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BRITISH COLUMBIA

MINING RECORD.

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For the Calendar Year 1906.

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NOTES AND COMMENTS.

The index for the 1905 volume of the B. C. MINING RECORD will be issued with the February number.

A recent press despatch from Rossland states that a body of ore of good grade, 20 ft. in width, has been encountered in a cross-cut at the eleventh level of the War Eagle mine, and describes this as the most important discovery yet made in that mine.

News from the Horsefly section of the Cariboo district is to the effect that the snowfall has been considerable—sufficient to insure ample water for mining operations through the coming season. As the Horsefly country is not far from Quesnel Forks section, in which is situated the big hydraulic gold mine of the Consolidated Cariboo Hydraulic Mining Co., recently acquired by New York capitalists, the good prospect should also favourably affect the latter.

According to J. W. Harrison's Fuel Report for 1905 there were 13,378 tons more coal from British Columbia received at San Francisco in 1905 than in 1904, the totals for the two years, respectively, being 348,515 tons for the former and 335,137 tons for the latter. On the other hand coal receipts from Seattle, Tacoma and Australia fell off heavily, their combined totals being 469,785 tons in 1904 and 251,476 tons in 1905.

The coal properties of the Diamond Vale Coal Co. at Quilchena, near Nicola, according to Mr. W. H. Wall, who has had charge of boring operations, give promise of proving extensive and capable of being profitably worked. The coal is described as a good bituminous coal, going as high as 54 to 56 per cent carbon. Now that the Nicola district is being opened up by a railway, the outlook for the local coal fields is greatly improved.

After commenting on the satisfactory progress the mining industry of British Columbia made in 1905, the London *Critic* observes: "Unfortunately, debarred by past failures resulting from over-capitalisation, English investors are taking but a languid

interest in the development of British Columbia's great mineral wealth; but the time is coming when the western province by sheer force of its intrinsic merits will recover its lost prestige amongst the investing public here."

The Canadian Metal Co., which a short time ago acquired the smelter at Pilot Bay, Kootenay Lake, lately tried a lead stack, described as a new furnace, the invention of M. Blanchard, of Spokane, Washington. It is the first of its kind to be used in Canada. A series of experiments has been carried out, chiefly with lead ores from the Canadian Metal Co.'s Blue Bell mine, Kootenay Lake, with results stated to have been considered very satisfactory.

In its review of "The Mining Market in 1905" the *London Mining Journal* makes the following brief reference to British Columbia mines: In British Columbia interest has attached to the Ymir and to Le Roi No. 2 by reason of discoveries of rich ore in each. The affairs of the Le Roi company have attracted a good deal of notice owing to the struggle between Mr. McMillan and his late co-directors, which has ended in the victory of the former. The shares have not moved much during the contest.

In its notes on "Mining Companies Registered in 1905" the *London Mining Journal* observes: British North America did not attract much attention in 1905, and the little it did was in favour of British Columbia, which gave six companies with a total of £975,000 capital, including the Princess Royal Gold, £500,000; the Slough Creek Gravel Gold and the Fraser Gold Reefs, each £200,000. The last mentioned registered in Guernsey. The Canadian Dominion gave only five companies of no magnitude. The Klondike district was, as in 1904, out of the list.

The opening up of the productive Douglas seam of coal from Departure Bay, near Nanaimo, Vancouver Island, by the Western Fuel Co. after much preliminary work is a matter for congratulation. The definite determination of the fact that there is in the Departure Bay coal fields a large quantity of coal of excellent quality has an important bearing upon the prospects of Nanaimo city and district. Both Douglas and Newcastle seams may be expected to henceforth contribute as large an output from this point as they have done in past years where worked elsewhere.

The following cablegram from the Provincial Department of Mines, received by the Agent-General for British Columbia in London, relative to the value of the mineral production of the Province for 1905, has been published in London newspapers: "Approximate estimate mineral production last year: Gold, \$5,960,000; silver, \$2,008,000; copper, \$5,480,000; lead, \$2,330,000; zinc, \$183,000; coal, \$3,330,000; coke, \$1,212,000; total, \$21,403,000." "Miscellaneous" accounts for the \$900,000 difference between

the totals of various items and grand total given in cablegram. Note: This shows an increase of more than \$2,000,000 over the value of the output for 1904.

During the week ended 25th inst. Granby Co.'s shares on the Boston market ranged from $9\frac{1}{4}$ to $10\frac{3}{8}$, with the last sale at $10\frac{1}{8}$. The sales for the week totalled 10,907 shares. The range of this stock during the period from January, 1899, to January, 1906, was—lowest, $2\frac{3}{8}$ in 1904, and highest, $10\frac{1}{4}$ in 1905. The *United States Investor* says: "The Granby's production for 1905 amounted to 18,000,000 lb. of copper. It is estimated that the production for the current year will be increased by at least 6,000,000 lb., as the company is now making about 2,000,000 lb. per month."

Announcement has been made that the Canadian Metal Co.'s zinc smelter, at Frank, Alberta, will be in operation in February, and that as soon as the practice is perfected and costs accurately fixed, the competition will be keen for zinc ores. It has also been stated that it will not be long before the Pilot Bay plant will be in the market, and this will open up a competition for lead. Concentrating ores will be purchased, and this will afford a market for a product that finds no sale now.

In his annual report on coal mining, published by the United States Geological Survey, Mr. L. W. Parker makes reference to the effect of the competition of fuel oil with coal—a competition also felt by the coal mines of Vancouver Island, B. C. He says that the increased production of fuel oil in California has affected the production of lignite in that State and in Oregon, as well as the production of bituminous coals in Washington, in much the same way as the production of Texas oil has affected the coal mining industry of Arkansas and Indian Territory. So serious has this competition become that the Coos Bay mines in Oregon may be closed down at an early date.

The Mining Committee of the Provincial Legislature for this session consists of the following members: Messrs. J. R. Brown (Greenwood), C. W. D. Clifford (Skeena), W. Davidson (Slocan), G. A. Fraser (Grand Forks), R. Grant (Comox), S. Henderson (Yale), H. Jones (Cariboo), J. H. King (Cranbrook), A. McDonald (Lillooet), J. A. Macdonald (Rossland), J. D. McNiven (Victoria), J. Murphy (Cariboo), J. Oliver (Delta), W. R. Ross (Fernie), L. W. Shatford (Similkameen), H. Tanner (Saanich), Thos. Taylor (Revelstoke), W. C. Wells (Columbia), H. Wright (Ymir), and H. E. Young (Atlin).

Mr. Frederick Hobart, one of the associate editors of the *Engineering and Mining Journal*, contributed to the *New York Times Annual Financial Review* an article on "The Year in Metal Mining," which was a short but comprehensive survey of the year's

progress in metal mining in the United States. Of the most northerly territory of that country, Mr. Hobart wrote: "Alaska still has its surprises. If Nome has begun to lose its interest for the miner, new districts have been opened up on the Tanana, on Copper River, in other parts of the coast country, and in the American Yukon. The great low-grade mines of Douglas Island continue to work steadily, and with no signs as yet of exhausting the ore deposits. New methods and better transportation are gradually overcoming the difficulties imposed by the rigorous climate, and making the far north a valuable contributor to our national wealth."

The *Toronto Globe* congratulates Mr. A. J. McMillan upon his victory over the powerful interests that sought to include the Le Roi mine in a dubious amalgamation scheme. "Mr. McMillan," remarks our contemporary, "must have had an impregnable case in order to prevail over the influential principalities and powers that were arrayed against him. However good his case was, it would have been no avail if Mr. McMillan had not displayed such tireless energy and fine generalship in presenting it to those interested in the Le Roi. The shareholders are to be congratulated on retaining the services of a gentleman who has already shown his knowledge, reliability, and integrity in the management of the property."

The *Nicola Herald* is to be congratulated on the stand it has taken in exposing the doings of the Nicola Coal & Coke Co., of Portland, Oregon, which appears to have been working the public rather than its coal lands. We heartily applaud the following sentiments of the *Herald*, which in this policy provides an example several other provincial newspapers might follow with eventual advantage to the districts in which they are published: "The *Nicola Herald* is fully aware of the fine coal showings in Nicola Valley and desires to see companies and owners doing *bona fide* work and will render every assistance possible to such parties. But to parties who secure supposed coal land, stock and sell the shares to the public, we believe it is our duty to the district to hinder such stock jobbing, as it will if permitted to go on, materially affect the district."

Advices from Ottawa state that the amount of the bounty paid by the Dominion Government on lead produced in Canada during the calendar year 1905 was \$334,224. For the fiscal year ended June 30, 1905, the total paid was \$337,216, and for the year ended June 30, 1904, \$195,284. As the bounty payable decreases as lead advances in price, and ceases altogether when the London price is £16 or higher per ton, which was the case from November 29 on through the remainder of the year 1905, the comparison of total amount of bounty paid in the fiscal and calendar years, respectively, does not show the actual position as regards production. As a matter of fact, the figures given by the official who distributes the bounty in British Columbia—there is little or no lead

produced elsewhere in Canada—show an increase in production during the last calendar year as compared with the last fiscal year of about 1,600,000 lb. of metallic lead.

The blowing in, on 11th inst., of the second furnace at the Dominion Copper Co.'s smelter, at Boundary Falls, brought about the satisfactory condition of affairs in connection with the smelters that every furnace in the district was in simultaneous operation. The total smelting capacity of the three district smelters, with all furnaces running, is rather more than 4,000 tons of ore per day, in the following proportions: Granby Co.'s smelter at Grand Forks, with eight furnaces, 2,800 tons; B. C. Copper Co.'s smelter at Greenwood, with two furnaces, 600 to 700 tons per day, and Dominion Copper Co.'s smelter at Boundary Falls, also 600 to 700 tons per day. All three smelters are now working 8-hour shifts in the case of men who previously had to work 12 hours. An understanding has been arrived at relative to wages to be paid under the new conditions. This desirable change has removed what had long been regarded as likely to lead to difficulties with the men and a probable interruption of work. Now there should be no ordinary obstacle to the smelters running continuously so long as ore shall be available for their furnaces.

On January 20, inst., under the caption "Prediction Realised," the *Week* published the following: "It is with regret that the news of the stoppage of all development work in the mines of the Tyee Copper Co., was received by the outside world this week. After all the recent report of the eminent American expert, and the hysterical efforts of a friendly press have failed to galvanise it into life." It would have cost 40 cents to have telephoned the Tyee Co.'s general manager and learned from him that development work had not been stopped, but rather than take a little trouble to ascertain the truth in that proper and easy manner, publicity was given to an unfounded rumour, and this with characteristic disregard of the editor to facts as affecting certain provincial mining companies that have earned comparatively large profits, but which he appears to take pleasure in misrepresenting. It is gratifying to us to now be able to state that less than a fortnight later the general manager was in a position to cable his co-directors in London as follows: "At the 1,000-ft. level in the cross-cut south of main shaft, at 187 ft. entered soft grey schist, and at 210 ft. encountered mineral-bearing rock, about 3 ft. wide, assaying 1.32 per cent copper, 23 oz. silver, trace of gold. Face of cross-cut is in soft grey schist."

The London *Financier* recently published a long article which was based on the Annual Mining Review published on January 1 in the *Nelson Daily News* and prepared for both journals by the editor of the B. C. MINING RECORD at their joint expense. The concluding comments of the *Financier* were: "With regard to copper production British Columbia is

slowly but none the less surely coming into its own. The wild-cat speculative element is practically dead so far as the Province is concerned; good work has been done in organising and developing on sane and safe lines, properties which are known to be of permanent value; while the higher price for the metal now ruling means not only additional profits to the recognised producers, but furnishes an incentive for the development of new and carefully surveyed propositions. Generally speaking, those interested in British Columbian mining have no reason to regard the future with anything but an easy mind. If, at times progress has seemed slow to the onlooker, it has been none the less sure, and to-day the industry in practically all its branches can claim to rest upon a sure and sound basis, which allows of at least the adoption of an optimistic attitude when attempting to forecast its future."

In the course of his speech at the recent opening of the Provincial Legislature, His Honour the Lieutenant-Governor said regarding mining in the Province: "You will be gratified to learn that the mining industry is showing signs of great activity throughout the Province. While the older mining districts are steadily increasing their output, new mineral areas are being opened in the interior and along the coast, some of which give promise of great mineral wealth. With the reduction which is steadily going on in the cost of the treatment of ores, the importance of the mining industry in the provincial economic situation is rapidly increasing, and large additions are being made to the capital invested in smelting and allied industries." In the address of the House in reply the following lines occurred: "We are gratified to learn that the mining industry is showing signs of great activity throughout the Province, and that while the older mining districts are steadily increasing their output, new mineral areas are being opened in the interior and along the coast, some of which give promise of great mineral wealth. We agree with the view that with the reduction which is steadily going on in the cost of treatment of ores, the importance of the mining industry is rapidly increasing."

After a long-continued search for ore at depth in its Tyece mine, at Mt. Sicker, Vancouver Island, the Tyece Copper Co. has at last met with some encouragement in finding ore at the 1,000-ft. level where, at a point 210 ft. south of the main shaft, a vein of mineralised rock or low grade ore has been intersected. Where cut this vein is about 3 ft. in width. It contains sulphate of barium and low values in copper and the precious metals. The presence of barytes at this depth is considered a most promising indication, for the only big shoots of ore as yet known to occur in this mine—those worked above the 300-ft level—carried up to 35 per cent barium sulphate. These shoots, including their extensions into Lenora ground, have yielded between 200,000 and 300,000 tons of commercial ore. Since no ore of value in

quantity had been met with below the 300-ft. level during prospecting operations that have been carried on without interruption for two years, last week's discovery, though not yet proved to be of any considerable value, possesses particular significance to mining men familiar with the Tyece mine, as it opens up a prospect of success in the further search for ore now being vigorously prosecuted and which, if fully realised, will give the mine a new lease of life.

The Britannia Smelting Co., which on 4th inst. commenced smelting operations at its works at Crofton, Vancouver Island, on 12th inst., made its first shipment of blister copper—50 tons, consigned to New Jersey. Since then other lots have been shipped. The Crofton smelter was erected in 1901-2 by Messrs. Jas. Breen and H. C. Bellinger, who organised the Northwestern Smelting & Refining Co. The works were operated until the early part of 1904, when the available supply of ore became so small that they were closed down and thereafter remained idle until last autumn, when they were acquired by the Britannia Smelting Co. Since then plant and buildings have been put in good order and additions made under the direction of the company's general manager, Mr. Thos. Kiddie. The bulk of the ore being treated comes from the Britannia Copper Syndicate's Britannia mine at Howe Sound, distant 58 miles from the smelter. Smaller quantities have been received from the Brown-Alaska Co.'s Mamie mine, Prince of Wales Island. South-east Alaska: from Mullen, Idaho, and other mines. A shipment of 400 tons of ore from the Mamie mine, and 495 tons of copper matte from the Alaska Smelting & Refining Co.'s smelter at Hadley, Prince of Wales Island, arrived at Crofton during the month.

We learn with much regret that Mr. E. C. Musgrave has resigned the position of superintendent of the Tyece mine, at Mt. Sicker, Vancouver Island. It is nearly six years since Mr. Musgrave was appointed to that position, and during that period he has given the Tyece Copper Co. zealous and efficient service. When first he took charge there had been less than 300 ft. of development work done in the mine, and that with but small results as regards the discovery of ore. For some months a visiting consulting engineer directed the prospecting of the mine, and then Mr. Musgrave was authorised to proceed with development according to his own ideas. Within a month of this change having been made ore was encountered in a raise from the old prospect workings; then a cross-cut from what was at that time the new shaft entered the ore at 40 ft. from the shaft. Where cut this ore shoot was found to be 23 ft. wide. The shaft was next deepened to 200 ft. and a level was opened at 165 ft. From that time to the present nearly 140,000 tons of commercial ore have been mined from this ore body and shipped to the Tyece Co.'s smelter at Ladysmith—a record that any mine manager would be amply justified in feeling proud of. Mr. Musgrave's resignation is not to take effect

until July 1, next. Meanwhile he has the satisfaction of having also found ore on the 1,000-ft. level of the mine. He has not yet decided where he will go when he shall leave Mt. Sicker, but there need be no doubt that he will soon obtain another appointment, and that suitable to one who has done such excellent and successful work.

Official information has been received from London to the effect the Messrs. A. J. McMillan, G. W. Wilson, Chas. Dunderdale and T. D. Grimke-Drayton, who received a majority of the votes given at the general meeting of Le Roi stockholders held a few weeks ago, and the regularity of whose election as directors, was challenged by the chairman, Sir Henry Tyler, "have been appointed directors and assumed the responsibilities of office." The following letter from their legal advisers explains the circumstances under which the two remaining members of the late board resigned and the new board was appointed: "As there appears to be grave doubt with regard to the effect or the legality of the proceedings at the recent shareholders' meeting, and as the (now unofficial) polling papers, which have been lodged at the office of the company, together with the show of hands and the proxies are in favour of Mr. McMillan, we have advised the directors to accept these circumstances as if they embodied instructions from the shareholders. The board have accordingly dropped the amalgamation proposal, and have to-day (December 27) passed resolutions electing Messrs. McMillan, Grimke-Dayton, Dunderdale and Wilson, directors of the company, and accepting Mr. Waterlow's resignation. The articles of association confer abundant authority for the election of Messrs. McMillan, Grimke-Dayton, Dunderdale and Wilson, as directors, by the above procedure, which obviates the uncertainty, which, we are advised, would otherwise exist with respect to the validity of their appointment. A board meeting will be held to-morrow at the office of the company, when the resignations of Sir Henry Tyler and Mr. F. W. Rolt will be handed in."

In connection with the amalgamation of the several companies and properties of which particulars are printed elsewhere in this issue, the directors of the Centre Star Mining Co. have given their shareholders additional particulars from their circular containing which the following has been taken: "Your directors are of the opinion that the amalgamation is very greatly in the interests of the shareholders of all the companies, as affording greater security for the payment of dividends, both in relation to a consistent or average production of ore and as giving to the amalgamated company a self-contained business not dependent upon its ability to make satisfactory contracts with independent smelters.

"The capitalisation of the Canadian Consolidated Mines, Ltd., will be \$5,500,000, of which the sum of \$4,698,800 stock will be issued in consideration of the purchase of the entire assets of the following companies, in the following proportion, that is to say:

The St. Eugene Consolidated Mining Co., Ltd.	\$2,333,300
Centre Star Mining Co., including War Eagle properties	1,555,500
Trail smelter	750,000
Rossland Power Co.	60,000
Total	\$4,698,800

"The remaining \$801,200 will be for the present retained in the treasury.

"Your directors consider it absolutely necessary that the new company should commence business with the full complement of supplies and with not less than, approximately, \$600,000 in cash as working capital, and accordingly have arranged that this amount should be contributed by this company, the St. Eugene company and the Trail smelter in proportion to the relative values fixed by them for the purpose of amalgamation, the working capital so contributed being included in the values above stated."

It has often been stated that little practical interest has of late years been shown in the development of the mineral resources of the southern portion of the Province by the business men of Vancouver and others resident in that city who might reasonably be expected to take an active part in fostering the mining industry of the Province. To what extent such assertions are true we are not in a position to determine. But whether this reproach—for such it has frequently been intended as—is deserved or not, it is gratifying to find in the organisation of the Similkameen Mining & Smelting Co., Ltd., particulars of which are printed on another page, evidence of an intention to take an active part in the opening up of a section of the northern Similkameen that is believed to give much promise of proving, as a result of considerable further development, productive and profitable to a degree that will be satisfactory to all concerned. In this connection we have pleasure in giving publicity to an expressed opinion of one who has been associated with the formation of the above-mentioned company, as follows: "The time has arrived when Vancouver and other coast cities should support the organisation of a mining company having high grade shipping ore in sight, which company will be managed and operated by well-known business men as a local company, and the profits of the mine be distributed locally. A policy of this kind is what has built up United States towns, such as San Francisco, Denver, Butte and Spokane, the last-named having made millions out of British Columbia mines." It is to be hoped that this enterprise will meet with marked success, which it has a fair prospect of doing since the excellent showings of mineral on the property acquired have been vouched for, after personal examination, by one known to be fully qualified to express an expert opinion and habitually conservative in doing so. The outcome of this venture will be watched with keen interest both on the coast and in the district immediately concerned."

SEQUEL TO MONTREAL & BOSTON CONSOLIDATED MINING & SMELTING COMPANY'S PROMOTION.

ONE of the Munroe chickens seems to have come home to roost, judging by proceedings for the recovery of \$25,000 reported in newspapers to have been taken by ex-Senator Warner Miller, of New York, against George H. Munroe, a promoter of the Montreal & Boston Consolidated Mining & Smelting Co., which last year was shown to be bankrupt, after a comparatively short period of activity so far as its mining and smelting operations were concerned. From the first the MINING RECORD regarded this promotion with suspicion and doubt, and shortly after the announcement of the consolidation (which included the old Montreal & Boston and took in the properties of the Dominion Copper Co. and Morrison Mines, Ltd., and the Athelstan) published some comment in which it was stated that "the outlook for the new concern, excepting always for stock-mongering purposes, is not a particularly promising one," and that "the possibility of the new company earning profits on its inflated capital is remote to a degree." In fact ever since the time when British Columbia visitors to New York reported, on their return from that city, that they had been repeatedly beset by employees of one of the leading hotels there, who were most anxious to obtain information concerning the Montreal & Boston, which they asserted they had been persuaded to buy stock in, we have been of opinion that the Boundary, or for that matter any other, district would suffer in reputation so long as promoters pursued what we considered questionable methods—in this case reported to have been to the extent even of getting hold of the hard-earned wages of hotel servants—in their stock-selling operations, ostensibly with the object of developing mines in that district. That the mines and smelter the Montreal & Boston Consolidated had possession of for a year or so are in themselves sufficiently valuable to form the basis of a profitable enterprise, if established and conducted on proper lines, is being demonstrated by the Dominion Copper Co. now operating them, but under the conditions obtaining during the Munroe control there could not reasonably be expected any other result than profit to unscrupulous stock-jobbers during the continuance of operations and loss to legitimate stock-holders when the inevitable suspension should come. There are others who have brought discredit upon mining in British Columbia whom we should also like to see prosecuted for having deceived their too confiding victims by gross exaggerations and even positive falsehoods, in which, by the way, they were assisted and sometimes defended by two or three provincial publications. While it is very probable they will escape well-merited punishment, it is well they be shown that now and again such trickery is proved to be illegal and those practising it have to pay penalty accordingly.

