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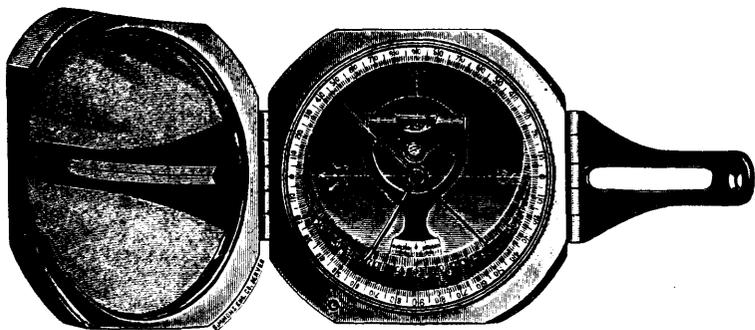
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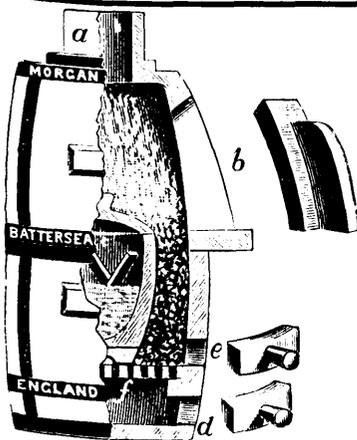
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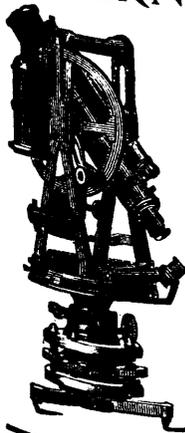
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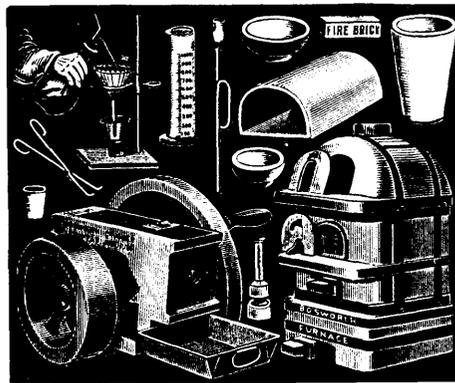
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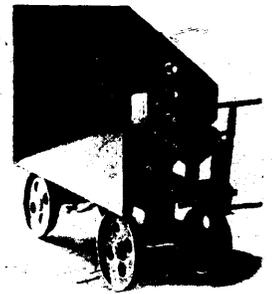
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Conveyor 328 feet centers, handling 4 tons "run of mine" coal per minute.

Link-Belt

ELEVATORS AND CONVEYORS.

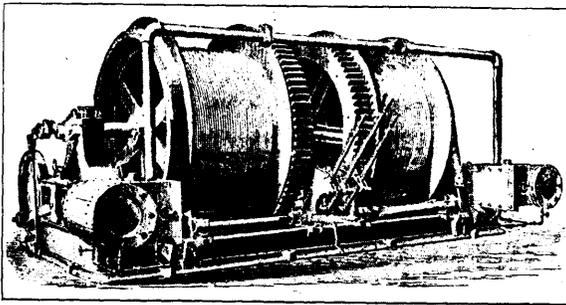


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Electric Coal Mining and Haulage Machinery,
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Builders and Contractors for Complete

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We carry a large stock of Machinery and Supplies at our Rossland Warehouse. If in need of anything for your mill or mine, please write our agent, MR. F. R. MENDENHALL, who will quote you satisfactory prices, and probably be able to fill your order at once from stock.

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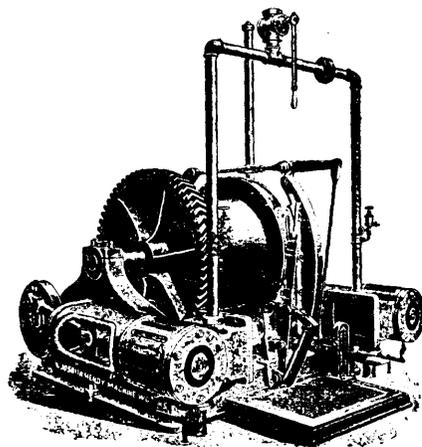
Nos. 38 to 44 Fremont St., SAN FRANCISCO, Cal., U.S.A.

—MANUFACTURERS OF AND DEALERS IN—

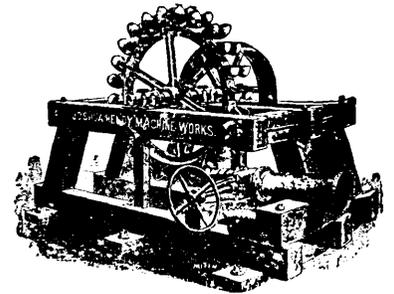
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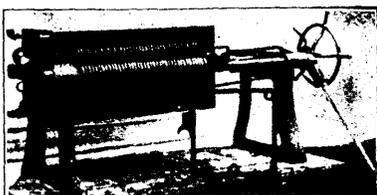
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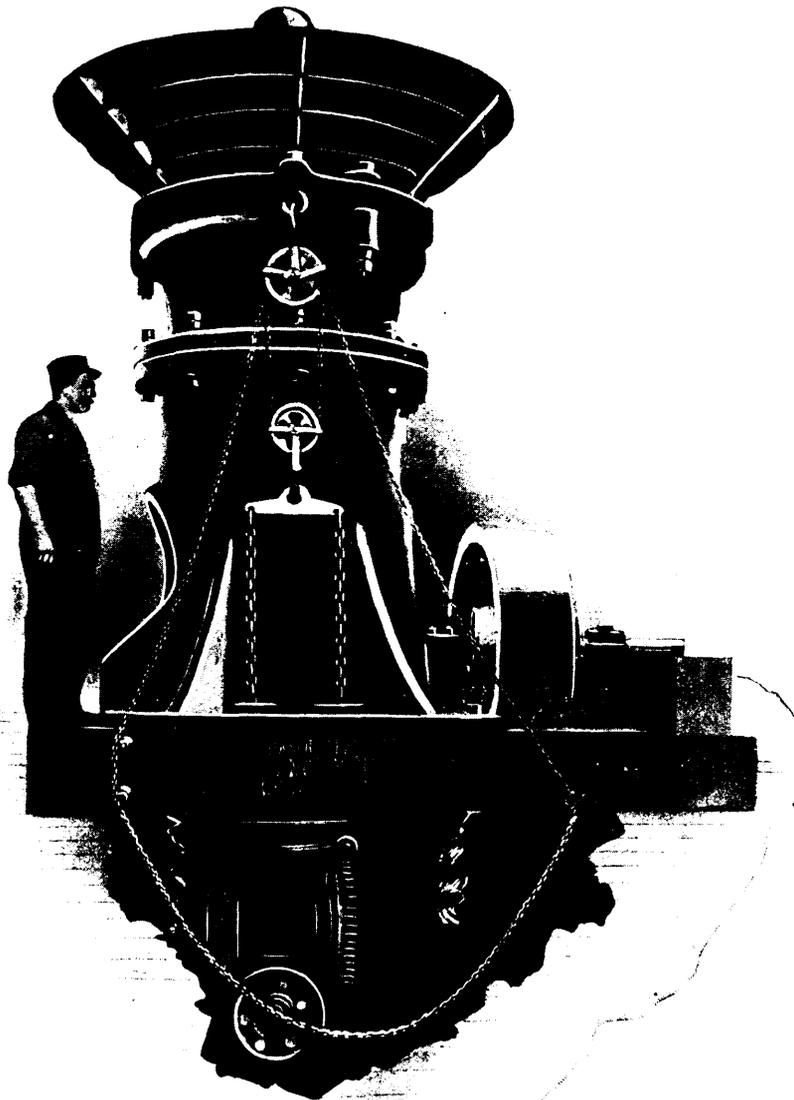
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And equipment of every kind. Our machinery in these lines is more largely used than that of any other manufacturer. It is in use on all gold fields and is recognised everywhere as the best. The Whitewater Deep Concentrator is a recent example of our work. Ball Pulverizers such as used at the Republic Mine and the Helena & Livingstone Mill are of our manufacture. Write for Catalogue.

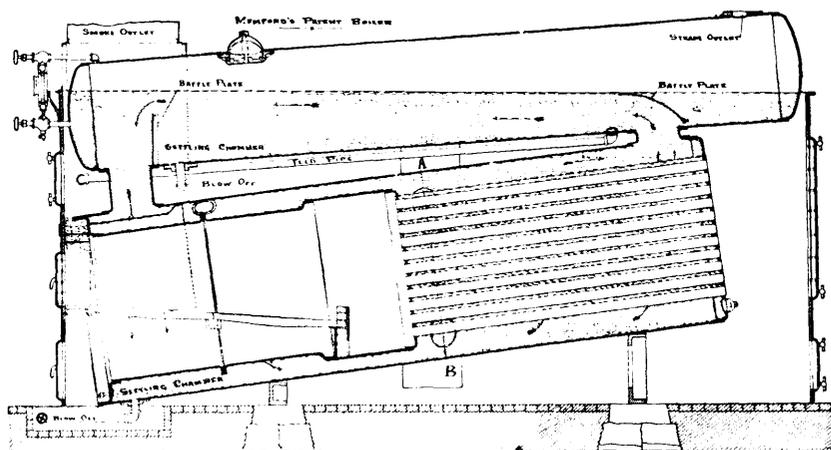
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MENNO UNZICKER, SPOKANE HOTEL, SPOKANE, WASH.

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Adapted to forced draft, increasing horse-power without foaming or priming. Specially arranged for using bad water with little or no scale formation.

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Gives exclusive attention to the development and utilization of Water Powers by the most modern, economic and improved methods. An experience of more than fifteen years, involving both the theory and practice of hydraulic engineering as relates to power development in its widest range of application, is at the service of customers.

NINE THOUSAND WHEELS NOW RUNNING—Aggregating some 700,000 h.p. ELECTRIC POWER TRANSMISSION—Pelton Wheels afford the most reliable and efficient power for such service, and are running the majority of stations of this character in the United States, as well as most foreign countries. Highest efficiency and absolute regulation guaranteed under the most extreme variations of load. Pelton Wheels are running every water power plant in British Columbia. Parties interested will be furnished with a catalogue on application. ADD: 333

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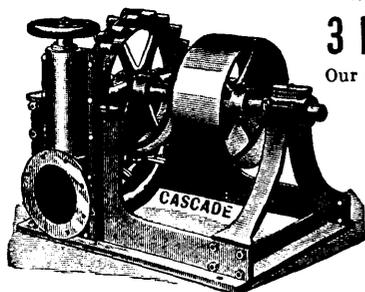
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Our experience of **33 YEARS** building Water Wheels enables us to suit every requirement of Water Power Plants. We guarantee satisfaction.

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I am pleased to certify to its successful operation as a most efficient motive power.

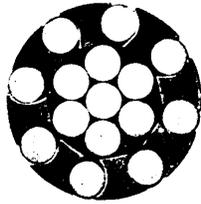
Yours truly, W. T. WHITEHEAD, Manager.

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**LOCKED-COIL
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No displacement of wires in any event. Gives three times the service of other cables, and adds correspondingly to the life of the rolling stock.

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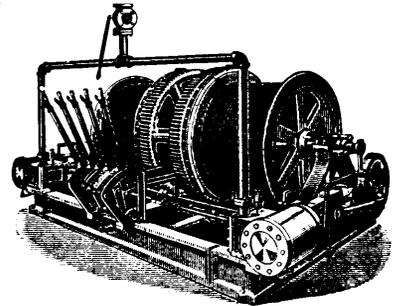
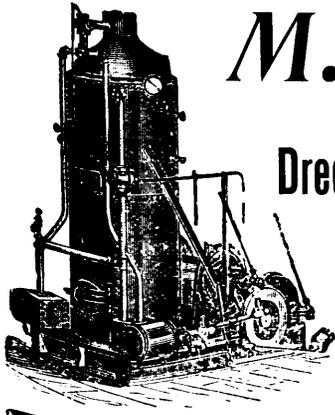
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Dredges, Ditchers and Steam Shovels,

For Dredging, Ditching, Dyking, Gold Mining, Etc.
Of various styles and sizes to suit any work.

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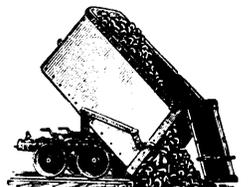
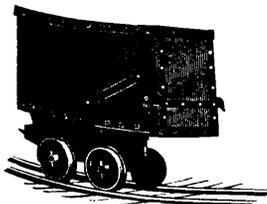
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AUTOMATIC ORE CARS!

— SOLD BY —

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Patented in Canada, June 21, 1898.

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The Simplest, Strongest and Most Easily Adjustable
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Nothing but the best Tool Steel and Bronze is used
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The HAMILTON ACETYLENE GAS MACHINE

SIMPLE, ECONOMICAL, DURABLE AND SAFE.

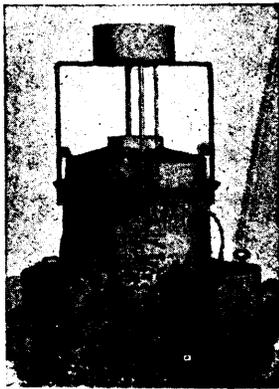
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Straight Line Duplex and Compound **Air Compressors**

COMPLETE MINE EQUIPMENT.

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BRAND
READY
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Why Certainly!

Easily knocks out all comers. It has held the championship of the world for nearly 50 years. We will never let it take a second place to any competing grade. It will always be **THE LEADER, THE WINNER, THE FIRST, AND BEST.** Others may cost more but none can beat it. Insist on "ELEPHANT," made in 69 beautiful shades, for any description of inside and outside work. Inquire for Liquid "Ironite" for floors and oilcloths.

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BANK OF BRITISH NORTH AMERICA.

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G. H. BURNS, Mgr., VICTORIA, B.C.

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The Mining Record.

Vol. V.

MARCH, 1899.

No. 3

BRITISH COLUMBIA MINING RECORD.

Devoted to the Mining Interests of British Columbia.

PUBLISHED BY

The Mining Record Limited Liability.

ADVERTISING RATES ON APPLICATION.

H. MORTIMER LAMB, Managing Editor,

London Office : 21 Coleman Street, E.C.

SUBSCRIPTION TERMS:

Canada and the United States, one year - - \$2.00

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THE EDITOR, B.C. MINING RECORD,
P.O. Drawer 685, Victoria, B.C.

All communications relating to the business department of the British Columbia MINING RECORD to be addressed to the
BUSINESS MANAGER, B.C. MINING RECORD,
P.O. Drawer 685, Victoria, B.C.

NO more important or responsible duty devolves upon a mining engineer than that of examining and reporting on mines or mining properties for prospective purchasers, who must perforce trust entirely to his skill, experience, care and honesty for guidance and protection. Before therefore a mining engineer is engaged to undertake work of this nature it is needless

to say that the greatest caution should be exercised in ascertaining that he is a man of not only high professional standing, but also has special knowledge and acquaintance of the particular class of mining enterprise which is to be examined and considered. That this very obvious and necessary precaution is frequently disregarded there can be little doubt; for, speaking generally, many of the disappointing and in some cases disastrous mistakes that have been made by English mining companies operating in British Columbia may unquestionably be traced to the fact that engineers have been selected who, although possibly well versed in the conditions of mining in other countries, have no special knowledge or experience of the gold-copper and silver-lead smelting ores or of the hydraulic gravel mines of British Columbia. Many instances in point, such for example, as the unfortunate fiasco of the Galena Farm, could without difficulty be cited.

Meanwhile a case, it is true, of somewhat dissimilar character, yet bearing directly on the subject under discussion has lately been brought to our notice in connection with a recent report upon certain hydraulic mining properties in the Omenica District made by Mr. Edgar P. Rathbone, M. Inst. M.M., A.M. Inst. C.E., M.I., Mech.E., late Inspector of Mines to the Transvaal Government in the Witwatersrand Goldfields.

It may be remarked in passing that this same Mr. Rathbone, as the result of a "flying trip" through

Canada during the summer of 1897 delivered at the Royal Colonial Institute a lecture upon "The Gold-fields of Ontario and British Columbia," which, although commended by some of the English newspapers, was justly and severely criticized for its inaccuracy by the Canadian press.

It appears that in the month of November, 1897, a London syndicate, promoted by Sir Ellis Ashmead-Bartlett, M.P., and others, and called the North Western Pioneers, Limited, acquired options upon certain properties in British Columbia, including those of the Omenica Consolidated Hydraulic Mining Company, Limited, consisting of seventeen partially developed hydraulic gold mining claims, each of eighty acres in Omenica District. This option was granted by the vendor company without cash payment upon the sole condition that within a period of eight months from date the London company should have the properties examined by a competent engineer, and if his report proved favourable, should purchase the ground at a price thereupon agreed. In the following spring the North Western Pioneers, Limited, to carry out this agreement engaged the services in England of Mr. Rathbone, who undertook to report on these hydraulic, as well as copper-gold and silver-lead, properties in British Columbia. Mr. Rathbone arrived in Omenica on the 12th June and less than ten days sufficed him to examine and test the ground (some 1,360 acres in extent) he had come so far to see. On the 24th June the return journey was commenced, and cabling from Ashcroft to the London Board of Directors that he could not recommend the purchase of the properties, Mr. Rathbone advised them to await his "detailed" report, then in course of preparation. It is with this so-called "detailed" report we now propose to deal, and we are free to confess that as a report by a properly qualified engineer upon a hydraulic gravel mining property it is truly a most remarkable production.

The report comprises some fourteen pages of type-written foolscap, ten of which at least are devoted to such matters as Mr. Rathbone's adventures en route; a geological description of the country between Quesnelle and Manson, which might very easily have been taken bodily from the Dominion Geological Survey Report—a by no means accurate history of the Omenica District, and a very misleading statement of the conditions affecting transportation and labour in that district. With regard to the question of transportation Mr. Rathbone makes the astounding statement that from Ashcroft to Quesnelle "goods can only be transported during the summer months; that is, the season commences somewhere about May and ends in October."

It is hardly necessary for us to point out that the most favourable period of the year for the transport of supplies over this route is during the winter season, when advantage is taken of the snow for sleighing.

Further, Mr. Rathbone proceeds to state that "as there is no means of communicating with the outside

world, it would take one month at least to send out any letter requisitioning materials." Mr. Rathbone himself left Omenica on the 24th June and arrived at Quesnelle on the 4th July, where there is telegraphic communication with the outside world.

It appears to us that in dealing with the questions of transportation, labour and supplies Mr. Rathbone has carefully refrained from alluding to the fact that very considerable development work preparatory to hydraulic mining, have been proceeding for some time in Omenica for which undertaking men, supplies and machinery, notwithstanding Mr. Rathbone's "insurmountable difficulties," have been transported to Omenica over what he describes as a "hardly discernable path cut through the virgin forest, strewn with fallen timber, and used only by a few desultory prospectors."

Enough has perhaps been said on this point, and we shall now pass on to the important portion of what he is pleased to call his "detailed" report dealing with his description, examination and valuation of the ground itself. It seems to us to be an extraordinary achievement to write a "detailed" description and report of such extensive properties within the space of half a foolscap page of typewritten matter, and in order that our readers may know what Mr. Rathbone's idea of a "detailed" report is we propose to produce it *in extenso* :

"The claims which were under offer to you are situated, as I have already stated, on Manson Creek, Lost Creek and Germansen Creek, and I carefully inspected all of them, devoting particular attention to those points where it was possible to examine any proper section of the beds. As, however, no preparatory work has been done in this way—that is, in making proper sections and tunnels to admit of a thorough examination—I was only able to take certain points. I, however, managed to make very careful panning at several points from the very bottom to the top of the gravel-beds, taking every few feet, and from a very large number of pannings taken in this way I found that there can, unfortunately, be no doubt that the gold is only to be found in very limited areas, usually in a bed two or three feet in thickness, the gravel lying above and below, being as a rule absolutely barren. In this bed I found that when it was worked together with the overlying and underlying gravel—from which, of course, it could not be separated—it would not average in most cases more than five cents per cubic yard, and frequently it would be much less. Now, as the cost of working in this district would be fully as much as it is in the Cariboo, where it is proved under far more favourable conditions to cost fully ten cents to the cubic yard, it is at once evident that these gravels are not nearly rich enough to pay even working expenses."

If this is a "detailed" report we may, we think, be pardoned for not discovering the details. Here are seventeen claims, each having an area of eighty acres and situated on three separate creeks at distances apart of from eight to ten miles, and the claims themselves in different localities on these creeks. Yet, Mr. Rathbone tells his employers that in a stay of a little more than a week he had "carefully inspected all of them." It will be noted, however, that he refers to none of the properties by name; that no plan accompanies the report showing where the pannings were taken; and that there is no record of any kind of the number of pannings made or of the results per pan. Furthermore, we leave it to any hydraulic miner or

engineer to say whether property of this character can be properly exploited by means of a pan only. Mr. Rathbone's explanation that he did not sink test-pits and take other measures to examine the ground because this preparatory work had not been performed by the vendors, appears to us to be to the last degree absurd, and we should like to ask him if were this the usual practice, what precaution would he take against the possibility of the mine being "salted?" Meanwhile, the following extracts from letters referring to the manner in which Mr. Rathbone conducted his examination are of interest: The first is from Mr. Fred W. Valteau, the Gold Commissioner of the Omenica district, and written with the approval of the Minister of Mines. Mr. Valteau writes:

I have read carefully Mr. Rathbone's report and I must say that I am very much surprised that a man having held the position he has could possibly write a report so much at variance with what is so well known of the country and the ground in question. Having spent the greater part of the last four years in the Omenica myself, and having travelled, spring, summer and winter, over the same route as Mr. Rathbone took, I cannot allow his statement that the trail from Quesnelle to Manson is such a very rough one to pass without contradiction. . . . Mr. Rathbone arrived at Manson on Sunday, June 12th, and a couple of days after began his work of inspection. Now, I note in his report he says he was "engaged in making a careful examination of the properties" on the Manson and Germanson Creeks until the 24th of June, when he left the district to return to England. Taking into consideration that the property under examination is situate upon three creeks, that these creeks are distant one from the other over eight miles, and the claims comprise an area of something over 1,300 acres, the time spent upon them, no matter how well it may have been employed, is, in my opinion, too short to enable any one to either recommend for purchase or condemn any property, and especially to condemn a whole district. The system of tests made by Mr. Rathbone was done by panning. No shafts were sunk, or cuts run in upon any portion of the ground, and in one particular point the ground sampled was a slide of gravel, where the samples taken were simply what had slid from the top of the bank at "grass roots."

