in a small gully opening to the south, are two other outcroppings of coal-bearing strata, but, as far as work had been then done, no seam of workable size had been exposed.

"The coal has every appearance of being a lignite; it 'slacks' on exposure to the air, in many instances shows a woody structure, and is in a lignite formation, but the samples of the coal, as taken from the outcroppings, gave the following analyses:—

Sample.	Moisture.	Volatile		Ash.
		Matter.	Carbon.	
No. 1	3.8	17.2	58.0	21.0
No. 2	4.3	14.2	33.7	47.8
No. 3	3.9	23.1	54.9	18.1

"These analyses show a percentage of ash altogether too high for commercial coal, but it must be noted that the samples, all of which proved to be non-coking, were from practically surface exposures and may improve with depth. The percentage of moisture is too low for a lignite and would represent nearer a bituminous coal, as would also the proportions of volatile and fixed carbon.

"Within a few hundred yards of the coal exposures on the lake shore is a belt of recent granite of very considerable, though undetermined, extent, while similar though smaller intrusions of the same granite occur in the vicinity of the coal croppings further south. These masses of igneous rock are probably younger than the coal-bearing formation, and their occurrence has probably been the cause of the alteration of the coal from a lignite to something approaching a bituminous coal; but such occurrence has so disturbed the adjacent country that whatever coal may eventually be discovered will probably be found to be much faulted and broken, rendering it improbable that any commercial coal field will be found in the immediate vicinity of the coal exposures seen, and upon which some little prospecting has been done.

"Fraser Lake is about 20 miles in length in an east and west direction, and its width is about one and a-half miles. The waters of Lac de Francais or Francais

Lake, the large lake lying to the west, empty through the Stellako River, some twelve miles in length, into the western end of Fraser Lake, which in turn discharges to the east by a short and unnamed stream, only about three-quarters of a mile long, into the Nechaco River. On this short connecting stream is the Fort Fraser Indian reserve, a village of about 30 houses and a Roman Catholic Church."

MINERAL LOCATIONS ON TELKWA RIVER.

Aldermere, in the Bulkley Valley, was reached by the provincial mineralogist on September 5. The part of the report dealing with this townsite and the mineral claims seen on the Telkwa River is as follows:

"After following the trail for about six miles through a succession of spruce swamps, the townsite

and even at very low water is difficult to cross with horses. The banks on the south side of the Bulkley, near the mouth of the Telkwa, are rocky and steep; in fact, there is a short canyon and rapids at this point, up which it is difficult to take canoes, so baggage is ferried across, below the rapids, while in crossing from the north to the south side of the river the horses have to be taken a mile higher up the river, where they can swim across and land on the south bank. There is a good beach on the north side at the canoe crossing, so that in coming from the south horses can be crossed.

"There was a bridge across the river at this point, built three or four years ago by Messrs. Limin & Davis, who were prospecting for coal on the Telkwa; but this was constructed with a central crib-work pier



Coal Seam Outcropping on Goat Creek, Telkwa.

of Aldermere was reached. There is no town here, merely two log saloon-hotels, in one of which is a store, containing a reasonable stock of essential supplies. The townsite is located on a high dry bench about half a mile from the junction of the Bulkley and Telkwa Rivers, and about a mile from the telegraph station on Tyee Lake, the telegraph trail proper keeping well back from the river on the hillside. Camp was made on a low flat on the bank of the Bulkley, just opposite the mouth of the Telkwa.

"September 6—Min. temp., 25; max., 60°; bar. alt., 1,900 ft. The day was spent in replenishing supplies at the Aldermere store, swimming the horses across the Bulkley, the baggage being taken over in canoes, and making camp on a gravelly flat at the mouth of the Telkwa River.

"The Bulkley River is a large and swift stream here,

in the river, which was promptly washed out at the first high water.

"September 7—Min. temp., 23°; bar. alt. (bench), 1,950 ft. The main trail on the Bulkley was here departed from and a trip was taken up the Telkwa River to inspect certain mineral locations which had recently been made there. It was learned that all the prospectors had gone away from their claims in the hills, driven out, it was reported, by a snow-storm about August 23; consequently a local prospector, Mr. P. R. White, was engaged as a guide to this section to show where the properties were. It was, however, subsequently found that his knowledge was general rather than specific, and a few only were found of the claims located.

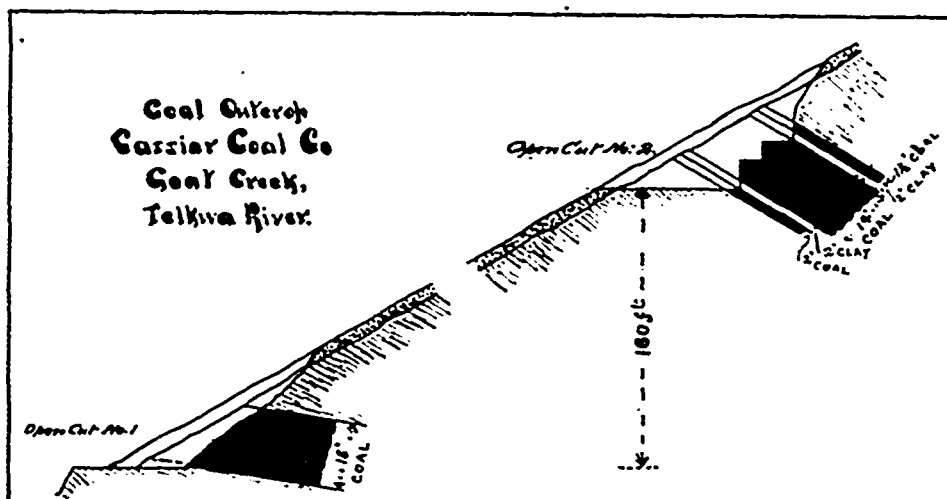
"The trail up the Telkwa is on the right or east bank of the river, and after leaving the flat at the

mouth runs along a gravel bench, the whole valley of the Telkwa being composed of rounded gravel wash, into which the present stream has cut its channel. About two miles up the Telkwa trail, a trail leading up Goat Creek branches off to the left. About four miles up the trail crosses over Goat Creek by a ford, known as the 'first crossing of Goat Creek,' and follows up the opposite side of the creek for about four miles to the 'second crossing,' a distance from the Bulkley of about ten miles. Camp was made at the second crossing, but there is very little feed for horses, and great trouble was experienced in holding them. The trail is very good up to the first crossing, being over gravel bench land, but after making the crossing it continues on the creek bottom, through spruce woods, for two miles, at an altitude of 2,500 ft. It then climbs a long, steep, clayey hill, reaching a bench with an altitude of 3,300 ft., a rise of 800 ft. in about two miles—about as bad a trail as could be.

The work done, as far as could be found at this point, consisted of two open cuts.

"No. 1 Cut was found about 100 ft. from the creek and about 50 ft. higher than the creek bed. Here the clay surface-wash had been removed for a width of some 10 ft., exposing the face of a seam of coal which, as far as could be determined from the exposure, had a thickness of some 15 ft., and appeared to be dipping into the hill (up the creek) in a N. 30° E. direction at a very slight angle, probably not exceeding 5 to 10°.

"The roof and pavement of this seam, as exposed, were clay, which, it is suspected, is the surface disintegration of a shale, to which it will probably alter as depth is gained. As is always the case even with the best of coal, the croppings are very much broken up and the interstices filled with clay, and here the coal has not been cut into more than a couple of feet, so that no very flattering idea of the probable quality of the coal is obtained. The most that can be said is that



Coal.

"Cassiar Coal Co.—Just before making the first crossing and within a hundred yards of the trail, there were some open cuts, made by the Cassiar Coal Co. in the development of its coal lands. The development work done is naturally rather superficial as yet, since there will be no market for coal until the railway is an accomplished fact, and serves rather to demonstrate the presence of coal, with its probable extension, than to prove the extent of the beds and the conditions under which they will have to be worked. The coal outcroppings in question occur in a low foot-hill, having a maximum height of some 300 ft. above the creek bed. This hill is perhaps better described as the edge of a clay bench cut by water-courses. The entire surface is covered with a wash, some feet deep, of clay, the outcroppings being further masked by a luxuriant growth of underbrush, etc., rendering any prospecting difficult if not impossible, unless carried out in a most systematic manner and by the aid of detailed surveys; and as this is expensive work, it is perhaps too early as yet to expect much in this line.

there is a seam as described, and that it appears to lie regularly and undisturbed. No sample was taken of this exposure, as such would not have done justice to the probable ultimate quality of the seam.

"No. 2 Cut.—Some 150 ft. higher up the hill, and about 75 ft. further to the north, is No. 2 cut, which is much more satisfactory, in that it presents a better exposure of seams in all probability quite distinct from that seen in No. 1. This No. 2 cut exposes, in ascending series: An underlying clay or clay shale; coal, 2 ft. thick, of fair quality; clay shale, 2 ft. thick, containing 'iron stones' (Fe S₂); coal, 14 ft. thick, which was sampled down the whole face; the analysis of which is given herewith; clay shale, 2 ft. thick; coal, 1½ ft. thick; clay shale, overlying, and only partly exposed. These measures dip N. 30° E. and the same direction as in No. 1 cut, but at an angle of from 20° to 25°.

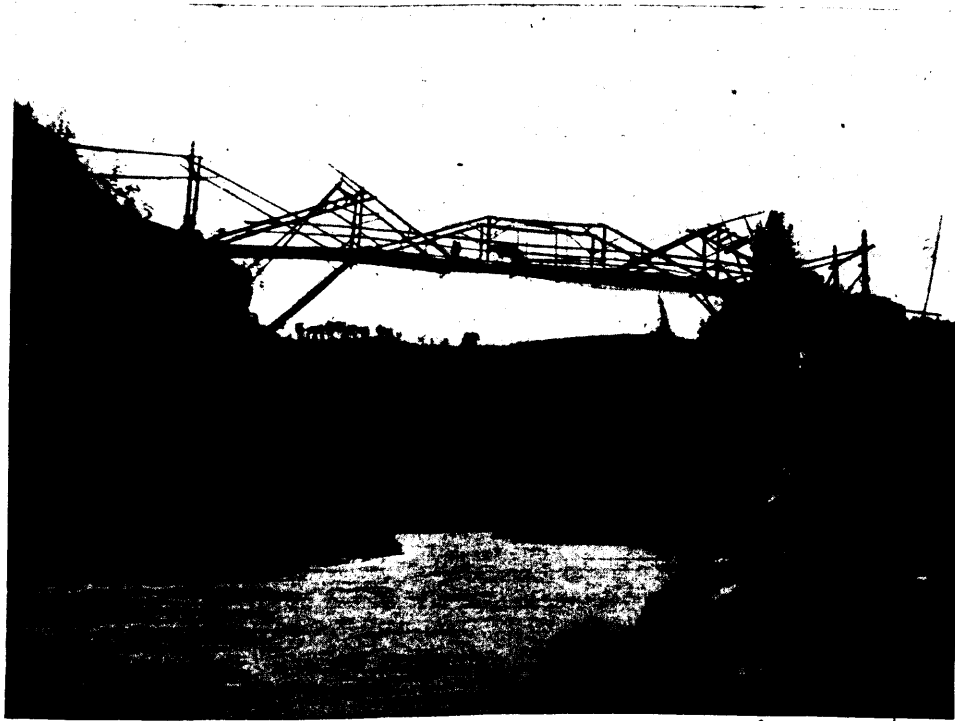
"A short distance above these exposures and above the 'first crossing,' Goat Creek has cut the edge of the hill in which the coal measures occur, so as to produce an almost perpendicular bluff extending from the

creek bed up to a height of 300 ft. About half-way up the face of this bluff, and quite inaccessible without constructing apparatus, was seen a longitudinal exposure of a coal seam, which from its position and size appeared to be the same seam seen in the No. 2 cut, just described. This exposure is about a quarter of a mile from No. 2 cut and shows that extent of the seam. In the bluff the seam is nearly horizontal, the dip of 20° noted in No. 2 cut having flattened out as it got under cover.

"Since the seam could not be actually measured by the writer, the following extract is given, taken from a report made in 1900 by Mr. Frank H. Shepherd, M.E., for Mr. Samuel M. Robins, of Nanaimo, and others:—

Bone and shale	1 ft. 9 in.
Coal	2 ft. 2 in.
Shale	1 in.
Coal	5 in.
	— —
Total	24 ft. 0 in.
	— —
Total coal	20 ft. 10 in.
Total shale	3 ft. 2 in.
Total seam	24 ft. 0 in'

("The total coal, above the 1 ft. 9 in. of shale, is 18 ft. 3 in., which would be considered the workable portion of the seam. Strike of seam, 292° (mag. variation, 25° E.); angle of dip, 16° 30'; course of dip,



Bridge Across Bulkley River at Ahwillgate.
(Constructed by Indians of Round Poles and Telegraph Wire.)