TRANSDUCING THE CROW'S NEST PASS COAL COMPANY, LTD.

IN APRIL of last year the MINING RECORD reproduced figures showing the assets and liabilities of the Crow's Nest Pass Coal Co., Ltd., for several years, as given in the company's published balance sheets; also tables showing, respectively, the net earnings from operations of the company during the years 1899 to 1904, inclusive, and the dividends paid, with each year's earnings and dividends shown separately. These particulars were printed at that time for the reason that erroneous statements had been published, even in influential journals, and, as then stated, "so that any misapprehension as to whether or not this company's distributed profits have been earned in the ordinary course of its coal-making, coke-making, and other legitimate business, may be removed." Since that time we had not seen published a repetition of the misstatements relative to this company and the source from which its distributed profits had been obtained until January 27, inst., when the following appeared in the *Victoria Week*, edited by Mr. Wm. Blakemore, M. E.:

"SIGNALS OF DISTRESS.

"The Crow's Nest Pass Coal Co., presented with 'coal lands worth untold millions by the Laurier administration as a sop for services rendered in the election of 1896, have never earned a dividend out of operation, although they have paid several out of profits on the sale of treasury stock. They have reached the end of their tether, and having failed to find salvation in the arms of the philanthropic 'J. J. Hill, they are now rushing 'reorganisation.' They were up against that or 'liquidation.'"

We hold no brief for the defence of the Crow's Nest Pass Coal Co., nor for that matter of any other; we simply insist that common justice should be done all engaged in mining and allied industries, and in particular that no untruths be published concerning *bona fide* companies, or individuals, engaged in legitimate mining business—an attitude that will be generally approved as being in the best interests of the Province. This is not the first time, though, we have shown the utter unreliability of some of the assertions relative to mining companies made in a newspaper edited by Mr. Blakemore, for when he was editor of the *Nelson Tribune* (now defunct) we easily disproved certain misstatements, among others, regarding the Tye Copper Co. that were published in the *Tribune*, remarking that "The allegation in regard to payment of a dividend out of capital is a gross misrepresentation, as, too, is the implication that sinking to considerable depth has not been carried out," and expressing the opinion that this attempted discrediting of the Tye Copper Co. was the result of ignorance or a reckless disregard of facts, either being culpable to a degree and deserving of unqualified condemnation.

Incidentally it may be mentioned that in 1898 Mr. Blakemore was appointed general manager at Fernie for the Crow's Nest Pass Coal Co., and that in the

following year the directors, for reasons that need not be stated here, found it necessary for the protection of the company to dispense with his services. To that dismissal may be attributed the bitter and, as we think, wholly unjustifiable hostility towards the company shown in repeated attacks upon it. We make this reference to bygone matters with much reluctance, but when persistent and deliberate misrepresentation of either company or individual is resorted to, as we believe has been the case time and again in regard to the Crow's Nest Pass Coal Co., it is in our judgment high time that the motive prompting such perversion be exposed.

The Crow's Nest Pass Coal Co.'s operations are the chief support of three towns in South-east Kootenay. Its standard number of employees in 1905 was 1,745. Its payrolls totalled \$1,511,430.95. On another page we print a brief summary of its financial statement for that year, together with a table exhibiting its net and distributed profits, respectively, year by year from 1899 to 1905, inclusive. These show the company's net profits for the year 1905 to have been \$497,898.68; its total net profits from 1899 to the end of 1905, \$1,845,449.23; its distributed profits (dividends) to date, \$1,493,648.16; and its balance of undistributed profits carried forward to 1906, \$351,801.07. Further, during five years, 1901-5, the total amount received as premium on the sale of new stock was \$1,800,000, the whole of which has been transferred to a "Reserve" or "Reserve" account, at credit of which it appears in the audited balance sheet of the company for the year 1905. These figures carry their own refutation of the misstatement published in the *Week*.

As to the company being "up against reorganisation or liquidation," we do not know the reasons actuating the directors in seeking to increase the capitalisation, assuming they are doing so. We think, though, that a company with a going business making large profits and having assets valued at \$6,333,518, of which \$630,576 consists of accounts receivable and cash, and liabilities of \$594,217 bills and accounts payable, and \$87,500 dividend payable, making a total of only \$681,717 requiring to be discharged, and this after having declared during its last year four quarterly dividends totalling \$349,418, is hardly "up against liquidation," especially in the circumstances that it has a large and growing coal and coke business, its mines opened and fully equipped, and that its net profits for the year just closed were within \$2,112 of half a million dollars.

One other matter may be mentioned, not that it is of importance, save as showing further the untruthfulness of the statements here challenged. The Crow's Nest Pass Coal Co. obtained its coal lands indirectly from the Provincial government, not from the Dominion government, which had no lands in South-east Kootenay to give to any company, neither as "a sop for services rendered in the election of 1896" nor on any other account. It will therefore be seen that in no single particular can the above-quoted allegations of the *Week* be shown to be true; on the contrary

they are false from beginning to end, and of such a character as should not have been permitted to appear in any publication having regard to the ordinary requirements of truth and justice.

CANADIAN MINING INSTITUTE.

FROM exchanges it is learned that the annual meeting, for 1906, of the Canadian Mining Institute will be opened in the City of Quebec on Wednesday, March 7. It is not practicable at this time to give an outline of the business to come before that meeting, no information having been received.

Once again there seems to have cropped up evidence of antagonism between certain Ontario members and others resident farther east. The nominating committee has made the nominations shown on the list printed below, but Mr. Eugene Coste is asking, for himself and others, that certain Ontario members be voted for rather than others resident in Quebec or Nova Scotia. If the struggle between Ontario and Quebec is to be continued year after year it may be well for the western members to consider the advisability of withdrawing from the Institute altogether, and forming their own organisation, which might be expected to be free from the petty jealousies and disturbing influences of opposing factions. Already a decided preference is felt by western professional mining engineers and metallurgists for membership in the American Institute of Mining Engineers, so if the Canadian Mining Institute is to make all possible material progress it will first be necessary for it to vigorously repress the comparatively few malcontents and redouble its efforts to promote harmony and unanimity of purpose throughout the Dominion. A Canadian Institute must necessarily long continue numerically small in comparison with the much older and stronger A.I.M.E., but given unity among its members it can do valuable and useful work to a steadily increasing extent. Should dissension prevail, though, the western members may be expected to either organise on their own account or confine their membership to the A.I.M.E.

The nominations of the nominating committee are as follows:

For President.—Mr. Geo. R. Smith, Thetford Mines, Que.

For Vice-Presidents.—(For one year) Dr. F. D. Adams, Montreal; Major R. G. Leckie, Temagami, P. O. Ont. (For two years) Mr. Frederic Keffer, Greenwood, B. C.; Mr. G. Herrick Duggan, Sydney, C. B.

For Treasurer.—Mr. J. Stevenson Brown, Montreal, Que.

For Secretary.—Mr. H. Mortimer-Lamb, Montreal, Que.

For Councillors.—(For one year) Mr. John Blue, Eustis, Que.; Mr. C. J. Coll, Stellarton, N. S.; Mr. Thos. Cantley, New Glasgow, N. S.; Mr. Frank B. Smith, Calgary, N. W. T.; Mr. J. C. Gwillim, Kingston, Ont.; Mr. Jas. McEvoy, Fernie, B. C.; Mr. W. G. Miller, Toronto, Ont.; Mr. Harry Williams, Dan-

ville, Que. (For two years) Mr. W. H. Aldridge, Trail, B. C.; Mr. B. A. C. Craig, Toronto, Ont.; Mr. A. M. Hay, Rat Portage, Ont.; Mr. R. T. Hopper, Montreal, Que.; Mr. Thos. Kiddie, Crofton, B. C.; Dr. A. E. Barlow, Ottawa, Ont.; Dr. J. Bonsall Porter, Montreal, Que.; Mr. D. W. Robb, Amherst, N. S.

"AN INCENTIVE TO LITIGATION."

NOTWITHSTANDING the insistence of some friends and supporters of the present Provincial Government that its policy of non-interference with the mining laws as now on the Statute books is in the best interests of the mining industry of the Province, there occasionally come up distinct evidences of an opposite opinion in regard to certain sections of those laws, being held by entirely disinterested outsiders who are free from party bias and whose purview may be regarded as wider and uninfluenced by considerations of loyalty to party or leanings towards political friends. Apart from such apparent injustice as was experienced in connection with the notorious Lucky Jack case (*Tanghe v. Morgan et al.*), in which Hon. Mr. Justice Martin, in the course of his comment on the statement in Tanghe's affidavit "That from indications I have observed on the claim applied for I have reason to believe there is therein a deposit of placer gold," observed "the difficulty is that the belief required is not that of a sensible or an honest man; the insane delusion of a criminal under the Placer Act is just as efficacious;" or the difficulties it is an open secret have been encountered in inducing New York capitalists to purchase a big hydraulic mining property in Cariboo, for lack of title they regard as secure; there are other instances in which it would appear that amendments to the laws are really necessary. One of these has lately been given wide publicity through the columns of the *New York Engineering and Mining Journal*—a publicity that few will claim is likely to encourage the investment of outside capital in British Columbia mines. We therefore call attention to the comments of that journal in the hope that steps will be promptly taken to remedy a condition which our influential contemporary suggests is "an incentive to litigation." The article referred to follows:

"BRITISH COLUMBIA MINING LAW.

"The Supreme Court of Canada has rendered a decision in a mining appeal from the British Columbia courts which will have far-reaching effects in the methods of locating mining claims in that province. The decision was made in the matter of *Dockstader vs. Clark*, which has been before the British Columbia courts for several years, and by consent the judgment covers thirteen other cases, analogous to that which was tried. The point involved in all these cases was the correct interpretation of the provincial mining law regarding the location of mineral claims. The *Mineral Act*, 1896, Ch. 34, Sec. 15, specifies that a

mineral claim where possible may measure 1,500 ft in length by 1,500 ft in breadth 'in as nearly as possible rectangular form; that is to say, all angles shall be right angles, except in cases where a boundary line of a previously surveyed claim is adopted as common to both claims, but the lines need not necessarily be meridional. In defining the size of a mineral claim, it shall be measured horizontally, irrespective of inequalities of the surface of the ground.' Section 16 relates to location posts and specifies that 'a mineral claim shall be marked by two legal posts, placed as near as possible on the line of the ledge or vein and the posts shall be numbered 1 and 2, and the distance between posts 1 and 2 shall not exceed 1,500 ft.'

"The looseness in the language of this Act has given rise to a large amount of litigation, and led to considerable confusion and insecurity of tenure. The *Dockstader vs. Clark* appeal to the Supreme Court was consequently followed with much interest in mining circles in Western Canada. The court ruled:

"(1.) That 70 degrees is too great a variation (from a right angle) to allow as an approximation, though no exact limit is fixed.

"(2.) A location may be wholly on one side of a location line.

"(3.) A location may traverse any number of claims.

"(4.) A discovery post may be even located on a Crown-granted (patented) claim.

"This sweeping ruling will make confusion worse confounded. It is evident the court clearly recognised the bad drafting of the Act and framed its decision so as to exhibit fully the latitude given to prospectors in locating new claims. The precedents set by the ruling greatly extend this latitude. According to this ruling, any number of prospectors can now go upon a developed mining property and drive posts locating claims in all directions. Although this may not disturb the title of patented, or alienated, ground, it will certainly inconvenience mine-owners and will be fruitful in litigation. The effect of the two last clauses of the ruling on the location of claims in a new mining district will be to cause endless trouble. It is likely to act as a premium on claim-jumping.

"The Government of British Columbia has always recognised the value of the mining industries. It will now, doubtless, quickly recognise the anomalous features of the law relating to the location of mineral claims as it is left by the Supreme Court's ruling, and it will lose no time in amending it so as specifically to define a prospector's rights in securing mineral land. The ruling of the court in the case under review practically decides that the prospector has the utmost latitude in choosing his ground, and in interpreting the mining law the principle that technicalities shall not prevail holds good. This, however, is not sound practice, as it is too great an incentive to litigation. Experience the world over demonstrates the fact that statutes relating to land titles cannot be too specific."

GENERAL REPORT OF THE BERRY CREEK
MINING CO., LTD.

UNDER date December 15, 1905. Mr. Alexander Hamfield, manager of the Berry Creek Mining Co., Ltd., submitted the following general report, which was addressed to the Chairman of the

At your request for a general report dealing with the operations since the inception of the Berry Creek Mining Company's hydraulic mine in Cassiar, British Columbia, I beg to submit the following, in which is given a short *resume* of the work done, accompanied by a sketch plan showing the position of the ground and creeks; also a few illustrations from photographs.



Looking Down Thibert Creek from Junction of Berry Creek.



Berry Creek Mining Co.—Flume Conveying Water to Mine.

Board of Directors of the Berry Creek Mining Co.,
Ltd., Victoria, British Columbia:

Location.—The mine is situated in Cassiar mining
division, in the northern portion of British Columbia,

and is reached by ocean steamer from Victoria to Wrangel, Alaska, thence by river steamer to Telegraph Creek, B. C., thence by pack train 72 miles to Dease Lake, thence by boat 26 miles to Porter's Landing, and lastly by pack train 8 miles to the mine. The elevation of the mine above sea-level is about 3,000 ft.

History.—The Cassiar district was discovered in 1873, when a considerable rush to the new diggings took place. It produced during a few years gold to the value of something over \$5,000,000 from three creeks, viz., Dease, Thibert and McDame creeks; Thibert Creek being credited with about one-third of this amount. After this no work was carried on, except by a few Chinamen in a desultory way, until this company undertook to prospect and open up Thibert Creek.

Title to Leases.—The Berry Creek Company is the owner of ten hydraulic leases, each 800 acres, in one continuous block fronting Thibert Creek for 15,000 ft. The title to this ground is held by lease from the British Columbia Government and is in perfect order. Abstracts of title and inspection of title deeds will be furnished on application to the company's solicitor.

Character of Deposit.—The mine is situated on an ancient river channel, probably pre-glacial, on the south side of Thibert Creek, following the same general direction as the latter, from west to east, and is of similar nature to the channels in Cariboo, Atlin and Yukon.

The general formation is schist, making a favourable bedrock for retaining the gold, which occurs from the size of nuggets to very fine, some being almost invisible and its existence having only become known through assays of concentrates, but the greater portion is of the size of small shot and is easily caught in the sluices. The principal part of it is found in the gravel on bedrock, although some also occurs through certain layers in the upper part of the deposit. The deposit shows the unmistakable river strata; first heavy gravel with boulders, then lighter gravel, then clay and sand, and lastly again finer gravel.

Size of Deposit.—It is rather difficult to correctly estimate the size of a deposit of this nature as the width varies from 300 to 600 ft., and the height from 50 to 200 ft. Perhaps the average width may be put at 350 ft., the height at 125 ft., and the length at 15,000 ft. This will then give on the company's properties an estimated gravel deposit of about 30,000,000 cu. yd. of gravel, of which not more than between 400,000 and 450,000 cu. yd. have been washed by the company, and perhaps 100,000 cu. yd. by former miners.

Water Rights.—The company is now the registered owner of the following water rights:

Berry Creek	}	3,000	miners' in.
1st—French Creek		500	" "
2nd—French Creek	}	300	" "
1st Tributary of Dease Creek		300	" "
2nd Tributary of Dease Creek	}	500	" "
Boulder Creek		1,000	" "
Five-Mile Creek	}	1,000	" "
Little Deloir		500	" "

This amount of water is far in excess of what most of the creeks can furnish, but the water rights were thus recorded, partly with a view of storing the surplus water in dams during the spring freshet, and partly from lack of knowledge in early days of the water supply.

The following is an estimate, as nearly correct as possible, of the water flowing in the different creeks during an extremely dry season at the lowest stage:

Berry Creek			
1st—French Creek	600	miners' in.	
2nd—French Creek			
1st Tributary of Dease Creek	100	" "	
2nd Tributary of Dease Creek	700	" "	
Boulder Creek	150	" "	
Five-Mile Creek	100	" "	
Little Deloir	500	" "	

It follows that these amounts vary considerably according to a wet or dry year and to time of season. For instance, Berry Creek, together with 1st and 2nd French Creek, will during the spring freshet and in a good season run about 2,000 miners' in. So far only the water from these three creeks has been available for the mine.

Ditches from the 1st and 2nd Tributary of Dease Creek will be finished early next summer, giving their respective above stated amounts as an additional supply. For Boulder, Five-Mile and Little Deloir the company has been granted a lay-over by the Government until the working of the mine shall make it necessary and profitable to use this water.

Ditches.—Only short ditches were necessary to turn the water from 1st and 2nd French Creek into the Berry Creek water shed.

Last summer a ditch 2,900 ft. long, capacity 600 miners' in., was dug from 1st Tributary of Dease Creek into the Berry Creek head waters, and a ditch 10,000 ft. long, capacity 500 miners' in., was nearly completed, leaving only about 1,300 ft. of ditch and flume to be finished next season. Lumber for this purpose is being hauled this winter.

Flume.—Water for working the mine is delivered by a flume 6,000 ft. long, 30 by 30 in., with an average grade of 40 ft. to the mile, and a capacity of about 1,000 miners' in. At the end of the flume the water goes into a pressure box whence it is taken by the supply pipe to the mine, giving a head of 300 ft. to bedrock.

Plant.—The plant in operation for washing gravel consists of 1,550 ft. of 18-in. pipe, 400 ft. of 14-in. pipe, 675 ft. of 12 in. pipe, 425 ft. of 10-in. pipe, 2 No. 6 giants, 2 No. 4 giants, 2 No. 2 giants, 2 No. 18 water gates, 2 No. 12 water gates, and 2 No. 10 water gates. Beside these there are on hand extras: About 800 ft. of pipe of different dimensions, one No. 4 giant, and extra nozzles, mining cars, headlights, etc. This plant will handle, with a head of 300 ft., all the water that the flume will carry, or 1,000 miners' in.

Facilities for Washing Gravel.—The mine is at present opened by five cuts, not following up the grade of the old channel, but cutting through the outer rim rock.

As the old channel is 85 ft. above the modern stream at the junction of Berry Creek with Thibert Creek, where the work has been carried on, and the valley of the latter creek is between 300 to 600 ft.

giants and water gates are so placed that the water can in a few minutes be turned from one cut to another.

Concentrates.—An experiment was last summer



Berry Creek Mining Co.—Showing Position of Mine Above Thibert Creek.



Berry Creek Mining Co.—Showing Mine With One Giant Working.

wide, it gives a splendid grade for the cuts and ample room for the tailings.

The sluices in the cuts are 5 ft. wide, lined with 8-in. wooden blocks, are set on a grade of 9 in. to 12 ft., and vary in length from 100 to 225 ft. The

carried out for the saving of platinum, osmiridium and fine gold. and an undercurrent and tables, lined with cocoa matting and canvas, were built at the end of No. 2 sluice. Mechanically it was successful as the tailings showed very little iron or other metals,

but I am not yet prepared to state how much per ton the concentrates will go, or how much to the cubic yard can be recovered. The assay of samples varied considerably, giving as high as 60 oz. in platinum and 7 oz. gold per ton. It will, therefore, be necessary to carry out further experiments, but it looks as if the concentrates may be made a future asset, especially as most of the gravel put through No. 2 cut was top, and better results will naturally be expected from the bottom.

Buildings.—The following buildings have been erected at the mine: General storehouse, frame, 20 by 16 ft.; boarding house, frame, 20 by 16 ft.; kitchen, frame, 10 by 10 ft.; office, frame, 12 by 14 ft.; house, log, 16 by 12 ft.; house, log, 16 by 14 ft.; two frames for men's sleeping tents, 20 by 16 ft.; blacksmith shop, and cellar. These accommodations are sufficient for the present working crew of 25 to 30 men.

Sawmill.—On Dease Lake, 8 miles from the mine, the company owns a sawmill site of 40 acres, with about 50,000 ft. of standing timber. Beside this, there is plenty of timber around the lake which can be cheaply put into the water and towed to the sawmill.

There are also: Sawmill, capacity from 4,000 to 5,000 ft. per day, 20-h.p. pipe boiler, 15-h.p. engine, with all necessary tools and fittings, and all properly housed.

Stores and Lumber.—On October 8 the following stores were on hand:

Groceries	\$1,533
Hardware	3,760
Lumber—65,000 ft. b.m.	1,575

Total \$6,868

Labour.—The scale of wages at the mine is as follows:

Foreman	\$5.00
Pipers	4.50
Blacksmith	4.00
Carpenter	3.50
Labourers	3.00

to which must be added \$1.25 per day for each man's board. Men brought from Victoria receive 50 cents per day less than this scale, as the company has to pay the cost of their transportation. The price of ordinary labour can probably be cheapened by hiring Japanese, or men from Eastern Canada.

Freight.—The Hudson's Bay Company has had the handling of the company's freight for the last three years at 11½ cents per lb. from Wrangel to the mine. This can probably be cheapened from 2 to 3 cents per lb. by the Berry Creek Company being prepared early in the season to enter into a fairly large contract.

Working Season.—Preparatory work on the mine is commenced some time in April, and washing can usually be begun on May 10, and be continued until about October 20. If everything is in readiness for the spring work so that no time is lost, this will give

from 150 to 160 days, 24 hr. per day, for washing gravel.

Former Mining Operations.—The mining work so far carried out on the mine can hardly be considered much more than having thoroughly prospected the ground. When the company first undertook to open up this property very little was known as to extent of deposit, value of same, water supply, and other working facilities, and for this reason a small experimental plant with two No. 2 giants was installed. With this equipment, and using 45,000 in. of water, gravel yielding \$13,500 was washed, or at the rate of 30 cents per miners' in. As these returns were quite satisfactory two No. 4 giants were then added, and with this plant a run was made in 1903 of 98 days, using 475 miners' in. of water per day, or 46,500 in. for the season. With this amount of water gravel was washed which gave \$21,000, equivalent to 45 cents per miners' in.