The next letter is from Mr. Jarvett T. Richards, of Santa Barbara, California, President of the St. Anthony's Exploration Company, Limited, which has since purchased the properties Mr. Rathbone condemns. We take the following excerpt :

We hope to be in possession of the property formally by the 18th of January. Mr. Thompson's (the company's engineer) report to us showed that he had made a thorough examination in company with Mr. More, of the Germansen and Manson Creeks, taking into consideration the drifts made and other work done by parties who worked the shallow diggings twenty-five years ago, and also prospecting and panning the river beds and benches himself. Upon this examination he presented us such a showing as to area and richness of gravel, and comparatively limited expense of plant and current working that we determined to make the purchase from the Omenica company, believing that in so doing we secured property that will yield us sufficient to satisfy our ideas of profit. The property is bought and acquired by us as an investment to be worked by us, a close corporation, as an income yielding investment, and it is not for sale. Mr. Thompson is a practical and conservative man and he and all of us felt that we were acquiring a property sufficiently valuable for our purposes when we decided to acquire the Omenica holdings.

A third letter is from a well-known practical miner, Mr. Jack Kavanaugh, who owns and works claims in Omenica district. This we publish for what it is worth :

I met Mr. Rathbone at Manson Creek, Omenica District on the 16th of June, 1898. . . . After a short talk I came to realize that he was not a man who wanted to talk to a common miner, but I watched to see what he would do. Here Mr. Kavanaugh expresses his opinion too freely and his remarks are omitted for obvious reasons. Not

would he listen to any one, in fact he told Mr. Keynton he did not want any assistance, neither did he spend time enough on any one of the claims to prospect it, let alone the seventeen he reported on. Captain Black asked me if I would take my partner and help to prospect the ground by sinking shafts and running open cuts. I told him "Yes"; but Mr. Rathbone refused the help, saying that he could make the examination that he wished to from the surface. He had two Indians and a cousin of his. They went to the top of the bank of gravel and took enough dirt to fill a gold pan, then he went down the hill about thirty feet and took another pan of dirt from the surface and repeated the operation until he came to the bottom of the bank. By doing that he had the same kind of gravel in the last pan as he had in the first, as the gravel keeps rolling from the top of the hill down. He did not take any gravel to prospect at a greater depth than 18 inches from the surface. . . . From my working on the creek and benches I find that a man cannot tell anything about the ground by the surface prospects, as I can get gold in most any place, but it is fine. I also find that the gold is scattered all through the ground, but that the most is on bedrock. . . . I have hydraulic mined from here to Colorado River, California, and know what a hydraulic mine is. (At this point the writer again indulges in personal reference to Mr. Rathbone's professional capabilities, and these it is not advisably or perhaps fair to publish). What I say is square, and I can give you references both here, in California and also in the State of Washington, where I have mined."

These letters do not, we think, require any comment. However, we do not desire to be understood as meaning that Mr. Rathbone was wrong in condemning the properties in question. He may have had strong reasons for arriving at the conclusion that the ground was valueless, that the unquestioned inaccessibility of the country would render the profitable working of these claims a matter of great difficulty. If he held these views, after making a careful and systematic investigation, it was clearly his duty to report accordingly to his employers, the North Western Pioneers, Limited. Mr. Rathbone, of course, may, as he states, have made what in his judgment was a careful examination of the ground, but we are reluctantly compelled to admit that after reading his report, any hydraulic mining engineer to whom it might be submitted, would come to the conclusions that Mr. Rathbone's idea of what constituted a "careful investigation" of hydraulic ground differed strangely from his own. A mining engineer's report to be of any value should be so worded that when it is submitted, those for whom it was prepared—provided they possess the slightest technical knowledge of the subject—should be able to form as accurate an opinion regarding the nature and value of the property on which the report is based, as the expert who examined it. How can this be accomplished but by the closest attention to detail and salient facts? It often, however, happens that while an engineer may recognize this fundamental principle of mine reporting, he is loath to follow it. If a man is ignorant of his subject he is wise to talk as little as possible, and it is also easier and safer to condemn than to commend. Many mines that are now on a substantial dividend-paying basis have been at one time pronounced worthless, and in the case of a British Columbia mine, we have the Rosslund Le Roi as an example. The properties upon which Mr. Rathbone reported in the Omenica District are now owned by a syndicate of Americans who are expending large sums for machinery and equipment. It is yet possible that this American syndicate will demonstrate to Mr. Rathbone's English company that a practical hydraulic engineer and miner, who has learnt his business in the hydraulic gold fields of California, is a superior judge of alluvial bench ground than a Watersrand Inspector of Mines.

All duly qualified assayers practising in this Province will, we think, have every cause to be well pleased with the eminently proper and sensible legislation which has just been passed by the Provincial Parliament to provide in future against the performance of as

THE
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OF ASSAYERS.

work by incompetent and unfit persons. That there was real need for legislative action in this regard we have repeatedly shown in these columns, and while expressing our gratification that measures have been taken to remedy the evil complained of we at the same time derive some natural satisfaction in the knowledge that the efforts put forward through the MINING RECORD to secure legislation of this character have not been unavailing. Briefly, the Act provides for the bi-annual institution of examinations under Government for efficiency in the practice of assaying and "other kindred subjects as may be deemed advisable; and after the expiration of two years from the 1st of March, 1899, no one not holding a Government certificate of efficiency will be allowed to practice as an assayer in the Province; but in order to save men of recognized professional standing the annoyance of undergoing a test of this kind provision is made that any person applying for a certificate of efficiency on satisfying the duly appointed examiners that he has passed a course of practical analytical or assay work in any school of mines or college in Canada, Great Britain or Ireland, shall be entitled to receive such a certificate on recommendation of the examiners; or, in other words, the Government certificates will be granted to all applicants able to produce satisfactory credentials. The passage of this measure will unquestionably have the effect of raising the standard of efficiency among assayers in British Columbia, and by debarring incompetent men from practising as assayers in the Province, it will furthermore, to a considerable extent, achieve the purpose for which it was really intended, namely, the protection of the public against imposition at the hands of ignorant and fraudulently disposed persons assuming a knowledge of analytical chemistry. It is, however, we think, to be regretted that so long a time as two years must expire before the Act can become operative. This, notwithstanding, legislation upon such lines is, in British Columbia, a step in the right direction, and we hope before long to see measures of a similar nature introduced in the Provincial Legislature applying to the professions of both mine managers and mining engineers. Incompetency in either of these callings may, and very often does, lead to the most serious consequences, not only as regards ill-directed effort and misapplied expenditures, but often in the loss of human life. We shall take an early opportunity of referring more fully to this important subject.

The amendments placed upon the statutes of this Province with regard to the Coal Mines Regulation Act will prove of the greatest possible benefit to the coal miners of this Province. The first amendment has for its object the exclusion of Japanese from coal mines. Some years ago an act was passed prohibiting the employment of Chinese in these mines, but by reason of a technical flaw in the wording of the act it was not enforced until last year, when the necessary alterations were made rendering the act effective. Finding that the law prohibited the employment of Chinese the coal companies at once proceeded to engage

Japanese labourers, and for the same reason that Chinese were excluded, it thus became necessary that further protection should be afforded white miners against Japanese competition. It has, moreover, been demonstrated that Mongolians in coal mines endanger the safety of the white miner. Very serious accidents have occurred at Wellington and Nanaimo wherein the loss of life was very considerable and these accidents were attributed in part to Mongolian carelessness, and in consequence the two superintendents of coal mines in the Province at that time voluntarily agreed not to again employ Chinese under ground at Wellington and Nanaimo, an agreement which has been strictly adhered to by the Nanaimo Company and up to recent years by the Wellington Company, but in other mines on Vancouver Island Chinese have of late years been largely employed. The second section of the amended act compels coal owners to weigh the coal sent out of the mine by the coal miners before putting it over a screen. This practice is not followed at the Union Coal Company's mines, but all the other mines place the gross weight of coal to the credit of the miner, making any deductions in accordance with an arrangement in force between the company and the miners. The Union Company by this unfair system gain all possible advantage at the miner's expense; for when the coal is soft a large percentage passes through the screen and the miner is only paid for what remains, the company profiting from the sale of the small broken coal for the mining of which they are put to no expense.

It is further provided that a collieries inspector must hold a mining engineer's certificate. Under the former provision the Minister of Mines could appoint any fit person, and it was consequently possible that this important and responsible position might be held by a not thoroughly qualified person.

It is rather amusing to contrast two articles, both referring to the War Eagle mine, which appeared this month, the one in the *Canadian Mining Review*, the other in the *Toronto Globe*. The writer of the article in the *Globe* is that exceedingly optimistic individual, Mr. P. A. O'Farrell. The *Mining Review*, on the other hand, is a little inclined to be ultra-conservative. Its criticisms have not, however, so far as we are aware, been successfully controverted.

THE MINING REVIEW.

"In the manager's report we can find only six lines devoted to 'Ore Reserves,' the substance of which is that the aggregate tonnage in sight is 100,000 tons, of a total gross value of \$1,700,000, or a total net value of only \$625,000, since the total cost of extraction and treatment (according to Mr. Hastings' figures) is \$10.75 per ton. That the present market value of a mine showing only \$625,000 net should be \$5,600,000 seemed to us so contradictory that we read and re-read, figured and re-figured, only to end, as above said, with a feeling of great and unmixed surprise. * * * Referring to details of the report, we note, in President Gooderham's address, that charges for transportation were reduced during the year

MR. P. A. O'FARRELL.

"Two French-Canadians—Joe Morris and Joe Bourgeois—were the discoverers of the War Eagle. * * * But could those two weary wanderers in their fondest hopes or dreams imagine that when they placed the stakes on those mountain fissures they had really found the hiding-places of the greatest golden treasures the world had ever yet seen? Could they dream that they had found gold mines that would enrich the Dominion and the world? They had found something that was destined to make vast fortunes for many, and that was also destined to lead others to renown and glory. Under Mr. J. B. Hastings, the War Eagle has developed into one of the great gold mines of the world. It is worth \$5,000,000.

some \$3.50 to \$4 per ton, but on examining the tabulated figures in the General Manager's report, we find the difference put at \$2.46 only. Moreover, we are surprised to find a difference of only 84 cents per ton between the net values per ton received for ore shipped during 1897, when the Directors announced that charges were so high it was expedient to stop ore shipments, and the values received in 1898, when the policy is one of pushing shipments. It is doubtful whether a smelting proposition, whose policy is dictated by a margin of only 84 cents a ton, can long remain 'gratifying' to shareholders who have gone into it as an investment. Taking into consideration the reduction in charges (\$2.46 if we believe Mr. Hastings, \$3.50 if we believe Mr. Gooderham), it becomes evident that the grade of ore shipped during the period when the stock was ruling about \$2.90 was some \$3.30 to \$4.34 per ton lower than when the stock was ruling at 80 cents; again a matter of surprise! The financial statement calls for little comment; it is significant to note that but for the sale of 100,000 shares of treasury stock, which brought into the exchequer some \$270,000, there would have been no 1½ per cent. dividends and no profit balance of \$85,747. The item of \$10,000 for remuneration of Directors, we should think, required some explanation to the shareholders; the work of the Board must have been very heavy to justify such remuneration; and the item of 'Interest and Exchange' \$8,439.93 is also very heavy, but is accounted for, we suppose, by the interest on loan from Geo. Gooderham; why this loan was not paid off with the first receipts, and why a dividend was declared and paid, with this loan account still standing, are questions an English company would have to answer satisfactorily."

It has not more than probably \$2,000,000 in sight above its lowest work level, but then the vein shows such strength and generous deposits of ore that I believe that below the 700-foot level there will be found ore bodies that it will take twenty years to mine, and that during that twenty years it can pay \$500,000 a year in dividends. This is a bold statement, but while it cannot be verified, it is the belief of those old prophets of the hills, the old miners who have worked in the deep level mines of California. Hitherto this company has been at enormous expense in opening up this mine and making those vast improvements. I have no interest in the War Eagle as a stock exchange proposition, and I do not care one green gooseberry whether its stock barometer goes up or down; but I will state what we all here believe, that the War Eagle will, inside of twenty years, pay \$10,000,000 in dividends. That is, it can and will pay \$500,000 a year in dividends."

The placing of the stock of the Payne Mining Company, Limited, of the Slocan, on the Eastern Canadian market first reveals to the public the real profit earnings of the undertaking. These have been to date \$1,000,000, of which no less than \$450,000 have been earned since April last, while there are apparently ample moneys in hand to pay a further dividend of \$50,000. The company, as organized in April, 1897, has now a capital stock of \$2,500,000, representing a million shares of \$2.50 each, and these shares stand at a goodly premium of between 70 and 80 cents on their par values. At this rate the present average dividends show profits of over 18 per cent. per annum. The dividend returns of the Payne mine show also that it has legitimately earned its credit for being the largest profit-earner to date among the precious metal mines of the Province, although a silver-

lead and not a copper-gold proposition. As regards aggregate of dividends, however, the Le Roi undertaking runs the Payne rather close, its total earnings representing \$25,000. The Le Roi mine has, however, now to earn dividends on a capital of £1,000,000, whilst that of the Payne Mine Company, Limited, only represents a capital stock of rather over half that amount in sterling. Hence, there is reason to believe that the Payne mine will continue to hold its pride of place for some time to come, as the largest dividend-earner amongst the precious metal mines of British Columbia.

In this connection it would be interesting to learn what are respectively deemed the probable productive lines of the Payne and the Le Roi mines, but as to these no data of sufficient authenticity are forthcoming. Each company, however, evidently expects long years of further profitable productivity, since neither yet makes any provision for the gradual accumulation of a sinking fund in ultimate replacement of capital.

It is meanwhile gratifying to note the significant fact that moneyed men in Montreal and other large Eastern Canadian cities are beginning to invest heavily in British Columbia mine securities. Thus we are informed by one of the most prominent firms of stock brokers in Canada, Messrs. McCuaig, Rykert & Co., of Montreal, London and Glasgow, that they succeeded in securing a controlling interest in the Payne mine and are also investigating properties at the Coast with a view to purchase. British Columbia mining stocks were never so active on the Eastern exchanges as at present, and if only the "wild-catting" tendency is restrained the movement will grow in strength and intensity.

A correspondent writing from Sandon draws our attention to an unfortunate slip which occurred in last month's issue of the MINING RECORD with regard to the annual 1898 output of the Payne, Ruth and Slocan Star mines. These were given as 8,780, 1,700 and 1,900 tons respectively, instead of Payne, 13,190 tons; Ruth, 3,606 tons, and Slocan Star, 2,933 tons. The former figures represented the shipments for the last six months of the year only.

The Hon. Mr. Cotton's statement in the course of his Budget Speech, that the aggregate copper, gold, silver and lead output of the Province last year will, as indicated by the Government returns, show an increase on 1897 of 2 per cent. only in value, will cause some disappointment here and elsewhere, as we all anticipated a considerably larger growth of output values. According to Mr. Cotton's advance estimate, the gold, silver, lead and copper yield of British Columbia in 1898 will be in the neighbourhood of and probably somewhat exceed \$7,720,000. The result is attributable to a somewhat lessened output of the Slocan silver-lead country, the development of which suffered early last year rather considerably by the Yukon excitement, which temporarily tempted away the richest silver country in our Province and one of the richest in the world, some capital and large numbers of workers. Already, however, there are indications that the Slocan output will this year increase very considerably on 1897, the value of the yield of

the first six weeks of 1899 being estimated at nearly half a million dollars.

Another interesting point brought out in the speech of the Provincial Finance Minister is suggested by his estimate that exemption of working miners from liability to take out free miners' licenses will reduce the revenue from that source by about \$50,000. This means that about 10,000 working miners are relieved by the abolition of the duty in their cases. Free miners' licenses of \$5 each will, however, continue, payable by all who seek to locate or own mine claims and are not merely engaged as wage-earning metalliferous miners.

On the other hand, Mr. Cotton reckons that the one per cent. net duty on metal mine returns will in 1899-1900 realise \$60,000 as against \$45,000 in 1898-99. The Finance Minister, who is usually a cautious advance calculator, thus anticipates an almost immediate increase of about \$1,500,000 in the yearly output of our gold, silver, copper and lead mines. In this estimate he will probably be found—as indeed we all hope that he will be—well under the mark reached by actually forthcoming results.

It is stated that advantage is to be taken by the Nelson and Bedlington Company of a clause in the charter granted to the Crow's Nest Pass Railway, whereby running powers must be conceded over that line to other railway companies applying for the privilege. The outcome of this application is awaited with some degree of interest.

The complaint has been made to us that several British companies owning really valuable properties in this Province also have interests in West Australia and other countries of the veriest "wild-cat" type, and that consequently the association is most prejudicial to the British Columbia mines. The incident is certainly unfortunate, but it is fair to ask if there are not companies in possession of good West Australian mines but saddled with British Columbia wild-cats? It makes all the difference, of course, on which foot the shoe pinches.

In expressing the hope that the application, it is understood, Mr. Corbin intends again making when the Federal Parliament meets, for charter rights and privileges for the construction of the proposed Kettle River Railway into the Boundary Creek district, will meet with no better reception at the hands of the Railway Committee of the Dominion House than was accorded it last year, our contemporary, the *Nelson Miner*, takes the very narrow and selfish view that the wholesale trade of this flourishing West Kootenay mining and commercial centre would suffer if a rival American railway is allowed to enter into competition with the Canadian Pacific for the traffic and transport business of South Yale. The same argument could be, with equal sense and justice, offered in opposition to the building of a much-needed railroad connecting the line now under construction at Midway with the main system of the C.P.R. at Hope. When this connection is made through the Similkamen district there can be no doubt but that a large proportion of the trade of the mining districts of South Yale will be shared by the coast cities of Vancouver and Victoria, possibly to the detriment of Nelson. But this is all beside the question. The point

to be considered is what conditions are most essential to promote the advancement and welfare of mining in the Boundary Creek district. One of these conditions is the cheapening of supplies consequent upon railway competition. In the successful development of the wonderfully promising mines of South Yale the Province as a whole is directly interested.

The beneficial result of the building of the Crow's Nest Pass Railway is already becoming apparent, in the increased activity in the mining districts of East Kootenay. This month for the first time shipments of ore were made from the St. Eugene and Lake Shore mines at Moyie to the Trail reduction works. The ore, of which some 220 tons aggregated the first consignment to the smelter, is said to have an average value of \$60 per ton, leaving after all transport and treatment charges have been deducted, a very handsome margin of profit to the owners.

The case of Grant vs. the Gold Exploration Syndicate of British Columbia once more reveals the dubious methods which are too common amongst a certain class of London company promoters. It showed that Mr. Grant-Govan, who is best known here by his flotation of the companies known as the Goldfields of British Columbia, Limited, the Waverly Mines, Limited, and the Tangier Mine, Limited, while acting in a judiciary capacity as managing director of the Gold Exploration Syndicate, asked and received a commission from the vendor of certain British Columbia gold claims acquired by his company. As a result, Mr. Grant-Govan has been compelled to hand over his secret commission to the company, which in the suit in question, nevertheless, lost £500 and costs, as a result of the Grant-Govan transactions. This, however, was a direct consequence of the company's subsequent ratification of part of the Grant-Govan commission agreement, and though the company has made only a loss by defending the action, the outcome should be good. It ought to serve the purpose of clipping short the wings of a promoter, whose "boodle" methods have contributed not a little to discredit British Columbia mining opportunities in the money market of England. There is no longer the slightest fear—indeed there never was any worth mention—that Mr. Ernest Grant-Govan will succeed in his once loudly-trumpeted intention of becoming the "Cecil Rhodes" of British Columbia.

Mr. J. B. Hobson's annual report, which we print *in extenso* elsewhere, to the directors of the Consolidated Cariboo Hydraulic Mining Company, Limited, is of more than usual interest. On the whole the result of this company's operations in Cariboo last year were eminently encouraging. It is true that the expenditures over receipts were very considerable, but the large sums spent in carrying out the extensive system of increasing the water supply seem to be entirely justified by the condition and showing of the mine. Mr. Hobson now asks for a relatively small appropriation of \$17,000 to purchase necessary hydraulic plant and appliances, and to complete the equipment of the property. This is the last expenditure that will be required in order to place the property upon a dividend-paying basis, and after next season shareholders have every assurance of receiving substantial profits on their investments.

The London *Critic* is doing really splendid work in exposing frauds and wild-cat schemes of every description. It is Mr. Hess who successfully exposed that most impudent of swindles, the New Golden Twins (Ontario), Limited, the directors of which concern were compelled to admit that no value could be placed on the report purporting to be signed by Johnson Brown, "M.E.," for the simple reason that "M.E." stood for, not mining engineer, but "mineral prospector and explorer" (save the mark!), and now the rottenness of another of Mr. Morris Catton's promotions, the Klondike and Columbian Goldfields, Limited, is being shown up in this journal. Mr. Catton in order to induce the unfortunate shareholders of his company to buy more shares has adopted the humourously original plan of writing to the holders of shares inviting them to give him an option for six months of purchasing their holdings at 25s. 6d. per share. Thanks, however to the *Critic* this wily dodge on Mr. Catton's part is not likely to prove so effectual as no doubt was fondly imagined. The *Critic* points out that Mr. Catton does not propose to pay any thing for the options he asks for, and that consequently he has nothing to lose in the event of declining to take up the shares at the end of the six months. Moreover, if he were really anxious to increase his holdings in the company he could buy at once thousands of shares at rubbish prices. To use an expressive Western colloquialism, Mr. Catton is a "bad egg," and the sort of companies he promotes do more to injure British Columbia in London than can well be imagined.

If there is anything in the reports circulated last summer that vast deposits of high-grade copper ore had been discovered in the Skeena River district, the value of these finds should now soon be made apparent. We learn that representatives of one of the wealthiest and certainly one of the best known mine operators in the West, Mr. Marcus Daly, have, after making careful investigations in this locality, bonded a number of claims for a large sum of money, and arrangements are now being effected for the commencement of development work on quite a large scale. Copper mines are in great demand at the present time, and it seems that British Columbia will ere long take a very high rank among the countries of the world producing this metal.