"The first outcrop encountered and hereafter referred to as the 'lower location' is on the north bank of the Telkwa, the seam forming a perpendicular bluff of about 30 ft. and ending in the swift waters of the river. It was necessary to be lowered by a rope to obtain a complete section of the seam, which, notwithstanding the difficulty of the position, was carefully taken as follows:—

"Roof	Gray shale.
Coal	2 ft. 3 in.
Shale	2 in.
Coal	7 ft. 3 in.
Shale	2 in.
Coal	4 ft. 6 in.
Shale	1 ft. 0 in.
Coal	4 ft. 3 in.

22°. This is a splendid outcrop and sufficiently hard to have withstood the torrents of the Telkwa for an 'evidently long period.'")

"This is an altered coal possessing a high percentage of fixed carbon, due to its contiguity with the igneous rocks which underlie the whole of the field. The result has been to raise the fixed carbon and to reduce correspondingly the volatile hydro-carbons, and appears to have been fairly uniform in its action."

"Continuing, Mr. Shepherd gives the actual section of what he calls the 'upper location,' and which is probably identical with the exposure described as on the claims of the Cassiar Coal Co. on Goat Creek.

"The 'lower' and 'upper' locations are about three-quarters of a mile apart, and the ground is covered with heavy vegetation, rendering a rapid exploration

impossible." (The provincial mineralogist makes this distance nearer three miles.)

"The upper location is shown on a steep precipitous bluff and is inaccessible, but is again exposed on Goat Creek a little to the east, where the following section was taken:—

"Roof	sandstone.		
Coal	4 ft 0 in.		
Shale	5 in.		
Coal	3 ft. 5 in.		
Hard shale	1 in.		
Coal	1 ft. 7 in.		
Bony shale	3 in.		
Coal	4 in.		
Black sandy shale	1½ in.		
Coal	1 ft. 0 in.		
Bony	1½ in.		
Coal	1 ft. 0 in.		
Bony Shale	2 in.		
Coal	1 ft. 10 in.		
Shale	1 ft. 4 in.		
Coal	1 ft. 2 in.		
	—		
Total seam	16 ft. 10 in.		
	—		
Total coal	14 ft. 4 in.		
Total shale	2 ft. 6 in.		
Workable coal	13 ft. 2 in."		

"The following is the analysis of the sample of the 14-ft. seam taken only about six to eight ft. in from the absolute outcrop, and represents the average of the seam as at present exposed. If a sample could have been obtained from a greater depth and freer from surface influences, it would probably show a materially better analysis.

"Analysis from 14-ft. seam of Coal on Cassiar Coal Co., No. 2 cut, on Goat Creek, Telkwa River basin.

	Per cent.
Moisture	6.6
Volatile matter	29.0
Fixed carbon	55.9
Ash	7.5
	—
(Non-coking.)	100.0

"This analysis indicates the coal to be a fair quality of bituminous coal, with a percentage of ash in this surface sample higher than it should be, while the percentage of volatile matter is lower, and the percentage of fixed carbon higher than is usually found in a bituminous coal.

"This coal-bearing formation is probably of Tertiary age, and under normal conditions should still be evidenced a lignite, but as to what the unusual conditions were which produced the change evidenced in the coal as found, the easiest and most probable explanation lies in the fact that the immediately adjacent higher mountains are found to be composed almost exclusively of volcanic overflow rocks, basalts, tuffs, etc., which represent a later period in geological history than do these coal measures. This volcanic over-

flow has been found to have at one time covered the whole of the interior plateau, and its absence in any particular place is probably the result of erosion and disintegration of the deposit. In the surrounding mountains the volcanic rocks are found little disturbed, often only slightly tilted, although frequently faulted, while the valleys, basins and gulches are the effect of erosion. It is possible, therefore, that the entire coal formation as it may exist here, was covered by this molten overflow, and that the exposures found have been rendered 'get-at-able' by the removal of the overlying formation by erosion.

"If such was the case, as is supposed, the superincumbent weight and heat of this molten mass would undoubtedly have changed a lignite into coal of the character found. Not only would such geological conditions have had this marked beneficial effect upon the coal, but they would have a much more important bearing upon the value of the field from a practical point, inasmuch as, in the old wide valley of the Telkwa, the greater part of the coal known is found at an elevation superior to that of the larger area of the valley; hence, except for possible action of faulting, the greater part of the coal originally deposited over this area would appear to have been removed by subsequent erosion.

"If, however, the supposition as to the volcanic rocks overlying the coal is correct, then the coal might be expected to be found underlying many of the remaining hills, which, as exposed on the surface, are undoubtedly of volcanic origin; in which case there is no visible limit to the extent of the field, and the chances are that underlying the solid formation the coal would be found better and under more easily workable conditions than under the clays of the present valley.

If, on the other hand, as has been reported by certain engineers who have examined the district, these igneous mountain masses surrounding the exposed coal field are igneous bosses thrown up directly from below, and not a volcanic overflow, then these volcanic rocks must be the absolute and final boundary of the coal field. In such case, which is not assumed to be proven, the area of the field would be very limited, since the coal, at least here, is found near the border of the valley and is dipping towards and, it is hoped, under these surrounding volcanic rocks. A volcanic flow must, of course, have had points of issue, remaining to-day as 'stems' (perhaps of great size, practically volcanic bosses or upheavals), and whether these may be underlying these particular hills is a question which can be determined only by extensive works, or by explorations in detail.

"Coal exposures were later noted in the valley of the Bulkley, at an altitude of some 1,800 to 2,000 ft., also in the main Telkwa, at an altitude of about 2,400 ft. There will be described later exposures on the locations of the Transcontinental Development Co., situated some four to five miles higher up Goat Creek, at the junction of 4-Mile Creek, at an altitude of 3,400 ft., while over the watershed, on the Copper River

slope, coal exposures have been carefully surveyed which lie at an elevation of about 4,000 ft. These latter are in a district bordering on the main Coast Range, and this has probably been elevated by the same upheaval, and is, therefore, not connected with the basin at present under consideration.

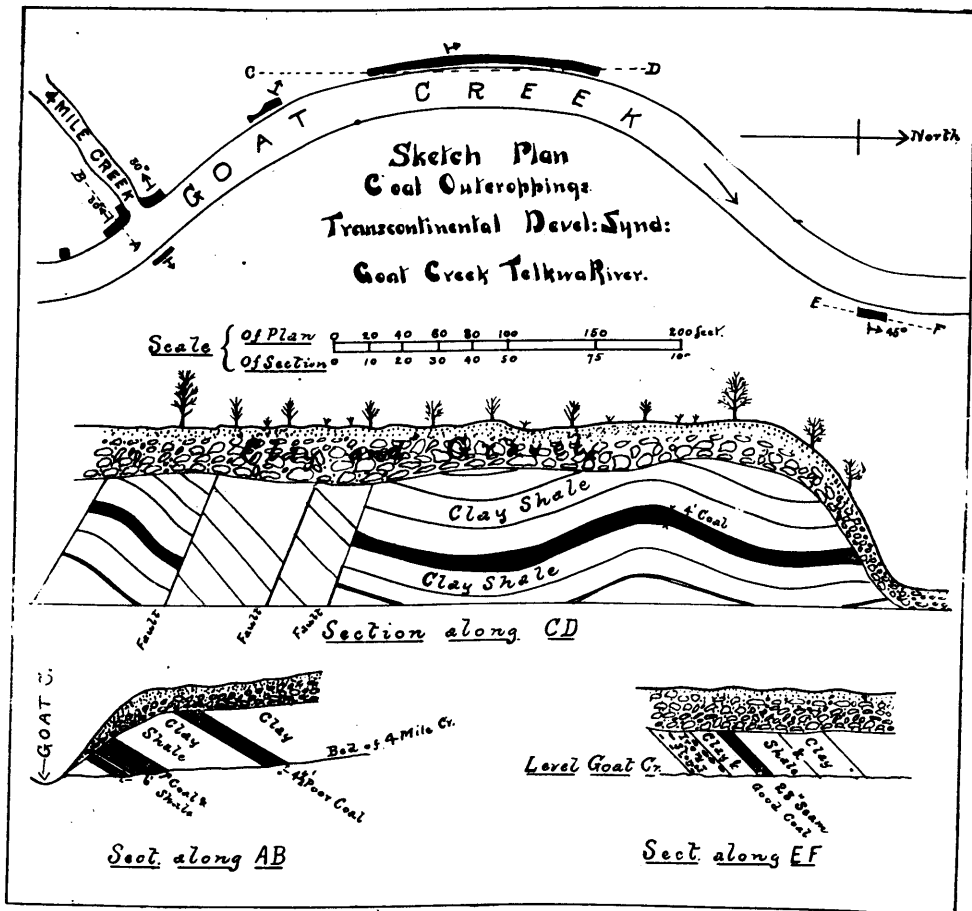
"(The chronological order in which this Report has been carried out will here be temporarily departed from, in order to keep together the descriptions of the coal deposits visited.)

"The coal exposures next seen (September 9) were those of the Transcontinental Development Syndicate, situated on Goat Creek, about two miles above the 'Second Crossing,' at the junction of 4-Mile Creek

and extent of the outcrops seen can best be indicated by the accompanying sketches.

"The valley of Goat Creek at this point is about 2,000 ft. across, to the base of the high banks, the bottom land being from 20 to 40 ft. above the creek. The coal measures are here, at least locally, so very much contorted, faulted and eroded, that it was found impossible to correlate the various exposures found, or to form any idea as to the probable extent of the deposits; so that, consequently, description will be confined to the individual exposures.

"Where 4-Mile Creek flows into Goat Creek, on the west side, it cuts through a coal outcropping which is found dipping S. 70° W., at about 30° angle. The



with Goat, and are reached by a short trail branching off to the left from the main Goat Creek trail leading to Hunter Basin.

"Preliminary surveys and development of these areas had been carried on during the summer (1905), under the direction of Mr. Arthur Webster, who had been seen at the mouth of the Telkwa on his way out, and from whose description and sketches the locations were found. Mr. Webster's work had been confined to a short season with a small force of men, and, as much of the time had been occupied in the construction of a log cabin for the workmen and in preliminary surveys, the amount of actual development work done was slight and was confined to the stripping of coal outcrops where cut by the creek. The location

underlying seam is about six ft. thick, and consists of narrow bands of good coal, interstratified with bands of shale in about equal proportions. Above this, and separated by about 15 ft. of clay shale, is a bed four and a-half ft. thick of coal, also mixed with clay partings. No attempt had been made to trace these seams under cover.

"On the east side of Goat Creek, at this point, a narrow seam of coal was noted in the creek bottom, on which no stripping had been done, and which appeared to be dipping to the north-east.

"A short distance down stream, on the west side, a 4-ft. seam of coal, impure with shale partings, has been exposed by the creek for a distance of over 150 ft. These measures are found to be so faulted and

contorted as to render it uncertain as to whether or not they are in place.

"Some 150 ft. down the creek from the last exposure, and on the east side, a 28-in. seam of coal was seen, dipping at a fairly steep angle. The coal in this seam is almost free from shale partings and is of very good quality, as the following analysis by the Provincial Government assayer indicates:—

	Per cent.
"Moisture	0.8
Volatile matter	8.2
Fixed carbon	81.6
Ash	9.4
	—
(Non-coking.)	100.0

"Near certain fault planes, samples of the coal so affected approach in character to an anthracite, but the quality of such is unimportant.

"On September 14, the coal areas of the Kitimat Development Syndicate were visited. On these the exposures were reported to be chiefly on the main Telkwa River, above the junction of Goat Creek. The trail was followed up the south bank of the river for from 2½ to 3 miles above the mouth of Goat Creek, where coal measures were found outcropping on the trail, with evidences of an old tunnel, long since caved in, so that no measurements as to the thickness of the seam could be obtained. The tunnel appeared to have dipped to the south into a clay-shale hill. The dump was carefully examined, and from its evidence it appeared that the coal in the seam was so very much mixed with clay-shale partings as to be of no commercial value.

"On the north bank of the river, about a quarter of a mile below this, in a bluff about 30 ft. high, formed by the river cutting into a lower foot-hill, there was seen a splendid exposure of coal. It was found impossible to cross the river to the bluff, as the bridge was gone, so a photograph, which accompanies this report, was taken from the south bank, a distance of some 50 to 60 ft. Here is exposed, in a perpendicular face from the water up, a coal seam judged to be from 18 to 20 ft. thick, dipping N. 25° E. at an angle of about 15°. There were visible certain shale partings and bands, but there appeared to be bands of coal of workable thickness.