Having thus proven the value and extent of the gravel, recommendations were made by the manager for installing a plant proportionate to the size of the deposit, but the company not being in a position to follow out these, a compromise was made by adding two larger (No. 6) giants and some larger pipe. The year 1904 and part of 1905 season were occupied in getting this put up at the mine, but unfortunately, when in readiness to commence washing, the supply of water became so short that only 35,000 miners' in. were available during last summer. This gave a return of nearly \$7,000, or about 20 cents per miners' in., but it must be remembered that during this year almost only top gravel was washed, which naturally lowered the result per inch. We have, therefore, used:

45,000 miners' in., which gave . . .	\$13,500
46,500 " " " " . . .	21,000
35,000 " " " " . . .	7,000

126,500 \$41,500
or equivalent to about 33 cents per miners' in.

There is no question but that the recovery of gold per inch would have been greater, if the water had been used in a larger volume as thereby the efficiency of the inch would have been much increased, and also if this year a fairly even amount of top and bottom gravel had been washed in place of nearly all top.

Only the first year was a survey made of the amount of gravel washed, and this gave an output of 3.5 cu. yd. per miners' in., which can be considered a fair average for succeeding years. The value of the cu. yd. was then about 13 cents, and the subsequent output concurs fairly well with this estimate. We have used 126,500 miners' in., which at 3.5 cu. yd. per inch gives an output of 432,750 cu. yd.

The total output of gold has been \$41,500, or about 9¾ cents per cu. yd., but it must be remembered that so far a larger proportion of top to bottom gravel has been washed, and if an equal amount of the two

had been worked the result per cu. yd. would fully have come up to 13 cents.

It may be of interest to note that former miners, who worked with a canvas hose, washed out certainly

been too intermittent, and mixed up with other work. In that year the mine was, as shown before, operated 98 days with 475 in. of water per 24 hr., and the total working expenses for the whole year were \$17,-



Berry Creek Mining Co.—Showing Part of Mine With Two Giants Working.



Berry Creek Mining Co.—Showing No. 3 Pit with One Giant Working.

not more than 100,000 cu. yd. of gravel which yielded over \$80,000.

Only during 1903 has it been possible to arrive at a correct estimate of working costs for washing gravel, for during the other years the washing has

400 in which was included a certain amount of new development work and all salaries, government fees, etc. This amount, as the company's books show, was divided as follows: One-third was paid out for salaries, government fees, part of travelling and gen-

eral expenses, etc., and can be called a fixed charge as it will not increase, if through a longer season and more water the output becomes four or five times larger than it was during 1903. One-sixth, being wages and travelling expenses for higher priced labour, such as pipers, sluice men, machinists, etc., will only increase with a longer season, but not materially with a larger amount of water. The other half of the working expenses was paid for ordinary labour, mostly for removing boulders, and would not increase in the same proportion as the amount of water is increased, for it is a well known fact that the efficiency of the inch is greatly increased by handling water in a large volume out of one giant.

It is hard to estimate, without a practical working test, how large this reduction in cost would be, but it would be considerable as a number of the boulders, which now with a small amount of water have to be taken away on cars by hand labour, would with a larger volume go through the sluices. More efficient appliances for removing boulders, such as derricks or cable ways, would also help to materially lessen the expense account under this head.

Future Mining Operations.—In considering future operations, it should be the aim to get all the water, which is available for a reasonable expenditure, on to the ground. So far the supply has been altogether too small, and although this will be considerably improved by the new ditches from Dease Creek, it will still be inadequate to the size of the deposit.

The water from Little Deloir, 500 miners' in., can be brought on to the ground by a ditch probably about 3 miles long, and on this creek there is a good reservoir site, which will store approximately 108,000,000 gal. of water, equal to 11,000 miners' in. The surplus water from the spring freshet could be stored here, and thus about 600 miners' in. could be relied upon from this source during the whole season.

On Berry Creek there are possibilities of increasing the water supply by building one or possibly two reservoirs. One of these, at the head of Berry Creek, would hold about 140,000,000 gal. or about 9,000 miners' in., and a second one could probably be made lower down the creek, which would contain a somewhat similar quantity. As Berry Creek for several weeks during the spring freshet flows at least twice as much as the present plant can take, and as 1st and 2nd Tributaries of Dease Creek have during this time probably 2,000 in. of water which is not needed until Berry Creek becomes low, it will be seen that sufficient water is available for filling these reservoirs.

It must be understood that the water proposed to be stored in these reservoirs is part of the surplus now going to waste during the early part of the season, and would only be drawn upon in the latter part of the summer to help out the natural flow. Also, if the present flume and plant were enlarged, it would be possible to utilise during May, June and July about 2,000 in. of water from this surplus amount.

There is, as well, a small lake on Berry Creek, where the flume begins, that could and should be made into a reservoir for the purpose of storing

surplus water, and to regulate the flow into the flume.

By digging the Little Deloir ditch, building these reservoirs, enlarging the ditches from the Dease Creek water shed, and enlarging the present flume, 2,000 miners' in. of water could probably be secured for the mine. Another source of water supply is from Thibert Creek, which has from 2,000 to 3,000 miners' in., and this can be brought on the ground by a ditch from 5 to 7 miles long, depending upon what head at the mine is desired. The cost of the former undertaking would probably be between \$75,000 and \$100,000 and of the latter between \$100,000 and \$150,000.

In any future operations it will be well to have proper surveys made of these different sources of water so as to be able to arrive at the exact cost of same, for the figures given here, although near enough to show that the cost is not prohibitive, are only approximate estimates.

Appliances, such as derricks for handling boulders, drills for putting up rock cuts and drilling large boulders, and electric light for night operations, should also be provided, if the best results are to be obtained, and for this purpose cheap water power is available from Thibert Creek.

Sufficient capital should be provided so that a continuous plan in the mining operations, and consequently a more economical policy in the management, could be adopted. It is also easy to see that, if the mine were run on a larger scale, more favourable contracts could be made for transportation, freight and buying goods.

Summary.—From the foregoing it will be seen that the Berry Creek Company has a large deposit of workable gravel, estimated at about 30,000,000 cu. yd., of which only a small fraction has so far been washed, and that the conditions for working the mine are good.

Water to the amount of 1,000 miners' in. is now, or will shortly be available, and an additional 1,000 or 2,000 in. can be secured by a reasonable expenditure of capital.

As the old channel is about 85 ft. above the modern stream, and the valley of the latter is from 300 to 600 ft. wide, it gives plenty of dump for tailings and all necessary grade for sluices and cuts.

The head from the flume to bedrock in the mine being 300 ft. gives the water plenty of force for attacking the banks, even to disintegrating a cemented layer which is occasionally met with on bedrock. The banks are easily caved, no bank blasting being necessary. Most of the gold is of a quality easy to save, a very small percentage going below the first three or four boxes.

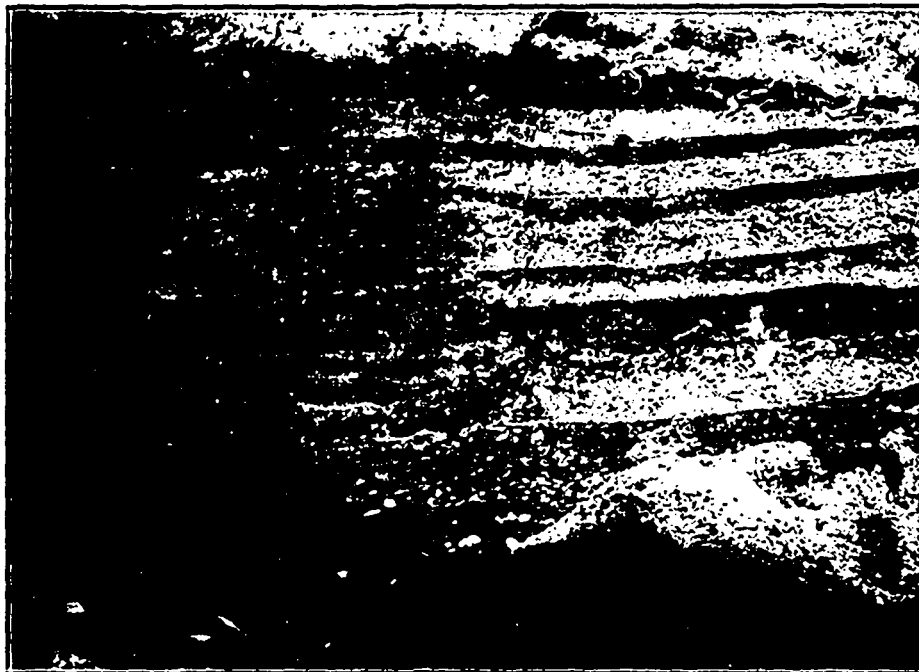
Wages, transportation, and freight are fairly high, but these can with proper arrangements and sufficient working capital be cheapened.

The washing of gravel can be maintained for 150 to 160 days, of 24 hr. per day. Each miners' in. of water, out of 126,500 used during different periods and under most unfavourable conditions, has given a return of 33 cents per in., and there is no doubt that

the average return will be at least 40 cents; the season of 1903 showed 45 cents.

As an illustration of what the mine can put out if properly equipped, let it be supposed that there are

the running expenses of the mine should certainly not be more than 20 cents per in., or a total of between \$80,000 and \$90,000. This amount of water would wash about 1,500,000 cu. yd. of gravel each



Berry Creek Mining Co.—Showing Strata of Gravel in Bank.



Berry Creek Mining Co. Showing Dump of Washed Gravel.

3,000 miners' in. available, and that this is maintained for a full working season of 150 days. There would then be used 450,000 in. of water, giving a return of 40 cents per in. or \$180,000. Working on this scale

season, which, according to the present estimate of 30,000,000 cu. yd. in the deposit, will give a life of about 20 years to the mine.

It will be seen from the foregoing description that

the Berry Creek mine must be considered as a large gravel deposit of medium or low grade, with good natural facilities for working the same. This being the case, it is essential, if the best results are to be obtained, to equip the mine with a plant proportionate to its size, to make use of all available water, to introduce labour saving appliances, such as machine drills and derricks, to practise other economies, and to keep the mine running for the full season, and if sufficient capital to do this is furnished, and this is expended in a business like manner, the mine will return a good profit on money invested.

AINSWORTH MINING DIVISION.

AINSWORTH division had more of its properties at work in 1905 than for several previous years. As, however, so few of those working them have responded to a request made for particulars of their operations during the year, not much information can here be given.

Highland.—Work was confined to the development of the upper levels, along the course of the vein, and was attended by encouraging results. A winze was sunk on the outcrop of the Josephine claim and the vein was proved to be 40 ft. wide and to contain a large and valuable ore shoot. No. 1 tunnel was extended 800 ft. from the old workings under this winze and disclosed a nice shoot of ore, in the same ground, at a depth of 300 ft. below the outcrop in which the winze was sunk. Drifting is being continued with increasing success, and the development of a large lode of ore is in progress. Beside this a new ore body was found outcropping 300 ft. north of the Highland vein. From this, when stripped, a quantity of clean galena was broken off a small section of the vein, which ore was of a much higher grade than any hitherto found on the property. The outlook for the property, which is now under lease and bond to Messrs. P. Burns & Co., is promising.

Krao.—The first shipment of silver-lead ore from British Columbia to the United States was made years ago by Mr. A. D. Wheeler from the Krao mine. It resulted in the introduction of American capital into the country, and was the primary cause of the development which led up to the present advanced stage of the mining industry in West Kootenay.

Owing to market and other adverse conditions the Krao mine had been closed down for several years, until, in June, 1905, the owner, Mr. Wheeler, resumed work on the property. With an average of four men per day employed since June he has built 200 yd. of wagon road, and 200 yd. of rawhide trail (this without government aid), has erected a commodious bunk house, cook house, blacksmith shop and ore sorting shed. The mining since done has consisted of quarrying out of two glory holes, about 20 by 25 ft. deep; chambering out of ore at a depth of 30 ft. in the shaft, which is 145 ft. deep, to the extent of 30 by 12 ft. and 15 ft. high; stripping and surface cutting of the vein at another point 20 by 50 ft., and shipping since July 1, 817 tons of silver-lead ore.

United.—This property has been taken over by the

Canadian Metal Co., who have built a bunk house and cook house, put in hoisting machinery and a compressed air pipe line, and have been engaged in developing it.

General.—The Highlander shipped some ore to Nelson, but no particulars have been received. Among other Ainsworth properties known to have been working is the No. 1, but nothing has been learned of its operations. The same comment applies to several other Ainsworth claims.

Woodbury Creek.—The operations of the King Solomon's Mining Co. in 1905 consisted only of incidental development work at the head of Woodbury Creek, with encouraging results. It was mostly dead work, though, so of little public interest.

Blue Bell.—This well known mine—the first lode mine opened in the Kootenay—has been purchased by the Canadian Metal Co. Twenty men are now at work getting the property into shape for shipping ore. Ore bins have been erected, crushing machinery and a picking belt put in, bunk and cook houses erected, and a lot of preliminary work done. The intention is to ship ore from this property to the company's smelter at Pilot Bay.

South Fork of Kaslo Creek.—Similar lack of information exists in regard to this part of the Ainsworth division, the only property of which a few notes have been received being the Bismark, which worked but a small force of men. The owners, however, express themselves as being very well satisfied with the results of their season's work, which included about 100 ft. of development. The mine is reported to be in a promising condition; its shipments for the past season totalled about 100 tons of ore, which brought in satisfactory returns.

WHITEWATER.

Whitewater.—This property is under lease to Mr. S. S. Fowler. It is looking very well at present. Production totalled 755 tons, of which about 500 tons were shipped as crude ore and 200 tons were concentrated. Some 65 tons of concentrates were shipped. Not much development work was done—only 75 ft.

Whitewater Deep.—Messrs. Fowler and Retallack obtained a lease of this property quite lately. Previous to their taking hold of it no work was in progress on it.

Wellington.—Very little development was done, but 100 tons of zinc ore were shipped to the United States Zinc Co., at Pueblo, Colorado. The metal contents of this ore were: Zinc, 51 per cent; silver, 35 oz. per ton; lead, 3 per cent. The ore was nearly all taken from the old dumps.

Echo.—This is one of the groups in the district in which zinc ore of high grade is found side by side with galena. Development work was kept up, but no ore was shipped last season.

Jackson.—The Jackson mill having been remodelled and largely extended, so as to make a separate zinc, as well as lead, product, it was run during 1905 long enough to make about 1,200 tons of zinc concentrates. This requiring further treatment, by a zinc separator, arrangements were made to send it to the Kootenay Ore Co.'s works at Kaslo, where the installation of

a zinc separation plant was approaching completion. Meanwhile work at the Jackson mill was stopped. The Kootenay Ore Co.'s plant was afterwards completed, and the results of its work on the Jackson

the lead ore in the Jackson mine was not separately worked in 1905, the object being to get out zinc ore only until such time as production of that class of ore shall have been successfully established, about



Berry Creek Mining Co.—Mine Buildings on Thibert Creek.



Berry Creek Mining Co.'s Sawmill on Dease Lake.

zinc concentrates proved highly satisfactory. These concentrates are, therefore, now being treated at Kaslo. Early next spring the Jackson mill will be started up again to continue production. Although

250 tons of galena ore were produced while working with the zinc.

BEAR LAKE.

There are several small properties in this neigh-

bourhood that have made occasional carload shipments of ore of high grade, among them the Empress and Silver Glance. The Jo Jo, at the headwaters of the north fork of Carpenter Creek is another claim that appears to be in a similar dry ore belt, in which shoots of ore containing very high values are sometimes met with. The operations on these several properties are not extensive, but when a shoot of rich ore is encountered, high returns are obtained, which knowledge encourages the owners to endeavour to find such rich bunches.

LARDEAU DISTRICT.

PROGRESS in the Lardeau district, while in some instances satisfactory, has not on the whole come up to expectations entertained at the beginning of the year.

The geological and topographical examination of the north-east Lardeau upon which the Geological Survey Department of Canada entered two years ago, was not continued in 1905, political and other interested influences having interfered with the plan of work prepared by the director of the Survey and secured the transference of Mr. R. W. Brock and his colleague from the practically unknown field above mentioned to that of Rossland, of which much had already become known and which could better have waited for the particular attention of the officials of the Survey than could the Lardeau. And, too, as yet only a summary of the progress made in north-east Lardeau in this connection has been made public, the official responsible for the preparation of the promised more full report having, seemingly, put off its preparation indefinitely. Some particulars of individual mines in the several sections of the Lardeau are appended:

CAMBORNE, FISH RIVER.

In Camborne camp several properties have shown much improvement, these including the Eva, Mammoth, Beatrice and Silver Dollar. The Eva group, owned by the Eva Gold Mines, Ltd., and situated on Lexington Mountain, has been developed under the direction of Mr. A. H. Gracey, and the excellent results he has obtained are indicated in the notes on that property which follow. The Mammoth group on Goat Mountain, is a property, the development of which a Rossland syndicate commenced last year, when two tunnels were started and some 700 sacks of ore containing good values in silver and about 75 per cent lead were taken out. Since then a company has been organised and work has been prosecuted with a fair measure of success. The Beatrice has had more capital furnished and has entered upon an era of active development, which promises to prove the property one of much value. The Silver Dollar, owned by an Indiana organisation known as the Elwood Tinworkers Mining Co., has also made much preparation for permanent working.

Among other well-known properties, but which have not been so progressive, are the Oyster-Criterion group and the Goldfinch-Camborne group, the former owned by the Great Northern Mines, Ltd., and the

latter now in the hands of the Camborne Gold Mining Co., organised to take over the property from the Goldfinch Co., which was compelled to suspend work when, last year, its mine buildings, aerial tramway, etc., were destroyed by fire.

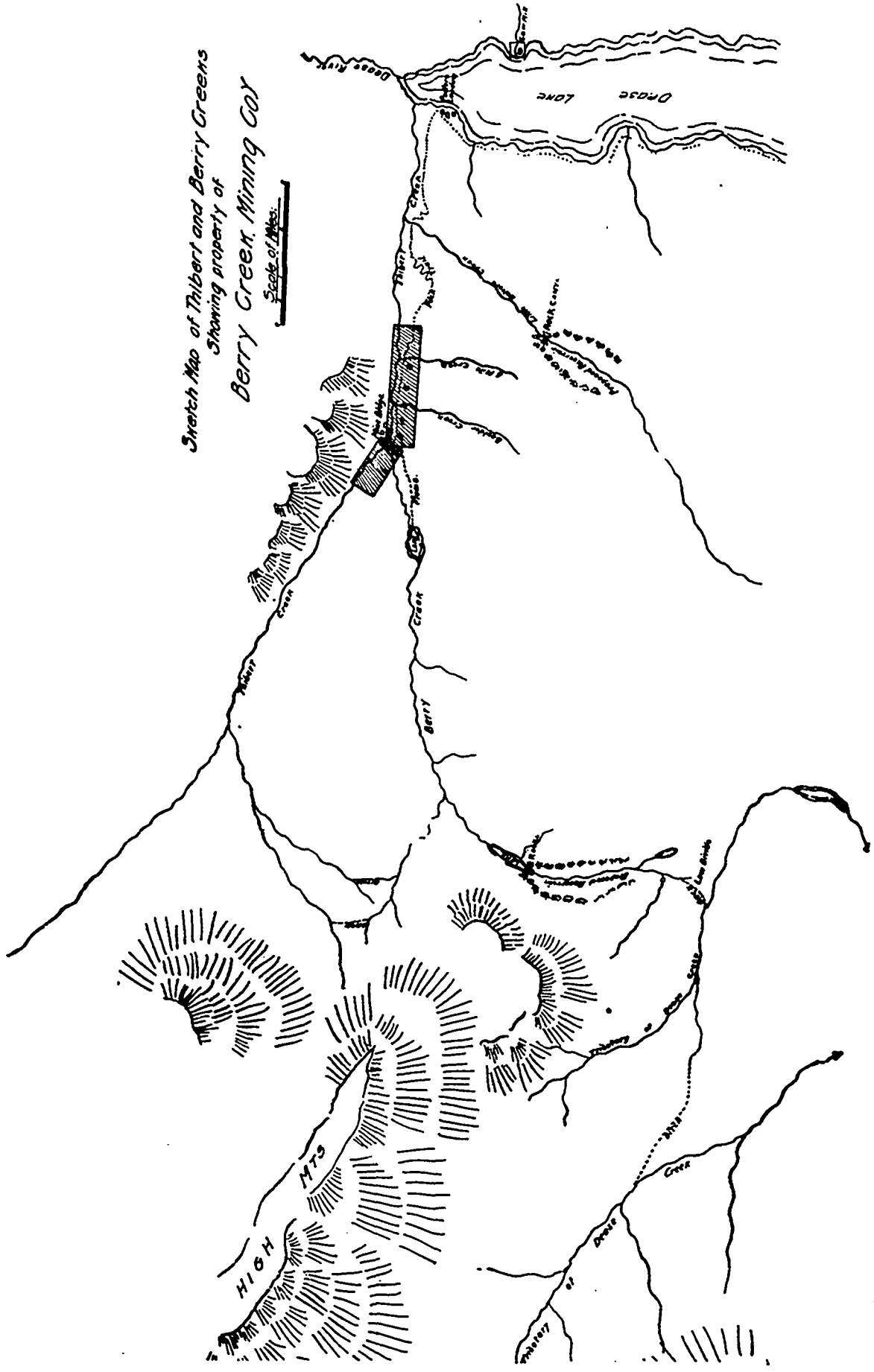
Eva Group.—Operations at the Eva mine proceeded uninterruptedly throughout the year, the damage caused by the forest fire in August, 1904, having been fully repaired by January 10, 1905. From 20 to 25 men have been regularly employed at mine and mill. More than 1,300 lin. ft. of development, consisting of drifts, cross-cuts, and raises, practically all in ore were driven. This work proved the existence and the average value of very large bodies of ore a considerable portion of which can be mined cheaply by the "glory hole" system. Production in 1905 was, approximately, 12,000 tons of ore, more than 25 per cent of which came from the development faces. Of this quantity 11,375 tons were milled at the company's 10-stamp mill at Camborne, and a recovery of gold valued at about \$50,000 was made. The gross average value of all ore mined and milled was a few cents more than \$5 per ton. The average costs per ton in connection with the year's work including development, were as under:

Mining and development	\$2.80
Tramming (by aerial tramway)15
Milling62
Maintenance, etc.06
Management, general expenses, office, etc.22
	<hr/>
	\$3.85

As these average costs have been practically on a 10-stamp basis and hand-drilling, it can readily be understood that with a large plant and power drills (not yet in use at the Eva) a considerable reduction could be made. It is estimated that on a 40-stamp basis the total cost could be kept well under \$2 per ton. This would be possible by reason of the favourable facilities possessed here, both for mining and milling, including free water power and gravitation for ore transportation, a vertical depth of 800 ft. being obtainable by tunneling from the present upper terminus of the aerial tramway, and a possible vertical depth of 1,800 ft. by a tunnel starting from the mill site and to be driven not to exceed 3,800 ft. to reach the ore bodies.