It is to be regretted that the recent session of the Provincial Legislature was brought to a close before the proposed amendments to the Mineral Act were considered. Some of the contemplated changes were of great importance, particularly that specifying that the interest of each owner of a mineral claim should be described in Crown Grant titles. Last year's provision that the survey of a claim should count as assessment work, was an excellent one, and it is unfortunate that it will no longer remain in force.

An Australian correspondent, formerly a prospector and still an owner in a Slocan property, sends us the particulars of a remarkable performance in shaft sinking made in a mine known as the "Brilliant Deep Lead," Charters Towers, in less than a year to date a shaft, 12 feet by 4 feet in the clear and timbered into three compartments, was sunk a distance of nearly eleven hundred feet through hard grey granite. This, he states, is the Australian record for this class of work.

That there has been and is considerable distress among the unemployed in and about Dawson, is shown by statistics of Government relief, afforded those in need—mostly American citizens—by the Yukon Administrator, Mr. Ogilvie. That officer, we learn, received from liquor permits, fines, etc., between September and the end of December last the large sum of \$38,508, of which he and his aides, civil and military, expended no less than \$30,000 on sick and poor relief, in addition to \$990 paid for the burial of the destitute, and a modest sum of \$420, allowed in aid of the travelling expenses of unemployed Yukoners, seeking to leave the country. In all probability ere the long Klondike winter draws to a close, the Dominion authorities must expend at least \$70,000 on the relief of sick and destitute people in the Yukon. The money they appropriated comes at present, it appears, from fines and casual liquor revenue, the far larger ordinary receipts from royalty, licenses, etc., all going directly to Ottawa; and despite the necessarily considerable outgoing for administrative expenditure, including relief as above noted, there is no doubt that the Dominion receives from the Yukon, as it does from British Columbia, a large surplus of profit revenue. It is now stated, by the way, that the United States Government is likely at the request of its consular authorities, to do, as certainly it should, something in aid of the distress amongst American citizens in the Yukon.

Facts like these suggest that although a good and increased gold output is anticipated from the Yukon late in the spring and early in the summer of this year, it still remains, as it will remain, highly inadvisable for any would-be miners, prospectors or other workers to set out for the Yukon, unless of good physique, steady habits and in general possessed also of some means. Indeed there is already an ample supply of ordinary workers, either now in the Yukon, or about to return to the northern goldfields, after a brief absence during the winter months.

The Crow's Nest collieries have begun, it is said, in a very modest way, the export of some of its coal to the States, and last month, an aggregate of twenty tons of coal, doubtless representing trial orders, was shipped through the port of Nelson consigned to American consumers.

Meanwhile the colliery is putting out for home use in the Kootenay a large and increasing quantity of coal and coke, and apparently therefore has no immediate need for foreign orders, pending the furtherance of development work at the mines. Before the end of the present year, however, the coal mines of Fernie should be making very large shipments of their product to smelting and industrial centres in Montana, Idaho and Washington, in addition to meeting rapidly growing home requirements.

There should surely be no very great difficulty whether Dominion or Provincial aid be granted or not, in the raising by the White Pass and Yukon Railroad Company of sufficient funds for building and equipping the proposed branch with connections from Log Cabin to Atlin, extending over twenty-nine miles of land and twenty-two miles of waterway. The cost of the land construction has been estimated at \$25,000 a mile. In all the branch should seemingly be built and equipped as a narrow-gauge railroad and inland waterway undertaking, for a sum of not more

than £250,000, no very large amount of capital from the point of view of either London or New York. The expected mail subsidy and large passenger and freight receipts certain to accrue to such a line for a considerable future period, should greatly facilitate the raising of the needed capital, by those behind the railroad, a majority of whom are solid British and American financial men. In view, however, of the fact that both Klondike and Atlin are, as placer and hydraulic gold fields liable to exhaustion of their best mineral resources in two or three decades, railroad companies operating in the country need to make not only fair present profits but also gradually accumulate a sufficient sinking fund in replacement of capital, a very small portion of which can be recouped when the profit-earning life of such an undertaking terminates, by the sale of rolling stock and other material which has been in use.

By the 17th of March the Dominion Parliament will again be in session, and it is of very great importance that the agitation, commenced last year, to secure legislative assistance for the promotion of the Slocan lead mining interests should not be allowed to drop. It will be remembered that a deputation from the Kaslo Board of Trade waited upon the Government at Ottawa and urged that a commission be appointed to enquire during the parliamentary recess into the conditions affecting lead mining and smelting in the Slocan, with a view to reporting the result of their investigation to Parliament. It is a matter for regret that the suggestion was not then acted upon, but there are substantial grounds for the belief that the Ministry are now much more inclined to consider the subject seriously, and every effort should be therefore put forward to secure such a commission without further delay. There can be no doubt that if a commission of representative commercial and mining men were appointed to look thoroughly into the matters in question, both as regards the methods of manufacture and the conditions of foreign lead markets, the possibility of discovering a happy solution to the problem would be greatly facilitated.

The Provincial mineralogist, Mr. Robertson, is now busy with the concluding proof sheets of the annual report of the mines and mining developments of the Province. Last summer Mr. Robertson spent a good deal of time in the Fort Steele district, and this interesting section, which in the past has received scant attention in the official reports, will in this be prominently noticed. Those who know the district have the greatest faith in its mineral potentialities, and the result of the development of such properties as the St. Eugene, Lake Shore and Moyie mines on Moyie Lake, the North Star and Sullivan up St. Mary's River, the Dibble group to the southeast of Fort Steele, and the great copper-gold prospects of Wild Horse Creek, apparently well fortifies this belief and confidence. Last year, too, much public interest was aroused by the fine showings of properties in the Windermere district. All these, as well as many prospects in Northeast Kootenay, were visited by Mr. Robertson, and his statements and opinions regarding them will be of great public value as relating to sections of the country of which very little is definitely known. There will also be an interesting chapter on the Atlin country. Mr. Robertson was, of course, not able himself to visit Atlin last year, but the information nevertheless comes from a most reliable source.

A CHAT WITH THE NEW AGENT-GENERAL.

(From Our Special Correspondent.)

LONDON, FEB. 4, 1899.

WE had all been so seriously alarmed at the prospect of the abolition of the useful office of Agent-General in London, that a distinct sigh of relief went up when it was found that the new brooms did not after all propose to shut up the London Agency. It was feared that the victorious party at the polls contemplated iconoclastic measures, and that one of these was the act, the very prospect of which had aroused so much alarm in the minds of those who had been hoping for more information, rather than a complete curtailment of the supply. Happily the new Government never seriously considered such a foolish step; and even if they seem a little disposed to undue economy one cannot grumble at this when we bear in mind the fact that the rapid strides made by new countries are always accompanied by a corresponding expansion of the various items included in the expenditure side of the Finance Minister's statement. Instead of abolishing the London office altogether they simply changed the man, and the locality of the Agency. I do not know if my recent pleading may have helped in the decision, but it was distinctly satisfactory to find when the announcement was made of Mr. William Walker's appointment to the post of Agent-General for British Columbia that even if the office of the new representative was not to be situated in the heart of the city, it was to be in a much more central position than where it was located away up in Victoria street, Westminster, Sergeants Inn, Temple, London, the business home of the new Agent-General is infinitely more suitable for business men than Victoria street, being, theoretically, I suppose, "in the city," and many of use to whom a visit to the old Agency meant wasting half a day are grateful for the change, which will enable us to keep in closer touch with British Columbia's official representative than was ever possible under the old conditions.

It occurred to me that some of your readers might like to hear the views of the new Agent-General at the present juncture, and I therefore dropped in to have a chat with him this afternoon at his cosy chambers in the old Inn, within a stone's throw of Temple Bar itself. Mr. Walker made me very welcome. I found him a travelled, genial man of the world. He told me he had been connected with British Columbia some fifteen years, and prior to that had spent fourteen years of life in China. Mr. Walker was in the Province for several years on the first occasion of his becoming personally acquainted with British Columbia men and matters, and since then has paid periodical visits. I soon found that he had kept himself well in touch with all the leading questions, and that his knowledge of the country was real and not purely academic. He evidently knew his British Columbia well.

Interest in this country in the doings of British Columbia has not been quite so pronounced of late, and it therefore seemed to me that I might as well ask Mr. Walker what his experience was in this respect, seeing that his position affords him an excellent opportunity of keeping in close touch with the public.

"Will you tell me," I said, "if your duties have increased since the transfer of the Agency from Victoria street to Sergeants Inn?"

"Undoubtedly," replied the new Agent-General emphatically. "We have certainly had a lot more inquiries during the last month or six weeks than in Mr. Vernon's time. This can of course be ascertained by comparing the figures as to callers, inquiries, letters, etc."

"And you find the public continues to betray that increasing interest in British Columbia which was reported by the late representative of the Government?"

"Yes, certainly. You see the office is much nearer to the city. People come here where they would not go up to Victoria street. And then, it is of course the time of year for making preparations both by companies and individuals. Yes, undoubtedly public interest in the Dominion is steadily on the increase. There seems to be a great move towards Canada, and British Columbia is having its full share."

"And now for an important point, Mr. Walker. Over and over again the Government of British Columbia have been advised to inaugurate a system for the collection of statistical data to let us know—monthly, for instance—how the mines are going on, and what is the progress being made by the different districts. Can you tell me if any endeavour is being made to satisfy the London Stock Exchange, and the British investor in this respect?"

"I hope," replied Mr. Walker, "that something will be done in this connection before long. You, of course, know of the existence of the Bureau of Mines. Well, owing to the short time that institution has been established it is not yet in a position to furnish the information you require respecting the mining industry as promptly as it is hoped it will be able to do in the future."

And then Mr. Walker gave a quiet rub at the Rossland authorities. He said:

"In connection with this question of statistics I have to complain very much at the quite inadequate supply of information and literature I have received from Rossland, and the Kootenay generally. I have many inquiries about this district and there is so little in the way of statistics or data, to hand to the caller, that I regret the insufficiency of my supplies. The majority of the inquiries are about these districts, because they are looked upon as furnishing excellent scope for the employment of capital owing to the rapid developments going on in that part of the country. People are also beginning to recognize that the cream has been skimmed from South Africa and West Australia, and they are now turning their attention to British Columbia."

"And the Alien Act?" I tentatively suggested.

"Yes, the Alien Act will, according to all I hear the people in this country seem to think it a good thing. It shows a tendency to keep things for the Britisher. I had a caller this morning who was full of the question. The new law is liked, and it is thought that it will probably stimulate emigration from this country to the Atlin Lake district."

Having thanked Mr. Walker for his courteous reception of your representative, and being assured by him of his willingness to at all times place all the information at his command at the disposal of the British Columbia MINING RECORD I picked up the bundle of books he had kindly furnished me with, and passed out from the dignified and historic Sergeants Inn into the busy whirl of the Strand.

THE YMIR MINES.

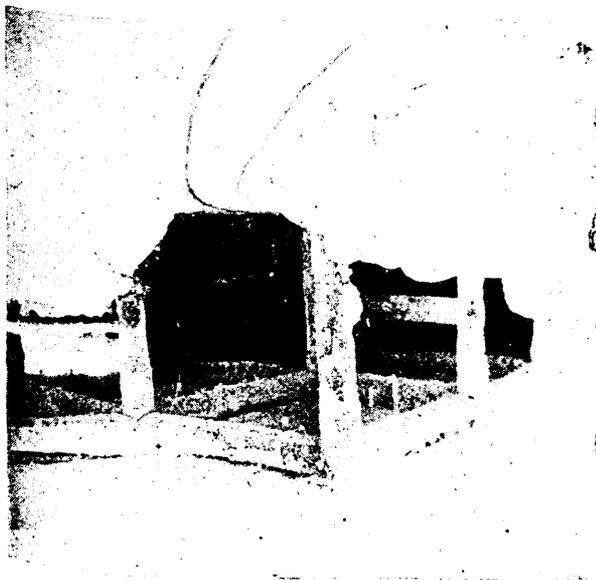
THE PORTO RICO GROUP.

(By A. Bernard Buckworth, J.P.)

RECOGNISING, no doubt, the growing importance of this District, and the very general interest that is being taken, both in this Province and in



PORTO RICO SIDING.



NO. 2 TUNNEL AT PORTO RICO MINE.

Great Britain, in the development of the exceedingly promising mines in the neighbourhood of Ymir, the Editor has asked me to prepare for the readers of the MINING RECORD a series of articles describing the principal mine properties in the Ymir camp. In compliance, therefore, with this request, I recently paid a visit to the Porto Rico group, a mine that is now being actively developed, and will, unquestionably, within a very short time, give a most satisfactory account of itself. The Porto Rico, comprising a group of five full claims, is situated seven miles to the west of Ymir, on the divide—at an altitude of 6,400 feet

above sea level—between the East Fork of the North Fork of Salmon River and Barrett Creek, and to which access is obtained by means of an excellent waggon road, seven miles in length, from Porto Rico siding on the line of the Nelson & Fort Sheppard Railway. To begin at the beginning, the properties were first discovered and located by two prospectors—Maxwell and Day—in the autumn of '96, and the nature of the find was so promising, assays of as high as \$2,600 being obtained from surface outcroppings, that in less than two months after the staking of the claims, the fortunate pair of prospectors were enabled to dispose of the properties under a bond, upon very favourable terms. This bond was secured by Mr. W. H. Corbould, managing director of the Canadian Pacific Exploration, Limited, an English company, capitalised at £500,000 in £1 shares. Having acquired the property Mr. Corbould at once set to work to thoroughly exploit the ground, and under the management of Mr. J. J. McMullen, who was engaged as superintendent, operations were commenced and actively carried forward.



NO. 3 TUNNEL OF PORTO RICO MINE.

The mine is now developed by three tunnels, which in each case have been driven in on the ledge, No. 1 to a distance of 250 feet, No. 2, 290 feet, No. 3, 550 feet in length. The ledge is a very highly silicious quartz, impregnated with iron pyrites and carrying free gold. Its width ranges from two to five feet, widening in places to eight feet, but the average width of the lode—which is a true fissure between porphyry, dipping to the west at an angle of forty-five degrees, and a strike of due north and south—is not perhaps more than three feet. In No. 3 tunnel an up-raise seven feet wide has been driven to No. 2 tunnel, a distance of 130 feet, the workings being in ore for the whole of this distance. Meanwhile stoping and development work is being carried on in No. 2 tunnel by means of five machine drills, driven by air compressed at the mill.

As the ore comes from the mine it is dumped into the ore bins situated at No. 3 tunnel. Thence it is conveyed over an aerial tramway to the mill. The tramway was installed by Mr. B. C. Riblet, of Sandon, who, by the way, has made many successful installations of this character during the past year in the

Slocan. The Porto Rico tramway has two one-inch cables, supported upon five towers, the buckets each having a carrying capacity of 1,000 pounds. To each bucket is attached a one-eighth inch cable, which passes over a drum with a lever and brake attachment located at the mine station. This system is both simple and highly efficacious, and it may be stated that in ten hours fifty tons of rock can be thus conveyed from mine to mill. The length of tramway from mine to mill is 2,500 feet, with a drop of 600 feet. At the mill the buckets dump automatically, and drop their contents into the ore bins, of which there are two, having a holding capacity of 200 tons. From there it falls into the grizzly, the fine ore passing into the No. 2 bin, while the coarse ore is run through a Blake crusher, which reduces it into cubes of about one and one-half inches in size. The crushed ore from bin No. 2 falls into the self-feeders, then into the mortars and under the stamps. The pulp from the stamps passes through a 40-mesh screen, directly on to the amalgam plates, which are twelve feet in length.



BUNK HOUSE, PORTO RICO MINE.

From there it is carried through the classifiers, of which there are three, to the Frue vanners.

The mill, which is in charge of Mr. J. C. Garvin, a well known mill operator and metallurgist from Colorado, is thoroughly well equipped, with ten stamps, weighing 1,000 pounds each. There are, moreover, two six-foot and one four-foot Frue vanners. The power plant consists of two boilers, a fine drill compressor, and a 40-h.p. high speed engine, the latter being employed in the operation of the mill. The building is lit with acetyline gas, and telephonic communication between the mill and the mine is also provided. I am furthermore assured that provided the water supply does not fail, the capacity of the mill is twenty-five tons of ore every twenty four hours. The mill commenced crushing early in December of last year, and has been since in continuous operation. The ore that has and is being milled, has been of a mixed character, that is, the management have not confined the treatment to clean ore only, but have mixed with it at least one-third of waste of very low-grade value. Notwithstanding, an average return of \$40.00 per ton on the ore treated has been obtained, I understand.

It is also pleasing to be able to state that the mill saves ninety-four per cent. of assay values. The concentrates run well in values, and average between \$40 and \$50 to the ton.

Since the Canadian Pacific Exploration Company came into possession of the property, it has expended over \$150,000.00 on its development, but of that amount \$8,000 was used for the construction of the waggon road I have referred to, from Porto Rico



LOOKING TOWARDS MILL, DOWN TRAMWAY, FROM LOADING STATION AT MINE, SALMON MOUNTAINS IN BACKGROUND.



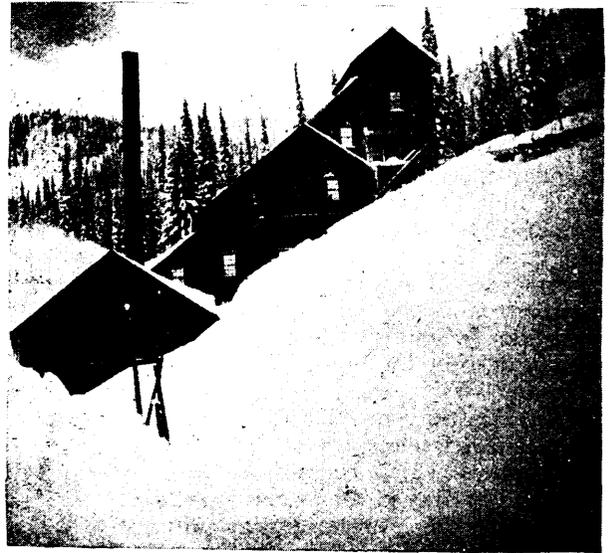
TRAMWAY LOOKING TOWARDS THE PORTO RICO MINE.

Siding. Towards the cost of this road, however, the Government agreed to contribute, but up to the present time this promise has not been carried into effect.

In conclusion I may mention that this Company is exceedingly popular in the Ymir district, by reason of the fair and courteous treatment accorded by the executive officers to those with whom they have relations—business or otherwise. The miners, of which over forty are employed, receive the highest wages, and as a consequence do their work well and



PORTO RICO MILL—ANOTHER VIEW.



PORTO RICO STAMP MILL.

contentedly. Indeed, they, in common with the residents of Ymir camp, are rejoiced at the success which has attended the Company's perseverance and energy, for the capacity of the Porto Rico which is now yielding a value of \$20,000 a month, in gold, is likely ere long to be increased by the installation of additional stamps, and the Company's profits in the near future will

therefore be very considerable. I am myself meanwhile, much indebted to Mr. A. B. Irwin, the Company's resident general manager, for hospitality extended to me during my stay of two days at the Porto Rico mine, and for his kindness in affording me every opportunity to secure such information as I required.



PORTO RICO MINE—BUNK AND BOARDING HOUSE, AND MANAGER'S OFFICE.

THE PELATAN-CLERICI PROCESS.*

(From the *Boletín de la Sociedad Nacional de Minería*, Santiago de Chili. Translated for the MINING RECORD, by A. A. Watson, B.K.F.I.C., Metallurgical Chemist, Rosslund.)

THE end of last year the Board of Directors had a series of official trials made with the Pelatan-Clerici apparatus, with the object of obtaining precise and reliable data with regard to this invention, and to be able to give the Government at the same time, information as to the industrial advantage which the country would receive by its acquisition. A commission composed of four members of the Directorate and two professors of the School of Mines, initiated experiments last November under the supervision of Eugene Lateurneau, sent by Mr. Pelatan, the inventor, but for reasons which need not be enumerated here, the results at this time could not be considered definite. It was thought necessary to inform the inventor of the difficulties which had arisen during the experiments, and in May of the present year a new series of operations on the large scale was initiated, this time under the supervision of the distinguished engineer, Charles Tizzoni, sent expressly by the "Compañía Explotadora de Sisseiva Pelatan-Clerici."

First Experiment.—This first trial was made in three treatments, with the quantities mentioned later, on ore from the mine of Senor A. Martinez. These ores were pyrites, having about 20 per cent. iron, a quartz gangue, and containing a black mineral, probably tourmaline. These ores contain a certain quantity of free gold, but the greater part was in combination with iron pyrites. The amount of copper or other metal was practically *nil*. The three treatments were made on ore ground fine enough to pass through a mesh of 80 to the inch. The quantity of water in each operation was equal to the quantity of ore. The quantity of cyanide was one part per thousand, that is, one kilogram of pure cyanide per ton of ore

*In submitting this interesting translation to the MINING RECORD Mr. Watson writes: "The Pelatan-Clerici process is now attracting much attention, and I therefore believe that the publication of the foregoing account of recent experiments in Chili, in a production like the RECORD circulating in all the mineral districts of the Northwest, should be valuable. In this country we have no institution where large scale experiments with this process can be done, with the object of publishing the results, and the various enterprises using the process will probably not give much information about their operations, and beyond the bare fact of its success or otherwise nothing will be known by the general public. The experiments appear to indicate that an extremely weak solution of cyanide is desirable. The results obtained in the second series of experiments, in which the strength of the solution was only $\frac{2}{3}$ per thousand or .066 per cent., were excellent, judged by the assay returns, and it is a pity that more experiments were not performed on exactly the same ore, with a sound tank, when no doubt the actual amount of gold obtained would have been equal to that calculated from the assay of the tailings. Using this weak solution in the fourth series of experiments the loss was nearly as great as in the first series, no doubt owing to the presence of copper and zinc in the ore, these metals destroying cyanide. Whether the copper-gold ores of Kootenay are adopted to this process or not remains to be seen, but with ore containing copper there is no doubt a very considerable loss of gold owing to the destruction of cyanide. Whether the expense of working is low enough to enable the process to stand this loss also remains to be seen. With ore free from copper, nickel or zinc, say iron pyrites containing gold, there is no reason why an extraction of 92 per cent., as mentioned in the second series of experiments, should not be obtained. The calculations on the expense of working, cost of mercury, etc., I have omitted in the translations, as with the Chilian dollar, worth only about twenty-five cents of our money and constantly fluctuating, the results would only be misleading."