"Boring for Coal.—On the Bulkley, just where the Telkwa flows in, there is an exposed bluff of a fine-grained, light-coloured rock, which extends underneath the surface gravel's and wash for some distance up the valley of the Telkwa. This rock formation has been popularly described as a 'sandstone,' and has been supposed to be a member of the local coal measures, probably from its general appearance and the fact that sandstones are associated with the carboniferous coal measures of England and the eastern portion of America.

"Messrs. Limin & Davis, who were among the original holders of coal locations on the Telkwa, brought in a hand-power diamond drill and with this put down bore-holes at a number of points. Of these

no definite information is obtainable, but it is reported by the workmen that in none of the holes was coal found. One of these holes was put down in the rock exposure at the junction of Bulkley and Telkwa, erroneously supposed to be a sandstone, while other holes were put down farther up the Telkwa Valley, a pit having been sunk through the gravel to bedrock.

"The fact that this formation is not a sandstone became evident upon closer examination, and some five samples were taken from different points, one being part of the diamond drill core obtained at a considerable depth. The samples were sent to Professor Dresser, of Montreal, for microscopic examination, who classes them, one and all, as of volcanic and not of sedimentary origin.

"As a matter of fact, the provincial mineralogist was unable to find any rock associated with the coal formation on the Telkwa which could properly be classed as a sandstone, such sedimentaries as were seen being all argillites, usually of fine texture."

(Note.—The provincial mineralogist's account of his visit to mineral claims and the country passed through until Hazelton was reached will be reprinted in next month's MINING RECORD, space not being available for it this month.—Editor, MINING RECORD.)

SUMMARY OF INFORMATION GATHERED.

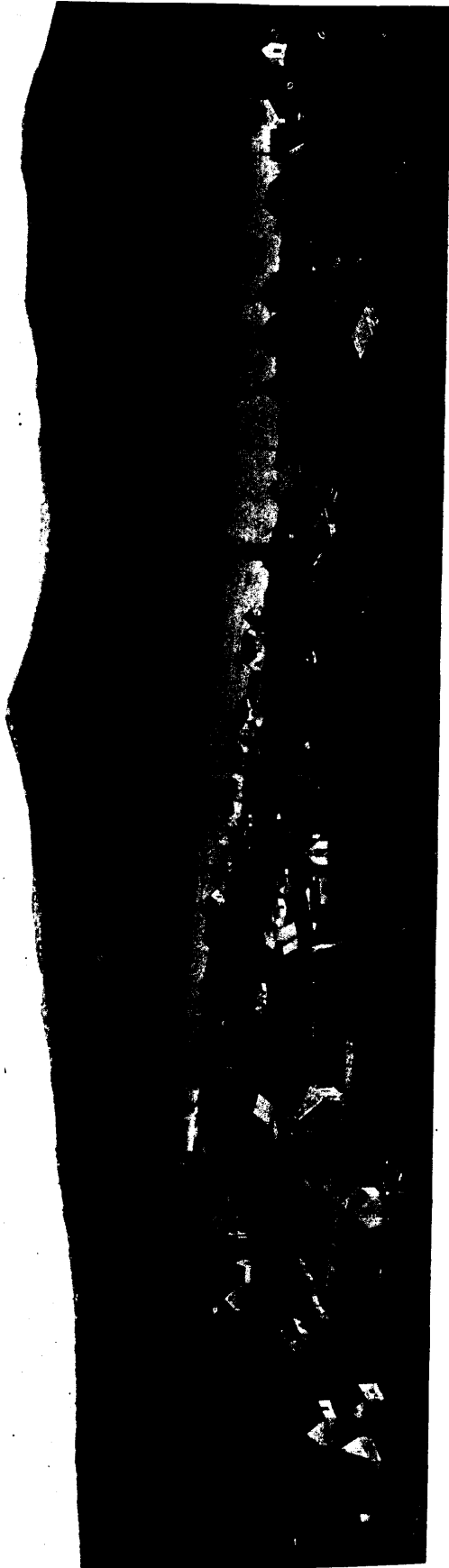
"The following is a brief summary of the information gathered respecting the district traversed during the trip:—

Agricultural Possibilities.

"Area Available.—The country from Quesnel to the headwaters of the Bulkley is a gradually rising plateau, having an altitude above the sea-level of from 2,500 to 3,500 ft., and lying between 53° to 54° 30' north latitude. This plateau has been at one time covered, except in a few places where the solid rock formation rose above it, by a deposit of the glacial age, composed of clay and of sand and gravel mixed with clay. The erosive action of water and ice has cut into this general plateau depressions now occupied by lake and river beds. Some of these lakes and rivers were primarily of very considerable size, and as only a portion of their original area is occupied by the beds of the modern lakes and rivers, there are to-day along these later water-courses benches and terraces representing the unoccupied portion of those ancient lake and river beds. It may be said, therefore, that the area or arable land consists of strips along the present water-courses, and represents the old river or lake beds. This area, while but a very small proportion of the whole, includes an acreage capable of supporting a large, though scattered, population.

"Very soon after the passing from the interior drainage area to that of the Skeena River and Coast, the rolling hills and plateaux give way to more sharply defined mountain ranges; the smaller streams become mountain torrents, and only in the main valleys, along the larger streams, is there any land available.

"The valley of the Bulkley—that is, of the old stream—is 4 to 6 miles wide, much of which, for distance of 50 miles, is suited for farming. This valley is also lower than the level of the interior plat



Town of Hazelton, at Head of Navigation on Skeena River.

eau, lying between 1,800 and 2,500 ft. above sea-level, while that of the Skeena, even above Hazelton, is still

lower, and contains a large amount of good land, although it is but a small percentage of the area of the district.

"Soil.—The soil found on the plateau proper is poor and usually gravelly, save in small recent depressions which have been filled by local washings from the surrounding ground. The benches and terraces which flank the water-courses, and which formed the beds of the ancient lakes and streams, are covered with a silt deposited by these old bodies of water, assisted, no doubt, by washings from the higher land, and this soil, while light, is remarkably free from boulders or stones and is very fertile, being formed from what were originally volcanic rocks, very easily disintegrated by atmospheric action. The amount of humus or leaf-mould is very slight, probably due to the evidently dry climate and to forest fires, which have repeatedly swept over the district and burned up all surface carbonaceous soil.

"As far as the quality of the soil can be gauged by chemical analyses, the bench-land and terrace soils appear to be unusually good, and are so classed by Dr. Frank Shutt, chief chemist of the Dominion Experimental Farms.

"The quality of the soil may be judged also by the growth which it did, or does, support. This criterion would, of course, be influenced adversely by the climate in an unfavourable year, and, consequently, to use the plant-life as an indicator of the soil, a favourable year, climatically, must be taken. In such years we find the growth of almost anything planted to be unusually prolific. All the grains and all the vegetables found in the most favoured provinces of the Dominion grow well, as do such of the small fruits that have as yet been tried. As to the grasses, the writer, who is familiar with all the southern portion of the Province and with much of the Dominion, has never before seen such prolific growth.

"Most of the luxuriant summer growth met with in the district, such as pea-vine, etc., provides splendid green feed for stock, and makes good hay if properly cured; but most of such feed grows annually from seed, and if cut or eaten before the seed is dropped will not come up again. This fact, taken in conjunction with the climatic conditions, warrants the assertion that the district is not a cattle-ranging district; that it is splendid for summer grazing, but that feed for winter feeding of stock must be put up, and that such winter feeding will have to be kept up for from three to four months.

"Climate.—The summer growth, in a latitude as far north as 53°, is such as would astonish one not familiar with the length of the summer days and the number of hours of absolute sunlight that a day in this northern latitude contains, sometimes about 20 hours out of the 24, at least three hours more than farther south. As vegetation grows only in the sunlit hours, this additional sunlight means just so much more growing time, and the crops grow and ripen in just a proportionately fewer number of days. In considering the season here available for agriculture, the

southern agriculturist must take this fact into serious consideration.

"The climate of the interior is dry, though there appears to be usually a sufficient rainfall, and the summers are not very warm, while the winters are sometimes very cold, the thermometer dropping to from 30° to 40° below zero. The only absolute statistics available are those of the meteorological observer at Stuart Lake.

"Summer frosts are unquestionably at present prevalent, but that these will disappear as soon as any appreciable area of the soil is cultivated, there is every reason to expect, from the experience of the northern part of Washington State and the Canadian Northwest.

"The climate of the valley of the Bulkley is undoubtedly much moderated by the influence of the warm winds from the Pacific Coast in spring and summer, although the coast vegetation does not show itself until within a few miles of Hazelton, the air being robbed of its moisture at this distance from the coast, although it still carries its warmth. The lower altitude of this valley has a marked influence on its climate, as compared with that of the rest of the interior, although summer frosts are even here prevalent at present.

"Forest Growth.—There are evidences scattered over the district indicating that at one time this whole district was covered with a heavy growth of very large fir. In many places an occasional charred stump, or a large root embedded in a muddy bank, proves this conclusively. This heavy growth was removed by fire, presumably in prehistoric times, and was replaced by a second growth of inferior timber, such as jack-pine and small spruce on the higher and drier levels, with poplar on the benches, and cottonwood and willow on the low lands. The low lands and terraces are easily cleared and can soon be brought under cultivation. The uplands will supply an amount of rather inferior timber sufficient for home consumption if the country was all settled up, but with little suitable for export out of the district.

Transportation.

"At present the district is absolutely devoid of transportation of any kind, and there is neither wagon nor wagon road between Hazelton and Quesnel. A trail there is, of a kind, which served in the past, but which cannot be accounted as a factor in the future economic development of the district. This lack of transportation (indeed of ordinary means of travel), renders the land in this part of the Province practically valueless, notwithstanding its undoubted possibilities. The farmer has no market, and no means of getting his produce there, if he had one, and if he drives his stock over the trail to Hazelton or Quesnel, he is met at the former place with a prohibitory steamer freight and at the latter by a further 'drive' of 200 miles through a competitive stock country, to the nearest railway.

"Before, therefore, any attempt can be made at development, wagon roads are an absolute necessity,

and must connect the agricultural sections with the distributing points of the district, and should, furthermore, be used to connect the system of natural waterways. This only by way of beginning, however, for the country will not begin its real growth until the advent of a railway.

Mineral Probabilities.

"It is much more difficult to summarise the mineral probabilities of the district than the agricultural, since the mineral-bearing formation is usually covered, and even where it is exposed and is of such character as elsewhere carries valuable mineral, there is no guarantee that such formation is here similarly mineralised; while, on the other hand, a formation which in one district may be barren may in a second district carry valuable mineral. The most that can be done is to judge the rock formation seen by the experience gained elsewhere with similar formations, aided by the few slight developments which have been made on such claims as have been located.

"From Quesnel westward to the Bulkley at the Telkwa, the country is, as a rule, so covered with glacial wash as to hide whatever solid formation may lie underneath, effectively blocking all prospecting for lode deposits. Such peaks of the formation as appear above the glacial drifts are practically all of comparatively recent geological age, and are of volcanic origin, belonging to the Tertiary age, and were so classed by Dawson in 1875.

"Aside from the theoretical consideration that such volcanic rocks are very unlikely to contain fissure veins of any importance, the actual experience of mining does not indicate that such formations elsewhere have been found to contain valuable mineral deposits. These rocks undoubtedly do contain small percentages of various economic minerals, disseminated throughout them, which through the solvent action of water have in places been leached out and re-deposited in small fissures, but such action requires much time and pressure to produce deposits of commercial importance. These conditions are here lacking, as the rocks are younger than even the lignite formations. With the older rocks effectively covered, as far as could be observed, and only the recent rocks exposed in a few places, the chances of successful lode prospecting in the section under consideration seem slight.

"At various points coal or lignite formation was noted, and although no seams of commercial size or quality have as yet been found, there is always the possibility of such being discovered at one of many points in this district.

"As the interior plateau approaches, on its western boundary, the Coast range of mountains, the conditions change: the upheaval which formed this range carried up with it on its eastern flank the adjoining rocks of older formations and sent off into these older rocks spurs and tongues as dykes or larger intrusions. Along the contacts thus formed there appears to be every likelihood of mineral deposits being discovered.

"The rocks of the Vancouver Island series are supposed to have been formed at the same time as were

those of the Coast range, and these have been shown to be mineral-bearing along their contact with the older rocks.



Port Essington, Viewed from Hill Behind—Showing Mouths of Skeena and Ecstall Rivers.