Mammoth.—This property is owned by the Edward Baillie Syndicate, Ltd., of Rossland. In his report submitted to the annual meeting of shareholders held at the end of November, the manager especially called attention to the large expenditure necessary in carrying on operations on the company's Goat Mountain property (which, it may be mentioned, is situated above timber line, and consequently in the region of deep snow for about half the year) under present conditions and without a tramway for transportation purposes. The report showed that the development work in progress was giving such satisfactory results as will probably justify the construction of a tramway in the near future. Buildings for housing the men and other mine buildings have been erected and all

Sketch Map of Thibert and Berry Greens
Showing property of
Berry Creek Mining Co.
Scale of Miles.



requisite supplies and equipment provided, and it was intended to continue development throughout the winter. Such encouraging results from the winter's work are looked for that the manager expressed the hope that the shareholders will next summer be asked to sanction the construction of the much-needed tramway and the enlargement of mining operations. The financial statement presented showed that the year's expenditure had totalled \$15,758 13, and that 58 shares had been sold at par, realising \$5,800, while proceeds of ore shipped had brought in \$4,594.47. The remaining 142 shares, comprising the balance of the authorised stock in the company, are held on treasury account. The second shipment of ore for the season was then in transit, and it was estimated that this would bring about \$1,500. On the Mammoth group there are several veins running into the mountain. With the object of finding the large ore body believed to occur here, a tunnel has been started farther round the hillside than that on the Crescent. It is proposed that the new tunnel shall be the main working adit on the property.

Beatrice.—Early in the year the Beatrice Mines, Ltd., made preparations for operating on a larger scale than last year, including further development and equipment and an increase in production. Last winter about 10 tons of high-grade galena ore were hauled down from the mine. Later a contract was let for driving a cross-cut a distance of about 250 ft., starting at a point some 300 ft. in from the portal of the tunnel. At 130 ft. in the cross-cut encountered a 5-ft. lead, which was described as one of the small leads of the property. By the end of November this cross-cut had been driven more than 300 ft., and it was then calculated that the lead would be met with about 50 ft. farther in. The shoot of ore being driven for was 150 ft. long and 4 or 5 ft. wide in the No. 1 or upper tunnel, and runs about \$75 per ton. It is intended when this ore body shall be entered to raise in it through to No. 1 tunnel, 150 ft. above. An aerial tramway 3,500 ft. in length has been constructed for the purpose of conveying lumber and supplies to the mine, which is above timber line. This tram consists of a single cable on which a carrier is hauled by horse-power.

Silver Dollar.—The Elwood Tinworkers Gold Mining Co., of Elwood, Indiana, is erecting a stamp mill for the Silver Dollar mine. The building is completed, and part of the machinery has been taken up, the rest being on the way. An air compressor has also been sent up and pipe for conveying air to the mine obtained. New cabins, blacksmith shop and shed for air receiver have been built. A cross-cut tunnel, driven some time since, reached the lead at about 240 ft. The ore body is large, the cross-cut having been driven in ore 35 ft. without reaching the foot-wall. The ore is quartz, with bunches of galena and iron pyrites occurring in it, and is of an estimated average value of \$5 per ton.

Goldfinch, Camborne Group.—This property has been acquired by the Camborne Mining Company, which is practically the Goldfinch Mining Company reorganised on an assessable basis. It is stated that

sufficient money has already been obtained from stock assessments to pay off the debts of the Goldfinch and to leave a balance in the treasury. The management hopes to shortly increase the amount in hand, so as to provide for resuming operations next spring. It will be necessary to first replace the mine buildings and aerial tramway that were destroyed by fire in 1904, after which underground development will be undertaken. It is believed that it will be possible to follow the example of the Eva, viz., to obtain by means of the company's small stamp mill sufficient returns to pay for development and prove the property, after which, if results shall warrant its being done, a larger mill can be put in.

Oyster-Criterion.—Very little work was done on the Oyster-Criterion group last season, but it is stated that the Great Northern Mines, Ltd., has announced its intention to raise funds early in 1906 to extensively develop the property in order to justify the addition of a larger number of stamps to the present 10-stamp mill, so that mining and milling may be carried on on a paying basis.

FERGUSON CAMP.

In Ferguson camp production was considerably less in 1905 than in several earlier years. While development at the Silver Cup, one of the mines owned by the Ferguson Mines, Ltd., a British organisation that, on the voluntary liquidation of those companies, acquired the property and assets of the Silver Cup Mines, Ltd., and the Great Western Mines, Ltd., were so important as to practically give the mine a new lease of life, the conditions in regard to the same company's Nettie L. mine are unpromising and consequently this mine has been unworked latterly. Development of the Triune was resumed as soon as communication with the mine, which is usually snowed up during several months of the year, was opened, but it is understood that results were not as satisfactory as were hoped for so far as the discovery of ore in quantity at the lowest level went. The company engaged in driving a long tunnel into Nettie L. Mountain at a low level, made good progress with this work, and it expects to cut several veins of ore before the intended full distance shall be driven.

Silver Cup and Nettie L.—The present policy of the Ferguson Mines, Ltd., which has appointed Mr. George Alexander, of Kaslo, general manager, is to carry out a scheme of development work on a large scale, including the running of a deep tunnel, 750 ft. below the Silver Cup upper workings, by means of which the property can be thoroughly exploited at depth. Some 2,000 ft. of this tunnel have already been driven, and a raise has been made through to the next level, between 300 and 400 ft. above. This work has been attended by satisfactory results, high-grade ore—running more than 200 oz. silver, 0.5 oz. gold, and a heavy percentage of lead—having been encountered in bodies apparently of large size throughout this development, which goes far to prove the permanency of the ore bodies at depth. The company plans to thoroughly and systematically develop this property, to which end a number of changes and

additions have been made, including the substitution of water power for steam for driving the compressor plant. The various Silver Cup workings are connected with the company's reduction plant at Five Mile by $5\frac{3}{4}$ miles of aerial tramway, and all necessary machinery is installed for the economical prosecution of work on a large scale. Meanwhile the shipment of ore has been stopped for a short time.

Other Properties.—Mention has already been made of the Triune and the Long Tunnel Co. No particulars of the work done on the former have been received. The latter installed an air compressor and vigorously prosecuted its long tunnel enterprise. The Broadview, one of the old Horne-Payne Company's properties, after having been idle for several years, lately passed into the possession of a Trout Lake syndicate, which put trail, buildings and mine workings in order, and by the end of the year had taken out and sacked ready for shipment about 100 tons of ore. The Surprise group, Baltimore, Mohican, Noble Five, Slinger group, Silver Plate, Bonanza and Linson View all had work done on them, and some took out ore for shipment to the smelter.

TROUT LAKE.

Information from this section is scant, numbers of applications for data as to the year's work and results not having met with a response.

Lucky Boy.—The best known property in the neighbourhood of Trout Lake is the Lucky Boy, owned by the Chestnut Hill Mining Co., of Philadelphia. Exploration has been continued, and there was production on a small scale.

Placer.—On Lardo Creek, near Trout Lake, the Spokane Falls Placer Co. put in about 1,000 ft. of flume. The only clean-up made prior to frost amounted to \$150 for two men, shoveling for two days.

POPLAR CREEK.

Thanks to the kindness of Mr. John Keen, of Kaslo, the MINING RECORD has received the following notes relative to Poplar camp:

The Great Northern Mines, Ltd., owning the Lucky Jack and Swede group, have at length settled their disputes in the courts and are in undisputed possession of the claims, which are now Crown-granted. The shareholders have decided to issue \$200,000 worth of debentures, half of which have been subscribed for, and in the spring the property will be opened up and thereafter operated continuously.

Little work has been done on the above-mentioned claims during the past twelve months, but earlier there had been done a large amount of open cutting, and two tunnels aggregating 240 ft. were driven, and they are now ready to supply a stamp mill with ore.

The owners of the Mother Lode, higher up Poplar Creek, have been busy driving two tunnels, and are now engaged in driving one lower down the hill, to tap the lead at greater depth, so as to facilitate stoping and cheapen the cost of production. This property is owned by the Laclede Mining Co., of Laclede, Idaho.

The Mother Lode No. 2 and three adjacent claims

just east of the Mother Lode have been bonded to an official of the C. P. R. and will be thoroughly examined during the coming spring.

The Spyglass had no work done on it during 1905, as the company owning it has been arranging for a wagon road to take in machinery. Meanwhile no more hand work will be done.

Marquis and Gilbert did about 140 ft. of cross-cutting and drifting on their Gold Park property in 1905. No ore was taken out except that encountered in cross-cutting the veins. Lack of funds prevented more development being done, but the owners are well satisfied with the results they have obtained thus far. The ore is free milling. In one tunnel, at a depth of 100 ft., a lead 20 ft. in width was cross-cut; it was well mineralised with arsenical iron, carrying gold values running \$6 to \$8 per ton.

The Hampton group has been worked during the year, two tunnels having been driven for a distance of 175 ft., and the ore, gold quartz, tapped in the old lower one. Work has been suspended for the winter.

The Lidie group, consisting of the Lidie, Golden Chest No. 2, ditto fraction, Independence, Nashville and Golden Cross, has had many open cuts put in, two tunnels driven and three miles of trail built, and good log cabin and blacksmith shop built. Gold quartz has been struck averaging from \$2.95 to \$9.35. Work has been suspended pending the erection of a small experimental mill to save the gold in the quartz now going over the dump.

During the year a large amount of assessment work has been done throughout the district, an unusual number of claims have been surveyed for Crown grants, and very few claims have been permitted to run out. Notwithstanding all the showings and the work done, no capital has found its way into the camp during the year. More than twice the amount of work was done during 1905 than there was during 1904, as it has been realised that ore at depth must be exposed before satisfactory sales can be made.

A special feature of this year has been the lower and more reasonable prices and terms asked by the prospectors for their claims, which will produce its proper effect in the near future.

On Rapid Creek the Schmidt & Rogers group has had considerable attention from its owners, and the tunnel has been extended for some distance. They now have about 600 ft. of work done on the quartz veins.

The Calumet and Hecla has had a shaft sunk 57 ft., and the vein has been cross-cut by two short tunnels on each side of the shaft. Free gold has been washed from the quartz, and the work was only stopped for want of a good pump to keep the workings clear of water. This is now being taken in hand, and it is to be hoped that this fine property will soon be working and have a mill to extract the gold.

On all these properties, although rich for milling, it has been found that the ores cannot be shipped at a profit, but must be treated on the ground, as indeed must all other free gold mines, and now that this is fully realised, good results from proper treatment may be expected in the near future.

PROGRESS OF MINING IN THE SIMILKAMEEN DISTRICT.

By Geo. E. Winkler.

IN describing the progress of mining in the Similkameen during the year 1905, it is probably well to take a glance back at the pioneer epoch now drawing to a close—for a transition period is at hand.

With the advent of railways—the Canadian Pacific Railway from the north and the Great Northern from the south—the real development of the district will begin. Many camps that have been visited only by a few prospectors in the summer season, for assessment purposes, will attract the capital necessary to demonstrate whether or not they contain mines of value. Doubtless there will be some disappointments (what mining district has not experienced them?), but on the whole the section is believed to be one that will rival, and probably surpass, the older mineral producing areas of the province.

The mining history of the Similkameen dates away back to the sixties, when the great Cariboo placer fields stimulated the early prospectors to explore all accessible portions of the province. The present generation knows little of those first gold hunters. They left no history beyond the excavations made with pick and shovel along the gravelly banks of the streams. Having worked out the richest pay streaks and pockets, they moved on to new fields, and, with the exception of a few hunters and trappers, not many white men invaded the district for a number of years thereafter.

In 1885 the Granite Creek strike was made and placer miners rushed in from all quarters. The old town of Granite Creek (now but a shadow of its former self) became in a very short time a city of 4,000 people, living mostly in tents. Saloons, dance halls, gambling houses, and all the usual concomitants of a new pioneer mining town, sprang up as it were in a night, and for a brief space of time flourished exceedingly.

Good diggings were found on a number of other creeks, which, like Granite Creek, were tributaries of the Tulameen River, and some fairly rich ground was also worked on the Tulameen itself. Granite Creek is reputed to have produced during this period more than \$250,000 worth of gold.

With the working out of the richer portions of the auriferous gravels of those streams on which it proved profitable to mine, the white population gradually left the district, and at present only a few Chinamen are engaged in placer mining there.

At the close of the second placer excitement, however, some interest began to be manifested in lode mining, owing, largely, to the development of Rossland, Stocan, and, later still, the Boundary district. The first important discovery was that of the Sunset, on Copper Mountain, which was found by a trapper named Jamieson and located by R. A. Brown, of Grand Forks, in 1894.

Not until a few years later did the people resident in the valley seem to realize the value of the mineral deposits in their neighbourhood. When they did there

was a rush for claims, and a number of the best properties on Copper and Kennedy Mountains were soon located.

Soon after this many prospectors came in from the Boundary and a number of other camps were discovered. In the northern portion of the district finds of copper glance and native copper were made in what was named Aspen Grove camp. In the Hope Mountains, near the head of the Tulameen River, promising veins of silver-lead ore were found, and in 1898 the rich Nickel Plate vein, in Hedley camp, was located.

A number of other camps have come into prominence since, namely: Olalla, Riordan, Dividend and Independence Mountain, in the Middle Similkameen; Rock River, Friday Creek, Wolf Creek, on the south fork of the Upper Similkameen; and Bear and Boulder Creeks, on the North Fork or Tulameen River.

Promising finds of free gold ore have also been made on Granite Creek, and some likely-looking showings of copper-gold ore are being opened on One-Mile Creek.

In addition to the veins and deposits of the precious metals that were found, a lively interest was awakened in the coal resources of the district, and many locations of coal lands were made in the Princeton basin, which contains more than 25 sq. miles underlaid with coal of a good steam quality. A smaller area of coal almost identical in quality with the coal of the Nicola Valley to the north, was found on Collins' Gulch, about 18 miles up the Tulameen River from Princeton.

No less than three diamond drills were at one time working in the vicinity of Princeton. More work has been done by the Vermilion Forks Mining & Development Co. in proving the size and character of the coal seams than by any other company in the district. In addition to sinking a number of drill holes to a depth of between 300 and 400 ft., that company has driven a tunnel into a large seam cropping on the southeast side of the Similkameen River, just opposite the Princeton townsite. From this tunnel considerable coal has been mined, and it has been used locally for domestic purposes. The company is now preparing to sink a shaft that will give it access to seams aggregating 28 ft. in width. Several drill holes have been sunk to a greater depth than any of those put down by the Vermilion Forks Co., the reason being that as the centre of the basin is approached the coal lies at a greater depth than at Princeton, which is near the southeastern rim. Companies owning land in some portions of the basin must sink hundreds of feet for the seams that on the Vermilion Forks Mining Co.'s ground are exposed at the surface. The affairs of this company have been well looked after for some years past by its resident manager, Mr. Ernest Waterman. The head office of the company is in London, England.

Little can be said regarding the Collins' Gulch coal measures beyond mention of the fact that the coal seams are large and the coal of coking quality. No work of any importance has been done on the ground there, which has been held for some years.

To return to lode mining—no very important developments have taken place during the past year in

Aspen Grove camp. The one company that has attempted to do anything in the way of serious work is composed of Terre Haute capitalists and known as the Portland Mining Co. They acquired the Portland group from Bates Bros. and Armstrong about three years ago and are reported to have exposed a large body of copper ore running in value between \$5 and \$6 to the ton. For some reason they have stopped work until a railway shall tap the camp, probably having found development under present conditions too expensive.

The Big Sioux and Copper Standard claims, on which rich shoots of copper glance have been developed slightly, are still in the hands of their original owners. The Cousin Jack, on Boulder Creek, has

of four shafts, each about 50 ft. deep, a short tunnel and a large number of open cuts. On the St. Lawrence claim there is a large low-grade ore body, averaging 8 ft. in width, composed of massive iron sulphides showing some yellow copper. The value of the ore in the bottom of the shaft is about \$10.00 per ton in gold, silver and copper.

On the St. George claim a rich shoot of ore has been opened up by two shafts each 50 ft. deep, which were sampled by Mr. Thos. Kiddie, now of the Crofton smelter, Vancouver Island, and found to contain copper 1.38 per cent, silver 20.83 oz., and gold 2.64 oz. per ton, or an average value of \$70, across a width of 4 ft. The vein filling is of calcite and quartz occurring in a schist formation in the neighborhood of



Valley of Tulameen River, Similkameen District.

been further developed this year by a cross-cut tunnel tapping the vein at a greater depth than any former workings. The vein is of white quartz, carrying iron pyrites in large quantities, and parts of it run high in gold. In addition to the high-grade ore, there is said to occur on the property a large body of ore averaging about \$6.00 per ton that can be easily mined and milled. The Cousin Jack group is owned by the Boulder Mining Co., with head office at Oshkosh, Wisconsin.

Probably none of the newer camps in the Similkameen are attracting more attention just now than Bear Creek, a tributary of the Tulameen River flowing in on the north side about 10 miles above Otter Flat. The first discovery in this camp was made in 1900, and is known as the St. Lawrence and St. George group. It is owned by Messrs. Armstrong & Law of Vancouver. The development work consists

large porphyry dykes with which the schist has been intruded. The high values appear to follow the silica in the vein.

There are adjoining this group several other claims which show good values in copper, viz., the Liverpool, Chicago, Morning Glory at one end, and the London, Frisco and Over at the north end.

During the past season a most important strike has been made on a group of claims at the head of Bear Creek, only two miles from the surveyed route of the Victoria, Vancouver & Eastern Railway, on Coldwater Creek. Locations have been made on a deposit of ore about 500 ft. wide, averaging 2 per cent copper and carrying small gold and silver values. The ore is in a porphyry contact with granite. A wagon road to be some 12 miles long has been started from the railway survey line at Otter Flat, to give access to Bear Creek camp. It will be completed next season,

when machinery for extensive development will be taken in.

Little outside of assessment work has been done this year on any of the silver-lead veins of Summit camp, in the Hope Mountain range. No doubt the development of the more accessible camps, which is certain to follow railway construction, will stimulate the owners of good prospects in this camp to try to bring their claims more prominently before the mining public. The Summit camp ores occur in an altered limestone. Some properties show high silver values.

At Granite Creek, between Otter Flat and Princeton, a number of small quartz veins, carrying free gold in association with pyrites, have been attracting some attention and quite a lot of work has been done on them. The veins occur in schist and the values are frequently found in the schist either on the foot or hanging wall of the vein. The largest quartz vein in the camp is probably that on the Rising Sun group, belonging to Princeton people. A tunnel on this property exposes 20 ft. of ore carrying values ranging from \$1 to \$20 a ton in gold.

These quartz veins on Granite Creek, which have lately been found to carry values, are probably the source of the placer gold obtained in the creek, the erosion of the schists freeing the gold in the quartz veins and stringers, which in places, though small, are numerous.

Large bodies of magnetite have recently been located near the head of Granite Creek, but it will likely be some years before much attention will be paid to them.

Up the south fork of the Similkameen, the most distant camp from Princeton is on Roche River, where Messrs. Pouwels and Bonnevier have been working for a number of years on a rich vein of copper ore occurring in a small schist belt near where the Roche and Pasayton Rivers join and form the Similkameen. During the past year they sank a shaft 50 ft., from the bottom of which they cross-cut 2 ft. of fine ore running about \$75 to the ton. The vein varies greatly in size, sometimes narrowing down to 6 in. and at other times opening out to more than 6 ft. Most of the work done on this property (the Red Star) has been in driving a tunnel on the strike of the vein. Owing to the soft nature of the surface ground the owners have had much trouble to prevent their workings from caving in.

Mr. J. B. Wood, owner of the Sailor Jack in this camp, has been sinking on a quartz vein between 2 and 3 ft. wide, carrying bornite and some free gold. Messrs. Pouwels and Bonnevier also find free gold associated with bornite in a claim they are prospecting.

About half way between Roche River and Princeton on the Kennedy Mountain side of the Similkameen River, the Columbia Copper Co., with head office at Conconully, Washington, is developing the Gladstone claim near the mouth of Friday creek. During the summer a cross-cut tunnel was run to tap the vein at a depth of more than 100 ft. The principal value is in copper, which occurs in the form of bornite. Some handsome samples running as high as 60 per cent copper are obtained from this property, but the average

of the ore would be about 6 per cent copper and \$5 in gold and silver. The vein is from 6 to 7 ft. wide. No other claim in this camp has had any work to speak of done on it during the past year.

In Combination camp, on the opposite side of the Similkameen, very little was done during the year now closing. Good ore showings have been uncovered both on the Johnson and Reco claims. On the Reco gold values running from \$28 to \$45 are obtained from a 4-ft. contact vein, while on the Johnson between 2 and 3 ft. of quartz heavily mineralised with chalcopryrite, which assays well in gold and silver, is exposed in the bottom of a shallow shaft.