(1 kilo.=2.2 lbs. 1,000 kilos=about 1 ton of 2,240 lbs). The time taken in treating in each operation was nine hours, approximately, employing in each charge 20 kilograms (44 lbs.) of common salt, to facilitate the passage of the electric current. The table below shows the quantities of ore combined in the charges, and the gold which remained in the tailings according to the assays:

Experiment.	Weight of ore in kilos.	Gold contained in ore in gr's per ton.	Gold contained in Tailings in grammes, per ton.
1	3000=6600 lbs.=3 tons.	36.0	7.50
2	3500=7700 " =3½ tons.	45.5	8.75
3	3400=7480 " =3 2-5 "	42.5	10.20
	9900	9'9 tons. 124.0	26.45

Gold extracted=124-26.45=97.55 grammes.

The extraction was therefore 97.55 grammes, but through the grinding not being at all uniform, some 250 kilos of hard pyrites which contained 3.55 grammes of gold remained in the tank and naturally increased the loss, so that the extraction was 94 grammes on a quantity of 124 grammes, or an extraction according to the assays, of 75.8 per cent. of the gold contained in the ore.

The actual extraction of gold was a little less. 96 grammes of gold were extracted and 12.54 grammes remained dissolved in the pure mercury used, so that the actual extraction was 88.54 grammes out of 124 contained in the ore, or an effective clean up of 71.40 per cent. of the gold obtained.

Second Series of Experiments.—The second trial, which consisted of two treatments of ore from the mine of San Rafael de Buen, belonging to Don Alejandro Garcia, was performed under about the same general conditions as the first, except that the cyanide was used in rather less quantity, employing about $\frac{2}{3}$ per thousand; that is, $\frac{2}{3}$ of a kilogram (1.45 lbs.) of cyanide per ton of ore treated. The ore was not ground so fine, a mesh of 50 per inch being used.

The results obtained were as follows:

	Ore in kilograms.	Gold contained in grammes per ton.	Gold left in the tailings in grammes per ton.
1.	3000	210.0	16.5
2.	5900	211.9	17.4
	5900	421.7	33.9

According to the assays the extraction would then be 421.7-35.9=387.8 grammes of gold, or 91.95 per cent. of the gold contained in the ore. The actual extraction of the gold was, however, much less. There was obtained a bar of 522.5 grains weight, containing 53.683 per cent. gold or 280.5 grains, equivalent to an extraction of 96.51 per cent. of the gold contained in the ore. The cause of this great difference was attributed by the engineer, Senor C. Tizzoni, to the defective condition of the tank, which has a copper bottom, and in view of this fact the tank was removed for repairs. This was done after verifying the third series of experiments.

Third Series of Experiments.—This trial was made on ore from Guanaco. The result of the assays and the gold extracted were so contradictory that it was impossible to deduce anything from them. The Commission therefore resolved not to consider them.

Fourth Series.—The ores treated were of the same class but inferior in quantity of gold to those treated in the second trial, procured from the before-mentioned mine of San Rafael de Buen; the ore was composed of white quartz and conglomerate. It

contained appreciable quantities of galena and zinc blende, two per cent. of iron pyrites and about the same quantity of copper. These ores, which were fairly hard, were ground fine enough to go through a mesh of 50 to the inch, but the grinding was not uniform, some of the coarse ore remaining at the bottom of the tank. Sixteen extractions were made with this ore, employing about .65 kilos (=lbs. 1.43) cyanide per ton of ore and about 1 per cent. of common salt in the bath. The time of each treatment was nine hours, and the experiments were performed under the same general conditions as the first trial. The table shows the quantity of ore taken and the amount of gold in ore and tailings :

Trial.	Total quantity of ore treated.	Gold contained in ore in grammes.	Gold contained in tailings in grammes.
16	49170 kilos=about 54 tons.	1306.5	288.1

According to the assays the gold extracted was 1018.4 grammes or 77.95 per cent. of gold obtained. The actual quantity of gold obtained was after repeated melting a bar of 1385 grammes weight, containing 63.35 per cent. gold or 875.4 grammes fine gold. This would give a result of 67.15 per cent. of the gold contained in the ore.

To refine the gold the crucible in which the melting was done was broken in order to remelt the slag. It is very probable that although it was remelted with great care there was an appreciable loss of gold here, for on assaying the bar before refining the result gave 942.99 grammes. It is, therefore, more than likely that this was the quantity the ore contained, and accepting it we thus get an extraction of 72.25 per cent. of the gold contained in the ore.

The results of the three series of experiments which were considered are as follows :

	Result of extraction by assays.	Result according to actual gold extracted.
1	75.80	71.40
2	91.95	66.51
4	77.95	72.25

Mercury used.—For the operations mentioned the following quantities of mercury were used in the tanks :

At the start 220 kilos (480 lbs.), and afterwards, during the third operation 68 kilos (150 lbs.) more, or a total of 288 kilos (630 lbs.) At the end of the experiments the weight of mercury was 86 kilos giving a loss of two kilos (4.4 lbs.)

In the settler, or mercury tank, none of this substance was distilled, except at the first trial when a washing with water was given and 60 grammes of mercury was recovered on redistilling a quantity not worth considering. The loss of mercury; two kilos (4.4 lbs.) during all these trials corresponds to a loss of 26.6 grammes of mercury per ton of ore treated.

Samples.—The system followed was to take from each sack of ground ore a small quantity by means of a sampler which was introduced as far as the bottom of each sack so as to obtain a true sample of the ore contained. The assays were done on fifty grammes of ore.

The samples of the tailings were taken from the discharge pipe of the tank by means of a small receiver, taking about one-quarter litre per minute during the discharge. These samples were then evaporated to dryness so that all the gold in solution should remain with the tailings, the assay of the latter showing therefore the gold in the solution as well as in the solid state. The determination was more easily effected in this way and was quite as

exact thereby, avoiding the filtration of the liquid as would have been the case if they had been assayed separately.

Power necessary.—The power necessary to work one tank and its dynamo was three and one-half horse-power.

THE MINING MEN OF THE PROVINCE.

THE PROVINCIAL MINERALOGIST.

WHEN Mr. Carlyle resigned his position as Provincial Mineralogist, in April of last year, to act as consulting engineer and general superintendent for the British America Corporation, the opinion was expressed that the task of worthily filling his place would be a difficult one; and, indeed, it appeared to be no easy matter to find any one man combining all the qualities of tact, judgment, experience and professional ability which won for Mr. Robertson's predecessor the esteem and respect of the mining community of British Columbia. The Province has, therefore, greater reason for congratulation in having secured for the occupancy of this important post, an engineer and mineralogist of the eminence and attainments of the present head of the Bureau of Mines, who in every sense is exceptionally well qualified to discharge the functions of his office. Mr. F. W. Robertson belongs to a distinguished and prominent Canadian family. His father, Mr. W. W. Robertson, is the senior Q.C. at the Quebec bar, and his uncle, who is intimately associated with Canadian politics, was for some time Finance Minister of the Province of Quebec. Mr. Robertson was born in Montreal, and educated at the high school of that place and at the Collegiate Institute at Galt, under the famous Dr. Tasse—the Dr. Arnold of Canada. In 1876 he matriculated at McGill University, graduating with natural science honours in 1880. While at McGill he formed, by the way, a close friendship with Mr. W. G. McConnell, of the Geological Survey, to whom he attributes largely the success he attained in his final examinations. It happened in this way: Mr. McConnell, who was Mr. Robertson's senior by a year at the University, had entered as a candidate for the Logan medal, awarded under competitive conditions for geology. Well, Mr. McConnell suggested that he should instruct his friend in the knowledge he himself had acquired, in order, he stated, that he should thus retain all the facts he had learnt well in his own mind. So the two friends spent all their spare time in the museum. Mr. McConnell holding forth learnedly; his fellow student and pupil attentively absorptive. Hence it came about that, while Mr. McConnell only just missed winning the medal, Mr. Robertson took a very honourable place in the list of graduates of his year. Immediately after leaving the University Mr. Robertson was fortunate in receiving an appointment as assistant engineer at the Capleton Copper Mines, near Sherbrooke, Quebec, under that well-known engineer, Mr. Henry M. Howe, at one time president of the American Institute of Mining Engineers, and winner of the Bessemer medal, awarded by Sir Henry Bessemer annually to the greatest contributor towards the advance of metallurgical science. Mr. Howe, it may be parenthetically stated, now occupies a professor's chair at Columbia College. The ore at the Capleton mines is copper pyrites and owing to market requirements and other conditions, all the crude product was sent the United

States and then treated by the Chemical Copper Company for whom Mr. Robertson was subsequently appointed superintendent. In the spring of '81 he was asked by Mr. Howe, who was also managing director of the Orford Copper Company, to take charge of the work of constructing this company's refinery at New York Harbour, opposite Staten Island. When this refinery, which is one of the largest refineries on the Atlantic seaboard, was completed Mr. Robertson went to Phoenixville, Pennsylvania, as superintendent of the famous Douglas Copper Works at that place, and here gained a very interesting experience with the Hunt-Douglas process, of which Mr. Douglas was one of the inventors. He then returned as engineer to the Orford Copper Company then under the management of Dr. E. D. Peters, author of "Modern Methods of Copper Smelting"—a recognised standard work on the subject. After serving in this capacity for some time Mr. Robertson was sent to superintend a mine at Eustes, P.Q., but returning he was placed in charge of the construction of large works the Orford Company were then establishing to increase the capacity of their plant. During the time Mr. Robertson was with this company, they were directly responsible for the introduction of large blast furnaces, and in bringing the cupola furnace into general use. At the outbreak of the North-west rebellion in, 1885, Mr. Robertson resigned his post with the Orford Company and returned to Montreal with the object of enlisting in a regiment going on active service. After making enquiries he was

informed that the 5th Fusiliers were to be sent at once to the front, and through the interest of friends he succeeded in obtaining a commission in this regiment, going through a special course at the St. John Military School. Much to the disappointment of Mr. Robertson and his fellow officers, the 5th Fusiliers were not ordered out, and after being promoted to a captaincy, Mr. Robertson sent in his papers, and accepted an appointment as engineer for the Spring Hill Collieries—then the largest in Nova Scotia. Here he surveyed and planned the route for a railroad between the mines and the river Phillip and also

examined and reported on a number of properties. Shortly afterwards he was offered and accepted the position of metallurgist to the Minas Sotiel-Coranada, the largest copper mine after the Rio Tinto, in the Province of Huelba, Spain. While in Spain Mr. Robertson had some very amusing experiences caused by his inability to speak the language of the country, and he relates how once he wanted a wedge for some work in a particular hurry, so pulling out his dictionary he turned the pages over until he came to the word, but he failed to notice the accent over one of the letters, which, of course, altered the pronunciation, and he asked the man to bring a *cuna*, well

cuna with the accent omitted means a cradle, and the Spaniard who received the order was first very much perplexed and then when he recognised the mistake nearly died in a paroxysm of laughter. Mr. Robertson was in Spain for nearly eighteen months, but before returning to America he started on an European tour, which, however, was unfortunately curtailed by the breaking of a bank in which he had deposited his money. Back in New York Mr. Robertson submitted plans in competition for the building of a smelter for the Tamarac-Osceola mining companies, operating in the native copper district of Lake Superior, Michigan. Proving the successful competitor he was awarded the work, becoming engineer and superintendent of operations, and introducing into that country the large-size reverberatory smelting furnace for the first time. From Lake Superior Mr. Robertson went to



MR. F. W. ROBERTSON, THE PROVINCIAL MINERALOGIST.

Great Falls, Montana, as engineer in charge of the planning and construction of the Boston-Montana smelting plant, but resigned to become assistant superintendent of the Orford Company, having the privilege at the same time of practising privately, which thus enabled him to examine and report on properties at Santa Fe, New Mexico, and also carry on investigations in Cleveland with regard to the processes for the smelting of nickel, and it was at this time that the present method of treating the Sudbury ore was devised. In 1893 Mr. Robertson decided to practice privately as a consulting engineer

and metallurgist in New York, and one of his first engagements was for the planning and building of a large copper refinery furnace at Pawtucket, Rhode Island, for the well-known firm of Lewisohn Bros. He was also technical representative of the big Mexican companies in New York. Last year Mr. Robertson visited British Columbia in the interests of a British syndicate, and what he saw of the country then, perhaps, influenced him in accepting his present position as the Province's Mineralogist, for, as he will state, what he saw at that time convinced him that the country had a great future before it. Just before taking up his duties on the 1st of June last, Mr. Robertson returned to New York and the last work he did there was to prepare plans for what is now believed to be the largest copper refinery furnace in the world, with a capacity of fifty tons per diem, which Messrs. Lewisohn have since built at the Raritan Copper Works, Raritan, N. Y. Mr. Robertson's New York practice is still carried on by his partner, Mr. Zeigler, who yet retains the firm name of "Robertson & Zeigler." Mr. Robertson is now preparing the Annual Report of the British Columbia Mines, which he hopes to submit to the Minister of this Department early in March. The Report, this year, we understand, will deal somewhat extensively with the East Kootenay districts, Texada Island and Shoal Bay, where the Provincial Mineralogist spent much time last summer and autumn, succeeding too in obtaining some very admirable photographs with which his Report is to be profusely illustrated.



MR. ROBERTSON IN EAST KOOTENAY, AS HE APPEARED ON THE TRAIL.

A REPORT ON THE TREATMENT OF CARNES CREEK ORES.

THE very promising nature of the mineral discoveries made of late in several localities of what is known as the Big Bend district, or that portion of the two Kootenays north of the C.P.R. line between the stations of Golden and Revelstoke, afford strong grounds for the opinion locally entertained that at no distant date quartz mining on an extensive and highly profitable scale will be carried on in this field. So far, however, activity has been chiefly confined to prospecting or development work of a preparatory character, and while in a majority of cases results have been eminently encouraging, it is yet early to go beyond the statement that the outlook for the Big Bend and Illecillewaet districts is most favourable. On Laforme Creek, Carnes Creek and Keystone Mountain,

in the Standard and Ground Hog Basins, very fine quartz showings are encountered. On French Creek hydraulic enterprise is meeting with fair success, and at Albert Canyon the erstwhile unduly boomed "Waverley" and "Tangier" claims are now being systematically exploited, and these properties, together with those owned by a local Revelstoke Company, known as the Carnes Creek Consolidated Gold Mines are now developed to a quite considerable extent. In view of this fact the following report recently made by Mr. W. Pellew Harvey on the best means of treating the ores from this locality, is undoubtedly interesting:

CHARACTER OF ORE.—The material received for treatment consisted of about 350 pounds of coarse arsenical pyrites, containing both gold and silver, the metals present being associated partly in a free state, and partly so coated with the baser metals that a

double treatment for the recovery of the same is necessary, unless the one treatment referred to hereafter is accepted in lieu of the combined process. The pyrites is of a close but brittle structure, and was found rather hard to crush, but during the pulverizing only the average amount of slime was made. This, however, in the case of stamping would be different, as no doubt in that case there would be a large percentage of very fine material made. Many tests have been made to deduct opinions as to the best method for treating the ore in a practical way. Such dealt with the various meshes best suited to the ore, the amount of free gold that existed in it, and what amount of the balance, after amalgamation, can be recovered, and with what cost for treatment.

AVERAGE VALUE OF SAMPLE.—The bulk as received was dried and crushed by means of a ball mill, to pass 10-mesh screens. This sample was then thoroughly mixed and quartered and assayed, the result being as per certificate accompanying this report, which is:

Gold 1.1 oz. per ton.
Silver " " "

After sampling, it was necessary to see in what condition the gold existed in the sample, and this was done by sizing—taking 14,000 parts of the ore, the following results were obtained:

- (a) 12750 parts were found to pass a 40 scr'n, assay'g 1.2 oz. of this
- (b) 10590 " " " " " 60 " " 1.04 oz. of this
- (c) 7159 " " " " " 90 " " 1 oz. of por.
- (d) 1050 parts stood oe a 40 scr'n and gave assay of 1.25 oz. gold.

From these experiments it was easily seen that the gold in the sample is in a fine state and equally

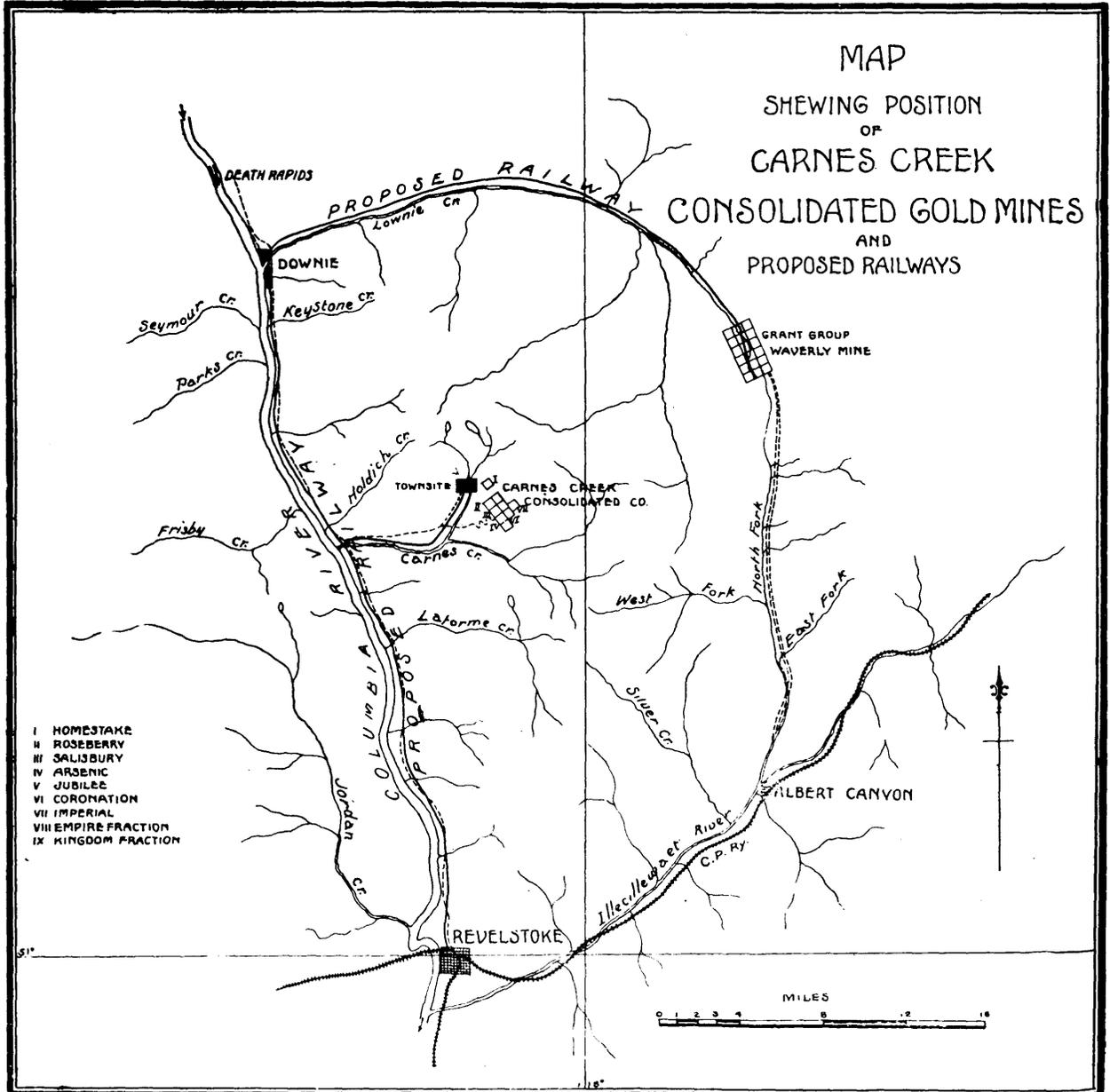
divided. Had it been coarse, there would have been a considerable increase in gold values with the coarse sizing. This opinion was amply confirmed when cyanide treatment was adopted, thus showing a complete extraction of values was made in a short time with comparative ease.

AMALGAMATION TESTS.—A large sample of the mixed ore was taken and crushed to pass a 20-mesh and amalgamated, the recovery being 52.4 per cent. of the assay value. Another experiment was then made with 30-mesh crushing, which gave an extraction

TEST 1—Percolation. Crushing 40-mesh, 72 hours' treatment, .4 per cent. cyanide. The ore was subject to direct treatment, that is without amalgamation; the extraction being 90 per cent. of the assay value.

TEST 2—Percolation. Crushing 40-mesh, 75 hours' treatment, .25 per cent. cyanide. The ore was subject to direct treatment, that is without amalgamation; the extraction being 87.3 per cent. of the assay value.

TEST 3—Consisted of cyanidation of tailings after amalgamation, the recovery being 87.3 per cent. of the tailing value in 48 hours.



of 63 per cent. It will be seen, therefore, that an average of 57.7 per cent. of the gold exists in a free state.

ROASTING.—Another portion of the sample was taken and roasted nearly to sweetness. The roasted ore on being treated by amalgamation, gave a recovery of 23.3 per cent. only. The tailings were treated by cyanide, and this gave an extraction of 85.1 cyanidation. Continuing the experiment, the following data was gathered: Consumption of cyanide per ton of ore, 15 per cent. or 3 lbs. Acid present in the ore, trace.

Many other tests were made, all bearing on the treatment of this ore, the conclusion to be arrived at being:

- (a) That the ore is easily milled at a small cost.
- (b) That 30-mesh crushing is the best for economic milling.
- (c) That amalgamation gives a little over 50 per cent. of gold on the plates.
- (d) That the ore can be treated very successfully by the direct use of the cyanide process.
- (e) That as fine crushing causes slimes and loss in

float gold, coarse crushing by ordinary crushers and rolls, instead of the stamp battery, would be desirable; especially is this so as more equal crushing is possible by such means, and a better pulp for percolation is obtainable.

(f) That the strength of the cyanide solution should be .25 per cent.