"Speaking generally and from a geological standpoint, it is considered that the Coast range and its eastern foothills is the only portion of the district which offers any very hopeful field for lode-mine prospecting, but this section is well worth such investigation. The headwaters of the Telkwa is about the eastern boundary of the area probably influenced by the Coast range. Here it will doubtless be found that the deposits will be smaller, though probably higher grade than nearer the main range.

"The present mineral development is too recent and too slight to permit of even an approximate estimate being formed of the district; the claims seen have been described, and they seem to indicate possibilities of very considerable mineral being eventually discovered in this vicinity.

"Until adequate transportation facilities are provided, even the best of the claims seen are of little value, as none of the ores are free milling, nor are they of a grade sufficiently high to stand pack-train transportation to Hazelton.

"The Coast range is exceedingly rugged, and the ultimate location of the railway to the Coast, whether by one pass or another, will have a material influence on the respective camps; and whichever route may be ultimately selected, it will be necessary to build from it branch lines to tap one or other of the new mining camps."

NORTHEAST KOOTENAY DISTRICT.

NORTHEAST KOOTENAY was reported on for 1905 by Mr. J. E. Griffiths, gold commissioner for the district, as under: "While the tonnage of ore mined has not been as great as in 1904, more development has been done on different claims and small quantities of very rich ore shipped, the main reason for the shortage in tonnage being the closing down of the Ptarmigan and the reduction of the force on the Paradise. Surveys for the Kootenay Central railway have been completed and work, in a small way, commenced, to be under way all winter. What with the mineral showings, and the possibilities of agriculture and fruit-growing, there should be sufficient encouragement to build the road without delay, and the fact that all available land is being taken up so rapidly should be conclusive proof that outsiders have faith in the ultimate outcome.

"The total revenue of the district from mineral resources during 1905 was: Free miners' certificates, \$1,262.50; rent of placer and water leases, \$174; general mining receipts, \$1,040.70; royalty on mines, \$105; acreage tax on Crown grants, \$573; total \$3,155.20.

GOLDEN MINING DIVISION.

"The Giant mineral claim is situated on Spillimacheen Mountain, about six and a half miles from the steamboat landing near Spillimacheen, on the Columbia River. Although this claim was located several years ago, but little work had been done on it until

late this fall, which development work has shown up a much larger body of ore than could be expected from the surface showing, the main feature being an unexpected body of zinc ore, which occurs in a soft black slate, forming the hanging wall of a galena ledge, about 25 ft. wide, and well mineralised for about 400 ft. on the surface. The upper tunnel was driven about 50 ft., and the lower tunnel, about 70 ft. lower, is in 400 ft. A winze is now being sunk to connect the two, and at a depth of 12 ft. had 30 in. of zinc ore. The face of the lower tunnel did not show much sign of zinc, although at the part which is under the winze there is a considerable showing, but as it had not been cross-cut no definite estimate of the width at that point can be given.

"The Labourers' Co-operative Mining Co. is still working on some of its numerous claims. A full account of the smelter was given in last year's report. It was built mainly to treat the Good Luck ore, but work has been stopped on this group for the winter, the intention being, according to the report of their engineer, to start work next spring at another point which would be more advantageous. The Shining Beauty group, upon which the company has about a dozen men working this winter, is situated on Ice River, a distance of about 16 miles from Leanehoil station, on the Canadian Pacific railway. About 10 $\frac{1}{2}$ miles of wagon road has been built, with a good pack-trail from there on. There is a very strong vein traceable for many thousand feet, showing signs of mineral all along, and, from the last reports, the ore in the tunnel was coming in much better than anticipated.

"With the exception of the above, the season has been a quiet one."

Office statistics include: Free miners' certificates, 94; mineral and placer claims, 36; certificates of work, 32; certificates of improvement, 14; conveyances, 14; Crown-granted claims in the district, 90.

The revenue received in 1905 was \$2,141.35.

WINDERMERE MINING DIVISION.

Included in the detailed report of Mr. E. J. Scovil, mining recorder for the Windermere mining division, are the following particulars:

Paradise Group.—This well-known group, situated on Spring Creek, a tributary of Toby Creek, known as the heaviest shipper of ore from the district, has already been described, in previous reports. The force was considerably reduced this season, the management having decided to wait until railway transportation is forthcoming. Development work has shown up a very large body of ore, the total amount of underground workings amounting to 5,242 ft. of which the following was done this season: No. 2 level, drift, 68 ft.; No. 3 level, drift, 59 ft.; No. 4 level, drift, 277 ft.; No. 4 level, upraise, 12 ft.; No. 4 level, cross-cut, 93 ft.; total, 509 ft.

Delphine.—The Delphine has been worked under a lease for the past two years, about 63 tons being shipped, averaging 85 oz. silver, 30 per cent lead, and from 2 to 3 per cent copper.

Lottie M.—The Lottie M. group, in a formation of slate and alternate lime, was located this year. Work commenced at once and is still being continued, the ledge averaging 3 ft. in width, carrying a paystreak of 11 in. of ore. Development work consists of tracing the lead for 800 ft. by numerous open cuts, No. 1 tunnel, 120 ft., tapping the ledge at a depth of about 75 ft. A trial lot assayed 150 oz. silver, 40 per cent lead, 4 per cent copper and and \$8.65 in gold.

Tecumseh.—The Tecumseh group, situated on Iron Cap and Horse Thief Creeks, has a ledge about 7 ft wide, carrying a paystreak 18 in. wide. Development work on the Tecumseh: No. 1 tunnel on lead 95 ft., which gives a depth of 75 ft., showing 18 in. of clean ore all the way; four carloads of ore have been shipped from this tunnel. No. 2 tunnel, 10 ft., showing 18 in. of ore. No. 3 tunnel, 30 ft., showing 18 in. of ore. A shipment of 53,675 lb. sent to the Trail smelter this fall averaged 83 oz. silver and 56.60 per cent lead.

Ptarmigan.—The Ptarmigan mines, a well-known property, situated on McDonald Creek, has been closed down, pending railroad construction.

Lead Queen.—On this group, situated on No. 3 Creek, in a quartzite, slate and schist formation, the ledge averages 10 ft. in width, carrying a paystreak of 3 ft., which assays in silver and lead. Development work on the Lead Queen: Cross-cut tunnel 264 ft., which tapped the lead at a depth of 150 ft.; south drift on lead 100 ft., showing 30 in. of clean ore and 6 in. of carbonates. Big Chief: Considerable surface work has been done this summer with encouraging results: cross-cut tunnel 25 ft., to be continued 175 ft. more this winter, to tap the lead at a depth of over 200 ft. First Effort: Tunnel 150 ft., driven on lead showing ore all the way. This claim assays higher in silver and lower in lead than the Lead Queen claim, besides carrying considerable zinc. Development work will be continued all winter by the owners.

Office statistics for 1905 are as follows: Free miners' certificates, 80; mineral claims recorded, 35; certificates of work, 149; conveyances, 29; certificate of improvement, 1.

The revenue received was: From free miners' certificates, \$434.25; general mining receipts, \$579.60; total, \$1,013.85.

NORTHWEST KOOTENAY DISTRICT.

COMPRISED in the annual report of Mr. Fred. Fraser, gold commissioner for the district, of the progress made in mining during 1905, within the Revelstoke, Illecillewaet, Lardeau and Trout Lake mining divisions of West Kootenay is the following:—"While the year has not recorded any discoveries of importance, nevertheless development has been going steadily onward.

"The Prince Mining and Development Co. has continued work on its properties throughout the year, employing 12 to 14 men. These properties are situated in Standard Basin, Big Bend, and were visited by Mr.

H. Carmichael, provincial assayer, during the summer.*

"Placer mining during the year has been carried on principally by the Revelstoke and McCulloch Creek Co., American and Buffalo Mining Co's on French Creek, the Camp Creek Mining Co. on Camp Creek, and the Duquesne Mining Co. on Smith Creek. All are satisfied with the season's work.

REVELSTOKE MINING DIVISION.

Mr. W. E. McLaughlin, mining recorder for Revelstoke division reports:

"During the past year but little development work

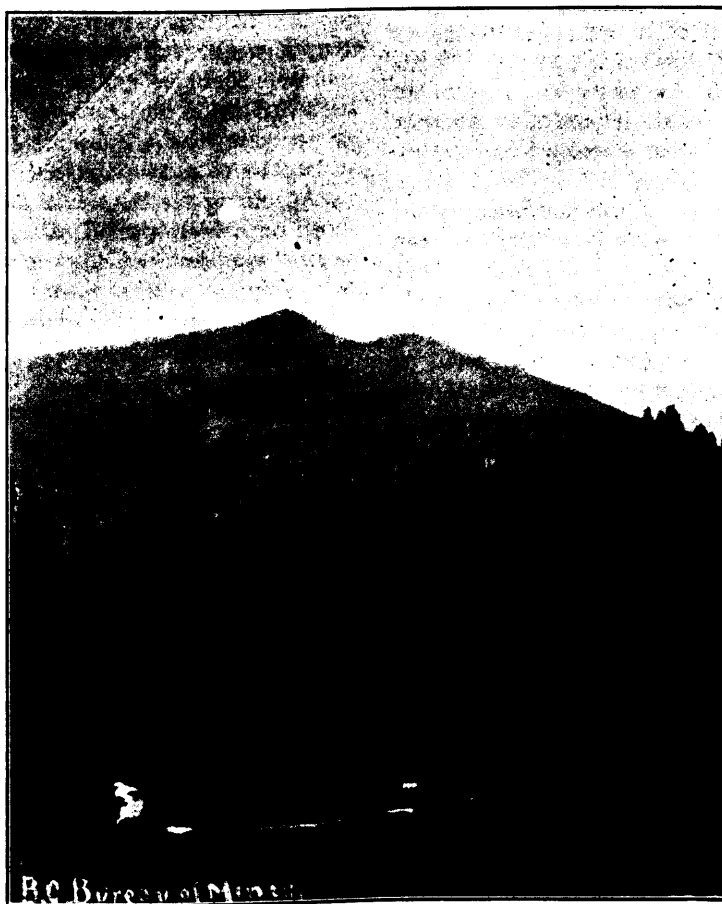
staked on the west side of the Columbia River, about 10 miles below Revelstoke, giving good assays."

Office statistics for the year comprised: Conveyances 25; mineral location records, 67; certificates of work, 87; placer leases, 10; free miners' certificates, 222.

TROUT LAKE MINING DIVISION.

Mr. F. C. Campbell mining recorder, in his report on the progress of the mining industry in the Trout Lake division for 1905, says, in part:

"While the statistics show a considerable decrease in the volume of business done in the office, this is



On Summit, Above Standard Basin, Revelstoke Mining Division.

has been done on the mines in this division, other than the necessary annual assessment work, except by the Prince Mining and Development Co., Ltd., of Revelstoke, B.C., at the headwaters of Downie Creek, which has kept a force of men on all season.

"The J. & L. group, owned by Messrs. E. McBean, J. P. Kelley and L. T. George, and the Keystone group of claims, A. W. McIntosh, manager, and a number of others, have had some work done on them. Some new discoveries have been made, one group which was

accounted for by the fact that during the year there has been considerably more development work done than prospecting. This, I am pleased to say, has in many cases been productive of good results, and will, in the near future, materially increase the output of the division.

About Ferguson.

"The Silver Cup and Nettie L. mines and the Five-Mile Reduction Works, which are connected by aerial tramways, are the property of the Ferguson Mines, Ltd. During the first part of the year, with the exception of March and April, about 30 men were employed on the Silver Cup, which, in conjunction with the Nettie L., supplied milling ore to the Five-Mile Reduction

*Note—The report of the provincial assayer on the Big Bend district was published in last February's number of the MINING RECORD, pp. 68-70.

Works. Since June only development work has been done, 20 men having been steadily employed. In all 845 ft. of drifts and cross-cuts were run and 230 ft. of raises made; and 120 tons of crude ore have been shipped since June, which represents only ore encountered during development. The Nettie L. employed about 25 men up to the latter part of April; since that time a small amount of development work only has been done. The Five-Mile Reduction Works were in operation from January 1 to June 10, employing about 40 men and handling 10,000 tons of Silver Cup and Nettie L. ore, making 615 tons of concentrates and and 37,120 oz. of silver bullion.

"On the Triune, situated on the Triune Mountain, and owned by the Metropolitan Gold and Silver Mining Co., Ltd., chiefly work of a development nature was proceeded with during the year, 920 ft. of drifts and cross-cuts having been run and 180 ft. of raises made. Shipments were 114 tons of ore, of an average value of \$135. Twenty men were employed from January to October.

"Adjoining the Silver Cup on the southeast is the Free Coinage, on which considerable work has been done in former years. This property is now under lease to local people, who have done considerable work of a prospecting nature during the year.