On Kennedy Mountain there is little new to report. No work has been done on the Fraser group, Magnetic or Brooklyn, the claims having been crown-granted and allowed to lie idle. A little surface work has been done on the Red Buck, owned by Revelly and Allison, and on the Mogul, belonging to Willarson and Johnson, which would tend to prove that the same shoot of copper-gold ore runs through both claims. On the Red Buck this ore body is exposed on the steep face of a cliff fronting on the river and rising to a height of 1,000 ft. The vein or deposit is from 40 to 60 ft. wide, and in places the copper and iron sulphides are extremely massive. It is generally regarded as one of the most promising copper properties in the Upper Similkameen. Unlike Copper Mountain the principal ore showings on Kennedy Mountain are on the precipitous hillsides, breaking off sharply to the river and presenting excellent tunnel sites. Development work for this reason will be much less costly on Kennedy Mountain. A difference exists also in the character of some of the ores. The massive, fine-grained silicious rock of the Sunset deposit has its counterpart on only one claim on Kennedy Mountain. This matrix appears to be the one in which bornite predominates, the yellow sulphides of copper being more frequently found in the felspathic rocks. As a consequence Kennedy Mountain ores are practically all of the yellow copper variety, and in addition to the copper carry considerable iron in the form of pyrites or magnetite. It is a noticeable fact that where iron abounds in these ore bodies there is an appreciable increase in the gold values.

It was on Kennedy Mountain that in 1902 the discovery of platinum values in a copper ore occasioned much newspaper comment throughout the province. The claim was owned by McRae Bros. and known as the Hamilton. The shaft from which the specimens were taken that Baker & Co., the platinum refiners of Newark, N. J., reported to contain platinum in commercial quantities, was sunk on a vein that might be described as a porphyritic diorite, showing copper carbonates and magnetic iron. The samples from which the best platinum returns were received were formed through the action of water depositing in crevices along the walls the metals from the vein. The material was of a friable nature, largely composed of copper carbonates. The whole vein, 6 ft. in width, would no doubt carry a little platinum throughout. In fact, all the ores of Copper and Kennedy Mountains should

be carefully tested for platinum. While it is a metal that occurs rather sparingly in nature, and is extremely variable in its manner of occurrence (as regards quantity in ores) there is a possibility that in working large deposits of copper it may be found, as at the Sudbury nickel mines, to add something to the value of the ore. It can be separated from copper by the electrolytic process.

(To be continued.)

HUNTER V. MINE, YMIR DISTRICT, BRITISH COLUMBIA.

By James Ashworth.

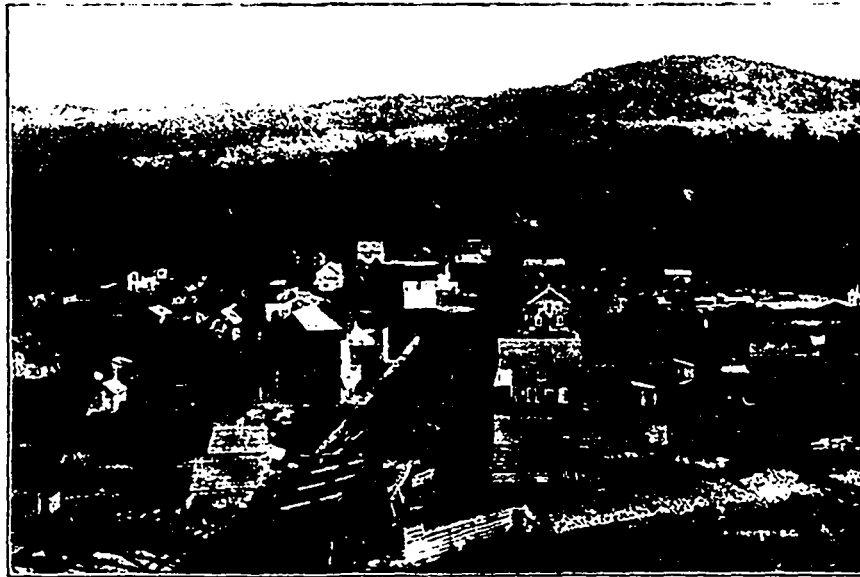
MR. JAMES ASHWORTH, an English engineer, after his return to England from a visit to British Columbia, prepared the following paper on the Hunter V. mine, which is situated near Ymir. This paper was read before the Manchester

On the main cableway, the top or fixed ropes, 1¼ in. in diameter, are in two lengths, the first being anchored at the top station, and tightened from time to time, as required, at a station about midway. At this station the bottom length is also anchored, and is tightened, as required, at the bottom terminal station.

On the Hunter V. cableway, the longest length between the supporting towers is about 1,800 ft., and the height above the ground is about 300 ft.

The haulage-rope, ¾ in. in diameter, is an endless rope. The buckets, of which there are 30, are placed at equi-distances apart. When the rope is running at the rate of 400 ft. per minute, 100 tons of ore can be easily transported and delivered into cars on the railway, in 10 hours, and this quantity can be increased by adding extra buckets.

Special cradles are used for carrying men and timber, two of these cradles being placed a short distance apart, so that the timber, in transit, is sup-



Princeton, Similkameen, as it appeared several years ago.

Geological and Mining Society and was afterwards printed in the *Transactions* of the Institution of Mining Engineers.

Aerial Cableway.—The Hunter V. and Double Standard claims, belonging to the British Columbia Standard Mining Company, Ltd., are located on the top of a mountain near Ymir, and may be reached either by aerial cableway, horseback or on foot. The writer, with three others, took the cableway, starting from the Nelson & Fort Sheppard railway.

This aerial cableway, being one of the most recently erected in British Columbia, may be safely assumed to exemplify some of the best points in this mode of transportation. The distance between the terminal stations of the main cableway is 13,000 ft., and there are in addition two supplementary cableways, 1,800 and 500 ft. long, respectively. All three are worked separately, entirely by gravity, and the speed is regulated by powerful brakes on the clip-wheels at the upper stations.

ported at both ends, and, therefore, rides practically horizontally.

Every movement in the loading and unloading of the buckets is, as far as possible, automatic; thus, starting from the bottom station, the catches which fasten the bucket in position when loaded, are opened by a fixed disengaging arrangement, and the bucket dumps its contents into the ore bin without a stop, and then, passing onwards round the return-wheel, continues its course back to the mine with the bucket in an inverted position. The object in running the bucket inverted is to prevent water or snow from filling it whilst in transit. On arrival at the top station the bucket strikes an inclined-plane arrangement, which forces the bucket into its proper position and allows the catches to close on to the hooks, and it is then ready for loading on the other side of the clip-wheel. Here a man, by means of three levers, regulates the loading and movements of the main cableway. In the intervals of time between the

buckets passing this point, the man opens the chute close at his left hand, and fills the automatic loader. On the arrival of a bucket a catch on the hanging frame of the bucket engages with a bar on the ladder and takes it in tow, and then the loader automatically discharges its contents into the bucket, while still in motion. The loader, after traversing a certain distance, disengages from the bucket, and is brought back to its original position, by a counterbalance-weight, ready for loading from the bin. The ore bin is filled by the supplementary cableway, and the buckets are dumped automatically.

The buckets at the top and bottom stations are run from the cable on to fixed edge-rails, which conduct them round the clip-wheel and the return-wheel. The return-wheel is mounted on a movable platform, by means of which, and a heavy counterbalance-weight, the haulage-rope is kept in tension. The flanged wheels are made in halves, so that the thread of the wheel, which is a separate part, and is fixed in position by molten lead, may be removed and replaced, without the expense of an entirely new wheel.

This mode of transportation can be applied for the cheap transit of ore and material over long distances, and for heavy outputs. Another aerial tramway, under erection, has a length of $3\frac{1}{2}$ miles, and a capacity of 800 tons per 10 hours; and another one, $4\frac{1}{2}$ miles long, demonstrates that long and continuous lengths can be worked by this system without its being necessary to place the ropes in one straight line. This mode of transportation being simple in its detail, the movement being as far as possible automatic, and the working power gravity, it is obvious that the cost per ton of material moved is very low.

When the writer travelled on this cableway, the time occupied in the transit to the mine, which is at an elevation of 5,500 ft. above sea-level, was about 50 minutes.

Hunter V. Mine.—The Hunter V. group of claims includes, within its boundaries, portions of a limestone-deposit, the extent of which has not yet been fully ascertained. Locally, it forms the upper portion of the mountains near the head of Porcupine Creek, in the Ymir district. The deposit is in the shape of a tongue, several miles in length, and on the company's claims is about 2,000 ft. wide. It is surrounded on three sides by a more or less altered gabbro of later origin, and belonging, it is thought, to the Carboniferous age. The gabbro cuts into the limestone in places, whilst in others the limestone appears to be entirely surrounded by igneous rocks, just as if portions had become detached from the main mass, and had floated off into the molten magna. No fossil remains have been discovered so as to establish definitely the age of the limestone.

Where least disturbed, the bedding planes strike in an east-and-west direction, and dip slightly to the south. In the process of mountain-building, the mass has, like many other parts of British Columbia, been subjected to great strains, with the result that in places it is faulted, folded and contorted into confusing shapes, and the original structure is almost entirely obscured. Fractures have also been formed, in

which the circulating waters have re-deposited the lime as pure calcite, and these occur in irregular bands throughout the mass, varying in thickness up to 6 or 8 ft. At some other period, silicious solutions appear to have been circulated throughout the formation, and silicia has been deposited in the free state, as also in combination with lime, magnesia, etc.

The most conspicuous minerals that have been found are tetrahedrite (grey copper), zinc-blende, galena, pyrites and native silver.

The origin of the mineralisation has not yet been determined, but it will no doubt be traced to the more recent eruptive rock surrounding it, and near the contact of which the largest mineralised areas have been discovered. It appears, however, as an impregnation in the limestone deposit, and no lines can at present be laid down to trace it to its source, because irregularity of occurrence, and indefiniteness of shape, appear to be its chief characteristics.

The mineralisation is more evident on the surface, in the bedding planes of the limestone, which the decomposition of the grey copper often colours green, whilst crystals of azurite are frequently seen scattered along these lines of enrichment.

Native silver, in leaves or plates, is more particularly met with on the faces of joint planes, and may have been reduced and deposited there through the agency of surface waters containing organic matter. Planes of fractures are common, some showing incipient movement and others none, but they appear to have an important bearing on the deposition of the ore, for in many cases it is found to be richer on one side of such planes than upon the other.

The opening of the mine has been principally confined to two areas, one on the Hunter V. claim, at the top of the hill, where the face of the quarry at present shows a width of over 70 ft. of ore; and the other on the Double Standard claim, 1,400 ft. distant, and vertically over 400 ft. lower down the hill, where the "glory hole" is more than 120 ft. wide, showing mineralisation from side to side. Other outcrops of mineral have also been discovered on various parts of the property, though not at present opened up.

This deposit of limestone is unique in the district, and until it is further explored, a more comprehensive study of the occurrence cannot be made.

When the quarries are more fully opened out, the ore will be delivered into railway-cars at a cost of \$1 or less per ton.

The ore, up to the time of the writer's visit, averaged about 13 per cent of silicia and 44 per cent of lime; at times the silicia had run as low as 9 per cent, and the lime had risen to 48 per cent: but experience had shown that an increase of silicia did not necessarily mean a proportionate fall in the percentage of lime. These figures show that this ore is a valuable flux to the smelters. The ordinary lime rock, which is used by the various smelters as a flux, when delivered at Nelson or Trail, costs about \$1.50 per ton, and at Northport 65 cents per ton; and such lime rock contains about 48 per cent of lime and 8 per cent of silicia.

In what form the gold and silver are combined has not yet been determined, excepting as far as the native

silver, and the silver contained in the grey copper, are concerned. The gold contents have proved to be relatively higher in the Double Standard than in the Hunter V. claim, and it is in the former that the most silicious material has been found.

WEST FORK OF KETTLE RIVER.

DURING 1905 more work was done in the mining camps of the west fork of Kettle River than in several earlier years, for the reason that the construction of the Midway-Vernon Railway was commenced, the route of this line being up the west fork and over the summit to Mission Creek.

Between Rock Creek and the confluence of the west fork with the main Kettle River are two camps—the Riverside and Crown Point. The former is about four miles above Rock Creek; development work has been proceeding in it on a small scale, and occasional shipments of ore made. Smelter returns have been



Small Stamp Mill.



Shaft and Hoist.
Horse.

Discovery of Carmi Lead on May Claim—First barrow-load of ore from tunnel driven from Carmi Creek.

At Carmi Mine, West Fork of Kettle River.

about \$40 per ton, with values in gold and silver. The ore taken out in driving the tunnels, so it is claimed by the owner, pays development expenses. Most of the claims in Crown Point camp are Crown-granted, so, being low-grade properties, little has been done on them of late years, nor will there be until the completion of the railway provides transportation facilities.

Up the main river, above the west fork, only the annual assessment work was done, except on the Silver Dollar and Mogul, which were further developed. Here, again, railway transportation is waited for. Most of the mineral claims in Silver Dollar camp are on the divide between the main river and the head of Beaver Creek, up which latter a branch from the Midway & Vernon line will, it is expected, eventually be constructed from Beaverdell, this being the only practicable railway route known to reach this section of the district.

In Boomerang camp, about 10 miles up the west fork from its mouth, the only development work, other than assessments, done during the year was on the Enterprise and S. M. claims. This is a gold-bearing camp and values are good.

About three miles farther up, on the west side of the stream, opposite Bull Creek, the Monte Carlo group has been worked. A shaft was sunk 50 ft. and drifts were run. The surface showings here are 5 to 10 ft. wide, and the ore carries good values in gold and copper. Thence up to Dry Creek there was little work done, but between Dry Creek and Curry Creek there was activity on several properties, principally on the Rambler, Sally group and Curry group.

The few men employed on the Rambler have been stoping ore, of which there has been sacked four carloads that is estimated to average at least \$150 per ton, silver values being high. When there is snow the ore is rawhided to the wagon road and shipped thence to the smelter. From the ore obtained from

the high-grade shoot returns are expected to pay for development and leave a margin of profit beside.

The Sally has had an average of 15 men at work the year through. Three miles of wagon road have been constructed from Beaverdell up the hillside to the camp, the grade being 10 per cent; and a two-story 32 by 32-ft. board and lodging house, and a 15 by 20-ft. kitchen have been built. The year's development work has included a drift 620 lin. ft. on No. 1 lead, one 75 ft. on No. 2 lead, and one 64 ft. on No. 3. Returns from the nine carloads of ore shipped have met the expenditures, even after paying \$16 per ton hauling charges from the mine to the railway at Midway. This was sorted ore, the second and third-class grade ore having been stored for concentration later. The Vancouver Development Co., which owns this group, has a water power at the foot of the hill sufficient to operate a mill whenever one shall be put in. A number of slips and jogs and crushes met with in the long tunnel have caused the

superintendent, Mr. Clement Vacher, much difficulty in carrying on development work, but as the next level will be in solid formation, the stoping will not be so expensive. Driving south to catch the vein in solid ground is in progress; this will pass the big slip and be away from the ground that has been so difficult to work. Notwithstanding the obstacles thus far met with, the management is encouraged by the results achieved, and is confident that the mine will pay its way and eventually provide sufficient funds for power equipment, and thereafter yield the shareholders dividends.

On the Curry group of five claims, last summer a tunnel was driven 100 ft. on a vein carrying gold values up to \$24 per ton in an iron gangue. Work was also done on the Atlantic Cable and Comstock claims. There was, as well, a little development on several claims on Cranberry Creek, on the west side of the west fork.

In Carmi camp very little was done at the Carmi, which in 1902 shipped 885 tons of ore that averaged between \$30 and \$40 per ton. The small experimental stamp mill was not operated after last spring, but it is stated that a larger mill will be installed next spring and the mine be again worked.

Mr. Philip B. S. Stanhope and associates believe they have met with the Carmi lead in a cross-cut they ran on the May claim near the Butcher Boy boundary. The character of the ore they extracted from their tunnel left them no doubt as to their having struck the true lead, which has faulted on the Butcher Boy, after passing out of the Carmi, and which had not previously been traced beyond the fault. This discovery is regarded as likely to be of much importance to Carmi camp.

From Carmi camp north much prospecting has been done in places up the creeks the Midway & Vernon Railway route follows to the summit of the divide between the west fork and Mission Creek, the latter being on the Okanagan slope of the divide. Many claims that had been allowed to lapse have been re-staked, and on some of these magnetic iron veins carrying a little copper and gold have been found. The final location of the line of railway and the construction of the road is being looked forward to with eagerness, the feeling being general that after the west fork shall have been provided with suitable transportation facilities it will become a productive section in some instances of high-grade ore that will yield good profits above the cost of mining, freight and treatment.

Of the seven principal gold-producing countries of the world, four of them showed increased production in 1904, compared with 1903, and three, decreased production. The latter are, Canada, Russia, and Australia. The total production of the seven in 1904, was \$307,480,514, compared with a total production for the seven in 1903, of \$285,430,597. The production of other countries in 1904, was \$34,065,500, compared with \$32,416,485 in 1903.

SMELTING WORKS OF BRITISH COLUMBIA.

BESIDE the smelting works, concerning which information was published in last month's issue of the MINING RECORD, there are the Sullivan Group Co.'s smelter, at Marysville, East Kootenay; the Canadian Smelting Works, at Trail, West Kootenay; the Tyee Co.'s smelter, at Ladysmith, Vancouver Island, and the Britannia Smelting Co.'s smelter, at Crofton, also on Vancouver Island.

SULLIVAN GROUP CO.'S SMELTER, MARYSVILLE.

The company owning the lead smelter at Marysville, East Kootenay, has been found non-communicative relative to its work and matters connected therewith. The following brief particulars will, however, show in a general way the nature of the plant that has been installed at Marysville and the method of operating it.

At these works there is a conveniently arranged crushing plant and sampling mill. The crusher and three sets of rolls are connected with a conveying belt, which passes the crushed ore and limestone to storage bins. These materials are taken out of the bins, weighed and dumped on a belt which elevates them over the top of two circular mechanical roasters with revolving beds, the ploughs being stationary, each roaster having a capacity of 50 tons per day. The product from these is elevated in cars and dumped into bins above the Huntington-Heberlein converting pots, of which there are 10, each 9 ft. in diameter, and subjected to an air blast entering the bottom of each converter. At the end of 10 to 12 hours the almost total elimination of sulphur has been effected, and the pots or converters are inverted by mechanical means, and the contents shot out in a porous, cinder-like mass, which, falling a distance of about 12 ft. on a conical iron block on the floor below, breaks up. After having been further reduced by hand breaking with hammers to a size suitable for the blast furnace, this converted product is shoveled into cars and elevated by means of a chain car-push to the blast furnace feed floor. There are two blast furnaces, 7 by 14 ft. outside dimensions and 40 by 138 in. inside of jackets at the bosh. Each has a capacity of about 150 tons per diem, but only one is operated at a time. The converter product being simply slag and lead bullion, the burning out of the sulphur by this Huntington-Heberlein process being practically complete, no matte is produced from the blast furnaces. It is stated that the ore from the Sullivan Group mines, which supply this smelter, would be an extremely difficult one to treat by ordinary blast methods and that, consequently, there would probably be little or no margin of profit left if it were so treated.

The sampling plant and building first put in have been completely remodelled, also the ore bins. The calciner shed is a building 72 ft. wide by 240 ft. long with 18 ft. posts, and covered with corrugated iron. The calciners have a 60-ft. bed, and are connected with a common flue, run underground to an iron stack 8 ft. in diameter and 150 ft. high, set on a concrete base 12 ft. above the ground. The dust cham-

ber flues from the blast furnaces also connect with this stack by an opening on the opposite side of the base. These dust-collecting flues are novel in construction and form, consisting of two walls of concrete 24 in. thick by 5 ft. high, placed 11 ft. 6 in. apart. Springing from these walls is an arch in the form of a catenary curve with a rise of 8 ft., built of 8-in. red brick laid in mortar. The arch is built in sections of 18 ft., with a space of 4 in. between each to allow for expansion, this space being covered by an extra ring of red brick, laid on top, and overlapping the ends of the sections of the arch.

Power for the works is derived from three Pelton wheels, placed below the smelter. The water is brought from Mark Creek in a 4 by 4 ft. 6 in. flume, and gives a head of about 175 ft. From the wheels power is transmitted to the smelter by three direct steel rope-drives.

CANADIAN SMELTING WORKS, TRAIL.

At Trail perhaps more than at most smelting points in British Columbia, there are unmistakable evidences of the confidence felt by leading smelting managers in the future of the smelting industry in the province. Here there are many improvements either completed lately or in progress throughout the works.

A new railway track scale has been put in; a 100-ton Fairbanks scale, and, notwithstanding its large size, so adjusted as to weigh within 15 lb.

A large trestle, 28 ft. high and 600 ft. long, is nearing completion. This is for the storage of coke and limestone, which will be discharged as required from the yard under the trestle directly into trains of cars running in a tunnel underneath and hauled by electric locomotives. There are in use here three Westinghouse electric locomotives and one Jeffrey. Each weighs about three tons and is equal to 700 lb. draw bar pull.

In the blast furnace department a fourth copper furnace, the same size as those previously put in, viz., 42 by 180 in., has been installed. A much larger furnace is being made for the works, its size being 42 by 270 in. The castings for this furnace, which will be erected in about three months, are being made at Nelson. There are now only two lead furnaces standing, leaving two in reserve, not erected.

A large Roots' high-pressure blower is being put in. This has a capacity of 130 cu. ft. per minute, and though it will ordinarily be run at a pressure of 40 oz., is capable of standing up to 48 oz. It will be belt-driven from a 200-kw. induction motor, which is also being installed. The impellers of this blower, are shorter than those of smaller blowers, but their diameter is greater. The gears are extra large and the shaft is also of a much bigger size than usual, thus avoiding "springing" when operating at high pressure.

In the lead smelting department the Huntington-Heberlein process is being installed, this process being considered most suitable for the great variety of ores usually handled here. This addition to the plant will shortly be ready for operation.

The plant in the lead refinery has been increased from 20 tons to 50 tons capacity, and materials are

being received for adding 10 tons more. In the tank room the number of electrolytic tanks is being increased to 220, and the first and second lots of tanks put in are being replaced by others of improved construction. The tank room building is to be lengthened 40 ft. Travelling electric hoists, run on I beams, are to be used in the enlarged tank room in place of chains and blocks as at present employed. The melting plant has been added to, a 50-ton kettle having been installed for melting pig lead. The two 30-ton kettles that were put in some time since are now both used for melting bullion and making anodes. The extension of the plant requiring that a larger electric generator be put in, the management propose to install a 400 kw. machine.