(g) That economic extractions are made in three days by maceration and percolation.

(h) That at least 87 per cent. of the gold present was recovered by the direct application of cyanide.

The total cost of treatment on the basis of the figures given, will not exceed \$3.50 per ton.

FORTY YEARS AGO.

(Concluded).

(By Nicolai C. Schou).

IN the final instalment of his contribution to *Chamber's Journal* our correspondent notes the equability and humidity of the coast climate of British Columbia, which, on the whole, he compares favourably with those in Australia

pecially—and rightly avers that as for mineral wealth, the variety and amount of it in British Columbia are beyond calculation." The profusion of coal, lime, copper and gold is specially noted, though in connection with the latter, there is naturally enough for that



BIG TREE, CHEMAINUS, SAID TO BE LARGEST ON ISLAND—52 FT. IN CIRCUMFERENCE.



ROAD BUILDING TO LENORA MINE BY MOUNT SICKER & B.C. DEVELOPMENT CO.

and California, troubled as are the latter by desiccated heat and summer drought in many parts. He calls attention to the promise of our forests, the productiveness of our rivers—in salmon es-

period; no reference is made to other gold deposits than those of quartz. The presence of iron is unnoted, and the writer had heard of no silver nor silver-lead discoveries, these last being left to a considerably later period than the days of the "fifties." *Chamber's* informant, on the other hand, hazards a surmise, which has not, however, been realized, that "the centre of British Columbia gold production may be reached among the altitudes of the Rocky Mountains."

He next notes the various Hudson's Bay forts of the Coast and Yale district, describing these as "little else than log cabins, surrounded with strong pallisades, defended with small arms against the attacks of savages,"—the British Columbian Indians in general then were. He instances Fort Langley, Fort Hope and Fort Yale.

Next he notes that no capital town has yet been selected, though Fort Langley is in the fall of '58 the centre of Customs collection. He adds, showing that in this respect our change is by no

means for the better as regards economic principle; that the Customs duties are "following out the principles of free trade," not at all onerous. British Columbia's enormous present customs tribute to Ottawa was then of course quite as inconceivable as the union

ing. There is not only gold in the sand in abundance there, but the river water holds it in solution in vast quantities; and the way money is made without work is this: The miner makes him a pair of sheepskin stockings, woolly side out, and saturates them in

quicksilver over night. The next day, seating himself on a rock in an eddy favourable to precipitation, he puts on his stocking so saturated, and holds his feet in the water all day. At night all he has to do is carefully to rene his stockings and \$150 in gold dust is the result. Much judgment, it is true, is required in selecting an eddy for operation, and a good deal of skill is requisite in performing the saturation properly, and great critical nicety is necessary in the manner in which you hold the feet—perfect immovable stiffness is one condition in order to complete success." So, indeed, one would think, for a working day's holding of the feet in the waters of the Fraser, cold even in mid-summer, would certainly ensure "perfect immovable stiffness," plus almost



TRESTLE ON THE NEW ROAD—MOUNT SICKER.

of our Province with those of far away Eastern Canada would have been at that time. American enterprise is, however, noted as having already established lines of steamships between Victoria and Fraser River points, in connection with well-patronised services between San Francisco and Victoria. Attempts to set up land routes of trade between Mid-Washington and the Thompson country had, however, failed, as a result of the great difficulty of carrying provisions and constant liability to attack by Indians.

A very amusing story is then quoted which sufficiently shows that the imaginative British Columbia newspaper correspondent of our days, for whom Vancouver has in particular become noted, or rather notorious, has, notwithstanding his extraordinary fertility as a fictionist, failed to better the instruction of his predecessors of the fifties. Thus a writer in the *San Joaquin Republic* says: "By late letters, on which I implicitly rely, I am assured that a man can make \$150 a day there (on the Fraser) and do nothing



THE ORIGINAL CABIN AT THE LENORA MINE—MOUNT SICKER.

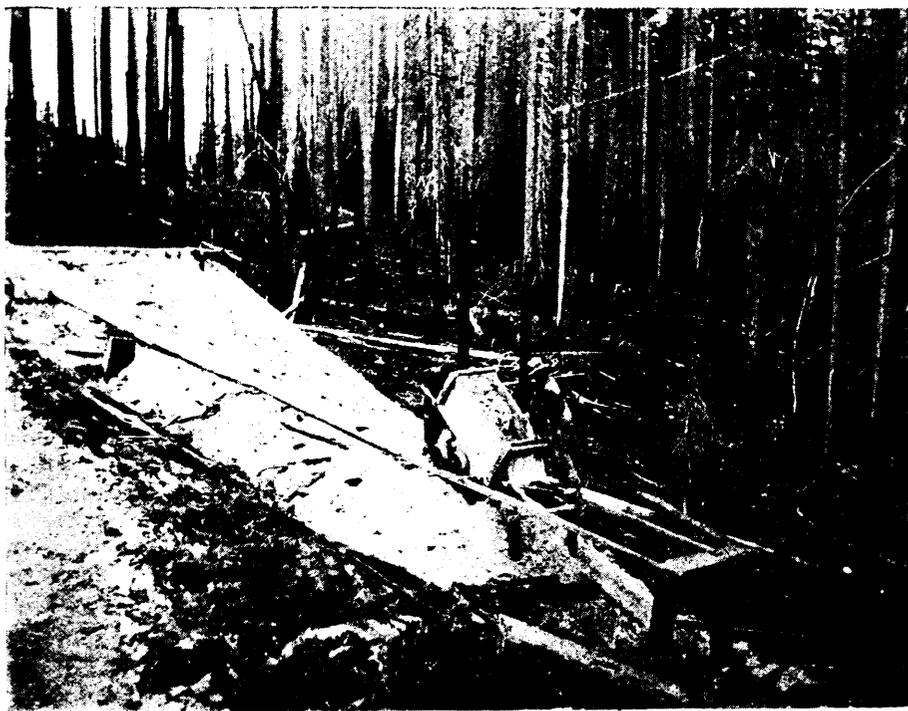
as immovable an attack of rheumatism. The suggested \$150 worth of gold, however, sadly fail to materialise. Chamber's correspondent further notes that in 1858 the quickest possible time of reaching British Colum-

bia from England, anticipated by Mr. Cunard, the founder of the famous Cunard service, was estimated at 35 days from Liverpool, via New York and Panama. Mr. Cunard had, it seems, hinted that if the British Government offered him sufficient inducements, he would establish mail steamship services to accomplish the journey in that time. It usually, of course, then took several weeks longer.

Other issues of *Chamber's Journal* for 1858 and 1859 contain in notes on current events and scientific society transactions then occurring month by month; various interesting allusions to the Pacific Canada of those days. One of these is taken from the notes of a traveller, whose investigations must certainly have been as limited in range as they were inaccurate, which is saying much. Thus a Mr. Colquhoun-Grant read to the Royal Geographical Society of England early in 1858, a paper on Vancouver Island, and in his notice of it declared "a comparatively small proportion of the land to be available for

region of British Columbia, as was the famous description given of Canada to the Fourteenth Louis, as a land of "quelques aspents de neige"—"a country of a number of broad acres certainly, but of snow."

One last quotation from another issue of *Chamber's* in midsummer, 1895 and our little repertoire of early references to British Columbia in that journal must conclude. This final reference is to an address delivered by the Hon. G. Allan at the Canadian Institute in Toronto, which contrasts remarkably with Mr. Grant's misdescription of Vancouver Island, by reason of the accuracy of its general forecast of what was to be accomplished nearly thirty years later by the building of the Canadian Pacific railroad and the linking thereto of Chinese and Japanese steamship services. Mr. Allan in his address explained that a company had so far back as those days of the "later fifties," been chartered by the Provincial Legislature of Ontario, "to open a route across British America." He explained that "its course would be from Lake



THE ORE DUMP AT THE LENORA MINE—MOUNT SICKER.

cultivation, this being on the coast, whilst the interior of the Island, the outer fringe of which interior he had probably never even penetrated, was "hopelessly barren and dreary." Mr. Grant, however, was condescendingly patronising of Victoria, which he described as occupying the pleasantist site in a dreary land. But by way of set off to this, Mr. Grant averred of Vancouver Island, that "worst of all is the climate: nothing but snow and rain from October to March and parching heat for the rest of the year." In the words of the "Jesuit missionary (left unnamed) 'huit mois d'hiver et quatre mois d'enfer.'" An extraordinary libel this on the fair and genial climate of a large part of an Island, the climate advantages of which some of us Mainlanders, prejudiced though we may be slightly in favour of our part of the Province, feel at times quite a little envious. "Huit mois d'hiver et quatre mois d'enfer"—"eight months winter and four months hell"—as atrocious a libel relatively on a fair

Superior to Red River Settlement (now Manitoba), thence to Carleton House on the Saskatchewan, to Edmonton House at the head of the navigation of the same river, thence across the Rocky Mountains to the head waters of the Fraser River and so down to British Columbia." "A good scheme," *Chamber's* editor styles this—a scheme, too, which, as it happened, very accurately portrayed the future course of the C.P.R. The worthy editor, briefly commenting on Mr. Allan's paper, adds that "if our Canadian cousins accomplish the project, they will have all the praise they can desire and profit, too, for that highway when finished would be the direct route to China and Japan."

All which we of British Columbia to-day fully realise with not a little satisfaction, as we simultaneously note the rapidly advancing progress of what we fondly believe destined some day—scarcely, however, in our own generation—to become the fairest and richest Province in Canada's great Dominion.

THE MOUNT SICKER MINES.

IT is a matter for some surprise that even among residents of the cities of Victoria and Vancouver so little interest is taken in the development of the mines of the Mount Sicker district. Yet, here are, perhaps, the finest showings of copper ore on the whole of Vancouver Island, and for the past three years these have been prospected and exploited. Without "booming" of any sort, work has been continuously carried on, and the principal claim, the Lenora, has been quite systematically developed. Now, the ore bodies on this property have been proved to quite a considerable extent, and it is the intention in the near future to instal machinery and set up a smelting plant for the treatment of the ore on the spot, at a minimum cost.

Mount Sicker is situated about six miles from Westholme Station, on the Esquimalt & Nanaimo Railway, some fifty miles from Victoria and six miles from tidal water. The altitude of the mountain is about 2,000 feet, and the Lenora mine is 1,700

as well numerous interests on Vancouver Island and in West and East Kootenay. This Company has, however, chiefly confined operations to the development of the Lenora mine, in which a tunnel has now been driven a distance of 350 feet, with an upraise to



TAKING OUT ORE.



MOUTH OF LENORA TUNNEL.—700 TONS NOW READY TO STOPE AND SHIP.

feet above sea level. The Mount Sicker & British Columbia Development Company, Limited, own seventeen claims in this neighbourhood, and hold

about 16 per cent. copper, with gold and silver values. The main ore body consists of a rich copper sulphide, carrying good gold and some silver values, and

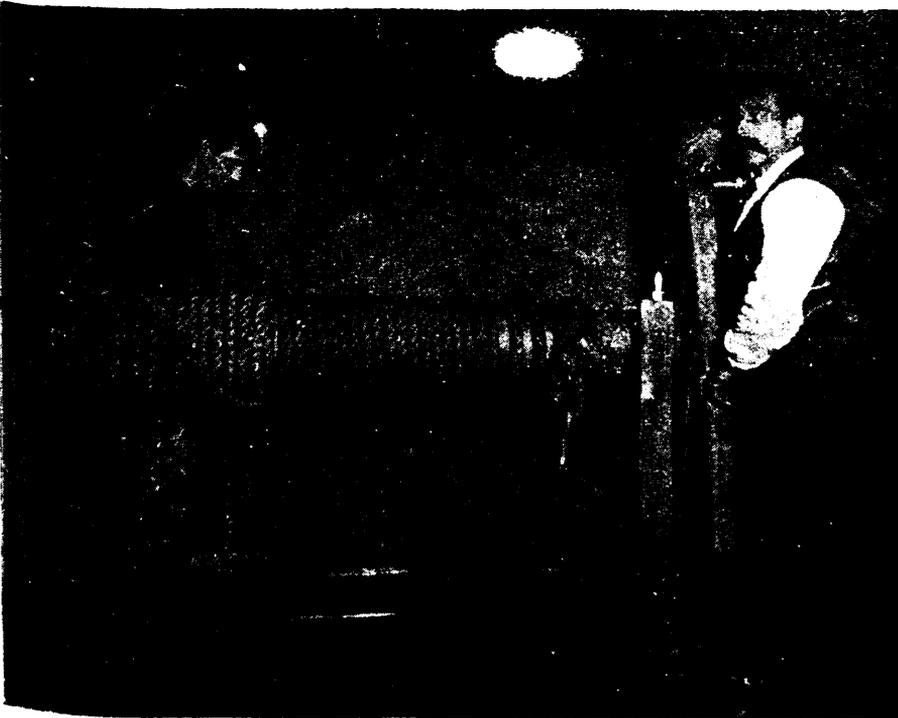
the surface, and a winze from the level of the tunnel sunk to a depth of 100 feet, from the bottom of which a cross-cut 85 feet in length has been run in a southerly direction. Besides this there are numerous open cuts and cross-cuts also to prove the ore bodies. The country rock of the district is diorite and diabase with altered grey calcose and silicious schists. On the northern and western sides of Mount Sicker the Chemainus River flows, and affords power for operating machinery. Indeed, both timber for mining purposes and water are both plentiful.

But to return to the mines. The Lenora has now in sight about 7,000 tons of ore of shipping grade, also some 800 tons on the dump. Assays from the Lenora ore run from 4 to 19 oz. in gold, from 4 to 10 oz. in silver, and from 2 to 25 per cent. in copper; the shipping ore now being hauled to the railway runs

where considerable development work is being carried on, the main shaft double compartment being down 220 feet with the principal cross-cut at the 156-foot level, being now 160 feet in length, of which 60 feet issues through the largest ore body.

approximately 50 feet, exposing a ledge nine feet wide, assays from which are as follows: Copper, from 2.24 to 23.4 per cent; silver, 1 oz. 17 dwt. to 7 oz. 18 dwt.; and gold, 2 dwt. to 11 dwt.

A third group of properties known as the Copper River group, and situated on either side of the Chemainus River, is attracting not a little attention, and promises exceedingly well. The same vein that is found on the Lenora and Tyhee is supposed to continue through this ground, and a tunnel a hundred feet in length has been driven in on this ore body and some thirty or forty tons of shipping ore have been taken out. In addition to the properties thus especially mentioned, there are numerous excellent prospects in the neighbourhood of Mount Sicker; in fact, the whole mountain side has been staked in mineral claims. The surface outcroppings indicate veins as wide as from 20 to 30 feet, and in nearly every instance fair to good values from assays have been returned. The Mount Sicker claims have as yet not passed the prospect stage, but the day is not far distant when



TOP OF WINZE—LENORA MINE.

Besides the Lenora, there are several other promising properties on Mount Sicker, notably the Tyhee mine group, which joins the Lenora on the east. These claims are now owned by the Tyhee Development Company, Ltd., recently formed in London, who have already commenced active development work. It is alleged that the Tyhee lode is a true fissure vein in a country rock, which is apparently diorite or diopside, with zones of altered schist. However, the exact classification of this country rock has not yet been determined by expert petrographers. The total length of the ore body so far exposed by trenching on the surface is 745 feet, of which about 100 feet has been so far proved on the Tyhee. The lode formation has also been found by sinking on the Richard III. claim, adjoining the Tyhee on the east. The strike of lode formation on all three claims of this group is S. 70 degs. W. On the Tyhee claim two prospecting shafts have been sunk to depths of



END OF MAIN DRIFT—LENORA MINE.

the development work that is now in progress will tell its tale; and if present indications are to be taken as any guide, the very brightest future awaits the district.

OUR LONDON LETTER.

Is it true that new Government has decided not to support the forthcoming Mining Exhibition to be held here this year at Earl's Court? I hope that the rumour that they have so decided, which reaches me on the very best authority, is not true, and that if it is, the Government will relent at the eleventh hour, for it seems to me incredible that such a splendid opportunity of advertising the Province in practical fashion should be lost. Surely it cannot be a question of expense, seeing that the total cost would not exceed some £500. And where Ontario is to be found British Columbia should not be missing. I learn from the *Mail and Empire*, of Toronto, of the 18th ult., that "the Ontario Government have practically decided to have a court at the Exhibition. In the face of such action on the part of a Province which has not yet come so prominently before the public as British Columbia, and which, not being a mining Province, cannot be complimented upon their enterprise in promoting the welfare of the country. I have it from Mr. Dyer that the outside cost of a British Columbia court from first to last would not exceed £500.

This, of course, assuming that mining companies provide their own exhibits. This £500 would include a court 500 square feet, decorations, light and general attendance.

Surely the Government will not leave to private enterprise what is obviously their own duty. I have it, however, on the highest authority, that there is some hope of the B.A. Corporation doing that work which the B.C. Government

have refused to do on the plea—so I understand—of poverty, viz., to pay the expenses of a British Columbia court and place the same at the service of such exhibitors from British Columbia as may choose to accept this opportunity of bringing their mines before the attention of the British investor.

The Secretary of the London Chamber of Mines—which, by the way, has just given further evidence of its vitality by publishing the *London Mining Gazette*, a statistical non-momentorial monthly publication—who has control of the arrangements in connection with the Mining Exhibition, informs me that the British Columbia Chamber of Mines of Vancouver wrote him some time ago to the effect that they would undertake to collect exhibits if the British Columbia Government would provide the court. Therefore, I take it that if the B.A.C. provides the court in the place of the British Columbia Government, the Chamber would still be prepared to carry out their undertaking to collect exhibits. As the Exhibition opens not later than the middle of May, although there is still sufficient time to make the necessary arrangements, there is no time to spare.

AMERICAN ENTERPRISE.

As I am finishing my letter cable messages are wending their way to the United States in response to pressing inquiries from the American authorities respecting the available space, etc., at the Mining Exhibition. This decision to entertain the American proposals was only taken when it was found that the Central Dominion Government, as well as the Provincial authorities had taken no official steps—so far as direct information is to hand—to be represented at the forthcoming Exhibition. It must be understood, however, that America's participation only applies to mining exhibits. It would have been infinitely preferable if the whole of the Exhibition could have been limited to the Empire, and thus afford the world an opportunity of ascertaining the enormous mineral wealth which it possesses and produces, but in view of the apathy displayed by Canada, and the evident desire on both sides of the Atlantic to strengthen the friendly relations between all the members of the Anglo-Saxon race, this decision of the Executive to open the Exhibition to United States exhibitors cannot be condemned even by those who belong to the ultra-Imperialistic school.



THE TRAMWAY OVER CHILCOOT PASS.

THE LONDON MINING GAZETTE.

This is a new publication, introduced by the Incorporated London Chamber of Mines, which deserves the hearty support of every section of the world's mining community, seeing that it essays the difficult task of keeping its subscribers fully posted with statistical data regarding every mine in the world. I have myself often longed for some such re-

cord, and can certainly say with confidence that it fills—to use the hackneyed but appropriate phrase—a long-felt want. The main advantage of the concern is that it is simply a statistical record, and does not comment upon the facts it publishes. This may seem paradoxical to readers, but the fact of the matter is that in London papers are so given to combine wholesale puffery—at regular but not published rates—with the facts they publish that the public are getting shy of both. It is a fact that many of the financial papers on this side will not insert even brief colourless records of work done unless for pay, so much a line for their insertion. The first issue is an excellent production, and if its excellence is maintained in future issues, which I have no reason to doubt, it will speedily secure a leading position among reliable mining records. In the next issue will be included an epitome of all the mining laws of all countries. A further feature will be the insertion of full information regarding the customs duties in all countries on mining machinery and appliances. These alone are contributions to our scanty supply of information—generally hidden away in ponderous and technical terms quite incomprehensible of the ordinary layman.

BRUNTON'S PATENT POCKET MINE TRANSIT.

THE accompanying engravings illustrate a new pocket instrument which furnishes means for performing, within the limits of accuracy imposed by its size and construction, all the operations for which the ordinary transit is used.



Fig. 1.

The instrument has been designed especially to meet the wants of mining engineers, mine managers and superintendents; but its peculiar features render it admirably adapted to the requirements of geological field work, the taking of topography, and, in short, for any purpose for which a light pocket instrument is desirable, and where a reasonable degree of accuracy will suffice.

Fig. 1 shows the instrument folded and ready for the pocket. An aluminum case covers all the working parts, its outside dimensions being but 2³/₄, by 2³/₄, by 1 inches, and total weight but 8 ounces.

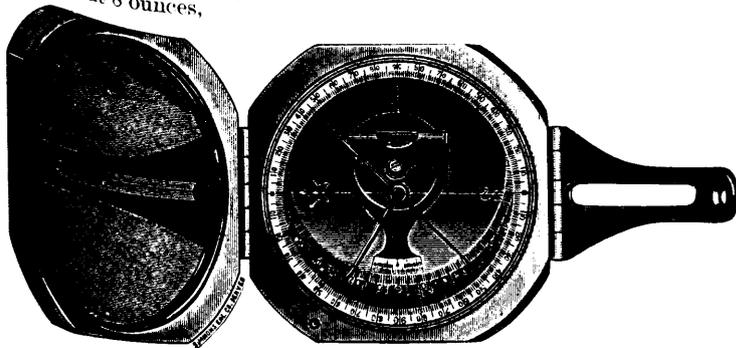


Fig. 2.

Fig. 2 is a plan of the instrument as seen when taking courses or horizontal angles, and shows the line on the mirror bisecting the opening of the reflected sight.

Our limited space prevents us from illustrating but a part of this valuable instrument, but figures 3 and 4 will show its commoner uses.

Fig. 3 shows the method of holding and sighting the instrument when taking courses or horizontal angles, where the point sighted is not more than 45 degrees above nor 15 degrees below the observer. The instrument is correctly sighted on the object when the eye looking into the mirror, sees the black line bisecting both the opening in the front sight and the object sighted at.

In taking vertical angles the instrument is held as shown in Fig. 4. The open sight is thrown out parallel with the face of the instrument, with sighting end folded at a right angle. The mirrored lid is held at approximately 45 degrees with the face of the instrument,



Fig. 3.

in which position the eye can see the object sighted at through the round opening in end of sight and the hole through the mirror. The clinometer vernier is operated by a lever from the back of the instrument and the mirror serves to show when the bubble in the level on the vernier is on the centre, thereby indicating the angle. The lid may then be opened and the angle read direct from the vernier.