"On the Alice No. 2, situated near the head of Brown Creek, a moderate amount of surface work was done, exposing a fissure vein carrying values of about \$165 in gold and silver.

"The I. X. L., situated in the vicinity, was worked under lease during the latter part of the summer, and a trial shipment of about eight tons made, which gave, I understand, very satisfactory returns.

On the Noble Four, a new location adjoining the last mentioned property, considerable surface work was done and about eight tons of ore shipped.

"On the Mohican, situated near the head of Gainer Creek, the cross-cut tunnel was continued about 200 ft. It is estimated that this tunnel, when continued 200 ft. farther will cut the lead at a depth of 500 ft.

The Reward Mining Co., Ltd., has acquired 21 claims near Seven-Mile Creek, and has commenced driving a tunnel which is to be about 3,200 ft. long, and will cut at great depth the porphyry dyke, in which the Silver Cup and Nettie L. mines lie. The company has installed a 5-drill compressor and run about 550 ft. of tunnel during the year. Thirteen men have been employed since operations commenced.

"On the Rambler, a promising prospect near Seven-Mile Creek, about 50 ft. of tunnel was driven with good results.

"A large amount of surface work was done during the year on the Surprise, situated on the north fork of Lardo Creek, exposing large bodies of medium-grade ore.

"About the end of October the Broadview, situated on Great Northern Mountain, on which a large amount of work was done in former years, was bonded by a local syndicate. Up to the end of December the new owners had done about 150 ft. of work and ship-

ped 80 tons of ore. Seven men were employed on the property during this period.

"On the St. Elmo, also situated on Great Northern Mountain, considerable work of a prospecting nature was done, disclosing a great body of medium-grade ore.

Around Trout Lake.

"The Lucky Boy, situated on Trout Creek, and owned by the Chestnut Hill Mining Co., was in operation from January 1 to April 30. During this time work of a developing nature principally was done, which consisted of the following: Sinking the main shaft 40 ft. farther; extending the second level to the right about 60 ft., and to the left about 75 ft.; extending the third level to the right 100 ft. and connecting it by a winze with the second level. The ore shoots continue about as before reported, running from 3 to 12 in. of solid ore, carrying about 250 oz. silver and 30 per cent lead. Fifty-six tons of ore were shipped and 10 to 16 men employed.

"Adjoining the last mentioned property is the Horse-shoe, on which considerable work of a prospecting nature was done during the year. Ten tons of ore were shipped, which gave very satisfactory returns.

"On the Copper Chief, situated on Trout Creek, the tunnel was continued along the No. 1 lead for a distance of about 60 ft., through which distance the lead maintains its uniform size and values. Sixty ft. west of No. 1 lead about 40 ft. of open cut was made, exposing a second lead, on which a tunnel was driven for a distance of 30 ft. This second vein proved very similar to the No. 1, and consisted of two and a half ft. of quartz with an 8-in. paystreak. A sample shipment of three tons made to the Hall Mines' smelter gave values of 255 oz. silver, 16 per cent lead, 1.71 per cent copper, and 17 per cent zinc.

"Considerable surface work was done on the Willow Grouse, also on Trout Creek, and about two tons of ore shipped.

"On the Silver Plate, situated on American Mountain, a cross-cut tunnel was run 200 ft., cutting the vein at a depth of 80 ft., and a drift made for a distance of 15 ft. At this point the vein is eight ft. wide and carries good gold values.

"The tunnel on the Bonanza, situated in the vicinity, was extended 35 ft. This opens up the vein for a distance of 125 ft. Vein consists of about eight ft. of quartz, carrying values of \$44 in gold and silver.

"About 80 ft. of tunnel was run on the Lanax, a promising prospect situated on the north side of Trout Lake near, Gerrard.

"On the Blue Grouse, also situated in this vicinity, a tunnel was run on the lead for a distance of 100 ft.

"Considerable work of a prospecting nature was done on the Homestake, situated on the south side of Trout Lake, near Gerrard.

Poplar Camp and Vicinity.

"On the Linson View, situated on Canyon Creek, at the intersection of the cross-cut tunnel with the vein, a shaft was sunk 20 ft., thus giving a depth of 70 ft. At this point the lead is about four ft. wide

with a 9-in. pay streak. A sample of 1,000 lb. shipped to the Trail smelter gave values of 201 oz. silver, 12 per cent lead, 4 per cent copper and 9 per cent zinc.

"Considerable prospecting work was done on the Red Hill, on Canyon Creek, exposing a good vein, which carries about 70 oz. silver, as well as a large percentage of zinc.

"Situated also in this vicinity is the Ruby Silver, on which a tunnel was run for a distance of 94 ft. on a quartz vein for two to four ft. wide, impregnated with gray copper and galena, giving values of \$65 per ton.

"On the Grand Solo, situated on Canyon Creek, 70 ft. of tunnel was run. This is a quartz lead impregnated with gray copper and galena.

"Considerable work of a prospecting nature was done on the Fear Not, also situated on Canyon Creek, with very good results.

"On the Calumet and Hecla, situated near Rapid Creek, a shaft was sunk 40 ft. and the ledge then cross-cut for a distance of 20 ft. This is a quartz vein heavily impregnated with pyrites and arsenical iron carrying gold values of from \$2 up per ton.

"Considerable work has been done on the Golden Chest No. 2, a gold proposition near Poplar, with very satisfactory results. I am informed it is the intention of the owners to install a small stamp-mill in the future.

"On the Gold Park, situated near Poplar, 140 ft. of tunnel was driven, exposing a large body of arsenical iron carrying gold values.

On the Mother Lode, operated by the Laclede Mining Co., Ltd., and also situated near Poplar, 400 ft. of drifts, cross-cuts and raises have been made during the year. This is a silver, lead and zinc property. The owners express themselves well satisfied with the year's development.

"Owing to high water continuing on Lardo Creek until late in the season, work on the placer lease of the Spokane Falls Placer Mining Co., Ltd., was somewhat retarded. The company, however, extended its flume 500 ft., besides making all necessary repairs in the old flume and dam. During the short time in the fall that sluicing was proceeded with, the clean-up was, I am informed, very satisfactory."

Included in the office statistics for Trout Lake mining division are the following: Free miners' certificates, 281; mineral claims, 182; certificates of work, 587; certificates of improvements, 33; bills of sale, agreements, etc., 109.

LARDEAU MINING DIVISION.

Mr. Geo. Sumner, mining recorder, reported for the Lardeau mining division in 1905, as follows:

"The locating of new mineral claims has fallen off, and only the locations having merit are now kept alive, and the assessments compare favourably with former years. There are now at least seven mining properties being operated by companies.

"Del Rey.—On the Del Rey a long tunnel has been driven and a vein of free gold quartz encountered about 20 ft. wide.

"Beatrice.—This property has a large surface-

showing of galena ore, and the company is at present driving two tunnels—the lower and the intermediate. Several hundred feet have been driven, but the ore has not yet been encountered.

"Silver Dollar.—This claim is situated on Mohawk Creek, about half a mile from the Del Rey. Character of ore the same; vein large, and considerable work done. I have been unable to ascertain the assay value of the ore, but as the company is doing a considerable amount of work, installing compressor, saw-mill, stamp-mill, etc., I take it that it must see values in the ore sufficient to justify all this expenditure. An aerial wire tram is contemplated from the mine to the mill.

"Oyster-Criterion.—This mine is situated in the immediate vicinity of the town of Camborne. It was worked for some years and is fully equipped with stamp-mill, compressor plant, power drills and aerial wire tramway, but owing to financial difficulties was shut down last autumn. The property is of considerable merit, and if allowed to stand on its own legs would work out its own salvation in a short time; but has been tied up to distant properties which were constantly in litigation, hence the financial difficulties. Head office, Nelson, B.C.

"Eva Gold Mines, Ltd.—The claims of this company are adjoining the Oyster-Criterion and the character of the ore is the same, the same veins being said to run through both. The Eva is fully equipped with everything necessary for turning the raw ore into bullion. Large ore reserves are kept ahead of the milling capacity. Manager, A. H. Gracey, Nelson, B.C.

"Gold Finch Mines, Ltd.—These properties are situated on Menhinnick Creek, opposite the Eva mines. This company, after having met disaster a few years ago, partly through mismanagement, partly through forest fires, intends to resume operations next spring. Samples of free gold ore taken from the Gold Finch were very rich, but what the average assay value was, I was never able to ascertain, as conditions in regard to the company were always very much mixed. The financial condition of the company is now completely rehabilitated, and with proper management there is no apparent reason why an era of prosperity should not set in for the company.

"Mammoth.—This is a silver-lead proposition high up on Goat Mountain and about ten miles distant from Camborne. The property is owned and operated by the Edward Baillie Syndicate, Ltd., of Nelson, B.C. The ore is sorted at the mine; hand-picked product is sacked and then raw-hided down the mountain over a very steep trail; thence taken by wagon to deep water at Beaton, from which point it is shipped to the smelter. The mining is done under great disadvantages, the location is above timber line, and the fuel, as well as all supplies, has to be packed on horseback, the wood for cooking and heating costing about \$40 per cord. The ore is very high grade.

"Office statistics for 1905 are: Mineral locations, 33; certificates of work, 170; conveyances, 36; free miners' certificates, 109; certificates of improvement, 15.

COMPANY MEETINGS AND REPORTS.

SMILKAMEEN VALLEY COAL CO.

The fifth annual meeting of the Smilkameen Valley Coal Co. was held at Nelson on April 25. After a report had been read by Mr. R. S. Lennie, solicitor, as to the present status of the company, its reorganisation was proceeded with. The former board of directors was retired by resolution, and the following were duly elected to the positions thus made vacant: Messrs. W. E. Gosnell, S. M. Brydges, F. E. Morrison, G. Tierney, H. G. Goodeve, I. G. Nelson and F. W. Swannell.

The new board afterwards held a meeting and elected the following officers: Mr. W. E. Gosnell, president; Mr. F. W. Swannell, secretary; Mr. F. E. Morrison, treasurer. Immediate steps will be taken towards placing the company on a safe financial basis, and it is confidently expected that work will be resumed on the company's coal holdings within a reasonable time.

POPLAR CREEK GOLD MINES, LTD.

At a meeting of the Poplar Creek Gold Mines, Ltd., held April 7, the following board of directors was elected: Mr. T. R. Morrow, Rossland, president; Mr. Phil Allen, Jr., Mineral Point, Wis., first vice-president; Mr. W. F. Lingle, Rossland, second vice-president; Mr. C. M. Oliver, Rossland, secretary-treasurer, and Mr. A. E. Planta, Nanaimo.

A newspaper report states that a deal has been made whereby the Cariboo Creek Syndicate's Mohican group, on Gainer Creek, Lardeau, has been taken over by the Poplar Creek Gold Mines, Ltd. Each syndicate share of Mohican will call for 5,000 shares of the new company. All promoter shareholders, which includes the original Mohican Syndicate, will pool their stock until such time as the treasury is fully provided for. It is understood that no work will be done on the Red Rock group until full provision has been made for the needs of the Mohican.

DENORO MINES, LTD.

The directors of the Denoro Mines, Ltd., have issued the following circular to their shareholders:—

"Your directors have arranged with the British Columbia Copper Co., Ltd., (of New York City), to give the latter until June 24, 1906, the privilege of developing the Oro Denoro mine and the option of acquiring the mine within that period, the price to be paid in that company's shares—in fact, to consummate an amalgamation. The company has made a substantial deposit, which will be forfeited in case the option is not exercised. After payment of the usual commission on the sale, the shares to be received will at their present market value equal about 20 cents for each outstanding Denoro share.

"The British Columbia Copper Co. is one of the pioneer companies operating in the Boundary district of British Columbia, and has its smelter at Greenwood, and its principal mines are four miles distant therefrom. It is owner of a three-fourths interest in the Emma mine, adjoining the Oro Denoro, and is developing other properties which it has under option. At present its smelter is treating 18,000 tons of ore per month, but enlargements that will be completed in the summer will enable it to treat 50,000 tons per month, and will give it a smelter and converter plant first class in every respect, thereby reducing the cost of treatment to a minimum and correspondingly augmenting profits. With the completion of this plant the chance for a marked advance in the value of its shares is first class, especially as its outstanding capital is now but \$1,815,000 in 363,000 shares of \$5 each. The market quotation of these shares is around \$10. If the exploration of the Oro Denoro proves satisfactory, its acquisition will give additional value to these shares.