As the lead received here contains considerable antimony, experiments have been carried on in connection with the electrolytic deposition of this mineral, which heretofore has been thrown away. These have been on a scale sufficiently large to demonstrate the success of the process, and it is probable that arrangements will be made to enlarge the operations to a degree that will provide for the saving of the antimony on a commercial scale.

Another advance is being made, in this instance towards the manufacture of hydro-fluosilicic acid, the requisite supply of which has hitherto been obtained from Pittsburg, Pennsylvania. The plant for this purpose is being put in and it is expected it will be in operation a few weeks hence.

Still another improvement has been effected—a machine has been devised for the purpose of making cathodes or starting sheets used in connection with the electrolytic depositing of the lead. Formerly these sheets were obtained by the deposition of the lead on iron plates or sheets; now they can be made very rapidly and cleanly by the machine. The apparatus is the invention of the superintendent of the refinery, Mr. John F. Miller, who has applied for patents for it.

Water supply has been receiving attention, in which connection a new system has been put in. Seven miles of 18-in. and one mile of 6-in. wood stave pipe have been laid. Stoney, Murphy, Rock and Trail creeks are levied upon to contribute to the water supply for the works, and the quantity available is ample for all ordinary requirements. A second fire pump has been obtained, this one being placed near the lead refinery. It is a Worthington centrifugal pump, with a capacity of 700 gal. per minute.

Each year sees the Canadian Smelting Works more self-contained than its immediate predecessor. There is still another necessary addition to be made, though, viz., the putting in of copper converters. This will, no doubt, be done when the available supply of copper ore shall be regular and large enough to justify the expenditure that would be involved. Meanwhile the copper matte from these works is sent to Tacoma, Washington, for converting.

The size and growing importance of the Canadian Smelting Works can hardly be realised, except by occasional visits to the works and the obtainment of information relative to their operations and products.

Some idea of their production of metals will be conveyed by the following figures for the year just closed. The total tonnage of ore received was 227,000 tons, 192,000 of which was from Rossland, while from other sections the receipts were about 20,000 tons of copper ores and 15,000 tons of lead and dry ores. From these ores there were produced 82,000 oz. gold, 1,360,000 oz. silver, 13,280,000 lb. lead, and 4,529,000 lb. copper. Part of the metals was refined at the company's refinery at Trail, together with bullion from the Hall Mining & Smelting Co.'s smelter, at Nelson. The refined product consisted of 9,200 oz. gold, 1,088,000 oz. silver, and 16,393,000 lb. lead.

It is known in a general way that the Trail product of refined gold is sold in the United States, refined silver and lead are shipped to China and Japan, pig lead is sent to the lately established lead corroding works in Montreal, metallic copper finds a market in the United States, sulphate of copper or bluestone is all sent to the Northwest Territories or Manitoba, where it is used for pickling seed wheat; and sheet lead, lead pipe, and other manufactured products are sold in different parts of Canada, wherever opportunity for business offers.

LE ROI MINING CO.'S SMELTER AT NORTHPORT, WASHINGTON.

Although the Le Roi Mining Co.'s smelting works are situated a few miles south of the International boundary line, at Northport, Washington (distant 18 miles from the Le Roi mine at Rossland), they are for all practical purposes British Columbia works, the great bulk of the ore treated at them having been received from Rossland mines. They were closed down last October, after an arrangement had been made by the directors in London to ship Le Roi ore to the Canadian Smelting Works, Trail, instead of continuing to send it to Northport. Whether the new directors, recently elected in place of those whose policy in this connection was disapproved by a majority of the stockholders, will resume operations at Northport remains to be seen. A decision will probably be dependent upon the legality or otherwise of the contract with the Trail smelter—a contingency unlikely to be found favourable to Northport.

During the late controversy over amalgamation proposals, the question of smelting costs at Le Roi and Northport, respectively, was freely discussed. At the annual general meeting of stockholders held in London on December 8, Mr. A. J. McMillan quoted from a late report to the directors of Mr. A. I. Goodell, the company's smelter manager, as follows: "The smelter closed down October 16. Our September costs were very close to \$3, after getting our credits for silica smelting. Third furnace would mean \$2.75; four furnaces, \$2.60. I am fully satisfied the past six months we have smelted ore cheaper than what Trail are offering."

TYEE COPPER CO.'S SMELTER AT LADYSMITH, VANCOUVER ISLAND.

The Tye Copper Co.'s smelter at Ladysmith, Vancouver Island, which was designed and erected by

Mr. Thos. Kiddie, who was in charge of it until last August, when he accepted the management of the Crofton smelter, has attracted the particular notice of a number of metallurgists for several reasons. First, it was built to treat an ore of a refractory nature (averaging about 38 per cent barium and 7 per cent zinc); next its practice in the roast yard is unusual in connection with the building up of the ore piles and the roasting of ore fines in bricks; and again it is using a hot blast system invented by Mr. Kiddie and proving successful under conditions ensuring greater economy and effectiveness in the treatment of ore.

Early in the year the sampling mill, the erection and equipment of which was well forward at the close of 1904, was completed and put into operation. The machinery installed included a No. 4 Gates' gyratory crusher, Snyder automatic sampler, and a 50-h.p. slide-valve engine, steam for which last is obtained from a second 80-h.p. boiler provided for this purpose. An additional ore bin, for custom ores, was built in such a position as to admit of delivery of ores direct from the bin to the crusher.

The hot blast system was first tried as an experiment with one tuyere, and with such good results that it was installed on a scale equal to the full capacity of the 250-ton blast furnace in use here. It is based upon the principle of long travel of the air at comparatively low temperature, as against the short travel at high temperature in the ordinary hot-blast system, the waste heat of the blast furnace being utilised in heating the air blast.

Upon Mr. Kiddie's retirement Mr. W. J. Watson, who had been his assistant, was appointed smelter manager.

BRITANNIA SMELTING CO.'S SMELTER AT CROFTON, VANCOUVER ISLAND.

During the first half of 1905 the Northwestern Smelting & Refining Co.'s smelting works, situated at Crofton, Osborne Bay, Vancouver Island, were purchased by leading stockholders in the Britannia Copper Syndicate, who organised the Britannia Smelting Co., Ltd., and later appointed Mr. Thos. Kiddie general manager of their smelting business.

Alterations and additions to the works were in progress throughout the autumn and early part of the winter, and preparation was made to start smelting in January, with Britannia ore and concentrate as a main supply, to be supplemented by whatever custom ores should be obtainable. The chief additions were a modern brick-making plant to make into bricks of the size of ordinary building bricks the ore fines, concentrates, etc.; enlargement of the power house; erection of new bins for the concentrates, etc. A general overhaul of the whole plant was made and the works put into condition for an uninterrupted run of the furnaces so long as ore should be available for the purpose.

It is understood that a hot-blast system, similar to that at Ladysmith, will be put in here as soon as practicable.

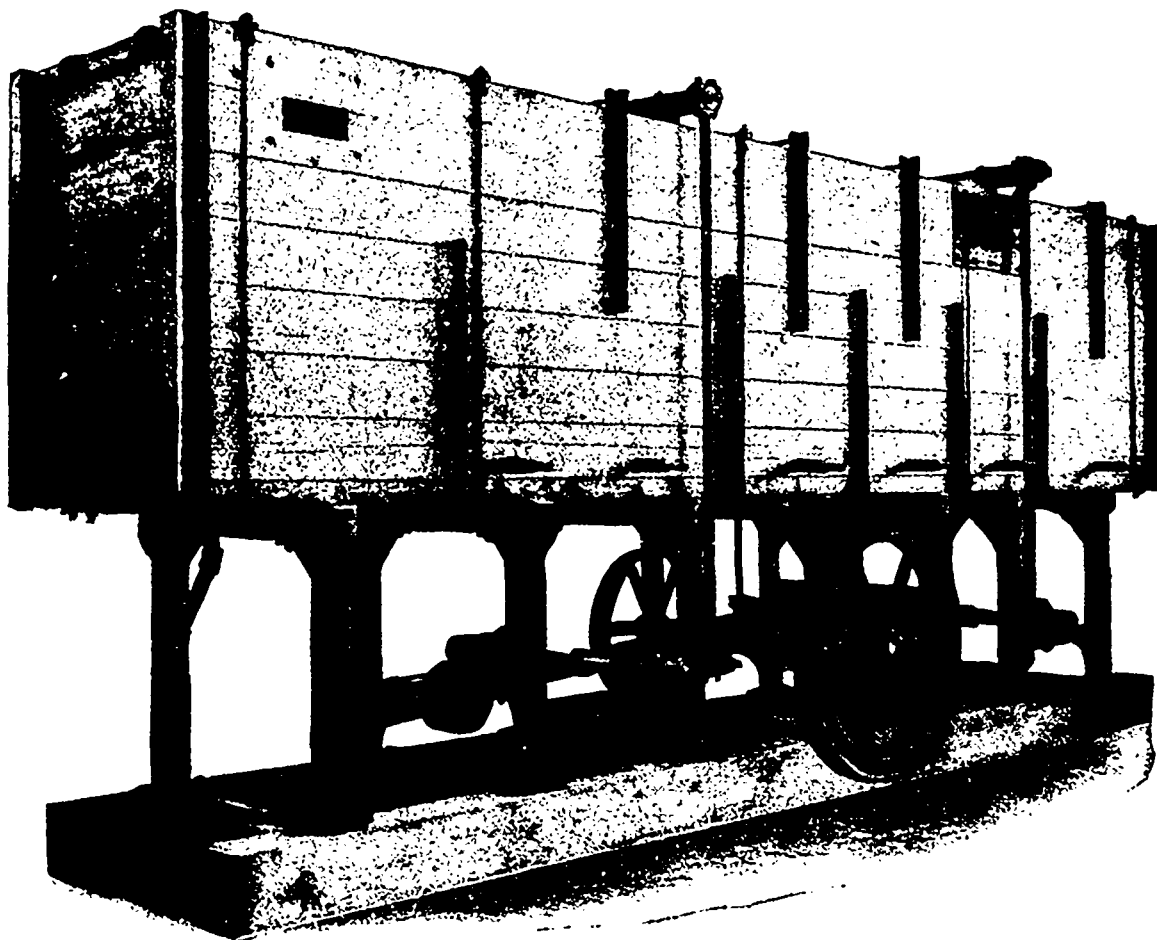
THE HANCOCK JIG.

CONCENTRATION of the mineral contents of ores has, during the two or three years past, been receiving more and more attention in British Columbia with results that, in some cases, have proved the suitability of the plant used for saving the values contained in ores, and that at a cost admitting of treatment at a profit of material that, without concentration, would be of little or no commercial value to the mine owner. Among the machines recently introduced the Hancock jig is especially noticeable, its practical value having been unmistakably demonstrated. Reference was made to this ma-

chalcopryite and bornite ores. Their treatment at a profit was, however, accomplished by means of the Hancock jig.

When Capt. Hancock assumed control of the Wallaroo copper mines, which are situated within eight miles of the Moonta mines, and were managed conjointly with the latter, he found great heaps of low-grade ore on the surface. This ore was considered too refractory for any method of water concentration. He at once installed his jigs and converted these so-called waste heaps into a valuable asset.

When the oxidized ores of the silver and lead mines at Broken Hill, New South Wales, were becoming exhausted, the mine owners saw that it was



The Hancock Jig—A machine of Australian invention that is superseding old style Jigs and Vanners.

chine in the description of the concentration plant of the Britannia Copper Syndicate at Howe Sound, British Columbia, published in the November number of the *MINING RECORD*. The following brief particulars of this jig and its capabilities are now printed as likely to be of interest to many connected with mining in this province:

This machine is of Australian origin and was invented by Capt. H. R. Hancock, then general manager of the Moonta copper mines in South Australia.

Up to the time of its invention, the mines in that district were not profitably dealing with their low grade

imperative to deal with the enormous bodies of low-grade ore, silver-lead and zinc blende, etc., for which no method of profitable treatment had hitherto been discovered. Capt. Hancock was induced to erect a small experimental plant at the Wallaroo mines to try to solve the problem, and this was so successful that his jigs were immediately introduced in the Broken Hill district, and the profitable treatment of these refractory ores was assured from that time onward.

The machine is, therefore, not untried, and, in addition to the results obtained in Australia, the success attending its operation in British Columbia and the

United States where it has been installed render its introduction a matter of great interest to the mining public.

The facts regarding its production, water saving, etc., as brought out in this notice, are based primarily upon the performance of the first jig installed in the mill of the Arizona Copper Co. and confirmed by working tests made at other plants.

Brief Description.—The Hancock jig consists of a box made of 4-in. lumber, properly braced with angles and rods, as shown in the accompanying illustration. This box is approximately 25 ft. long by 4 ft. 2 in. wide by 5 ft. 9 in. high, and forms the hutch of the jig. It is supported by cast iron legs, in order to raise the body of the jig sufficiently for the operating mechanism. This makes the height of the jig nearly 10 ft. However, it is customary to put the foundation of the jig underneath the operating floor of a mill so as to bring the bottom of the hutch box about a level with the operating floor.

In this hutch box, and submerged in the water, works the screen frame, or sieve of the jig. This sieve is 20 ft. long by 2 ft. 8 in. wide, and divided into a series of pockets extending across the screen. These pockets are intended to maintain and hold a ragging, or bed, through which the concentrates are drawn into the hutch. This screen, or sieve, is carried on two cast steel cross bars securely fastened to the screen. The cross bars are supported by four upright arms, two on each side. These arms or rods are connected at the bottom to rocking arm shafts, the latter being connected to levers the ends of which engage a three-way cam on the main driving shaft of the jig. This main shaft revolves at 60 to 65 r.p.m., and the result of this motion is a reciprocatory movement imparted to the sieve, which can be described as an upward and forward movement and downward and backward movement. The upward and forward movement is produced by the rocking arms, the downward movement of the sieve is produced by gravity, and the "bump" or backward movement is produced by the radial bar, which is connected to the end of one cross arm, as shown in the illustration. The up and down motion is about 3-8 in.; the backward motion, or the "bump," is only sufficient to advance the feed properly along the screen. Both the amount of the up and down motion and the "bump" are controlled by proper adjustment, so that this movement can be regulated to suit different kinds of ores. The number of reciprocations of the screen is 180 to 195 per minute.

Characteristic Features.—Some of the special features of this machine are as follows:

1st—A very large production. The ability of the jig to handle a large production is due to the fact that the feed is carried along the screen by what is practically a reciprocating motion, and not by a current of water; another reason for the large production is the size of the machine and sieve.

2nd—It has a marked ability to handle an unsized feed. The jig is now operating in the United States on coarse material which averages from 1/2 in. down

to 3 mm., and from 3 mm. to 40 mesh material. In one case the jig is doing coarse work, and in the other, fine work.

3rd—The small amount of water required in the jiggling operation. This is at least 50 per cent less than in the plunger jig.

4th—The jig will handle 100 tons per day as well as 500 to 600 tons.

The Hancock jig is, therefore, just as well suited for a small concentrating plant, say 100 tons in 24 hours, as for installation in larger sized mills. The reciprocating motion of the sieve can be so regulated as to carry forward properly a pulp of 100 tons per day as well as the larger quantities mentioned. The use of this jig simplifies to a very large extent the construction, size and usual complications in laying out a concentrating mill. The Hancock jig will do away with all trommel screens, except an over-size screen, and simplify the arrangement of launders and transmission of power. It is also evident that the jig should obtain in mill practice better results from the use of one machine in place of a number of machines, as closer attention can be given to the work of one machine than where it requires a dozen or more machines to do the same work.

All concentrates are made in the hutch, although it can be arranged to take off a clean concentrate from the top of the screen, if this be necessary.

In operation, the fine material in the feed is taken down through the screen into the hutch at once. The finest mesh screen that the jig uses is over the first hutch compartment. The coarser part of the feed forms a ragging, or bed, for this fine concentrate. The next hutch compartment receives the medium sized concentrate, and the third hutch compartment the coarse concentrate. In the last part of the jig, commencing where the coarse concentrate comes down, the screen consists of plates punched 1/8 in. larger than the largest size material the jig is handling. In this section of the jig an artificial ragging, such as round iron punchings, hematite or other heavy material, of a satisfactory size, is used as a bed. At this point the jig is a classifier as well as a jiggling machine. Each hutch is provided with its own independent water supply, so that its action can be regulated as to the kind of material which is taken down into the hutch, and also as to the cleanness of the concentrate. This only applies to the coarse concentrate compartment. The close bed over the fine concentrate compartments prevents any sand from going down there.

In the first section of the jig the action of the hydraulic classification carries along the fine sands, while the coarse concentrate is being taken down into the hutch. This is an important feature of the jig, as must be apparent to any one familiar with jiggling practice. The last two hutches are usually used for middlings, as practically all the free material contents of a feed are stratified and taken down into the hutch in the first three compartments. The hutch compartments can be changed as to their dimensions, in order to suit different requirements, by

moving the cleats which hold the hutch divisions.

Economies Effected.—In writing of a second jig, more recently installed, the Arizona Copper Co. states as follows:

"We have had a jig in operating for three months on ore which is ground in Huntington mills to pass through 4 mm. screens. This jig treats on an average 675 tons per day very satisfactorily and uses 283 gal. of water per min. This amount of water is greatly in excess of the amount required; but, as we have an unlimited quantity of water, we do not attempt any close saving.

"This Hancock jig has taken the place of 36 Frue vanners. The concentrates made by the Hancock jig were of a better grade than those made by the vanners, but the tailings from the vanners were cleaner by a small fraction. This, however, may be accounted for by the fact that the ore going on to the vanners passed through a 3 mm. screen in place of a 4 mm. with jig. This increased quantity of copper in tails has not affected our tails as they left the mill, as we have always retreated them on vanners in a separate mill, and the tails from this final treatment are just as clean now as formerly.

"The size of the second jig is the same as the jig used to take the product of the rolls, but is operated at a slightly higher speed.

"We have found the jig to be a great success on account of its large capacity, small floor space, simplicity of construction and saving of labour.

"The use of this type of jig greatly decreases the cost of construction of a mill."

In a mill where one of these jigs was recently installed the feed that was formerly sent to 24 jigs, requiring 25 h.p. to operate, was delivered to the Hancock jig, which required only 5 h.p. as taken from exact instrument measure.

The great saving in power alone, without considering the saving in water, and in repairs, will strongly commend this machine for concentrating work.

FRANKLIN CAMP, NORTH FORK OF KETTLE RIVER.

FRANKLIN CAMP is situated about 45 miles north of the town of Grand Forks, on the east branch of the north fork of Kettle River. The district is locally subdivided into three camps, viz., McKinley, Banner, and Mineral Hill.

MCKINLEY CAMP.

The principal claims on McKinley Mountain are the McKinley, Ajax, Jumbo, I.X.L., Manhattan, and Gold King. Much surface stripping has been done on these claims and on each there exist indications of the occurrence of large and permanent ore bodies, but there has as yet been comparatively little development to prove the extent of ore occurring here.

The McKinley claim is the only one on the mountain that has been even partially developed. Surface croppings make it appear that there are several parallel ledges. The largest has been tapped by a tunnel 220 ft. long, and at a depth of 175 ft. the

ore is of good grade and carries a high percentage of iron. At 110 ft. in from the portal of this tunnel a cross-cut was run 115 ft. to the right; at 45 ft. it encountered good ore and continued in it for 70 ft., while shoots of high grade ore are known to be ahead. Numerous test pits and open cuts show this deposit to have a surface width of at least 300 ft. The average values the ore carries are stated as running 3 per cent copper and \$1.50 gold and silver.

Two ledges have been encountered east of the main deposit, at 300 and 500 ft. respectively. On only one of these has work been done to any extent. Open cuts were made at intervals of 50 ft. along a distance of 250 ft., and a prospect tunnel was driven 30 ft. on the ledge. The ore seems to have a width of 20 ft., with values running up to 10 per cent copper, 10 oz. silver, and \$1.00 gold per ton. The ore in the third ledge is of a similar grade.

The McKinley property is under bond for \$200,000. It will be prospected by diamond drills next spring. There are sufficient timber and water on this group for mining purposes. A depth of about 1,000 ft. can be gained by tunneling some 1,500 ft.

A prospect shaft has been sunk in a promising surface showing on the I.X.L. claim, situate about one mile west of the McKinley. Other properties on McKinley Mountain give promise of opening up with development as satisfactorily as the McKinley.

BANNER CAMP.

On Banner Mountain there are some exceptionally fine showings, notably on the Banner, Bullion, Homestake, Alpha, Mountain Lion, Gloster, G. H., and Tiger.

On the Banner a tunnel has been driven about 200 ft., cutting a ledge described as being 36 ft. in width and containing copper ore worth \$8 per ton. A prospect shaft 20 ft. deep is in silver-lead ore stated to be 3 ft. in width and of a value of \$60 per ton.

The bottom of a 50-shaft on the Gloster is in ore said to average 13 per cent copper and \$2.50 per ton in gold and silver. Very little work has been done on the other claims mentioned as being in this camp, the holders seemingly being without sufficient money to develop them and not inclined to sell at prices prospective buyers think reasonable.

MINERAL HILL CAMP.

The principal properties on Mineral Hill are the Mineral Hill and Polard groups of claims. Both have excellent showings of copper-gold ore of high grade. They are still held by the locators, who do a little development work on them each year. A 40-ft. shaft on the Polard is all in ore of good grade. A tunnel on the Mineral Hill is 140 ft. in length, but has not yet reached the ore body.

GENERAL.

The chief characteristics of Franklin camp are the general regularity of the formation (which consists of lime, porphyry, and conglomerate, surrounded by granite hills), the large size of the surface showings, the generally excellent grade of the ore, and the depth that can be gained by tunneling either in or to the principal ore bodies

this would leave a net profit of \$16 per ton, which on 50 tons per day would equal \$24,000 per month or \$288,000 per year.

"The foregoing does not take into account the low grade vein which, being highly silicious, would, in the event of the ore being smelted on the ground, act as a flux for the high grade pyrrhotite ore.

"With a compressor plant and hoist in place the property could be developed sufficiently in about six months to produce the above-mentioned quantity of ore."