Fig. 4.

Among the noteworthy points characterising the new instrument, are:

1. The construction is such as to permit the sighting of the instrument and the reading of the needle to be performed by a single observer. This is not possible with the ordinary surveyor's compass, unless a Jacob's staff is used; and while

the prismatic compass admits of simultaneous sighting and reading, the use of the prism introduces many disadvantages.

2. Horizontal angles are readily taken between objects situated at almost any angle above or below the observer.

3. The combination in one instrument of means for taking both horizontal and vertical angles, and for obtaining clinometer readings,

The pocket transit was invented and patented by the well known mine manager, D. W. Brunton of Aspen; and is manufactured and sold by Messrs. Wm. Ainsworth & Sons of Denver, Colo., who issue a pamphlet giving a detailed description of the instruments and all its uses. The sole agents in British Columbia are Messrs. MacFarlane & Co., Vancouver.

THE MONTH'S MINING.

KAMLOOPS.

(From Our Own Correspondent.)

UNTIL the snow disappears from the hills—and this is taking place very rapidly—there will not be much done in mine development in this district. Work has, however, been carried on throughout the winter on a few properties. The Hela has been receiving some attention and a shaft, down some 24 feet, reveals promising indications. The Earncliffe, too, has had its shaft deepened and continues to improve with every foot of additional depth. The Dawson, Fragment, Kimberley, Copper King, Cyclone and other claims and groups have been worked to a slight extent, owners waiting until spring before proceeding further. It is reported that a gas engine and improved hoisting machinery has been ordered for the Pothook and that next month a large force of men will be put on. Should this prove correct it will be a stimulus to the camp. There is no doubt of the ore being here, and now that copper is increasing in value, the large deposits of copper gold ores on Coal Hill should readily find the necessary capital for their development. The Pythian, Iron Mask, Pothook, Iron Cap, Fragment, Dawson, Kimberley, Cyclone, Copper King, Chieftain, Lucky Strike, Lone Bay and Possum, are among the claims that can show ore. The coming season will be a busy one in the camp.

Mr. Gage, ore buyer for the Trail smelter, spent a couple of weeks here in February, and speaks highly of the camp and the ores.

The Tenderfoot on Copper Creek has been bonded for a large sum. A force of men are now taking out ore.

CAMP M'KINNEY.

(From Our Own Correspondent.)

Work is in full blast in all the principal mines which are under development in Camp McKinney. The Cariboo Company have their shaft down to 350 feet and are now drifting to the ledge, which, the superintendent informs me, should be reached in about ten days. The Waterloo people are drifting from the bottom of the No. 2 shaft (80 feet deep) to the No. 1 shaft. They have run some fifty feet. On the Minne-ha-ha Major Morgan has had three shifts employed

sinking his working shaft another 100 feet. After sinking 40 feet he has let the balance of the work by contract, as he is sinking a perpendicular shaft, when he reaches the 200 feet level he will have to drift to his ledge. Good progress is being made in the "Amnid" (The Little Cariboo Gold Mining Company), the shaft being down about 45 feet and some fair looking ore in sight. No work has been done recently on the "Sailor," but negotiations are now pending for the sale of this property to an Eastern syndicate at a very large increase in the price paid by the present owners. The river which joins the "Sailor" in the East and is between that claim and the "Cariboo" is also likely to sell for a big figure as the Sailor vein runs through it. This vein is undoubtedly the true Cariboo lead, and ore taken from the last shaft sunk on the Sailor was in every respect similar to that of the Cariboo mine. Several new companies have been incorporated to operate in Camp McKinney, the most promising of these is the Shannon Gold Mining Company. This company have bought the Dolphin and Shannon claims lying west of the Cariboo group of mines and originally owned by Mr. C. A. R. Tambly, Gold Commissioner, and Mr. W. Edwards. There is an 80-foot tunnel in the Dolphin, driven to cut the ledge and which is probably within 25 feet of it. A force of men has been already set to work to continue this tunnel and the stock, of which over 150,000 shares have been subscribed for in cash, has very largely increased of late. House or cabin accommodation are consequently at present at a premium, and the coming season promises to be a very busy one at McKinney. Even with the quantity of snow now on the ground—some three feet—the stages are bringing in prospective purchasers, who hope to acquire property before values increase, as is expected will be the case.

BOUNDARY CREEK.

From Our Own Correspondent.

Construction work on the Robson-Midway Railway being now in progress in the Boundary Creek district, there has lately been more activity in local mining matters, the certainty that the transportation difficulty will ere long be overcome having induced more speculation in prospects and investment in the better developed claims than was the case earlier. In half a dozen of the camps development work is being steadily pushed, in most cases with encouraging results. Several important deals have taken place lately, and others are in course of negotiation. The periodical—one might almost write it as chronic—freight difficulty is just now presenting itself in an acute form as the snow melts and the roads become too heavy for hauling except under conditions that entail a higher cost both in time and money. Still with the prospect ahead of an early removal of this obstacle to progress, the inconvenience and loss are borne with less impatience than heretofore, and consolation is found in the confident expectation that henceforward the good or bad state of the main lines of waggon road will not affect the business of the district nor the opening up of its resources.

Owing to lack of time and the difficulty of getting about in the hills whilst the snow is on the ground, it is not practicable this month for the writer to give much detail respecting the progress made in the better known of the many mineral claims that comprise the mining camps of Boundary Creek. In most instances, therefore, only general mention can now be made. Greenwood camp continues to attract much attention, developments on the Knob Hill especially and on the adjoining Old Ironsides being very satisfactory to the stockholders in the respective companies owning these claims, and of considerable importance to the district at large. The cross-cut tunnel on the Knob Hill was stopped at 435 feet in. This tunnel is not directly at right angles to the lode, so the 387 feet of ore it passes through does not represent the actual width of the ore body. At 430 feet in a drift has been run 126 feet west on the hanging wall side of the lode, and this is all in ore. An upraise is being made 140 feet to the surface. Some idea of the ore so far may be obtained from the foregoing figures, which give 387 feet of crosscut tunnel, 126 feet of drift, and 140 feet of upraise all in ore. On the Old Ironsides the airshaft is now down to the 200-foot level, which it enters at 280 feet from the main shaft. Sinking is being continued where the air shaft and tunnel intersect, it being intended to sink here to the 300-foot level, this work being all in ledge matter. An 80 horse-power boiler has lately been installed, the 60 horse-power previously in use not giving sufficient power for larger requirements as development proceeds. Only one-half of a 10-drill compressor has hitherto been in use, but the other half is now being obtained, and when installed will give all the additional power likely to be required down to any reasonable depth. Work is being continued on both

the Brooklyn and Stemwinder, also in Greenwood camp, but no particulars have been received.

The Mother Lode, in Deadwood camp, continues to give employment to a number of men. A big station has been opened out at the 200-foot level, preparatory to entering upon extensive exploration at that depth by drifting and cross-cutting. This station is all in ore, the full extent of which is not yet known. A new bunk house to provide comfortable accommodations for about thirty men is being erected, and other provision for permanent work is being made. It is stated that a plant is to be procured for the Sunset, upon which much more work will shortly be done. A new strike is reported from the Morrison, also in Deadwood camp, and satisfactory progress reports are coming in from the King Solomon and other claims in Copper camp.

Midway, B. C.

ROSSLAND.

(From Our Own Correspondent.)

The report on the mines of this district for the past month is the more interesting because of the general advance in mining shares of this and other Kootenay districts. Montreal is especially investing largely and other cities of the East are following suit. There has been a temporary close down of the smelter owing to the policy adopted by the mines. The Northport smelter has done the same. The latter is of course dependent upon the output of the Le Roi and other of the B.A.C. properties. Of these the chief, at present the only shipper, is the Le Roi. This has been closed down while the shaft has been sunk to the 900 foot level for a few days. The Trail smelter, depending on its chief supply from the War Eagle has run out of ore, while the War Eagle people have been placing their large electric hoist in order. Both causes are very temporary, indeed, and the resumption of shipments will be on a larger scale than ever though no gathering will vitiate the sum total.

Abe Lincoln.—Work is still progressing in the cross-cut to the south. The cross-cut is not as yet far enough in to cut the ledge expected.

Big Three.—Work is now going on in the Mascot property of this company. The electric plant has been installed and tunnel No. 2 is in nearly 500 feet. A small cross-cut tunnel. (No. 3) is in 185 feet and expects to cross the ledge at 300 feet.

Centre Star.—No ore is being taken out of this mine and the chief work is centreing in sinking the shaft now about the 600 foot level and in extending the tunnel now at a point 1,500 feet distant from its mouth. Some cutting is being done in order to furnish evidence for the Iron Mask-Centre Star suit shortly to be heard. It is expected that the mine is hardly likely to commence shipping to any extent until late in the summer.

Columbia and Kootenay.—The main ledge of this property is being opened up in grand style on tunnels Nos. 3, 4 and 5. An ore chute from the No. 4, averaging four feet wide and running from \$16 to \$25 in gold, has been opened for over 200 feet.

Commander.—A strike was made in the middle of February on the low level at a distance of 70 feet from the shaft, which has been drifted on a few feet and looks continuous. The ore is copper-gold.

Deer Park.—There has been a slump in the shares of this stock which is not justified by the evidence of the work progressing on the property, which is being actively prosecuted. A raise is being made from the drift on the 150 foot level to connect with the cutting on the 100 foot. Timbering is also being placed in position. Ore is not being shipped, as the management say that the recent cold snap prevented sorting owing to the lack of water.

Evening Star.—This property is one of those which has witnessed quite a renewal of confidence in its stock. Work is going on in the lower tunnel and a fresh scheme of progress has been thought out which the management are confident will meet with success.

Giant.—A cross-cut is being made at the 100 foot level, which, though only in a few feet, is justifying the hopes entertained of its success.

Great Western.—A station is being cut at the 300 foot level in the shaft anterior to its being sunk to 400 feet. A body of low grade ore has been found at the lower levels.

Green Mountain.—A shaft is now being sunk upon this property and is now down about 85 feet. Continuous work is proceeding.

Homestake.—The management have abandoned its primary intention of sinking to 300 feet before any cross-cutting

was done. The shaft has been completed to the 200 feet level and has been timbered to that point. Stations are being cut at the 200 foot and the 150 foot level and cross-cuts will be made under the hill to the northwest.

Iron Colt.—Another property which has had a rise in its stock. Work has been resumed. The shaft is to be sunk another 100 feet. In the meantime a quantity of iron ore, which had been removed from the upper workings, will be shipped to the smelter to be used as a flux.

Iron Horse.—The shaft is now down about 240 feet and will be extended to 300 feet before any cross-cutting is undertaken.

Iron Mask.—The Iron Mask has been increasing its shipments of late and intends to send out larger amounts yet. The principal work is proceeding on the drifts from the winze. Good ore is in sight continually.

Jumbo.—The sale of this property has not come off. This, however, is making no difference to the mine where work is going ahead as usual. The tunnels are both being driven simultaneously at the upper and lower levels.

Le Roi.—Developments are going on all over the mine and the completion of the shaft to the 800 feet level shows the mine at that depth to be as good as ever. Work is also being carried out on the incline to the Black Bear where a large electric hoist which has already been ordered will be erected? The Le Roi is now going to use Crow's Nest coal instead of wood from this time forth. The shipments during **March** may be expected to amount to seven or eight thousand tons.

Lily May.—Drifting is in progress on the vein at the 200 foot level. Work is slow being undertaken by hand as the compressor plant got seriously injured during the late severe frosts.

Nickel Plate.—The management express themselves satisfied with the results of their work. Drifting is progressing north and south at the 200 foot level. The amount of work done on this mine during the past nine months has been simply phenomenal.

Josie.—The west drift in the Annie, which is being worked, it will be remembered from the Josie, is coming into good ore. On the Josie proper the raise between the 300 and the 400 foot levels is in progress and will probably be completed early in March.

No. 1.—A hoist has been put in at the 200 foot level and work is going on from that to the various levels below. The west drift from this point is still being worked.

Novelty.—The tunnel is being pushed and is now in some 220 feet. There is nothing of any particular moment, however to be recorded.

Silver Bell.—Work has been re-started and the cross-cut from the bottom of the shaft is looking well. The main body of ore has not been reached though the directorate think they are reasonably sure of starting it ere long.

Sunset, No. 2.—Work is still proceeding on the great cross-cut, though at this moment a stringer of some width is being prospected. The main body is thought to be near at hand.

Velvet.—A big strike has been made upon this property at the 160 foot level. The strike is a vein six feet wide, which is said to run as high as \$40 to the ton. This vein was encountered at the higher levels but was of not nearly the same width. If the expectations formed are realised to any extent Sophia Mountain will be as celebrated as Red.

Victory Triumph.—The find on this property which sent the shares flying upward, has proved to be of greater importance than was at first thought. Not only does there exist a streak of clean pay ore, two feet wide, but there is in addition a quantity of mixed ore beyond which, though not running as \$65 as does the streak itself, has a commercial value. This property is also situated on Sophia Mountain not far from the Velvet.

Virginia.—Cross-cutting is proceeding both at the 300 and at the 500 foot levels. It is expected that the long-looked for ledge will soon be encountered at the lower level. Many investors who suffered severely with the slump of last October in this stock are beginning to feel jubilant.

Wallingford.—Two shifts are working on this property on Record Mountain on the tunnel which is being driven in towards the ledge. For a long time the tunnel was in country rock, but now the stuff taken out is getting mineralised, showing calcite, molybdenite and white iron. The old shaft, 40 feet deep is not being worked at present. The showing at its foot was good. The rock assayed went as high as 20 per cent. copper, 12 oz. silver and \$6.40 gold. This mine was recently taken over by a very strong Eastern syndicate, comprising S. F. Mackinnon, J. R. Barber, C. S. Poole, H. Lowndes and Ferguson Donovan, all of Toronto; J. W. Staebler, of Berlin, Ont., and W. C. Archer, of Rossland, while

last named gentleman is the resident manager. The property is partly Crown granted and the capitalisation is 3,000,000 shares at a par value of 25c. There exists a pool which is to remain in existence till November, 1900, or longer, if the directors see fit. The treasury shares amount to 1,250,000.

War Eagle.—There has been a block in the mine and the hoisting machinery is not as yet in running order. Shipments are therefore curtailed, though they will soon be resumed on a better footing. Messrs. Gooderham and Blackstock are both living at the mine for the present. Their experts are ready for the fray in the Centre Star-Iron Mask case, soon to come off.

Y.M.R.

(From Our Own Correspondent.)

A new district of very great promise is now beginning to attract some attention. This is what is known as the Cariboo Hump country, so named by the Hennessey Brothers, well-known Slovan prospectors, and the first discoverers of mineral in this locality. The district is situated twelve miles from Ymir on Sixteen-Mile Creek, which flows into Kootenay Lake from the east. The Messrs. Hennessey have already expended \$4,000 in developing their properties, the Wisconsin and Lucky Strike claims, which have been opened up by a tunnel of 125 feet, and show a ledge 20 feet wide at the narrowest point, the average assays returning \$25 in gold with small silver and copper values. The Messrs. Hennessey hope to send 100 tons of this ore to the smelter before long. Many Ymir residents are owners of claims in this section, and one of the most promising groups is the Great Northern, the property of Messrs. Bockworth and Fuller. The Government have promised to build the road from the head of Wild Horse Creek to Kootenay Lake this summer, and when this is done ore can be packed out at from \$10 to \$15 per ton and much activity may in consequence be anticipated.

Assays from Dundee concentrates are as follows: From Coarse Jig, \$24.09 and \$30.10; No. 2 Screen, \$50.30 and \$56.82, while those from concentrates off Wilfley table are \$34.20 and \$36.95, the average values running \$40.00. The one from which these concentrates were obtained averaged \$7.27. These tests are entirely satisfactory to the company. The mine is running steadily, and regular shipments of concentrates are now going to the smelters.

It is reported that the Canadian Pacific Exploration, Ltd., have elaborate plans for the enlargement of their mill and the commencement of new tunnels to further develop the Porto Rico property. Canadian Pacific Exploration.—Porto Rico Mine, Ymir, B.C.—Started battery December 8th, 1898. Result of crushings to January 18th, 142 tons milled yielded 295 oz. retorted gold; 540 tons mixed ore and country milled yielded 561 oz. gold; approximate value of concentrates \$1,000. By cablegram dated January 26th, "The stopes are looking exceedingly well."

Strong pressure has been brought to bear upon "our member," the Hon. J. F. Hume, for roads and trails which are absolutely necessary for the development of one-inch resources. He has promised his co-operation in this matter, and we feel confident that hence we shall get what we want.

The Second Relief Mine has just made a shipment of 270 tons of ore to the Northport smelter which will average \$70. As the smelting carriage and mining of the ore comes to \$15 a handsome profit is left for Messrs. Finch and Campbell, the owners.

The Arlington report a strike of inch ore in the bottom of their shaft.

The owners of the Rising Star mine, which adjoins the Porto Rico mine, have let a contract to sink 50 feet, and drift 25 feet on their property.

The lease on the Beach Creek has reverted back to the original holders, Messrs. Julian and Audit, who are now working the property and shipping regular.

NELSON.

(From Our Own Correspondent.)

In the days of our youth, we used to hear a good deal about the hardships inflicted upon a certain people, in that they had to make bricks without straw, and this was said to be the height of cruelty. In these later days, however, it has occurred to many that the hardships just referred to might be esteemed a picnic compared to what we frequently have to undergo; and to evolve items of mining interest when there is no news and no particular mining to speak of is about as difficult a process as to make strawless bricks. Naturally our long Kootenay winters make mining generally very quiet—such highly developed properties as the Sil-

ver King, the Athabasca, and one or two more being of course excepted—but the smaller concerns are as a rule shut down for the season owing to the difficulty of getting in supplies on account of the snow.

Messrs. Wilson Bros.' "Last Chance" mine on Toad Mountain made a brave effort to work all the winter, and succeeded for some time, but the heavy snow finally compelled a temporary shut down till such time as the trail becomes passable again.

However, to make up for want of excitement in Mining, Nelson has had another election, and returned its former member, the Hon. J. F. Hume, by a most astonishing majority. Those who profess to know say they considered the other candidate (A. S. Farwell, Esq.) stood nearly as good a chance as Mr. Hume, but the results of the polls showed they were mistaken. Now, however, that all the turmoil is over (including the Chinese New Year), it is to be hoped that people will attend to business once more.

Another thing that has helped to keep Nelson alive and emphatically kicking, is the effect of the cold spells we had upon the water supply—although at present the town is again fairly well supplied with that harmless and necessary fluid, yet some streets are quite without any owing to the mains freezing. Such weather has a very great use, in showing just where our weak points are and so enabling us to work on different lines in the future. The coldest day in January was 6 degrees below zero, and in February (so far) the coldest has been 7 degrees below—not very intense compared to some places, but it continued so long—fully a week each time—and we were so unprepared for it, that much damage and inconvenience has been caused. However, it appears to be all over now.

It is a source of the greatest satisfaction to find that our Provincial Government proposes to insist on assayers knowing the business they profess. It is needless to quote cases where the assayer has been either incompetent or dishonest, or both; and in a country like this that depends for its very life more upon its mines than on anything else, both prospectors and smelters ought to have some safe-guard that they shall not be injured by wilful or ignorant, false statements as to the value of their ore or other products. It may, however, be necessary to appoint examiners in other parts of the district than in Victoria only, as it would be a very costly undertaking for any young man just starting in business to have to make the trip to the Coast, in addition to the expenses and fees that would be incurred during his stay there. But it is entirely satisfactory to find that public attention has been called to this urgent necessity, and though some points may require amendment or obliteration, yet in the main it is a capital and most valuable measure. One point especially is noteworthy, that no exemption is offered to assayers of acknowledged standing and in actual practice at present, and there are many of them in British Columbia. That omission may possibly be neutralized by some other bill, or portion of this one, but the matter can hardly remain as it is. And to quote an old proverb: "Quis Custodiet ipsos custodes?"—who will examine the examiners to see if they themselves are capable? However, there is very little doubt that everything will eventually be arranged to the satisfaction of all competent assayers, and to the great advantage of those who employ their services.

SLOCAN.

(From Our Own Correspondent.)

Extremely severe weather during the past month has been the experience not only of the Slocan, but the entire country. For the first time in its known history the spectacle of ice oating freely around on Slocan Lake has been observed, and it is not at all improbable that a few more intensely cold days such as were common in the earlier part of the month, would have rendered navigation out of the question. The inevitable thaw, however, came at last, and though welcome to the majority, inaugurated a condition of affairs more apprehensive than pleasant to those at work in the hills. The breaking up of winter is always a most dangerous period and with the long continued cold and heavy snowfall, is likely to be even more so this year than usual.

The month has been very successful from the standpoint of shipments, mine-owners being anxious to take advantage of raw-hiding facilities while the snow lasts. In the case of many of the larger mines the advantage is not so evident on account of their possessing artificial means of transport, but to the ordinary shipper the saving is very considerable over the antiquated methods in vogue of hauling in waggons or packing on mules.

The Idaho still maintains its enormous output, ranking next to the Payne in point of tonnage. Among other

heavy shippers we note the Last Chance and Whitewater, the Noble Five is likewise coming into prominence by reason of late discoveries of large bodies of good concentrating ore.

A very successful meeting of the Ruth Mines, Ltd., was held in London a short time since, when the dividends for the first year were announced at 22½ per cent., a result, considering the depressed condition of the silver market, which is probably unparalleled in galena districts.

The directors of the Dardenelles, which include Sir Charles Hibbert Tupper and the Hon. F. W. Peters, paid a visit to that property quite recently and were much struck with its appearance. It is significant that the shares in this company continue to rise and the sales of stock as reported by brokers are very active. After a considerable experience with pumps, the new owners of the Antoine have decided to tap the ledge lower down by means of a long tunnel, work on which is expected to begin in the course of a couple of months. Pumping propositions are naturally very much the exception in a mountainous region, but occasionally where the ground is unduly flat, it is found more economical than driving an adit.

The town-site trouble at Sandon appears to have been pretty well threshed out by this time and has resulted as everyone anticipated, in confirming Harris in his title to the surface and right to demand ground rent of settlers. On account of the claim having been located under the old law, it can hardly serve as a precedent for future contentions involving the same principle.