"As to the success of copper mining and smelting in the Boundary district, reference may be made to the increase in the value of the Granby Co., operating similar copper ore deposits. While treating 50,000 tons a month, its market valuation rose from \$4,500,000 in 1904, to \$12,000,000, and

since it began a few months ago to treat 70,000 tons a month, has risen to over \$18,000,000. It is now said to be earning \$200,000 profits a month.

"The disadvantages of operating a low-grade copper ore property like the Oro Denoro without the mine owning a smelter are such that your directors can heartily recommend and approve of the arrangements made. The Denoro company retains its other mining claims and cash assets, from which after a time a fair return will doubtless be made.

"It will be remembered that at the last annual meeting special power was given your directors to close a sale. Before doing so, the approval of the holders of a majority of the shares was assured. On account of sale negotiations the annual meeting has been delayed, but will be held as per notice."

MOUNTS SICKER AND BRENTON MINES, LTD.

The annual general meeting of shareholders in the Mounts Sicker and Brenton Mines, Ltd., was held in Victoria, B.C., on April 11. Reports from the managing director, secretary-treasurer and auditor, showing the affairs of the company to be in a satisfactory condition, were submitted to the meeting. Mr. W. A. Dier has retired from the directorate and active management of the company. The directors and officers are now as follows: President, Dr. T. J. Jones, Victoria; vice-president, Mr. John Edmonds, Philadelphia, Pa.; managing director and secretary-treasurer, Mr. J. A. Cameron, Victoria; Dr. Harry Dier, Victoria; Dr. Roy B. Dier, Ladysmith; Mr. J. L. Beckwith, Victoria, and Mr. I. K. Evans, Philadelphia.

COMPANY CABLES AND NOTES.

CABLES.

British Columbia.

Cariboo Consolidated—March: Upraise has been completed. Driving north and south. Breast of the drift is now less than 22 ft. from old shaft; drift is now in 10 ft. towards deep channel.

Cariboo Consolidated—April: 360 cu. yd. of gravel yielding 47 oz. of gold. Have found a nugget of gold weighing 6½ oz. Recommended driving No. 4 east cross-cut so as to connect in the old workings. Total length is 110 ft. When it is completed we shall be able to work a large quantity of high-grade gravel. The general outlook is good.

Le Roi—March: Shipments amount to 10,465 tons, containing 4,672 oz. gold, 7,030 oz. silver, 246,500 lb. copper. Estimated profit on this ore, after deducting cost of mining, smelting, realisation and depreciation, \$53,000. Expenditure on development work during the month, \$12,000. With reference to strike of ore reported by cable March 14, there is nothing new to report at present; development proceeding. It will take some time to determine extent of this ore body. Mine is looking well.

Le Roi No 2—March: Shipped 2,040 tons. The net receipts are \$39,897, being payment for 2,112 tons ore shipped, and \$665, for 33 tons concentrates; in all, \$40,561.

Tyce—March: Smelter ran 13 days and smelted: Tyce ore, 2,154 tons; custom ore, 675 tons; total, 2,829 tons. Matte produced from same, 278 tons. Gross value of contents (copper, silver and gold), after deducting costs of refining and purchase of custom ore, \$37,966.

U. S. A.

Alaska Consolidated—Silver Bow Basin, Juneau, Alaska, April 2: No 3 east drift, running east from the Alexander tunnel, advanced during the week 18 ft. Large bodies of quartz coming in from the footwall. The assay value of ore is \$13, \$18.30 and \$24.91 per ton. No change to report in the upraise No 2 or cross-cut running north. We are having a heavy snowstorm. (Office Note.—The assays are taken every 5 ft. as drift advances into the ore.)

Alaska Mexican—March: 120-stamp mill 26¼ days, 17,681 tons; estimated realisable value of bullion, \$23,373. Saved 301 tons sulphurets; estimated realisable value, \$19,574. Working expenses, \$34,064.

Alaska United—March: Ready Bullion claim 120-stamp mill 27 $\frac{3}{4}$ days, 18,720 tons; estimated realisable value of bullion, \$25,454. Saved 345 tons sulphurets; estimated realisable value, \$12,161. Working expenses, \$28,336.

Alaska Treadwell—March. 240-stamp mill 27 $\frac{1}{2}$ days, 300-stamp mill 7 days, 38,148 tons, estimated realisable value of bullion, \$54,522. Sulphurets saved, 629 tons; estimated realisable value, \$35,520. Working expenses, \$52,090.

DIVIDENDS.

The Reco Mining and Milling Co., of Sandon, Slocan, has declared another dividend of two cents per share, or \$20,000. The amount paid to date in dividends is \$347,500, on a capital stock of \$1,000,000.

The Canadian Goldfields Syndicate, Ltd., has declared a dividend of 1 $\frac{3}{4}$ per cent on its issued capital stock. The dividend is for the quarter ending March 31, and is payable May 1. It amounts to \$8,955 and makes the total of dividends paid to date \$92,461.68. The syndicate owns 4,260 shares in the Consolidated Mining and Smelting Co. of Canada, Ltd.

The Granby Consolidated Mining, Smelting and Power Co., Ltd., has declared a dividend of 3 per cent on capital stock, payable May 15. On December 1, 1905, the company declared 3 per cent, which was the first dividend since December 16, 1903, when 1 per cent was declared. The last dividend amounts to about \$405,000, and brings the total paid to date up to about \$943,000.

The Consolidated Mining and Smelting Company of Canada, Ltd., owning the St. Eugene, War Eagle and Centre Star mines and the Trail smelter, a recent consolidation of several mining and other companies operating in British Columbia, has declared its first dividend, viz., one of 2 $\frac{1}{2}$ per cent for the quarter ended March 31, ulto., or at the rate of 10 cents per share per annum, payable May 1, prox. As the capital stock issued totals \$4,698,888, the amount of profits to be divided among the stockholders on this occasion is \$117,472.

The Le Roi No. 2, Ltd., has declared an interim dividend of two shillings a share on its 120,000 £5 shares, making a total of £12,000 (about \$58,200) for this distribution and £1 per share, or £120,000 in all, to date. The Le Roi No. 2, owing to the finding of valuable shoots of high-grade ore in its mines at Rossland, is in a position to make larger profits than in 1905, when it paid dividends to the extent of four shillings a share.

NOTES.

The Bear Hydraulic Mining Co. has been incorporated with a capital of \$250,000, divided into two hundred and fifty thousand shares of one dollar each. The objects of the incorporation are to take over the leases of LaSalle, Windle and Flint, known as the Bear hydraulic mine, on Cunningham Creek, near Barkerville, Cariboo.

It is stated that the Camborne Mining Co. will shortly commence operations on the Gold Finch, situate near Camborne, Fish River camp. The financial affairs of the company are said to be satisfactory and a manager for the property is being secured. The tram, terminals and bunk houses of the Gold Finch which were damaged by fire in 1904 will have to be repaired and alterations made to the stamp mill before ore can be treated, and it is anticipated that this work will be commenced shortly.

The Rosebery zinc plant is expected to begin work shortly on Bosun ore. The Bosun is owned by the Monitor and Ajax Fraction, Ltd., which also controls the Rosebery plant. A dock is being built at Slocan Lake to be in readiness for shipping the Bosun old dumps to the Rosebery plant.

Active operations have been resumed at the Payne Consol. Mining Co's mine and mill near Sandon, Slocan, with 25 men at work in the mine and the mill running night and day. A large body of concentrating ore has been met with between levels 4 and 5 and back fillings supplement this.

A special meeting of the shareholders of the Selkirk Mining and Milling Co., Ltd., will be held at the head office of the company, at Sandon, on May 22, for the purpose of con-

sidering, and if deemed advisable, of passing a resolution authorising the company to dispose of the whole of its property and assets.

Notice has been gazetted that Anthony J. McMillan, of Rossland, B.C., managing director of the company, has been appointed attorney for the Le Roi Mining Co., Ltd., in lieu of John H. McKenzie, whose appointment has been revoked.

Returns for April from the Tyece Copper Co's smelter at Ladysmith, Vancouver Island, were as follows: Smelter ran 13 days and treated 1717 tons of Tyece ore, giving a return, after deduction of freight and refining charges, of \$34,723.

CERTIFICATES OF INCORPORATION.

British Columbia Dredging Co., Ltd., with a capital of \$600,000, divided into 600,000 shares of \$1 each.

Bear Hydraulic Mining Co., Ltd., with a capital of \$250,000, divided into 250,000 shares of \$1 each.

Conrad Electric Power Co., Ltd., with a capital of \$10,000, divided into 1,000 shares of \$10 each.

Canada Western Oil Co., Ltd., with a capital of \$500,000, divided into 500,000 shares of \$1 each.

Phoenix Amalgamated Copper Mines, Ltd., with a capital of \$5,000,000, divided into 500,000 shares of \$10 each.

REGISTRATION OF EXTRA-PROVINCIAL COMPANIES.

Diamond Drill Contracting Co.—Head office in Spokane, Washington, U.S.A. Capital, \$15,000, divided into 50,000 shares of 30 cents each. Head office in British Columbia at Rossland. Attorney, (not empowered to issue and transfer stock) C. R. Hamilton, Bank of Montreal Chambers, Rossland.

Lucky Jim Mining Co., Ltd.—Head office in Phoenix, Arizona, U.S.A. Capital, \$1,000,000, divided into 1,000,000 shares of \$1 each. Head office in British Columbia at Rossland. Attorney, (not empowered to issue and transfer stock) W. B. Townsend, Rossland.

Keeward Gold-Copper Mining Co.—Head office at Spokane, Washington, U.S.A. Capital, \$1,000,000, divided into 1,000,000 shares of \$1 each. Head office in British Columbia at Princeton. Attorney, W. C. Lyall, Princeton.

PATENT OFFICE REPORT.

The following patents were granted to British Columbia inventors during the month of March through the agency of Rowland Brittain, patent attorney, of Vancouver.

To T. A. Fee, architect, of Vancouver, an allowance of a United States patent on an improved flour box for attachment to the door of a kitchen cabinet, and

To Layfield & Crisp, of Vancouver, a Canadian patent on an improved cement building block in which the outer and inner wall members of each block are secured together by a sheet metal tie, which effectually prevents the passage of moisture from the outer to the inner wall, and preserves an uninterrupted air space between.

The Director of the United States Mint, Washington, D. C., is stated to have predicted that the world's production of gold will average not less than \$400,000,000 per year for the next twenty years.

It is stated that copper mining is an industry which is rapidly decreasing in importance in Great Britain. In 1863 the production of copper ore and copper precipitate amounted to upwards of 210,000 tons, valued at more than £1,000,000 sterling, whereas in 1904 the production was only 5,465 tons, valued at £17,952. Cornwall is the main source of supply of this ore, and copper precipitate is being obtained from cupreous water pumped from old mines on Parys Mountain in Anglesey.

TRADE NOTES AND CATALOGUES.

From the Wellman-Seaver-Morgan Co., of Cleveland, Ohio, U.S.A., have been received the following publications, all of which are illustrated: (1) Electric Hoists, (2) Self-contained Geared Hoists, and (3) Locomotive Cranes, Buckets and Tubs.

Geo. G. Blackwell, Sons & Co., Ltd., metallurgists and manufacturers of Liverpool, England, have published a booklet containing a reprint of what the *Iron and Coal Trades Review* has to say of their operations in connection with the manufacture and supply of minerals and alloys, and the application of the earth's mineral products to the arts and manufactures.

The shareholders of the Canadian Westinghouse Co., Ltd., of Hamilton, Ontario, have almost unanimously approved of the proposed increase in the capital stock from \$2,500,000 to \$5,000,000. At the special general meeting to authorise this increase, the opinion was expressed that the prospects of the company are of a very encouraging nature.

Messrs. W. H. C. Mussen & Co., of Montreal, Quebec, sole Canadian agents for the well known Willey Concentrating Table, of which 10,000 have been sold for use in various parts of the world, are advertising this machine in the current issue of the *B. C. MINING RECORD*. This firm also announces that it designs and erects complete concentrating plants. Its representative, Mr. W. Stanley Lecky, spent several weeks in some of the chief mining districts of British Columbia last winter.

The annual meeting of the Canadian General Electric Co. was held in Toronto, Ontario, recently. The statement of accounts presented showed profits for the past year of \$603,206, an increase over the previous year of \$25,687.

Among San Franciscan advertisers in the *B. C. MINING RECORD* is The Paraffine Paint Co., which manufactures Malthoid Roofing, etc. This company's factory is located at Paraffin, Alameda county, across the bay from San Francisco, so it was not in any way damaged during the recent calamitous experiences of many manufacturers in that ill-fated city. The temporary main office of The Paraffine Paint Co. is in the Union Savings Building, Oakland, Cal. No advance has been made in the price of Malthoid Roofing or of any other of that company's products.