The company's intention is to as soon as practicable sink two shafts, one in low grade and the other in high grade ore, each to a depth of 300 ft. It is expected that by the time this work shall have been completed railway shipping facilities will have been provided, so that high grade ore can then be shipped to the smelter.

THE CROW'S NEST PASS COAL CO., LTD.

FROM the ninth annual report of the Crow's Nest Pass Coal Co., Ltd., owning and operating three collieries in the Crow's Nest Pass district of East Kootenay, it is learned that the net profits of the company for the year 1905 were \$497,898.68, beside which there was the sum of \$35,400, representing premium received from final payments on the stock last issued. The total at credit of Profit and Loss account, including \$203,320.44 brought forward from 1904, was \$736,619.12, which was disposed of as follows: Dividends paid in 1905, being at the rate of 10 per cent per annum, \$349,418.05; transferred to Reserve Fund, \$35,400: balance carried forward to 1906, \$351,801.07. On December 31, 1899, the balance at credit of Profit and Loss account was \$47,810.42, and the net profits since earned aggregate \$1,797,638.81, making a total to December 31, 1905, of \$1,845,449.23. The dividends paid during the past five years total \$1,493,648.16, being at the rate of ten per cent per annum on amount of the paid up stock, which has increased year by year until now the full amount of capital authorised—\$3,500,000—has been all paid. The following table shows the total net profits and distributed profits, respectively, to the end of 1905:

	Total Net Profits.	Profits Distributed.
Balance December 31, 1899	\$ 47,810.42
For year 1900	141,064.10
" " 1901	270,848.39	\$ 242,705.50
" " 1902	171,285.80	250,000.00
" " 1903	310,492.28	303,717.36
" " 1904	406,049.56	347,807.25
" " 1905	497,898.68	349,418.05
	<u>\$1,845,449.23</u>	<u>\$1,493,648.16</u>
Balance (undistributed profits)		351,801.07
		<u>\$1,845,449.23</u>

During five years, 1901-5, the company has received as a premium on new stock sold a total of \$1,800,000, which amount has been carried to a Reserve Fund. The production of coal last year was 831,933 tons gross, of which 397,822 tons were made into coke, 148,939 tons sold in Canada, and 246,002 tons exported to the United States. Of the coke produced, 145,044 tons were sold in Canada and 113,337 tons exported to the United States, chiefly to smelters in Montana and Washington. The increase in production in 1905 over 1904 was 89,723 tons of coal and 13,323 tons of coke.

PROVINCIAL REVENUE FROM THE MINING INDUSTRY.

THE PUBLIC ACCOUNTS of the Province, lately submitted to the Provincial Legislature, show the following revenue obtained from sources connected with the mining industry:

	Financial Years to June 30.	
	1903-4.	1904-5.
Free Miners' Certificates ..	\$ 59,854.75	\$ 53,504.04
Mining receipts, general ..	108,270.55	105,192.21
Tax on unworked Crown-granted mineral claims ..	28,696.35	39,869.86
Bureau of Mines	831.35	1,709.50
Mineral Tax	65,844.09	114,236.77
Royalty and Tax on Coal..	95,600.00	94,682.00
	<u>\$359,097.09</u>	<u>\$409,194.38</u>

The total increase in 1904-5 over 1903-4 was \$50,097.29, or nearly 14 per cent. The falling off of free miners' certificates appears to indicate that there was less prospecting going on in the Province, this class of revenue being derivable chiefly from prospectors. The increase in tax on unworked Crown-granted mineral claims seems to show that either many more claims have been Crown-granted or that fewer have been worked; perhaps both causes have contributed a share to this increase. The increase of 73.5 per cent in the receipts from the mineral tax, which is a charge of two per cent on the value of all metallic minerals disposed of, less freight and treatment charges, denotes a substantial increase in the mineral production of the Province prior to June 30 last, after which date, by the way, there was a still larger increase. There are other items of revenue contributed by the mining and smelting industries, but as they are not separately shown no idea can be obtained from the published accounts. It is not unlikely, though, that if added to the above they would make the aggregate about \$500,000.

The *Similkameen Star* states that the field for gold dredging in the district from Princeton up the Similkameen and Tulameen Rivers, also Granite Creek, is practically inexhaustible. Dredging ground may be obtained by lease from the Provincial Government. Pay dirt is found in the bars and benches along the rivers, many of which produced handsome returns for the placer miners of early days.

COMPANY MEETINGS AND REPORTS.

SKYLARK DEVELOPMENT CO., LTD.

At the annual general meeting of the Skylark Development Co., held at Phoenix on January 17, the directors were re-elected, as follows: Mr. A. B. W. Hodges, president; Dr. R. B. Boucher, vice-president; Mr. A. B. Hood, secretary-treasurer; Messrs. C. D. Hunter, W. S. Macy, O. B. Smith, Jun., and H. A. Wright.

The following is part of the report of the manager, Mr. O. B. Smith, Jun.:

Below is a brief report of the work done at the Skylark mine since January 1, 1905. Shortly before that time the mine was full of water, which was pumped out, disclosing the following conditions. An incline shaft, following the ore, had reached a depth of 75 ft. At this point a fault was encountered throwing the lead 40 ft. to the east. There were four drifts, the north drift and south drift from the bottom of the shaft, and the east north drift and the east south drift, following the lead after it had been picked up beyond the fault, in all about 160 ft. of drifting. Also there was a 30-ft. winze on the lead beyond the fault. All faces were in waste and most of the ore had been stoped out about the drifts.

Since January 1, 1905, the following work has been done:

	Feet.
Sinking	55
Upraising	174
Drifting	790
Cross-cutting	52
Total	1,071

535 1-3 dry tons of ore have been mined and shipped to the Granby and Nelson smelters.

At the 150-ft. level another fault was encountered, throwing the ore again to the east. In order to determine the extent of this fault a winze was sunk 10 ft. and a cross-cut run east 12 ft., encountering the ore again 16 in. wide. This is encouraging—both the smallness of the fault and the size and quality of the ore body below it.

Beside the development work done below ground, a shaft house and mess house were built and the old buildings repaired. The cost of this work was approximately \$700.

It is hard to determine definitely the amount of ore in sight, inasmuch as the width of the ore varies much from day to day, jumping from almost nothing to 24 in. sometimes in a few feet. So far as we know, the ore above the 75-ft. level has practically been all stoped out to a point 150 ft. south of the shaft. We can follow the ore on the surface for 100 ft. south of this and have it on the 150-ft. level 100 ft. south of this point.

Figuring the ore 6 in. wide (average) and 245 ft. long (from winz-mouth) and 40 ft. high, gives us a tonnage of 490 tons. This, I think, is a conservative estimate, the only doubtful figure being the 6 in., and our past experience would show this to be too small rather than too large. This leaves us a large block of ground south to be determined, and as the ore is on the surface it is reasonable to suppose we will get it below. Also, I have figured nothing for ground north of the shaft. We have this ground opened up on the 150-ft. level by a drift 155 long. So far we have found very little in this drift, but the walls have been good and regular all the way, and in many places we have had good ore several inches wide. As some of the best ore we have found in the mine came from directly over this north drift on the 75-ft. level, it is reasonable to suppose that this ground will be a good producer later on. At the present time one man is raising in the north end of this drift, and we hope to hear good reports from him shortly.

The coming year it will probably be necessary to sink to another level. We have been working to this end for some time, and a new shaft is practically through from the 150-ft. level to the surface. When this shaft is completed, all work can be done by the hoist, whereas, at the present time,

two hoists are used and the ore from the lower level has to be transferred on the 75-ft. level.

NORTH STAR MINING CO., LTD.

The following interim report, under date December 30, 1905, has been issued by the directors of the North Star Mining Co., Ltd., operating at Kimberley, East Kootenay: "In accordance with the resolution passed at the annual meeting of the shareholders held on June 28, 1905, it was determined to issue to the shareholders every six months a statement giving such information as may be of interest to them.

"The directors have to report that exploration work has been carried on, and two shafts have been sunk to some depth without favourable results. A drift was started west of the Kellogg shaft and carried to a length of 256 ft. and a depth of 75 ft. This exposed, between well defined walls, 5 ft. wide, a mineralised body which has shown improvement since first encountered. It is impossible to say whether this will lead to a body of paying ore or not, but it is on the whole encouraging.

LE ROI MINING CO., LTD.

The report of the directors of the Le Roi Mining Co., Ltd., submitted at the meeting held in London on December 8, stated that the accounts show a balance in favour of profit and loss of £49,741. This result is arrived at after paying to the bank £4,254 on account of interest and advances, and after writing off £21,345 for exploration and development and £14,139 for depreciation of machinery and plant, surface improvements, etc., at the mine and smelter. In the year there were fortunately extra profits (1) of about £10,000 owing to the receipt of a better price for matte at Tacoma; (2) of about £7,000 by reason of the increased price of copper, and (3) of about £2,000 owing to the decreased price of coke. The ore mined was of higher value than in the previous year by \$1.47 per ton, or, say, £34,843 on the tonnage mined during the year, and was produced more especially from the 700, 800 and 900-ft. levels. The accounts show that the liabilities at June 30 amounted to £54,394, and the liquid assets amounted to £125,483. This is an improvement in surplus liquid assets upon the previous year of £56,886.

DIAMOND VALE COAL & IRON MINES CO.

Directors for the ensuing year for the Diamond Vale Coal & Iron Mines Co. were elected at a meeting held recently in Vancouver, as follows: President, Mr. John Hendry; vice-president, Mr. T. J. Smith; treasurer, Mr. R. A. Smith; Messrs. F. W. Jackson, Quilchena; Geo. S. May, M. L. A., Ottawa; A. Guthrie, St. Paul, Minnesota, and W. E. Houston, Lockport, New York.

THE DENORO MINES, LTD.

Mr. Smith Curtis, managing director of The Denoro Mines, Ltd., has sent the following report to shareholders of the company:

"Rossland, January 5, 1906.

"To the Shareholders.—Since the last annual meeting, mostly development work has been carried on at the Oro Denoro mine. Sufficient ore has been taken out to meet the expense of mining, etc., so that the financial position of the company continues to be sound. The work of exploration carried on at various places on the property has shown that there is reasonable certainty of a large tonnage of ore of at least as good grade as that being shipped by the Boundary copper mines to smelters operated in conjunction with such mines. Were there a custom smelter buying such ores the Oro Denoro could maintain a large output. As it is now, it is only ores of special quality that the smelters will take from the Oro Denoro.

"A large body of ore was last summer and fall stripped of a deep layer of earth so as to permit its being quarried. This ore lies on the hillside between the two railway lines crossing the property and was ready for mining early in November, but the Great Northern Railway failed to observe its contract with your company to complete a shipping siding until a few days ago, when the siding was at last

finished and since then 800 tons have been sent to the Granby smelter and other shipments are under way.

It is too soon to tell how this ore body will turn out in values, but it is believed to be payable at the rates quoted by the smelter. If so regular shipments will be made from it.

Two months ago arrangements were made to acquire a half interest in the Hungry Man mine, situate three and one-half miles from Slocan Junction, a station on the C. F. R. branch line between Nelson and Castlegar Junction. One-fourth of this mine has been bought and paid for. The development work to date has been fully up to expectations, and a payable ore body has been followed down 33 ft. A steam hoist and pump have been installed, and will enable work to be done more cheaply and expeditiously. The ore is pyrrhotite, carrying an average of about \$20 in gold. As this interest at the present time seems likely to become a valuable asset of your company, the annual meeting will not be held until some time in February, when it will be possible to give more certain information about it."

LE ROI NO. 2, LTD.

The report of the directors of Le Roi No. 2, Ltd., for the year ended September 30, 1905, submitted to the fifth annual general meeting of shareholders, held in London, England, on January 16, inst., was regarded as satisfactory. It stated that although, for reasons with which the shareholders were familiar, the manager had been instructed to restrict the output during five months of the year, the accounts showed a balance to credit of Profit and Loss account of £29,810, after the sum of £13,911 had been written off against mine development and £3,924 as depreciation on machinery and plant, buildings, etc. There was brought forward from the previous year the sum of £28,690 and after paying a final dividend for 1904 of 2s. per share there remained the sum of £16,090, which, with the present balance of £29,810, gave a total of £45,901 available for distribution. Out of this a dividend of 1s. per share was paid on October 7, last, absorbing £6,300. The directors recommended a final distribution for 1905 of 3s. per share, leaving £20,701 to be carried forward. Messrs. Hill and Stewart reported that during the past year the development of the mine had been vigorously pushed with satisfactory results; 12,237 tons of ore were shipped to the smelter, and 10,678 tons to the company's concentrator. The mining expenses for the year, including diamond drilling showed an expenditure of \$4.22 per ton as compared with \$4.45 the previous year although the tonnage dealt with was less. The company had taken advantage of an opportunity that occurred to acquire various claims in the Rossland and Ymir district, but had relinquished the option over the Vernon-Thompson group, at Rossland. Mr. Paul S. Couldrey, who was mine manager during the years 1903-4, has now returned to Rossland and resumed charge of the property. The directors again recorded their appreciation of the services rendered by the company's consulting engineers, Messrs. Alex. Hill and Stewart, and of the ability and skilful management shown by Mr. Ernest Levy, who acted as mine manager during the year under review.

The chairman, Lord Ernest Hamilton, at the close of a lengthy address, moved the adoption of the report and accounts. This resolution passed unanimously; a dividend of 3s. per share on the 126,000 issued shares, totalling £18,900, was declared; and Mr. A. B. Dealtry, who retired by rotation, was re-elected a director.

Mr. Alexander Hill gave a long address, in the course of which he said:

In the Rossland district, and especially in our mines—the Josie, No. 1, and the others—the country is very much broken up. There are numerous dykes, slips and faults, and we have found it very difficult indeed to make any forecast without doing some work in the particular places where the ore bodies which we have found are located. Besides, the ore bodies themselves are extremely irregular in size, shape and value. In several cases we have got, by a diamond drill, a considerable number of feet of width and tested it

again, perhaps by a second bore, and got good results; then we have driven upon it and opened it up; but when we have opened it up either in height or length, we have found that it has pinched out. The same thing applies in other cases. We have opened up and found very narrow stringers of ore, which, when we have driven further and opened them out, have developed into some of our finest ore bodies. The stope H is very much a case in point. We first cut it by means of a diamond drill—a very long borehole—and it showed practically no value at all, being simply mineralised ground. Notwithstanding this, we drove on a small slip in that direction, and after driving for a very considerable distance we cut the ore body, but that ore body seemed to terminate after a few feet in length, and we thought stope H was going to be a very small thing, though it was showing high value. Notwithstanding this, we drove on the stringer of ore, and it continued in very low values indeed. In order to prove the ground somewhat further, we then, from the drift we had driven on the stringer, put out a series of boreholes to one side, and all these boreholes struck another and really the main body, which was considerably to the one side of where we had been driving. We then opened up on it, and found we had got rather over—actually over now—620 ft. of length, of which only 110 ft. is practically barren.

I think the system we are adopting just now, namely, that where we find an ore body on one level we immediately begin to put up raises through the ore and stope it out as soon as possible, even while we are working over it on an upper level, is the best one to pursue. Of course it does not always follow that we will find the ore body on the upper level, because it may pinch out, and if it does we shall be saved the expense we should otherwise have incurred.

As to the future prospects of the mine, we have this ore body on the 500 ft. level opened out very well for a total distance of 600 ft., of which some portion is barren, but the easterly end, where we are driving at present, is even richer than the \$41 stated in the report. Of course, you must not think too much of that. It might just as easily have varied in the opposite direction; but during this month it has gone very rich indeed in an easterly direction. At the 700-ft. level we found medium grade ore, and at the deepest level—the 1,350-ft. level—of our mine, we are driving in from the Le Roi mine, our object being to try and locate first the continuance in depth of the Annie ore shoot, which was the richest and largest shoot, both in quantity and value, ever found in the Josie mine. For many years it gave a large amount of ore, and after it was supposed to be worked out, when we took the management of the mine we went back and found a large quantity of ore remaining there. Now this shoot may, and probably does, go down in depth, but if it does, it goes down alongside one of the numerous dykes or faults, and the object of cross-cutting from a deep level is to try and strike the intersection of two dykes which are known to exist, and where we expect this Annie ore shoot will be found to exist in the deepest level.

From what we have been able to see in the adjacent mines—the War Eagle the Centre Star and the Le Roi—we think there is a probability of there being another rich zone in depth at quite a deep level in our mines. If this is so, we will then have a mine for many years to come. Besides these deep level prospects we have prospects of getting out ore at the 700-ft. level, also on the upper level near the May Day tunnel, where we found some very good indications of ore; and we also think there is a very good chance of some better ore being found below the No. 1 mine, which has been shut down for some time now because its ore was such low-grade stuff. No. 1 contained heavy pyrites, which it was almost impossible to concentrate. If we could afford it, we should like to prospect in depth—in fact, right through from the Josie mine underneath the No. 1, prospecting the whole country between the two mines.

As regards cost, you will perhaps have noticed that in our report we give the cost of exploration and development at \$2.75 per ton of ore. This seems a large sum, but then the tonnage was not very great last year, and, in fact, the total amount of money we spent in exploration and development was only £8,500. I, personally, should like to spend a great deal more, and I think the property warrants a good deal more expenditure on development and exploration, because I am becoming much impressed with the possibilities there are of encountering valuable ore throughout the whole district if we only search for it with method and persevere in our search. The life of the company depends upon exploration and development in such a case as ours. Unless we go forward developing and exploring the country, we will never find the ore. This has been the history of the mine ever since I have been connected with it. Everything we have found we have had to search for, and sometimes we have found it in very unlikely looking places. Many of our boreholes and drifts proved barren and did not give good results, but the majority of them have well warranted the expense, and I should like to impress upon you the absolute necessity of spending a good deal of money on systematic exploration and development.

CANADIAN CONSOLIDATED MINES, LTD.

Letters patent have been issued at Ottawa for the incorporation of the Canadian Consolidated Mines, Ltd., with an authorised capital of \$5,500,000, in 55,000 shares of \$100 each, to acquire the properties of the St. Eugene Consolidated Mining Co., the Centre Star Mining Co., the Canadian Smelting Works, and the Rossland Power Co. The company has since been licensed in British Columbia as an extra-provincial company.

The St. Eugene Co. owns the St. Eugene lead-silver mine at Moyie, East Kootenay, which last year produced nearly 40,000,000 lb. of lead and 1,000,000 oz. silver. The Centre Star Co. owns the Centre Star and War Eagle mines at Rossland. The Canadian Smelting Works owns the smelter at Trail, near Rossland, with both lead and copper stacks in operation and an electrolytic lead refinery of a capacity of 50 tons daily. The Rossland Power Co. erected at Trail large concentrating works for the purpose of concentrating Centre Star and War Eagle ores of too low a grade to bear ordinary smelting charges, but these works are awaiting the addition of more machinery before they will fulfill their purpose.

The following information relative to the properties and operations of the several companies included in this consolidation is from an official report made last November:

The St. Eugene Consolidated Mining Co., Ltd., owns the following: St. Eugene, Peter, Queen of the Hills, Moyie, Lake Shore, Meneiek, Jamison, Lake View and Trade Dollar; fractions Rose, Loretta, St John, Dude, General Buller, and the St. Eugene Mill site, in all about 484 acres at Moyie, B. C., including a 500-ton modern concentrator, a compressor plant of 40 drills total capacity, new hoisting machinery, tramways, shops, etc.

The St. Eugene has produced to date metals of a gross value of \$3,800,000, is milling about 500 tons of ore daily, from which it is producing about 100 tons daily of concentrates, containing approximately—

Lead, 63 per cent, of a gross value of \$42.21
Silver, 35 oz. per ton, of a gross value of 21.00

Total gross value \$63.21

which concentrates are readily marketed in Canada (at a profit of about \$15 per ton) and in Europe, particularly Antwerp.

The St. Eugene Co. is paying regular dividends amounting to \$280,000 annually, and earned in the fiscal year ending September 30, 1905, a total profit of \$639,936, and a net profit over and above all improvements, construction and so forth of \$575,827, and is making approximately this amount

of profit now. On August 31, 1905, the St. Eugene Co. had in its treasury and in cash due from ore shipments (less dividends payable October 1) \$372,000. There were no debts.

The Centre Star Mining Co., Ltd., owns the following in British Columbia: The Centre Star mineral claim, surface rights on the Ore-or-no-go claim adjoining the Centre Star claim, the War Eagle claim, the Crown Point group, consisting of the following claims: Crown Point, Hidden Treasure, White Swan and R. E. Lee; control of the Pilgrim claim, Rossland Red Mountain, Mugwump, Monita; also the Richmond group at Sandon, B. C., (where high-grade lead ore has been found) consisting of the following claims: Richmond, Mineral Hill, Eureka, Star View, Empire and one-half of the Summit. All the properties on Red Mountain, Rossland, are equipped with compressor plants, hoisting works, machine shops and so forth.

The Centre Star has produced \$5,200,000, and the War Eagle has produced \$6,300,000 (a total of \$11,500,000) to date, and are now shipping about 450 tons (two-thirds Centre Star, one-third War Eagle) of ore daily, containing:

Centre Star—
Gold, 0.40 oz., gross value \$ 8.20
Silver, 0.40 oz., gross value24
Copper, 0.50 per cent, gross value 2.24
(16 cents.)
Gross value per ton \$10.68

War Eagle—
Gold, 0.39 oz., gross value \$ 8.00
Silver, 0.80 oz., gross value48
Copper, 0.90 per cent, gross value 2.88
(16 cents.)
Gross value per ton \$11.36

which is being treated by the Canadian Smelting Works.

The Centre Star and War Eagle earned in the year ending September 30, 1905, a total gross profit of \$207,353, and a net profit over and above all improvements, construction, and so forth, of \$144,846 (of which the War Eagle earned about one-fourth). On August 31, 1905, the Centre Star had in its treasury and in cash due for ore shipments \$217,254. There were no debts.

The Centre Star Mining Co. has absorbed the War Eagle properties upon the basis of 10 shares of the Centre Star for 15 shares of the War Eagle (there were twice as many Centre Star shares issued as War Eagle before the consolidation of these properties). The War Eagle had practically no cash on hand at the time of the transfer and no debts. I consider the prospective value of the War Eagle as considerable, and the property continues to earn profits.