A month ago we were in high glee at the immediate prospect of having a sampler in our midst, but once again we seem doomed to disappointment. It is only preliminaries are all thoroughly arranged in matters of this kind, that the real difficulty came to the surface, and apparently this was never better exemplified than in the present instance. Whether the C.P.R. were responsible for the failure as has been asserted, or the site was more difficult to obtain than at first supposed, is really immaterial, one thing is quite certain, viz.: that overtures have been made to the City Council at Nelson with a view to locating it there, if sufficient inducement is forthcoming.

The smelters at Nelson and Trail are now bidding briskly for our lead ores and more than one prominent mine and the majority of small shippers are lending their support to this movement. The Queen Bess has recently contracted to send three months' output to Nelson and the bulk of the product of the lake mines is finding its way to Trail. The Monitor is sending forty tons on trail to a firm on the Manchester Ship Canal, which announces a special process of treating zinc ores. The question of shipping ordinary galena to England has been thoroughly gone over by more than one manager in the Slocan, but the margin, if any, in favor of so doing, is so slight as not to compensate for the extra time and trouble involved. What may be the result in the case of ores carrying a high percentage of zinc is of course another matter and quite impossible to predict, but the owners of such producing properties do not appear to have become very much enthused over the idea, judging by the tardiness of their action.

Work has had to be discontinued in the shaft at the Boston on account of the influx of water. At a depth of 110 feet they were still encountering gravel with no sign of bed-rock, notwithstanding they had already cut through several layers of indurated or hardened mud which was taken as an indication of its near approach. The problem will probably be attacked from a different direction in the near future. The shipments for January amounted to 120 tons and this month will probably witness a similar production. The company are evidently preparing for prolonged operations as they have recently acquired by purchase an adjoining fraction which might otherwise at some time interfere with their plans.

The owners of the Marion despatched a car of ore to Trail last week, which is regarded locally as a fore-runner of others to follow.

The Wakefield continues to ship heavily, and will probably total up to a thousand tons for the winter, all of which is high grade. The Vancouver, too, is a steady producer and the Emily Edith has recently joined the list, with a forty-ton consignment, which we are assured is merely an initial effort. The event of the month, however, on Four-Mile has been the starting up of the concentrator at the Comstock. This has been designed and built by Mr. Mitchell, who is responsible for all the works of the same nature in the Slocan, and when run to its full capacity will treat sixty tons of crude ore per day. The mine is well developed, and with the splendid water power available to run the concentrator it

is to be hoped there will be no difficulty in providing a continuous ore supply.

Great excitement has been aroused over the discovery of high-grade galena on the Noonday, a claim almost immediately contiguous to the property of the Galena Mines Ltd. Everybody here still has firm faith in the possibilities of that district, despite the unfortunate results attending the operations of that company. One thing in connection with this locality must not be overlooked, namely, that the surface is buried beneath several feet of debris, which renders exploitation extremely difficult.

Work on the Enterprise has been almost discontinued, being confined to driving one tunnel and putting up a raise by contract, eight men only finding employment.

The power of monopoly is keenly felt at all lake points, freight and treatment being from six to seven dollars a ton more than from Sandon, which enjoys the advantage of competing roads. The sooner the K. & S. taps the lake district the better for them and everyone concerned.

HOWARD WEST.

EAST KOOTENAY—FORT STEELE.
(From Our Owa Correspondent.)

The North Star Mining Company are now working three eight hour shifts on the large double compartment shaft, which is now down 200 feet in heavy mineralized rock. It is the intention of the company to cross-cut at this depth, and it is expected that the results will be astonishing. On the Stenwinder property the same company are employing a force of men of two shifts, and the workings are now in a distance of a hundred feet. The last 30 feet of the tunnel is in solid ore, the value of which is steadily improving. The ledge, which, at this point, is over 100 feet wide, gives big values in gold, copper and silver, and the ore in appearance is very similar to that of Rossland.

Wild Horse Creek.—A contract has been let for the sinking of a 75-foot shaft on the Hollander group of claims. These claims are situated four miles from Fort Steele. The present development work consists of a tunnel 65 feet in length and of a shaft 12 feet deep. The ore is galena and decomposed quartz, carrying gold and copper.

The bond on the Big Creek group of claims, which are situated on Boulder Creek, a tributary of Wild Horse Creek, has been renewed. Mr. Corbiggan, of Macleod, who negotiated the deal, represents the interests of the Winnipeg capitalists acquiring the bond.

In view of the attention that is now being accorded to East Kootenay it is interesting to note that a local firm of brokers, Messrs. E. A. Elton & Co., this month sold a block of 2,000 Crow's Nest Coal Company's shares to Victoria purchasers for the large sum of \$104,000.

The Public Accounts of the Province for the fiscal year ending June, 1898, as recently received at the Government office, Fort Steele, show that the revenue derived from this district during 1898 was \$14,396.23, against \$13,830.45 for the preceding year; from West Kootenay, \$292,595; Victoria, \$168,476; East Kootenay \$58,151, and Vancouver \$34,357.

The revenue for the whole of East Kootenay was \$58,151, made up as follows:—

Land sales	\$ 9,921
Land revenue	712
Timber leases	402
Free Miners' Certificates	6,827
Mining receipts	9,827
Licenses	7,860
Fines	2,502
Revenue taxes	6,882
Real property tax	3,808
Wild land tax	7,343
Mineral and Personal property tax	1,667
Total	\$58,151

THE CONSOLIDATED CARIBOO HYDRAULIC MINING COMPANY, LIMITED.

THE MANAGER'S REPORT.

To the President and Directors of the Consolidated Cariboo Hydraulic Mining Company, Limited, Toronto, Ont.

GENTLEMEN,—As the Manager of the Consolidated Cariboo Hydraulic Mining Co., Limited, I hand you this, my Annual Report for the season of 1898, which, reviews briefly the work performed in connection with the equipment, opening and operation of the Company's mine.

The work of cleaning the canals of accumulations of ice was commenced in the latter part of March and completed on April 10th.

The catchmen water was pooled in the South Fork reservoir and washing gravel commenced on the 14th of April, in pit No. 1. Washing was also commenced in pit No. 2, to remove the vast accumulations of boulders and tailings deposited by the early Chinese miners in Dancing Bill Gulch and on the worked out ground fronting the lower or bedrock bench, also the slide and other waste material from the north-west rim, the complete removal of which was necessary to make possible the installation of the permanent sluices and gold saving appliances.

A run of 70 days 19 hours was made in pit No. 1, during which time 143,475 miner's inches of water was used to wash out 350,000 cubic yards of top gravel and clay, which produced 4,403½ ounces of gold, valued at \$75,166.16, an average yield of 21 cents per cubic yard, an improvement of about three and three-tenths cents on the average for 1897.

A run of 40 days 15 hours was made in pit No. 2, during which time 89,989.2 miner's inches of water was used in the removal of 436,200 cubic yards of tailings, boulders and other waste material, which produced 351½ ounces of gold, valued at \$6,021.70.

The removal of this waste consumed about one-third of the season's water supply, added materially to the cost of the season's operations, and caused a proportionate reduction of the season's product.

The installation of the permanent sluice plant and gold saving appliances in the bed of Dancing Bill Gulch was commenced July 1st and completed August 1st. This plan consists of two lines of sluices 7 feet wide by 3 feet deep, each line 240 feet long, both paved with improved steel riffles, which are the best in use for the recovery of fine gold.

After the installation of the plant, the work of opening the lower bench was commenced. A run of 16 days and 3½ hours was made, during which time 31,416.4 miner's inches of water was used in the removal of 35,670 cubic yards of gravel and slide rock from the bottom bench, which produced 1,389 ounces of gold, valued at \$23,953.50, an average yield of 67.15 cents per cubic yard, which is 18.15 cents better than the average produced from the test pits sunk and prospected during the season of 1896 and 1897.

The opening work was attended with many delays and difficulties, on account of the immense slide bedrock found underlying the old workings near Prospect Shaft No. 1, the immense deposit of boulders found in the old workings on the east side of the channel under the main sluice from pit No. 1, and the hardness of the underlying bedrock in which the working sluice cuts had to be sunk and advanced to facilitate the removal of the gravel to the sluices. During the progress of the run two bedrock cuts were excavated for a distance of 300 feet each and lowered in the rock from 2 to 60 feet in depth.

When the workings were carried to a point under the old main sluice from pit No. 2, and the bedrock uncovered under the deposit of slide rock, a rich stratum of gravel containing coarse gold was encountered and appears to continue up the channel on the flat rock on the east side. The gold recovered is heavier than any found in the upper workings, one nugget weighing 6¼ ounces and valued at 115.00.

WATER SUPPLY.

The water supply during the season was somewhat in excess of that in 1897. This was to be expected, as the record of rain and snow fall exceeds that of 1897.

Inches.

Rain and snow fall from Nov. 1, 1896 to Nov. 1, 1897...25.56
Rain and snow fall from Nov. 1, 1897 to Nov. 1, 1898...28.37
Making the precipitation for '98, in excess of that of '97, 3.01

Two inches of the extra precipitation occurred during winter, and should have caused the water in the storage reservoirs at Polleys and Bootjack Lakes to rise higher than it did in 1897.

The winter snow passed off under influence of warm days and nights of low temperature, at times considerably below freezing point, conditions most unfavorable for making water, and explains the cause of the failure of the water to rise in the reservoirs as high as expected.

On the other hand, the summer rains were in excess of the previous season. They came in protracted storms of several days' duration, which are favorable for increasing the flow, and much more water finds its way into the reservoirs and canals.

Miner's Inches.

Quantity of water used in 1897	223,416
Theoretical quantity expected for 1898	250,212
Actual water used in 1898, per Mine Reports	264,880.9
Excess of actual over theoretical	14,668.9
About 7½ days' water for 2,000 miner's inches.	

The Morehead Dam and Canal are now completed, at a cost of \$118,458.08, this amount being \$6,541.32 under the estimates.

The Mine may, in future, depend upon double the supply of water afforded by the South Fork and Dancing bill water system, and will insure a steady supply throughout the season even under more unfavorable conditions than have occurred since the commencement of the equipment of the property.

The Morehead system is not complete, however, without a small pooling reservoir to collect and converse the early spring and late water when not delivered in the quantity required to operate the Mine, and to conserve the water flowing down the canals at times when the head gates are ordered closed down.

The necessary pooling reservoir can be made in the valley above the main South Fork canal, a short distance above the South Fork reservoir, which will hereafter be used for pooling water for use in the South Fork pit No. 3.

Such a reservoir can be made by the construction of an earth dam containing about 4,500 cubic yards of earth, and can be constructed, together with the necessary gates, at a cost of \$5,000.

This pooling reservoir will materially simplify the problem of the economical use of water in the Mine.

LAND AND LEASES.

The twenty-five Placer Mining Leases purchased during the season are situated on Long Lake Creek, Little Lake Creek and Morehead Creek.

The area of the leases is 2,112.8-10 acres. These leases cover the auriferous deposits of an ancient river channel of stupendous proportions, for a distance of 42.530 feet, about eight miles, commencing at the old Cariboo Company's line west of the South Fork reservoir, and extending down to the confluence of Morehead Creek with the Quesnelle River.

Appurtenant to the above described property, are valuable water and reservoir rights, one for 1,000 inches of water from Morehead Creek, and 1,000 inches of water from Little Lake Creek, together with the right to use said Little Lake for a storage reservoir. These additional water rights increases the Company's water supply to 7,000 miner's inches.

The acquirement of this most valuable property adds at least four hundred millions of cubic yards of auriferous gravel to the Company's holding, making the total quantity of auriferous gravel available for future washing, amount to about four hundred and sixty-three millions of cubic yards.

OPERATING THE MINE AND OPENING THE LOWER BENCH.

PIT No. 1.

COMMENCING APRIL 19TH AND ENDING NOVEMBER 1ST, 1898.

Water Used.			How Used.
Days.	Hours	Quantity Miner's Inches.	
8	21½	19,717.6	Clearing out ice and frozen clay. Washing top gravel and clay. Washing top gravel and clay. Washing top gravel and clay.
40	3	80,257.8	
17	9	34,749.9	
4	9	8,750.0	
70	19	143,475.3	

SUMMARY OF RUN IN TOP GRAVEL PIT No. 1.

Time occupied in washing	143,475	miner's inches.
Quantity of water used	143,475	miner's inches.
Quantity of material removed—		
Ice and frozen clay	42,300	cubic yards.
Clay of top, west side of pit	106,000	" "
Top gravel and clay, east side	201,700	" "
Total quantity material washed	350,000	" "
Duty of water per miner's inch	2.44	" "
Gold recovered	4,403½	ounces.
Value	\$75,166.16	
Average yield per cubic yard	21	cents.
Product per day of 24 hours	\$ 1,058.67	

PIT No. 2.

COMMENCING APRIL 14TH AND ENDING NOVEMBER 1ST, 1898.

Removal of accumulations of Chinese boulders and tailings and other waste material, preparation to installation of gold saving appliances and opening of lower or bedrock bench.

Water Used.			How Used.
Days.	Hours	Quantity Miner's Inches.	
4	11½	8,958.5	Clearing out ice and frozen clay. " " earth, top waste and slide rock from N.W. rim, and accumulations of boulders front of Lower Bench.
23	4	55,072.5	
2	20	5,708.2	Clearing out accumulations of boulders and tailings from bed of Dancing Bill Gulch. Clearing Chinese boulders from front of Lower Bench.
6	9½	12,750.0	
3	18	7,500.0	Clearing Chinese boulders from Lower Bench.
40	15	89,989.2	

SUMMARY OF CLEARING OUT WORK DONE IN PIT No. 2.

Time occupied in washing	40 days, 15 hours.
Quantity of water used	89,989.2 miner's inches.
Quantity of material removed—	
Ice and frozen clay and gravel	31,200 cubic yards.
Accumulation of tailings and boulders	72,000 " "
Top waste earth and slide rock from N.W. rim	333,000 " "
Total waste removed	436,200 " "
Duty of water per miner's inch	4.84 " "
Gold recovered	351½ ounces.
Value	\$6,021.70
Yield per cubic yard	.01 37-100 cents
Product per day of 24 hours	\$146.87

PIT No. 2 LOWER OR BEDROCK BENCH.

COMMENCING AUGUST 1ST AND ENDING NOVEMBER 1ST, 1898.

Water Used.			How Used.
Days.	Hours	Quantity Miner's Inches.	
11	14½	23,166.6	Washing bottom gravel and lowering cuts. Washing bottom gravel and lowering cuts.
4	13	8,249.8	
16	3½	31,416.4	

SUMMARY OF OPENING RUN ON LOWER BENCH.

Time occupied in washing	16 days 3½ hours.
Quantity of water used	31,416.4 miner's inches.
Quantity of gravel washed	35,670 cubic yards.
Duty of water per miner's inch	1-10 cubic yards.
Gold recovered	1,389 ounces.
Value	\$23,953.50.
Yield per cubic yard	.067 15-100 cents.
Product per day of 24 hours	\$1,483.58.

An immense bedrock slide encountered near Prospect Shaft No. 1 interfered materially with the progress of washing gravel, and reduced the duty of the water for the washing done on the lower bench.

SUMMARY OF THE SEASON'S WORK.

Total time occupied in washing	128 days 16½ hours.
Total quantity of water used	264,880.9 miner's inches.
Total quantity of pay gravel washed	385,670 cubic yards.
Total quantity of Chinese tailings and other waste material removed	436,200 cubic yards.
Gold product for season	6,144 ounces.
Value of gold recovered	\$105,141.36.

The receipts and expenditures attending the equipment, opening and operation of the Company's Mine for the season, will be found distributed in detail in the following statement:—

EXPENDITURES FOR SEASON OF 1898.

PERMANENT IMPROVEMENTS—	
Drain Tunnel	\$ 3,533.42
Land and Leases	1,322.00
Installation of steel riffles	11,600.01
Equipment Lower Bench	7,424.01
	<hr/> \$ 23,879.44

MOREHEAD DAM AND DITCH.

DAM—	
Clearing Dam Foundation..\$	327 36
Excavating Dam Foundation	2,852 51
Making Dam Embankment	14,866 71
Facing inner slope with rock	3,918 44
Trunk conduit and gate tower	15,608 12
	—\$37,573 14
DITCH—	
Right of Way Clearing....\$	1,471 23
Excavating of Ditch.....	46,571 29
Jaw-Bone Pipe Line.....	2,954 42
Flumes	12,378 34
Waste Gates	1,002 70
Engineering Walling and	
Incidentals	5,448 28
	—\$69,826 26
SPECIAL—	
Clearing Reservoir Site....\$	7,321 14
Changing Government roads	1,133 60
Telephone	1,174 55
Camp Buildings	1,429 99
	—\$11,059 28
Total cost dam and ditch	\$118,458 68
Total Cost of Per-	
manent Improv'm'ts	\$142,338 12
OPERATING EXPENSES—	
Lands and Leases.....	\$ 432 14
Labour, etc.	31,766 33
Mining—Explosives	\$20,089 90
	51,856 23
South Fork ditch mainten'e	5,963 65
Sluice Maintenance	7,047 57
Portable Hydraulic Plant	
maintenance	2,402 15
Mine Light maintenance....	930 90
Camp maintenance	1,244 35
Buildings maintenance	1,088 15
Melting Plant maintenance..	75
Wagons and Harness main-	
tenance	187 95
Telephone maintenance	49 50
Roads and trails main-	
tenance	364 85
Insurance Account	663 35
Transportation of Miners, etc.	4,983 56
Stable expense	3,199 92
Bullion expense, Govern-	
ment Tax and Transporta-	
tion	3,382 81
Postage and Telegraph.....	328 86
Mine Office expenses.....	2,504 74
Incidental expenses	456 15
Stationery and Printing	190 52
Management	5,161 50
Wagons and Harness Ac-	
count, Loss on Pack Train	
Rigging, sold	1,026 75
Horses and Mules Account,	
Loss on Pack Train, sold	1,443 80
Tools and Implements, De-	
preciation for Season	668 93
Quicksilver Account, Loss	
for Season	927 60
Total Operating Ex-	
penses for Season	9 96,506 68
Summary—	
Total Permanent Improvements	
for Season	\$142,338 12
Total Operating Expenses for	
Season	96,506 68
Total Expenditure for Season....	238,844 80
Receipts for Season—	
Gold Recovered	\$105,141 36
Inventory—	
There is on hand at the Mine, as per inventory taken	
October 31st, 1898, as follows:—	
Miscellaneous Provisions and Min-	
ing Stores	\$ 32,795 43
Explosives	4,958 88
	\$37,754 31
Total Stores	
Quicksilver, 56 Flasks	\$ 2,685 80
Blacksmiths' Stores	1,614 12
Lumber, Logs and Sluice Blocks.....	9,059 67
Live Stock	1,675 00

Wagons and Harness	1,781 25
Tools and Implements	6,646 72
	\$ 23,462 56
Total	\$ 61,216 87

WATER SUPPLY SYSTEM.

The Water Supply System, as now completed, consists of the

	Length, miles.	Capacity, miner's inches.
Main South Fork from Polleys Lake reservoir to the mine	19	3000
Canal from Drop Gulch to South Fork reservoir	1	3000
Canal from South Fork reservoir to Dancing Bill Gulch	1	3500
Ditch from Dancing Bill Gulch to South Fork reservoir	1	1000
Old South Fork Ditch from South Fork reservoir to French Barr Bluff.....	1	1000
Morehead Canal, from Morehead Lake reservoir to its junction with South Fork Canal	10	2500

Total length of Canals and Ditches completed

All the above named canals and ditches are in good condition, excepting the old South Fork Ditch from South Fork reservoir to French Bar Bluff. This ditch will be improved, and used hereafter for the delivery of surplus water for use in the South Fork Pit.

CONDITION OF THE MINE.

Since the opening of the lower bench in Pit No. 2 at Dancing Bill Gulch, the Mine may be considered in good condition for the use of the increased water supply from Morehead Lake.

The installation of the hydraulic plant in the South Fork Pit, which will be called Pit No. 3, is now under way, and will be completed early next spring ready for the use of the spring freshet and any surplus water that cannot be profitably used in Pits Nos. 1 and 2.

The heavy body of indurated clay overlying the gravels on the west side of Pit No. 1 is rapidly decreasing as the workings are advanced easterly up the channel.

There is a marked improvement in the average yield of the top gravel in Pit No. 1 as the workings are advanced up the channel.

The character and grade of the gravel in the lower bench is as good as expected and is likely to improve as the workings are carried up the channel above the old Chinese workings.

When the improved condition of the working pits, the high grade of the gravel and the increased water supply is considered, it is reasonable to expect that the product should double that of any season since the opening of the hydraulic excavations.

The sum of \$17,000 should be appropriated to purchase hydraulic plant and appliances required in addition to that now in stores, to complete the equipment of the South Fork Pit, construct a pooling reservoir for the Morehead System and to complete the Bullion Retorting and Melting Plant. When this work is completed, the property will be fully equipped for the economical use of the increased water supply and the successful and profitable operation of the Company's mines at Dancing Bill Gulch and Black Jack Gulch.

With the additional force required to handle and utilize the increased water supply and perform the extra work attending the opening of South Fork Pit, it is expected that the operating expenses for the ensuing season will be increased, but will probably not exceed \$108,000.00.

This Report deals with the revenue and expenditures attending the equipment, opening and physical operation of the mine, and does not include Head Office expenses.

Very respectfully yours,

J. B. HOBSON,
Manager.

PUBLICATIONS.

HYDRAULIC MINING—Part I.—Ditches. By Captain C. C. Langridge, M.F., I.M.E. Price 3 shillings. Published by *The Mining Journal*, London, England.

This book, the first of a series of three volumes, treats entirely of mining ditches, while the second volume relates to

flumes, tunnels and pipes, and the third to reservoirs, monitors, elevators, sluices, etc. (Parts 2 and 3 are illustrated.)

The contents of Part 1 embrace ditches, velocity of flow, area of cross-section, leakage and evaporation, form of channel, side slopes, grade and carrying capacity.

These important features are supplemented by very complete hydraulic tables and estimates of cost of ditches, etc.

Altogether the book is a concise hand-book on the subject of hydraulic ditches, and will prove useful to those engaged in hydraulic mining.