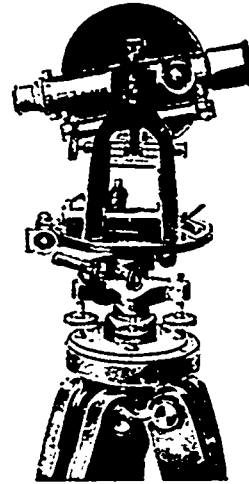
The construction department of electric locomotives at the East Pittsburg, Pa., factories of the Westinghouse Electric and Mfg. Co., is very busy at present. Within the last few weeks, orders have been received for no less than fifty-five electric locomotives. Some of these are for mining plants and will be used for hauling coal in the pits; others are for manufacturing plants, where the electric locomotive is now finding extensive use in the transportation of material from the shops to the railroad siding, and a large number are for railroad companies, which are gradually finding out the many advantages of this class of motor and as a consequence use the electric locomotive for hauling freight.

A folder recently received gives general views of the Davenport Works and the Ornamental Iron Department, respectively, of the Canada Foundry Co., Ltd., of Toronto, Ontario; also the works at Peterboro, Ontario, of the Canadian General Electric Co., Ltd., which has its head office at Toronto. The first-mentioned works comprise 60 acres, including six acres of operative floor space divided among various shops, offices, warehouses, etc., while the last comprises upwards of 45 acres, and, as well, includes numerous large buildings fully equipped with modern plant and machinery. Motive power for the Peterboro Works is obtained from the company's hydro electric plant at Nassau, six miles distant.

The *Boston News Bureau* says. "It is estimated that Mexico will output this year 150,000,000 lb. of copper, and British Columbia about 50,000,000 lb., so it is evident the production of copper from the American continent in 1906 will amount to 1,200,000,000 lb."

A PROTECTED TRANSIT INSTRUMENT.

Every engineer who has had to use surveying instruments in mines or in difficult country knows how much trouble, dirt and dust, and wet can cause, remarks *The Engineer*. Messrs. J. Davis and Co., Ltd., of Derby, England, have brought out a transit instrument specially designed for surveying in gold mines. The principal feature in this is that all the circles, verniers, draw tubes, and screws are protected by metal covers, the verniers being read under glass. The telescope is



The Davis Protected Transit.

7 1/2 in. long, and has a 1-in. aperture, the eye-piece being "1 1/8 diameters and inverting." Both the object glass and eye-piece are protected with mud, rain, and dust guards. There is a 4-in. graduated level under the telescope. The horizontal circle is 4 in. in diameter, and is provided with a double row of figures from 0 to 360 deg. The vertical circle is also 4 in. in diameter. The instrument is made either in gun-metal or aluminium, weighing in the former metal 18 lb. 7 oz., and in the latter 15 lb. 4 oz., the weight of the legs in each case being included. The instrument is wonderfully compact, the intention is excellent, and the reputation of the makers is sufficient guarantee that it has been successfully put into practice. The accompanying engraving gives a good idea of what the instrument is like. Messrs. Peacock Brothers, Canada Life Building, Montreal, are sole representatives for Canada.

The *Mining Journal* of London, England, recently published the following: A new process to extract gold from pyrites, introduced into Italy by the Belgian chemist, Mr. Body, has awakened keen interest amongst Italian metallurgists, says the *Gaceta Minera de Espana*. The new method is not based upon elimination of sulphur, but its addition. Though this may seem in contradiction of actual metallurgical processes, extremely marvellous results have been attained, as the yield of gold is much greater than that obtained by current methods. The principle of the new process is said to be polysulphurisation resulting from chemical disaggregation of the ore by means of special salts, and under the influence of a temperature not exceeding cherry red. The process also has the advantage of being relatively short, and the disaggregating action of the salts separates the gold from substances most firmly adhering. In Piedmont, where this new process has been adopted, the cost of labour per tonne of ore does not exceed 2 or 3 lire. As gold pyrites are very abundant, the Body process is sure to become very useful.

The British Commercial Agent in Russia reports on the authority of the *Commercial & Industrial Gazette*, of St. Petersburg, that the Ural platinum yield in 1904 and 1905 was as follows: South Ekaterinburg—1904, 180 oz.; 1905, 1,402 oz. South Verkhoturksi—1904, 113,900 oz.; 1905, 113,718 oz. Perm—1904, 35,596 oz.; 1905, 39,261 oz.

MACHINERY AND CONSTRUCTION NOTES.

Bankhead, Alberta.—The Pacific Coal Co., which has semi-anthracite coal mines known as the Bankhead colliery, situated near Banff, Western Alberta, has decided to install a briquetting plant with a nominal capacity of about 2,000 tons per diem. It is stated that the requisite machinery has been ordered from a Pennsylvania firm which makes a specialty of that class of plant, and that it will cost about \$85,000. The first part, which is the grinding and mixing plant, will have a nominal capacity of about 4,000 tons per diem, but the remainder of the installation as now arranged for will only be equal to half that quantity.

Lille, Southwest Alberta.—The West Canadian Collieries, Ltd., recently completed the installation of a coal washery of the jig type, Luhrig pattern, having a capacity of 30 tons per hour, at its Lille colliery, near Frank, Southwest Alberta. Further additions to plant are contemplated, these to be made during the ensuing summer and including more power installation to operate high pressure compressor for locomotive haulage and low pressure for inside hoists, pumps and drills. Shops with modern equipment, to make provision at the mines for renewals and repairs, are also to be put in.

Coleman, Southwest Alberta.—It is announced that the International Coal and Coke Co., Ltd., has decided to build at its colliery at Coleman, Southwest Alberta, fifteen more beehive coke ovens, stone lamp house, oil house, powder magazine, and men's wash house, the last mentioned to accommodate about 165 men.

Phoenix, Boundary District.—The Dominion Copper Co., Ltd., of Phoenix, Boundary district, has ordered from the Canadian Rand Drill Co., of Sherbrooke, Quebec, a tandem compound electric-driven air compressor, to have a capacity at the altitude of Phoenix of about 2,300 cu. ft. per min. This machine will be rated at about 25 machine drills; it will be driven by a 400-h.p. electric motor. The same company has ordered from the Jenckes Machine Co., of Sherbrooke, Quebec, a 150-h.p. motor for operating the 150-h.p. hoist for use at the three-compartment shaft that is being sunk at the company's Idaho mine.

Bullion, Cariboo.—The Cariboo Hydraulic Mines is advertising for 100 mine labourers and axemen for its mines at Bullion, Quesnel Forks, Cariboo district, also for 500 labourers, accustomed to railway construction or excavation work. The latter lot of men will be wanted on and after July 1. The company's mines are reached from Ashcroft, on the Canadian Pacific railway, from which town they are 180 miles distant. Work during the open season of three years is promised to steady, industrious men.

BOOK REVIEWED.

The Nature of Ore Deposits.—By Richard Beck, professor of geology and economic geology, Freiberg Mining Academy. Translated and revised by Walter Harvey Weed, geologist United States Geological Survey. Pp. Vol. I, 340+XIV; Vol. II, 341-669, with index; illustrated with 272 figures and a map. 6 by 9 in.; cloth, \$8. New York, 1905: *The Engineering and Mining Journal*.

This is an intelligent dissertation on Ore Deposition, written by an eminent expert on the subject and translated and thoroughly revised to date by Mr. Walter Harvey Weed, of the U. S. Geological Survey, from the original German of Dr. Richard Beck. Treating in an authoritative style the nature and methods of occurrence of ore deposits in all parts of the world, together with detailed descriptions and characteristic cross sections of veins, ore bodies and ores from many famous mines of ancient and modern times. The data embodied in this important manual distinctly applies to local conditions, and the almost inexhaustible amount of general and precise information scattered through its various pages essentially makes the work a splendid text-book for college classes in the study of economic geology.

Prof. James F. Kemp, professor of geology at Columbia University, New York, has contributed to *The Engineering and Mining Journal* the following review of this valuable work:

In translating and placing at the command of English-speaking readers Prof. Richard Beck's *Lehre von den Erz-lagerstaetten*, Mr. Weed has done a notable service. The value of it to the American mining fraternity is increased by the additional notes (contributed by the translator himself) upon North American localities. The work is presented in clear and well-written English, and the book is certain to be studied by all who desire to acquire modern knowledge and conceptions of the formation, associations, and alterations of ores.

In preparing the original, Professor Beck attacked the subject with admirable preparation. Succeeding the lamented Stelzner in the historic chair at Freiberg, he found at hand a rich collection of illustrative material and an inheritance of theoretical results in good scientific form dating back over a century. Not only is the vein system of the Freiberg region complicated and instructive, but it has also been extensively developed and carefully studied by generations of acute observers. Professor Beck brought to his work the qualifications of petrographer, mineralogist and experienced geologist. His work is therefore thorough and authoritative.

The book is planned in its larger frame-work on much the same lines as was von Groddeck's work in 1879, which bears almost the same title. That is, in the large classification, ore deposits are regarded with respect to the wall rocks, as:

1. Those original and contemporaneous with the wall-rock—the *syngenetic* in the phraseology used by Beck.
2. Those subsequently introduced into the wall-rock, or the *epigenetic*.
3. Detrital deposits.

The same terms, syngenetic and epigenetic, appear also in the posthumous work of Professor Stelzner, issued under the editorship of Dr. Bergeat; and we may conclude that they have become current in German usage. Under the syngenetic we find discussed: Magmatic segregations and bedded ore deposits; under the epigenetic, mineral veins and epigenetic ore deposits in stratified rocks, exclusive of veins; finally the detrital deposits complete the series.

The larger groups are then subdivided into types, first upon larger and more comprehensive characters, then upon smaller ones, until individual cases are reached.

Under veins, for example, in the narrow sense of the terms, 22 different kinds are described; based first on the leading metal; and, second, on the mineralogical associations afforded by ore and gangue. In the same way, under the other heads a similar line of treatment is followed, until we find the ore deposits of the world grouped so far as possible according to their mineralogical character. As a result there is afforded a comprehensive picture of the range of phenomena embraced under the subject.

Nevertheless one cannot but question sometimes if, in so widely applying the distinctions and characters which have attained such prominence in the work of earlier observers in the limited Saxon region, too great stress is not laid upon the fortuitous associations of minerals; and whether they should not be regarded as interested coincidences when we view the world at large rather than as involving any very profound relationship. The advantage in emphasizing associations, however, lies in the fact that they lead the student to group like with like, and to note the occasional recurrence of similar aggregates in new and remote localities. Being now set forth in English, they will at least make familiar to a wide circle the classic Saxon types.

The discussion of the structural features leading to the production of the epigenetic deposits is thorough and excellent, as is also the treatment of the method of introduction of the materials. Yet it seems to the reviewer that it would have been better not to attempt this general discussion at page 193 with the catalogue of the vein types and their detailed descriptions for 168 pages, but to have continued with the

general discussion, which is introduced again on page 301 and continues for 71 pages further. A reader loses the thread of the discourse and is much better able to understand the particular descriptions after a perusal of the entire theoretical treatment. He will therefore find it advantageous to skip from p. 193 to p. 301, to read the seventy-one pages and then go back to p. 193.

The illustrations have often suffered in the reproduction in the American print and the reason for this is not apparent. They are fine and clear in the German original and could be easily photo-engraved. In reproduction in English, they, no less than the text, ought to experience translation, whereas the German words for drift, vein, fault, etc., may convey but little significance to one unacquainted with the original.

BOOKS, ETC., RECEIVED.

California State Mining Bureau—The Structural and Industrial Materials of California. By Lewis E. Aubury, State Mineralogist. Containing full information relative to (1) the Building Stones of California; (2) the Portland Cement Industry; (3) the Clays and Clay-working Industries; (4) Miscellaneous Industrial Materials, and (5) general information concerning quarries, mines, etc. Pp. 391; illustrated by half-tones, etc.

Canadian Mining Institute—Journal of the Canadian Mining Institute, Vol. VIII. Containing Papers and Proceedings of Meetings of the Institute in 1905. Edited by the Secretary (Mr. H. Mortimer Lamb). Pp. 367; with half-tone illustrations of the Officers and Council of the Institute, and diagrams and other illustrations accompanying papers included in this volume.

Columbia University, New York—The School of Mines Quarterly, a Journal of Applied Science. January, 1906. Pp. 182; illustrated.

State of Idaho, U.S.A.—Seventh Annual Report of the Mining Industry of Idaho, U.S.A.; for the year 1905. By Robert N. Bell, State Inspector of Mines. Pp. 149; illustrated by half-tones and diagrams of representative mining subjects.