The Canadian Smelting Works, at Trail, B. C., includes the following:

Complete lead smelting works,
Complete copper smelting works,
Complete electrolytic lead and silver refinery,
all equipped with electric power and modern furnaces, and also includes electrical crushing and other machinery in the concentrator at Trail.

The Canadian Smelting Works produced from August 1, 1898, to April 1, 1905, over \$16,000,000 and are now treating about 900 tons of ore daily and producing approximately the following:

Gold, gross value \$6,000 daily.
Silver, gross value 4,000 "
Lead, gross value 3,000 "
Copper, gross value 2,000 "

Total output \$15,000 daily, or over \$5,000,000 annually, which is shipped in the form of copper matte, copper sulphate, fine silver bars to China, fine gold bars to the United States assay office, lead bullion, pig lead to Canada, China, Japan, and occasionally London and Australia, and lead pipe.

The Canadian Smelting Works have always earned a reasonable profit. In the year ending September 30, 1905, they made a gross profit of \$266,653, and a net profit over and

above all improvements, construction (except the refinery), and so forth, of \$188,850.

The above mentioned companies earned the following during their last fiscal year:

	Gross profits year ending Sept. 30, 1905	Net profits over and above all construction, year ending Sept. 30, 1905.	Cash on hand earned through operations.
St. Eugene	\$ 639,936	\$575,827	\$372,233
Centre Star	207,353	144,846	217,254
Canadian Smelting Works.	266,653	188,850	223,496
	\$1,113,942	\$909,523	\$812,983

COMPANY CABLES AND NOTES.

CABLES.

British Columbia.

Le Roi.—December: Shipments amount to 6,925 tons, containing 2,772 oz. gold, 5,300 oz. silver, 205,700 lb. copper. Estimated profit on this ore, after deducting cost of mining, smelting, realisation and depreciation, \$32,500. Expenditure on development work during the month, \$8,000.

Tyce.—November: Smelter ran 11 days, and smelted—Tyce ore, 2,304 tons; custom ore, 265 tons; total, 2,569 tons. Matte produced from same, 220 tons. Gross value of contents (copper, silver, and gold) after deducting costs of refining and purchase of custom ore, \$31,062.

Tyce.—December: Smelter ran 11 days, and smelted—Tyce ore, 2,036 tons; custom ore, 223 tons; total, 2,259 tons. Matte produced from same, 234 tons. Gross value of contents (copper, silver, and gold), after deducting costs of refining and purchase of custom ore, \$33,460.

U. S. A.

Alaska Mexican.—November: 120-stamp mill, 30½ days, 20,959 tons ore; estimated realisable value of bullion, \$33,338. Saved 415 tons sulphurets; estimated realisable value, \$35,059. Working expenses, \$36,572.

Alaska Mexican.—December: 120 stamps, 29½ days; 19,543 tons ore; estimated realisable value of bullion, \$31,659. Saved 353 tons sulphurets; estimated realisable value, \$26,748. Working expenses, \$32,386.

Alaska Treadwell.—November: 240-stamp mill 30½ days, 300 stamp mill 30½ days, 82,747 tons ore; estimated realisable value of bullion, \$75,339. Saved 1,635 tons sulphurets, estimated realisable value of same, \$70,870. Working expenses, \$85,162.

Alaska Treadwell.—December: 240 stamps 29½ days, 300 stamps 27¾ days; 81,760 tons ore; estimated realisable value of bullion, \$83,668. Saved 1,630 tons sulphurets; estimated realisable value, \$87,905. Working expenses, \$81,991.

Alaska United.—November: Ready Bullion claim—120-stamp mill 30½ days, 20,900 tons ore; estimated realisable value of bullion, \$22,647. Saved 302 tons sulphurets; estimated realisable value, \$9,117. Working expenses, \$28,053.

Alaska United.—December: Ready Bullion Claim—120 stamps 29½ days; 19,670 tons ore; estimated realisable value of bullion, \$29,503. Saved 319 tons sulphurets; estimated realisable value, \$11,255. Working expenses, \$29,097.

DIVIDENDS.

The Granby Consolidated Mining, Smelting & Power Co., Ltd., on 15th inst. paid a dividend of three per cent on its issued stock, which the published reports of the accounts submitted to the general meeting held in New York last October show to be \$13,500,000, making this dividend \$405,000, and bringing the total paid to date up to \$538,630.30.

The 20th quarterly dividend of the Crow's Nest Pass Coal Co., Ltd., was payable on 1st inst.—total amount \$87,500, being at the rate of ten per cent per annum on the issued stock, \$3,500,000. The total amount of dividends paid by this company is now \$1,493,648.16, distributed over a period of five years.

The Le Roi No. 2, Ltd., at its annual general meeting, held in London on 16th inst., declared a dividend of three shillings per share on its 126,000 issued shares, total £18,900. Adding the dividend of one shilling per share—£6,300—paid last October, the total of distributed profits for the year 1905 is £25,200 (about \$126,000). The company had a balance at credit of Profit and Loss of £20,701 after payment of above-mentioned dividends.

It is reported from the Ketchikan district, South-east Alaska, that the Hadley Consolidated Copper Co., operating on Prince of Wales Island, paid one dividend of \$15,000 on December 10, last, and another of a similar amount on January 22, inst.

The Alaska Mexican Gold Mining Co. has declared a dividend of 30 cents per share on its 180,000 issued shares, payable January 29. Total of dividends paid to date, \$1,293.381.

The Alaska Treadwell Gold Mining Co. has declared a dividend (No. 72) of \$1 per share on its 200,000 issued shares, payable January 29. Total of dividends paid to date, \$9,260,000.

NOTES.

The London Mining Journal says: Le Roi No. 2 have risen to £1 12s. 6d. ex-div., having encountered \$14 ore in the 1,350-ft. level from the Le Roi mine. Ymir's have put on another shilling. It is said that Mr. Faithful Begg, of the West Australian Goldfields, is about to visit the property, with the engineer, Mr. Gilman Brown, who recently reported on it.

The following extracts from the mine manager's report for December have been published by the London office of the Le Roi No. 2, Ltd.: "Josie mine—Development has been carried on from the 500-ft., 600-ft. and 700-ft. levels. At 500-ft. level—H drift west—151.9 ft. were driven. The values at the beginning of the month were very good, but later on the vein twisted somewhat in its course, and we had some difficulty in following it. We hope soon to meet with good values again, as we are near diamond drill hole No. 76, where good ore was met with. H drift east—16 ft. were driven. The showing in the north cross-cut was followed eastwards, and with the exception of one day, the values have been good consistently. We have 90 ft. still to drive before reaching the porphyry dyke, and we expect the ore to be continuous to this point, as diamond drill hole No. 77, on the 16th floor, stope 20, located ore just west of it. In this connection it may be well to mention that diamond drill hole No. 83 met with ore from 52 ft. to 53.5 ft. Though not within the scope of this report, this fact serves to show that the assumption of continuity is reasonable. At 700-ft. level—Stope 11—In the hanging wall further investigation of the mineralised streak met with some time back in the 600-ft. level was carried on. The ore relocated is not high in grade, but gives promise of adding considerably to our monthly tonnage, as it is very heavily mineralised. In all 36.5 ft. were driven.

A table published in the *Anaconda News* shows that twelve high-grade properties, situated in the neighbourhood of Greenwood, Boundary district, shipped during 1905 2,745 tons of silver-gold ore which ranged in value from \$50 to \$100 per ton.

Mr. W. H. Wall, formerly surface manager for the New Vancouver Coal Co. at Nanaimo, and for some time past in charge of drilling operations on the property of the Diamond Vale Coal Co. at Quilchena, Nicola district, has been spending a few days with friends in Nanaimo and district.

BOUNDARY DISTRICT SMELTING AND PRODUCTION NOTES.

During the calendar year 1905 there were 687,988 tons of ore—an average of 57,332 tons per month—smelted at the Granby Consolidated Mining, Smelting & Power Co.'s smelting works at Grand Forks. Of this quantity 654,483 tons were the product of the company's own mines at Phoenix, and the remainder was custom ore. The tonnage smelted each month is shown below:

Month.	Granby Ore. Tons.	Custom Ore. Tons.
January	41,759	3,770
February	41,212	2,478
March	54,493	2,716
April	49,538	2,249
May	54,751	2,794
June	50,882	1,847
July	54,450	3,216
August	36,944	3,265
September	53,650	4,682
October	70,957	2,310
November	67,141	2,535
December	78,706	1,643
Custom ore	654,483	33,505
Total	687,988	

At the British Columbia Copper Co.'s smelter, Greenwood, the quantity smelted during the year was 210,830 dry tons. This included 194,473 tons of ore from the company's Mother Lode mine, and 16,357 tons from other mines, as under:

Mine	Tons
Mother Lode, Boundary	194,473
Le Roi No 2, Rossland	5,039
Mountain Rose, Boundary	3,269
Napoleon near Marcus, Washington	3,227
Emma, Boundary	2,417
Ben Hur, Republic, Washington	1,261
Snowstorm, Idaho	472
Seven other mines	672
Total tonnage treated	210,830

The figures for each month were as follows:

January	17,725
February	16,634
March	19,563
April	15,856
May	19,668
June	18,413
July	15,675
August	18,561
September	18,606
October	18,374
November	17,726
December	13,989
Total	210,830

The Phoenix Pioneer reports that the tonnage of ore shipped from Boundary mines to smelters in January was larger than that of any previous month in the history of mining in this district. Shipments were as under:

Mine	Tons.
Granby Co.'s mines	74,995
Dominion Copper Co.'s mines	15,257
B. C. Copper Co.'s mines	11,820
Oro Denoro	1,709
Sundry small shippers	597
Total	104,378

A million dollars in gold weighs 3,686 pounds and a million dollars in silver weighs twenty-eight and one-quarter tons.

CERTIFICATES OF INCORPORATION.

- East Kootenay Power & Light Co., Ltd.*, with a capital of \$250,000, divided into 250,000 shares of \$1 each.
- White Bear Mining Co., Ltd.*, with a capital of \$1,000,000, divided into 10,000,000 shares of 10 cents each.
- Coast Quarries, Ltd.*, with a capital of \$25,000, divided into 250 shares of \$100 each.
- Crescent Mines, Ltd.*, with a capital of \$1,000,000, divided into 1,000,000 shares of \$1 each.
- Norma Mines, Ltd.*, with a capital of \$300,000, divided into 300,000 shares of \$1 each.
- B. C. Powder Co., Ltd.*, with a capital of \$50,000, divided into 50,000 shares of \$1 each.
- Schaake Machine Works, Ltd.*, with a capital of \$100,000, divided into 1,000 shares of \$100 each.

REGISTRATIONS OF EXTRA-PROVINCIAL COMPANIES.

- Atlin Consolidated Mining Co.*—Head office at Denver, Colorado, U. S. A. Capital, \$500,000, divided into 150,000 shares preferred stock, and 350,000 shares, common stock, all \$1 each. Head office in British Columbia, at Victoria. Attorney (not empowered to issue and transfer stock). Alexander S. Innes, barrister, Victoria.
- Canadian Consolidated Mines, Ltd.*—Head office in London, Ontario. Capital, \$5,500,000, divided into 55,000 shares of \$100 each. Head office in British Columbia, at Trail. Attorney, W. H. Aldrige, M.E., Trail.

NEW REGISTRATION IN ENGLAND.

New Velvet Portland Mine, Ltd.—Registered November 18, by C. W. Brown & Ayles, 2 Gresham Buildings, E. C. Capital £10,000, in £1 shares. Objects: To acquire, prospect, examine, explore and work any property or ground supposed to contain gold or minerals in Canada or elsewhere, in particular to take over the undertaking and all or any of the assets in British Columbia of the Velvet Portland Mine, Ltd.; to adopt an agreement with W. Trotter and C. W. Brown; and to carry on the business of gold and general miners, metallurgists, &c. Minimum cash subscription, 10 per cent of the shares offered to the public. The first directors (to number not less than two nor more than five) are: E. H. Clarke, A. Maclean, and W. J. Newhall. Qualifications of subsequent directors, one share.

BOOKS, ETC., RECEIVED.

- Geological Survey Department of Canada.—Report on the Geology of a Portion of Eastern Ontario.* By R. W. Ellis. L.L.D. F.R.S.C. Pages, 89; with accompanying map.
- Columbia University, New York City.—School of Mines Quarterly.* November, 1905. Pages, 86; illustrated.
- Bureau of Mines, Ontario.—Part II. of Report, 1905. The Cobalt-Nickel Arsenides and Silver Deposits of Temiskaming.* By Willet G. Miller, Provincial Geologist. Pages, 62; illustrated by maps and half-tones.
- Origin of Petroleum, Coal, Etc.* being an expert Treatise on the actual occurrence of those products in strata of the earth crust. By Wm. Plotts, Whittier, California. Pages, 29; illustrated by diagrams.
- American Institute of Mining Engineers Bi-Monthly Bulletin.* January, 1906. Pages, 138; illustrated by half-tones and diagrams.
- Statutes of Canada—4-5* Edw. VII, 1905. Volumes I and II.

A careful sampling of 54 ft. of a ledge 75 ft. in width on Marquis & Gilbert's Gold Park group, Poplar Creek, is reported to have given an average of \$4.90 per ton in free gold.

MINING MEN AND MATTERS.

Mr. J. B. Tyrrell, of Dawson, Yukon, is spending the winter in Ottawa, Ontario.

Mr. W. H. Jeffrey, mining engineer, of Greenwood, was married at Nelson on 30th. inst.

Mr. Geo. H. Barnhart is resigning charge of the Second Relief gold mine at Erie, Nelson mining division.

Mr. D. P. Kimpton is superintendent of the Shuning Beauty mine, in the Golden district, North-east Kootenay.

Mr. J. A. Darragh has returned to Camborne from Indiana and has been examining the Del Ray property on Mohawk Creek.

Mr. J. J. Warren, managing director of the White Bear Co., Ltd., is expected to shortly arrive at Rossland from Toronto, Ontario.

Mr. John L. Howard, president of the Western Fuel Co., will visit that company's collieries at Nanaimo, Vancouver Island, early in February.

Mr. A. Dubois, superintendent of the Silver Dollar mine, near Camborne, northern Lardeau, has gone to Elwood, Indiana, U. S. A., on a visit.

Mr. Herbert Young, of the Provincial Government office, Atlin, has been appointed mining recorder at Atlin, to succeed the late Mr. E. J. Thain.

Mr. Geo. W. Hughes is about to ship 600 tons more zinc ore from the Lucky Jim mine, Slocan district. This shipment will be made to Pueblo, Colorado.

Mr. Gilman Brown, of San Francisco, is expected to shortly pay another visit to the Ymir mine, in the Nelson district, in the capacity of consulting engineer.

Mr. Jas. Finlay, who recently resigned the managership of the Sullivan Group Co.'s mine, near Kimberley, East Kootenay, has gone to the old country for a time.

Mr. Stanley A. Easton, some years ago manager of the Gold Drop mine, near Phoenix, Boundary district, is now managing a mine in the Coeur d'Alene district Idaho.

Messrs. A. G. Langley and Robert Musgrave, mining engineers, both with the Copper Consolidated Co., Bisbee, Arizona, are spending a winter vacation at Victoria, B. C.

Mr. J. E. McAllister, of Greenwood, manager of the British Columbia Copper Co., was confined to his room by illness after his recent return to the Boundary from New York.

Capt. Armstrong, of Golden, has been at Galena, a mining camp on the Columbia River, in North-east Kootenay, arranging for the shipment of ore from his zinc property.

Mr. Thos. E. Ehrehart, manager of the Chestnut Hill

Mining Co., owning the Lucky Boy mine, near Trout Lake, is expected to return to the mine about May 1 to resume operations there.

Messrs. F. H. Shefman, Peter Patterson and John Howbrook were delegates from Fernie to the annual convention of the United Mine Workers of America, at Indianapolis, Indiana, this month.

Mr. A. Colville, superintendent of the Crow's Nest Pass Coal Co.'s Coal Creek colliery, has returned from his holiday trip to the Yellowstone National Park, Wyoming, and other interesting places.

Mr. R. H. Anderson, formerly superintendent of the Le Roi mine when Mr. S. F. Parrish was general manager of the Le Roi Mining Co., has been appointed manager of the Sullivan Group Co.'s mine, near Kimberley, East Kootenay.

Mr. Walter Harvey Weed, a prominent geologist on the staff of the United States Geological Survey, was occupied examining the large copper mines in the Boundary during two or three weeks of last month, afterwards returning to Washington, D. C.

Mr. E. C. Musgrave, superintendent of the Tyece Copper Co.'s Tyece mine, Mt. Sicker, Vancouver Island, has resigned, his resignation to take effect on July 1, next, by which time he will have been exactly six years in the position from which he will then retire.

Mr. H. H. Claudet, of Claudet & Wynne, Rossland, has been in the Windermere country, North-east Kootenay, for several weeks arranging for the further development of the Swansea property, situated on Windermere Mountain, about 5 miles from the Columbia River.

Mr. Percy Reid, one of the mining inspectors in Yukon Territory, who has done duty in both the Gold Run and Klauane districts, was married at Chatham, Ontario, on December 19 to Miss Gertrude Isabel Macpherson. Mr. and Mrs. Reid are now at Whitehorse, Yukon.

Mr. Harry H. Shallenberger, manager of the Crescent mine, near Greenwood, has returned to the Boundary from Chicago, where arrangements were made during his stay there to organise a company, to be called the Crescent Mines, Ltd., to acquire and operate the Crescent mine.

Mr. Bruce White, who is interested in the Slocan Star and La Plata mining companies, has been in Vancouver. It is stated that while on the Coast he purchased for the La Plata Co. four Crown-granted mineral claims that adjoin the La Plata group, in the Nelson mining division.

Mr. Wm. Thibadeau, who was engaged last summer on surveys connected with a proposed water supply for mining purposes on creeks in the Dawson district, has gone to Ottawa to report to the Dominion Government on the probable cost and other details of the proposed water system.

BRITANNIA SMELTING COMPANY, Ltd.

Buyers, Smelters and Refiners of Gold, Silver and Copper Ores, Matte, Bullion and Cyanide Products.

WORKS AT

Crofton, Vancouver Island, B. C.

Shipments will be received on and after July 1, 1905.

**BEWARE of inferior Eastern roofings
now being dumped on the Pacific Coast
because of their failure to make good at
home—these roofings must not be con-
founded with M A L T H O I D**



Booklets tell of Malthoid's Merit--Write for them.

The Paraffine Paint Company, San Francisco.
W. L. RHOADES, Agent N. W. T. 408 Occidental Avenue, Seattle

The Diamond Drill Contracting Co., of Spokane, Washington, is to do some diamond drilling on the Humming Bird mineral claim, situated near Hedley, Similkameen, and owned by Mr. J. J. Marks. The same company will also drill at the Betts and Hesperus mine, near Grand Forks, Boundary district.

Mr. J. B. Hobson, manager of the Consolidated Cariboo Hydraulic Mining Co., is expected to return to British Columbia shortly from a visit to New York. He will probably go up to the company's mine at Bullion, Quesnel Forks, soon after reaching the Coast, and thereafter take a trip south, to California.

Mr. A. Stark has resigned the management of the deep drift mine of the Slough Creek Gravel Gold, Ltd., Cariboo, and has gone to California for a trip. On his way south he visited Mr. Clermont Livingston, at Duncans, Vancouver Island, who showed him the Tyee Copper Co.'s mine at Mt. Sicker and smelting works at Ladysmith.

Mr. Paul Johnson, manager of the Alaska Smelting & Refining Co.'s smelter at Hadley, Prince of Wales Island, South-east Alaska, has been at Crofton, where during his visit 495 tons of copper matte from Hadley were sampled before being converted into blister copper. Mr. Johnson went over to Seattle before returning north.

The death occurred at Atlin on 11th inst. of Mr. E. J. Thain, mining recorder for Atlin mining division. The deceased official also filled a number of other offices under the Provincial Government. He had been resident at Atlin for nearly seven years. Mr. Thain was born in St. John, New Brunswick, in 1847, and came to British Columbia as a boy. The cause of death was heart disease.

Mr. W. S. Ayres, consulting mining and mechanical engineer, is returning to Hazleton, Pennsylvania, from Banff, Alberta, where he has been engaged in connection with the opening up of the C. P. R. Co.'s Bankhead anthracite coal mine. The immediate object of his going East, says the *Engineering and Mining Journal*, is to install his new separating machine for coal and ore in some of the anthracite breakers of Pennsylvania.

Mr. Leslie Hill of Nelson, has been at Silverton, Slovan, making an examination of the Hewitt and Lorna Doone mines which are being worked under lease by Mr. M. S. Davys, also of Nelson. Mr. Hill, who is manager in British Columbia for the Hastings (B. C.) Exploration Syndicate, of London, England, and consulting engineer to other companies, is now in the East and will meet some of the directors of his companies in New York.

Mr. Norman Carmichael, who last summer resigned the position of manager in British Columbia for the Highland (Kootenay, B. C.) Mining Co., operating at Ainsworth, to accept an appointment as one of the mining engineers of the Arizona Copper Co., with headquarters at Morenci, Arizona, has been appointed head superintendent of all the company's mines. He also has the management of the same company's 700-ton concentrator.

Mr. Geo. E. Green, superintendent of the Hadley Consolidated Copper Co., was presented with a gold watch, chain and charm by the company's employees, at Hadley Prince of Wales Island, on 25th inst. The *Mining Journal*, of Ketchikan, Alaska, states that Mr. Green is one of the oldest timers in the camp, having been associated with Mr. Sam Silverman in all his operations on the Island during the past five years, and congratulates him on being superintendent of the first dividend-paying mine in South-eastern Alaska.

Mr. James Milne, of Toronto, Ontario, has been appointed electrical superintendent of the British Columbia Electric Railway Company, owning the electric street railways in Victoria and Vancouver and the Vancouver-New Westminster inter-urban electric railway. Mr. Milne, who has already commenced his new duties at Vancouver, was for six years superintendent of the Toronto Electric Light Co., during two years of which period he also delivered lectures in the Toronto Technical School on electricity, applied mechanics, steam, and the steam engine.