Economic Geology for February-March, 1906. A semi-quarterly journal devoted to Geology as applied to Mining and Applied Industries. Published at Lancaster, Pa., U.S.A., by The Economic Geology Publishing Co.

The Terlingua Quicksilver Deposits—A paper on the Quicksilver Deposits of Terlingua, Brewster County, Texas, U.S.A.; reprinted from *Economic Geology*. By H. W. Turner, Ladd Metals Co., Portland, Oregon.

Elements of Mining Geology and Metallurgy—A practical field and office manual, and reference compendium, treat on the Geology of Mining and Metallurgical Methods of Western America. By G. W. Miller, E.M.C.E. Published by *The Daily Mining Record*, Denver, Colo., U.S.A. Pp. 480; illustrated.

*Handbook for Mining Investors—*Containing reports printed in the Information Department of *The Daily Mining Record* during three months ended December 31, 1905. Pp. 162.

*International Mining Directory—*Embracing concise and reliable data respecting location, ownership, management, character of ore, development, equipment, etc., of the principal operating mines and metallurgical plants in North America. Published by the Western Mining Directory Co., Denver, Colo., U.S.A.

Bureau of Mines, British Columbia—Annual Report of the Minister of Mines, for the year ended December 31, 1905; being an account of mining operations for gold, coal, etc., in the Province of British Columbia. By Wm. Fleck Robertson, Provincial Mineralogist, Pp. 250; illustrated by diagrams and a number of superior half-tones, and accompanied by a Sketch Map of British Columbia showing the Mining Divisions of the Province.

A RECORD MONTH FOR THE CROW'S NEST PASS COAL CO.

The *Ferme Free Press* states that the month of March was a banner month at the collieries of the Crow's Nest Pass Coal Co., all previous coal production records having been broken. The output of coal for the month amounted to 81,273 tons. The highest previous record was made last January when the total amounted to 70,303 tons, so it will be seen that March leads in the history of the company by 4,970 tons. The March figures for each colliery were

	Tons.
Coal Creek	43,702
Michel	29,607
Carbonado	7,904

Total 81,273

The increase in March over January was about evenly divided between the Michel and Coal Creek collieries.

The coke production in March, while not a record breaker, was very satisfactory, there having been 25,451 tons, 1,700 lb., made during the month.

The March pay roll was as under:—

Coal Creek mines	\$67,472.70
Ferme coke ovens	6,709.00
Michel	52,422.95
Carbonado	12,541.20
M., F. & M. Ry.	2,218.70
Wardrop	1,341.40

Total \$142,705.95

The highest total previously reached was in July, 1905, when the pay roll was \$134,278.40.

YUKON NOTES.

There are large dumps of gravel on Hunker Creek, taken out through the winter. The coming summer will, it is expected, be a busy one on this creek.

The result of the visit of the Commissioner of Yukon Territory to Ottawa, for the purpose of urging the Dominion Government to adopt recommendations made to it in several matters of great importance to the Yukon, is being awaited with confident expectation that these will have favourable consideration. The chief subjects submitted are the following: The purchase of gold in the Yukon by the Government; the establishment of a Government Assay Office for the Yukon; the adoption of the Mining Code drawn up by the Yukon Council and Government local officials; and Government action to secure for the district cheaper transportation. These matters are of concern to all residents in the Territory so that interest in them is practically universal. It is reported that the Commissioner's recommendations are likely to be approved at Ottawa, consequently a successful issue to his visit is anticipated.

Col. J. H. Conrad has returned from England, whence he went to secure capital for the development of mining properties in the Windy Arm district of Yukon Territory. On his way back he spent some time in Eastern Canada. Interviewed in Victoria on April 14 he was reported to have stated that the title to the whole of the Windy Arm mineral claims in which he is interested has been vested directly in Mr. Wm. Mackenzie (of Mackenzie & Mann, Toronto), and himself; also that ample funds had been secured to carry out his plans for development and equipment of the Windy Arm mines. It is intended during the ensuing summer to construct five aerial tramways from the mines down to the Windy Arm water-front, and to commence excavating preparatory to erecting concentrating works and a smelter at Conrad City. These reduction works will not, however, be built until after the mines shall have been considerably developed, but next year will probably see this work undertaken.

MINING MEN AND MATTERS.

Mr. W. J. Elmendorf has returned to Spokane, Wash., from a visit to Vancouver Island and neighbouring parts.

Mr. H. L. Frank, of Montana, president of the Canadian-American Coal and Coke Co., was recently at the company's coal mine at Frank, Alberta.

Mr. G. L. Parker, manager of the Brown-Alaska Company's mines in the Ketchikan district of Southeast Alaska, has returned north from a visit to Seattle, Wash.

Mr. Fred. F. Sharpless, of Westbury Station, Nassau Co., N. Y., was lately in Victoria on his way to a mining property in the interior of Vancouver Island.

Mr. A. J. McMillan, managing director of the Le Roi Mining Co., was a recent visitor to Victoria, returning to Rossland *via* Vancouver.

Among recent admissions to membership in the Institution of Mining and Metallurgy of London, England, was that of Mr. E. Philip Gilman (transfer), of British Columbia.

Announcement has been made that Mr. James Humes, of Butte, Montana, U.S.A., has been appointed general superintendent for the Mounts Sicker and Brenton Mining Co., owning mining property on Vancouver Island.

Capt. John Hampson, for several years manager of the Alice mine, near Creston, Kootenay, has gone to Hadley, Prince of Wales Island, Southeast Alaska, to superintend operations at one of the Brown-Alaska Co's mines.

Mr. James McEvoy, geologist and chief engineer for the Crow's Nest Pass Coal Co., with collieries and coke ovens at Michel, Fernie and Carbonado, Southeast Kootenay, has been on a business trip to St. Paul, Minn.

Mr. R. R. Bruce, manager of the Paradise mine and other properties in the Windermere mining division of Northeast Kootenay, has returned from a visit to Scotland and Eastern Canada.

Mr. H. W. Turner, of Portland, Oregon, has relinquished the management of the Omar Mining Co's mine at Kiam, Prince of Wales Island, Southeast Alaska. On his return to Portland recently he proceeded thence to Berkeley, Cal.

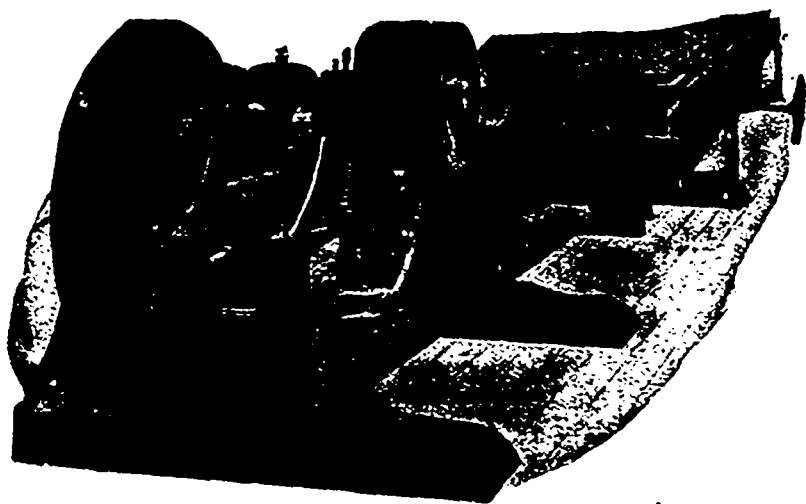
Mr. Paul Johnson, manager of the Alaska Smelting and Refining Co's smelting works at Hadley, Prince of Wales Island, Southeast Alaska, has returned to Hadley from a business visit to Seattle, Washington, and Crofton, Vancouver Island.

Mr. Erland G. Hadow, for some time in charge of the affairs of the Silver Cup Mines, Ltd., which owns mines and a chlorination mill near Ferguson, Lardeau district, will shortly return to this Province after a year's absence in England.

Mr. Maurice M. Johnson, of Salt Lake City, consulting engineer for Mr. Samuel Newhouse, has lately been in the Boundary district in connection with projected additions to plant and machinery at the mines and smelter of the Dominion Copper Co., in which Mr. Newhouse is largely interested.

Capt. F. A. Hill, general manager for the Canadian-American Coal and Coke Co., of Frank, Alberta, was at the company's coal mine lately. He was accompanied from the Coast by his brother, Mr. L. G. Hill, who recently returned from an extended trip through China.

Mr. A. R. Wilson, for two or three years past superinten-



10,000 SOLD

Saving Money All Over
the World.

The Wilfley Concentrating Table

SOLE CANADIAN AGENTS

W. H. C. MUSSEN & CO.
MONTREAL

Mining and Metallurgical Machinery and Supplies
Complete Concentrating Plants Designed and Erected.

Malthoid Roofing



When you put on a roof, remember it is not so much what you pay as what you get for what you pay. It is cheaper and more satisfactory to cover your building with Malthoid than to suffer the annoyance and future expense of a poor roofing. Booklets free for the asking.

THE PARAFFINE PAINT COMPANY

Oakland, Cal., Portland, Seattle, Spokane, Denver, Los Angeles, New Orleans, Dallas, Texas.



dent of the Crow's Nest Pass Co's colliery at Michel, Southeast Kootenay, has gone to the Okanagan, where, with Mrs. Wilson, he will remain for a time on his ranch in that district.

Mr. W. F. Ferrier, formerly geologist at the Centre Star and War Eagle mines, Rossland, but now of San Francisco, writing a friend at Rossland informed him that he came safely through the troublous times experienced in that city this month.

Mr. F. L. Underwood, president, and Mr. W. H. Thomas, consulting engineer, of the British Columbia Copper Co., lately paid another visit to the company's mines and smelter in the Boundary district, afterwards spending two or three days at Victoria.

Hon. W. B. Hoggatt, the new governor of the District of Alaska, was sworn in as governor at Juneau, Southeast Alaska, on April 30. The oath was administered by Judge R. A. Gunnison. Governor Hoggatt left Juneau for Sitka immediately after the ceremony.

Mr. Frederic Keffer, of Greenwood, Boundary, resident engineer for the British Columbia Copper Co., has been examining some copper claims situated in Franklin camp, North Fork of Kettle River, that are under option to the company.

Mr. John Kiddie, C.E., elder son of Mr. Thos. Kiddie, metallurgist, will shortly proceed to Arizona, U.S.A., having received an appointment with the Arizona Copper Co. under Mr. Norman Carmichael, formerly manager at Ainsworth, B.C., for the Highland (Kootenay, B.C.) Mining Co.

Mr. F. J. George, for a long while chief surveyor for the Western Fuel Co., operating collieries at and near Nanaimo, Vancouver Island, before leaving to take up the duties of his new position with the Canadian Pacific Railway Co. at Winnipeg, was presented with a handsome set of drawing instruments.

Mr. M. K. Rogers, late general manager of the Yale Mining Co., owning the Nickel Plate group of mines, on Twenty-mile Creek, and of the Daly Reduction Co., operating a 40 stamp mill at Hedley, also in the Similkameen district, has returned to the Province after having been some time in New York.

Mr. J. B. Hobson, general manager for the Cariboo Hydraulic Mines, of New York, which company lately acquired the big hydraulic gold mining property of the Consolidated Cariboo Hydraulic Mining Co., at Bullion, Quesnel Forks, has gone up to the mine to commence work on some important mine development and water supply operations.

Mr. E. C. Musgrave, whose resignation as superintendent of the Tyee Copper Co's mine at Mt. Sicker, Vancouver, will take effect on June 30 next, intends thereafter practicing as a consulting mining engineer, with office at Victoria. He will be joined later by his brother, Mr. W. N. Musgrave, who recently opened an assay office at Windy Arm, Yukon Territory.

Mr. Elijah Heathcote, holding a coal mine manager's certificate in British Columbia, has been appointed an assistant coal mine inspector for Alberta. His district includes the coal mines of that part of the Crow's Nest Pass situated on the eastern slopes of the Rocky Mountains, and those at Lundbæk, Tabor, Lethbridge and other places along the Canadian Pacific Railway Co's Crow's Nest railway.

Mr. Warburton Pike left Vancouver for Cassiar recently in charge of a party of men to carry on hydraulic operations at the Berry Creek Mining Co's hydraulic gold mine on Thibert Creek, Cassiar. The company holds ten hydraulic leases, in all 800 acres, in one continuous block fronting Thibert Creek for 15,000 ft. and containing an estimated deposit of about 30,000,000 cu. yd. of gold-bearing gravel.

Mr. J. P. Rogers who, early in the current year, resigned the position of superintendent of the White Pass and Yukon railway, has been appointed general manager of the group of mining companies organised by Col. J. H. Conrad to oper-