We are in receipt of a copy of the "Williams Official British Columbia Directory" for 1899. This work is the most complete of its kind that has yet been issued from the press, and gives evidence of the most painstaking and careful compilation. We can cordially congratulate the publishers upon the thoroughness displayed in the production.

BOILER SCALE.

TO THE EDITOR:—Possibly some of the readers of the MINING RECORD may be interested in the subject of the formation of "scale" in steam boilers.

With regard to the nature of scale, it may be stated that for the most part the deposit on the inside of steam boilers consists of carbonate of lime, gypsum and magnesia.

Water that is entirely free from solid matter in solution, or in suspension is seldom found in any lake, river or other source of water supply.

The fact is that the only water that in any way approaches purity and freedom from objectionable solids is water which has been condensed from steam, and also rain water, which has been collected in tanks, and has not come in contact with the ground.

The scale, or incrustation of boilers, is caused by the solid matter which was formerly in solution or suspended in the water, remaining behind after the evaporation of the water. This solid matter is either in the form of slime floating on the surface of the water and clinging to the sides, or as a solid mass which adheres to the hot surface of the boiler, forming a crust, the thickness of which depends on the amount of material that was suspended or dissolved in the water. A peculiar form of scale is known as "crust cakes," which forms in some boilers by the contraction and expansion of the boiler, dividing the scale deposit into separate masses or "cakes."

This is a particularly injurious as well as dangerous form of scale, as it produces unequal expansion and contraction of the plates, and is apt to produce cracks in the boiler, as well as loosening of the rivets. Incrustation of boilers in some instances chokes feed pipes and prevents the access of water to gauge tubes and other safety attachments of boilers.

To prevent incrustation we may in the first place make a careful selection of water for boiler use. With reference to the selection of the best water available for boiler purposes we of course choose the water which, upon chemical analysis, is found to contain the least quantity of scale-forming material. If a water free from scale-forming material is not available the chemist should be able to suggest a complete, or at least, partial remedy for the objectionable material.

The water from condensed steam should in all cases be collected and saved for boiler feed purposes.

If water containing much dissolved or suspended solid matter is to be used without previous purification the boiler should be so arranged as to admit of frequent cleanings.

Water-tube boilers should only be employed when the water supply available is reasonably free from scale-forming material.

A great many waters deposit the greater portion of their dissolved and suspended solids when they are heated to a moderate temperature; it is often advisable to provide a feed water heater for warming the water before it is allowed to enter the boiler.

By this means the greater part of the solids may often be removed in the heater and a comparatively pure water flows into the boiler.

One of the simplest methods of reducing the risk of scale formation in boilers is by the use of caustic soda, added in the requisite proportion to the water intended for boiler use.

In order to ascertain the most suitable treatment for any particular sample of water it is essential that it should be submitted to chemical analysis.

Sometimes it is found that boiler water carries free acids, which have been derived from peat bogs, etc., over which the water flows.

Acids of this kind frequently attack and corrode the material of boilers. Again, certain salts in solution will produce similar injurious effects.

It is frequently found that one or more chemical tests of a boiler water will indicate the most satisfactory method of treatment in order to remove scale-forming material, and in the end will save the owners of the machinery much annoyance and expense.

W. F. B.

ENGLISH-CANADIAN MINING DEVELOPMENT COMPANIES.

TO THE EDITOR:—It is within the province, I believe, of your journal to discuss matters affecting the bona fides of mining development in this colony, so that whilst the general interests of investors, in England and elsewhere, may be protected, the fair fame of British Columbia as a field for genuine mining investments shall be preserved. One has only to direct attention to those mining districts in which operations have been legitimately carried on by a proper method of skilled supervision to see the beneficent results that have been achieved by the efforts of English and American companies applying the rule—"that mining business requires the application of skilled mining men to carry it to a successful conclusion." We can, however, point to other mining districts which have suffered most severely through mining companies pursuing a contrary policy, and it is these districts that we propose to deal with. Companies have been formed and officials appointed to administer their affairs who have been entirely ignorant of the first principles of mining, and the resultant effects have been most disastrous, both to districts and companies concerned, and if we succeed in preventing a repetition of these blunders, our object will have been accomplished. The main questions to be considered are: (1) How mining prospectors having mining claims to dispose of are to be brought into connection with capital. (2) The intermediaries employed and their methods. (3) The administration of mining operations. As a rule mining prospectors making discoveries of mineral outcroppings desire either to sell their discoveries out and out for cash, or, to sell a portion of their interest to raise sufficient capital to develop their discovery or to bond their property for a term, varying from sixty days to twelve months, to persons or companies, for a stated sum, conditional upon a certain amount being spent in development of the property during term of option; generally speaking, the amount is limited to the bare compliance of labour conditions imposed by the Government. In order to place these properties in a partially developed form upon the English market, principally, different methods have been applied. In some cases private enterprise, in others local companies have done the preliminary work of investigation, but the most feasible method, and that seemingly offering the best security to English investors, has been the incorporation of English mining development companies who proposed to act as intermediaries between the mining prospectors of this Province and English mining companies, and who proposed doing the necessary mining development work, preparatory to a re-floatation on the English market, properly voted for, as a genuine mining investment and eliminated from that class, generally denominated as "Wild Cat" schemes. Let us see how this laudable intention has "panned out" in favour of the English investor. We will take the companies in their alphabetical order. The "Alberni Gold Development Syndicate, Limited," was formed in Liverpool, England, in June, 1897, with a nominal capital of £15,000, in 1,500 shares of £10 each. Licensed in Victoria, B.C., September, 1897. Their first property launched on the London market was the "Regina Proprietary Gold Mines of British Columbia, Limited," the property consisting of a group of claims, situated on China Creek, Alberni. The purchase price claimed by the syndicate being £185,000 (nearly \$900,000). Four assays (made by a member of the syndicate), from samples taken from the lodes, were said to yield from 1½ ozs. to 2 ozs. of gold, per ton of quartz, besides silver contents. The property was bonded from the prospectors, by the syndicate for \$15,000, and the only development work performed by the syndicate was in the extending of one tunnel for five feet and cutting 1½ miles of trail, costing less than \$1,000. The claims were also surveyed for the purpose of obtaining Crown grants. In this instance, the intermediary syndicate demanded a profit of \$880,000, at least, from an English mining company of investors. The re-floatation failed, as it deserved to do, and the bond lapsed, but previous to this the property was offered by the syndicate to "Capt. De La Mar," who sent his engineer to examine it, accompanied by an assayer. The confication of the assay values were so great that the offer was refused. This syndicate bonded claims indiscriminately, in some instances without even seeing them. The work done on some claims as assessment work, and also in driving tunnels, were cut in country rock, which was thought to be

lode matter and which was so apparent that the miners wondered at the gross ignorance governing their instructions. But the most stupendous folly achieved by this wonderful organization was to take up the "Cataract Hydraulic Placer Mine," in China Creek, from a company unable to pay its debts. This circumstance, coupled with the fact that the adjoining placer mine ("Duke of York") has just before turned out a disastrous failure, should have led to an investigation, as to the payable character of the gravels to be worked, in accordance with recognized procedure, as a first consideration. Instead of this course being adopted, further reckless expenditure of new capital followed, after which hydraulic operations were carried on without rhyme or reason, for three months, when the mine was closed down and pay cheques dishonoured for a considerable time. Is the career of this mine not properly closed? It seems not, if the statement of the managing director be true, that the mine has been resold by them, to some other company. Should this be so it is evident that the Government ought to include it within the scope of their enquiry, on behalf of English shareholders into the "Golden Cache" mine. There is abundant material for such enquiry. In only one instance has this syndicate proved a fairly good prospecting show, on a claim named the "Happy John," situated on the Alberni Canal, with an expenditure of about \$1,000, in surface prospecting, this claim. A further expenditure of several thousand dollars is required to prove its existence in value at a depth, by the driving of tunnels. This is legitimate work for a development company to undertake, but to float a company on the present prospects, at a figure involving any cash by way of purchase would be most unjust to English investors. The question may therefore be asked, has this English Development Company succeeded in doing its duty, according to any second proposition? viz.: as an intermediary between the mining prospectors of this colony and English capitalists? and has it sufficiently eliminated the "Wild Cat" element in placing its ventures before the British public? Or, rather, has it not been successful in trying to introduce that element in its re-floatations? ALBERNI.

SHIPPING MINES.

ROSSLAND.

The February shipments of this camp have been very light owing to the shutting down of the Le Roi, and a block in the War Eagle. For the three weeks ending February 17th the following shipments of ore were made:

	Tons.
Le Roi	396
War Eagle	1,332
Deer Park	18
Iron Mask	92
Total	1,836

NELSON.

We are indebted to the General Manager of the Hall Mines, Limited, for the following results of smelting operations for the four weeks ending 27th January, 1899: 22 days' 6 hours smelting; 2,727 tons of ore were smelted, yielding 69 tons copper, 39,250 ozs. silver.

SANDON.

Shipments from January 20th to February 24th:

	Tons.
Payne	989
Last Chance	400
Reco	100
Ivanhoe	40
Sovereign	20
Treasurer Vault	34
Ajax	40
Total	1,614

THREE FORKS (From Jan. 21 to Feb. 24).

	Tons.
Queen Bess	241
Idaho	580
Wild Goose	15
Total	836
	Tons.
Whitewater	320
Jackson	1,33½
Bell	30
Total	483½

M'GUIGAN (To Feb. 8).

	Tons.
Rambler	15
Dardanelles	19
Great Western	33
Total	67

SLOCAN LAKE (From Jan. 1 to Feb. 18).

	Tons.
From Bosun Landing—	
Bosun	140
From New Denver—	
Marion	20
From Silverton—	
Emily Edith	40
Fidelity	3
Vancouver	260
Wakefield	500
Total for Silverton	803
Grand total	963

SLOCAN—JANUARY.

The Collector of Customs at Kaslo kindly sends the returns of ore exports through that port for the month of January as follows:

Weight of Ore	Value.
5,916,506 lbs.	\$268,823

From the 1st of January to the 16th of February the ore shipments were:

	Tons.
From Sandon—	
Payne	1,440
Last Chance	640
Sapphire	18
Coin	12
Sovereign	20
Reco00
Ivanhoe	85
From Three Forks—	
Idaho Mines	519
Queen Bess	288
Wild Goose	15
From Whitewater—	
Whitewater	285
Jackson	98
Bell	15
From McGuigan—	
Rambler	75
Dardanelles	152
Great Western	33
From New Denver—	
Bosun	160
Marion	20
From Silverton—	
Fidelity	3
Vancouver	240
Wakefield	480

A total of 4,663 tons, valued at approximately \$500,000.

FEBRUARY DIVIDENDS.

Feb. 1—Ruth Mines	22½ per cent.
Feb. 15—Idaho	\$12,500
Feb. 15—War Eagle	\$26,250
Feb. 20—Cariboo, Camp McKinney	1½ cents per share

THE METAL MARKET—FEBRUARY.

[Compiled from special telegraphic quotations to the B.C. MINING RECORD, from the *Engineering & Mining Journal*, New York.]

BUSINESS during the month has been exceptionally good, but it is feared that the speculation in metals, notably copper, resulting in forcing up prices to an extremely high figure may exercise an infurious effect on industrial enterprise, Money in New York is fairly easy, and in London rates are much lower.

SILVER.

The market for silver has been steady, the chief feature, however, being that forward rates are the same as prompt, and buyers are willing to pay for May delivery as for immediate shipment. Prices throughout the month have fluctuated between 50¼ and 50¾, our latest quotation by wire (Feb. 27th) being 50¾ and 50½.

COPPER.

This market has been astonishing active and higher prices do not appear to check business; on the contrary, large

transactions, limited only by the quantities available, are reported. Manufacturers have raised their prices. The rolling mills are being operated to their full capacity and are supplied for orders for several months ahead. While most mills are supplied with raw material some of them are not, and their orders will tend to maintain what would appear to be the otherwise abnormal prices now ruling. Lake copper since February the 4th has been quoted at 18 to 18 $\frac{1}{4}$ c and electrolytic at 16 $\frac{3}{4}$ to 17c in New York. The latest quotations are 18 to 18 $\frac{1}{4}$ c for lake, 17 and 17 $\frac{1}{4}$ c for electrolytic copper in cakes, bars or ingots; 16 $\frac{3}{4}$ to 17c for cathodes, and casting copper at nominally 17c.

LEAD.

At the commencement of the month lead showed a further advance with \$4.70 quoted on the New York market and \$4.45 St. Louis. But during the following week a sharp decline was experienced, and prices fell to 43 $\frac{3}{8}$ c New York and 41 $\frac{1}{4}$ c St. Louis. The recovery since has been, however, rapid and prices have since remained fairly steady, in the vicinity of \$4.47. Our quotations for the last day of the month are \$4.47 $\frac{1}{2}$ New York, and \$4.42 St. Louis.

SPELTER.

Spelter is extremely strong and prices have advanced rapidly. Consumption is constantly improving, and as a result a scarcity is felt for immediate deliveries. The latest New York prices are \$6.45 to \$6.55.

COAL SHIPMENTS—JANUARY.

Following were the foreign shipments for January, by the New Vancouver Coal Mining and Land Co., Limited:—

Date.	Vessel.	Destination.	Tons.
1—SS.	Siam.	San Francisco	4,360
6—San	Mateo.	Port Los Angeles	4,344
11—SS.	Wyefield.	San Francisco	5,148
16—SS.	Titania.	San Francisco	5,030
18—SS.	Amur.	Alaska	192
24—SS.	Siam.	Port Los Angeles	4,335
29—SS.	Amur.	Alaska	203
31—SS.	Wyefield.	San Francisco	5,314

Total.....33,185

Shipments of same mine till 20th February:—

Date.	Vessel.	Destination.	Tons.
3—SS.	Titania.	San Francisco	5,069
8—Bark	Haydn Brown.	Kahului, H. I.	1,190
9—SS.	Siam.	San Diego, Cal.	4,312
11—Str.	Sea Lion.	Port Los Angeles	4,382
16—SS.	Titania.	San Francisco	5,069
17—SS.	Wyefield.	San Francisco	4,651

Total.....24,642

Following were the Wellington shipments for January:—

Date.	Vessel.	Destination.	Tons.
5—SS.	Fastnet.	San Francisco	250
6—SS.	Al-Ki.	Mary Island	200
6—SS.	Bristol.	San Francisco	2,500
10—SS.	Wellington.	San Francisco	2,500
14—Sp.	Two Brothers.	San Francisco	2,000
15—SS.	Pioneer.	Port Townsend	40
19—SS.	Al-Ki.	Seattle	200
19—SS.	Bristol.	San Francisco	2,500
20—SS.	Pioneer.	Port Townsend	30
23—SS.	Wellington.	Comox	1,200

Total.....11,420

Following were the shipments from Union for January:—

Date.	Vessel.	Destination.	Tons.
7—SS.	Warrimoo.	Vancouver	1,150
14—SS.	Rapid Transit.	Seattle	256
14—Brig	Colorado.	Mary Island	1,700
21—SS.	Rapid Transit.	Seattle	258
28—SS.	Centennial.	San Francisco	708
28—SS.	Wellington.	San Francisco	1,100

Total.....5,172

Shipments of same place till February 13th:—

Date.	Vessel.	Destination.	Tons.
1—Bark	Dirigo.	Skagway	450
2—Bark	Aorangi.	Vancouver	1,600
2—Bark	Ogar.	Skagway	60
13—Bark	Rangar.	Vladivostock	500
13—Bark	Richard III.	Nanaimo	1,200

Total.....3,810

STOCK MARKET—FEBRUARY.

THE local Stock Market during February has been very active, and the shares of Crow's Nest Pass Coal Company have been in extraordinary demand, one firm of Victoria, Messrs. A. W. More & Co., reporting the sale of those shares to the value of \$400,000 in the last three months. Since our last report Crow's Nest shares advanced from \$34 to \$55, but owing to the introduction of a certain bill in the Legislature, they afterwards declined to \$45. Prices, however, have again rallied as a result of assurance from the Government that the bill will be amended so as not to interfere with the grant to the Crow's Nest Pass Coal Co. The market was very active until the introduction of this measure, which, however, prevented the consummation of several sales for which negotiations were in active progress.

In the Rossland market Big Three has advanced from 17 $\frac{1}{2}$ to 30c, Evening Star from 7 to 11 $\frac{1}{2}$ c, Iron Colt from 11 to 20c, Monte Christo from 11 to 16c, Victory Triumph to 10c, Virginia from 47 to 50c, War Eagle from \$3.20 to \$3.50, whilst Deer Park has fallen from 19 to 12c, Iron Mask from 95 to 83c and Georgia is quoted at 2c.

Slocan stocks have been in great demand this month and notably Noble Five, Rambler and Dardanelles. Noble Five has advanced from 18 to 31c, Rambler from 28 to 42c, Dardanelles from 16 to 18c. It is reported that the Rambler will pay a dividend next month.

In Nelson shares Dundee has advanced from 28 to 35c, Athabasca from 42 to 50c, Exchequer from 10 to 15c.

Coast mining securities have been very quiet with no movement to report.

Camp McKinney stocks have advanced in an astonishing manner and this is becoming a favourite camp with Toronto and Spokane investors. Several new stocks have been put on the market recently and there has been great activity displayed. Little Cariboo advanced in a few days from 3 to 4c, Shannon is selling from 2 $\frac{1}{2}$ to 3c, Waterloo has advanced from 9 to 15c, Minne-ha-ha from 20 to 30c, Cariboo from \$1.50 to \$1.75. Camp McKinney Development Company's stock is selling at 16c (Warton claim). The Fontenoy was put on the market in Victoria and 40,000 treasury shares were offered and immediately taken up by Victoria purchasers at 15c within two hours. Application for 100,000 additional shares was also made, but orders could not be filled. It is supposed that the Fontenoy ledge is a continuation of the Cariboo vein. The stock has advanced to 20c., with scarcely any sellers at that price.

THE ROSSLAND STOCK MARKET.

(Special report and quotations by Messrs. Dickenson & Orde).

THE Stock Market here has, we think, during the past month and at the present time never been in a healthier condition since the great drop in Monte Christo. Just now there is a strong demand for these very shares, caused, undoubtedly, in a measure, by the arrival from Europe of Mr. Charles Hosmer, now in Montreal. It may be, and to us it appears probable, that this mine will very shortly be examined by that gentleman's expert; upon which resumption of work will be decided on. The favourite stocks of this market during February have been: Victory Triumph, Rambler, Cariboo, Virginia, Iron Horse, Monte Christo, Big Three, Athabasca, Noble Five, Tamarac, Dundee, King, Winnipeg, and Brandon & Golden Crown. The three last named properties are in the vicinity of Greenwood. It will be observed from the above list that many stocks of Ymir and of Slocan are mentioned; in fact, it may safely be asserted now that Rossland is the headquarters for all Kootenay mining shares. A stock worthy of particular mention is Big Three. This company owns the Snowshoe, Southern Belle and Mascot. The two former are situated on Red Mountain, upon its northern slope, and have no particular development work done upon them. The latter adjoins the Columbia and Kootenay and is an excellent property. The capitalisation of the company is \$3,500,000, in \$1 shares, which are at present quoted at 30 cents. This gives a value to the property of \$1,075,000. These facts speak for themselves; we fail to see any justification for such figures. We would rather recommend for present investment such shares as Rambler, Cariboo, Dundee, Virginia, Winnipeg and Brandon & Golden Crown. Of the first, we understand, that it has been authoritatively stated that a dividend will be paid on the 1st of March, and that the company have sufficient funds in the treasury to pay two more. Dundee is looking well and really very good results have recently been obtained from its concentrates. Winnipeg and Brandon & Golden Crown, adjoining each other, are reported to have very considerable bodies of high-grade ore in sight. The pooled

Mining Stocks.

Prepared by A. W. More & Co., Mining Brokers, Victoria, B.C., Feb. 23, '99.

Company.	Capital.	Par Value.	Price.
TRAIL CREEK.			
Alberta.....	\$1,000,000	\$1	\$ 4½
Big Three.....	3,500,000	1	30
Bruce.....	1,000,000	1	10
Butte.....	1,000,000	1	02
Caledonia Con.....	1,000,000	1	5½
California.....	2,500,000	1	15
Camp Bird.....	1,000,000	1	05
Celtic Queen.....	750,000	1	03
Centre Star.....	3,800,000	1	
Commander.....	500,000	1	12
Deer Park.....	1,000,000	1	12
Enterprise.....	1,000,000	1	20
Evening Star.....	1,000,000	1	11½
Georgia.....	1,000,000	1	02½
Gertrude.....	500,000	1	11
Golden Drip.....	500,000	1	15
Gopher.....	1,000,000	1	04
Hattie Brown.....	1,000,000	1	03
High Ore.....	500,000	1	05
Homestake.....	1,000,000	1	6
Imperial.....	1,000,000	1	10
Iron Horse.....	1,000,000	1	18
Iron Mask.....	500,000	1	83
I.X.L.....	1,000,000	5	10
Iron Colt.....	1,000,000	1	20
Jumbo.....	500,000	1	52
Le Roi.....	£1,000,000	£5	£6
Lilly May.....	\$1,000,000	1	\$0 20
Mabel.....	1,000,000	1	15
Mayflower.....	1,000,000	1	10
Monita.....	750,000	1	19
Monte Cristo.....	2,500,000	1	16
Morning Star.....	1,000,000	1	09
Nest Egg-Firefly.....	1,000,000	1	05
Northern Belle.....	1,000,000	1	10
Novelty.....	1,000,000	1	05
Palo Alto.....	1,000,000	1	05
Phoenix.....	500,000	1	13
Poorman.....	500,000	1	14
R. E. Lee.....	2,000,000	1	5
Red Mountain View.....	1,000,000	1	3
Rossland, Red Mountain.....	1,000,000	1	13
St. Elmo.....	1,000,000	1	06
St. Paul.....	1,000,000	1	12½
Silverine.....	500,000	1	6
Silver Bell Con.....	500,000	1	25
Victory Triumph.....	1,000,000	1	10
Virginia.....	1,000,000	1	53
War Eagle Consolidated.....	2,000,000	1	3 30
West Le Roi.....	500,000	1	28
White Bear.....	2,000,000	1	08
AINSWORTH, NELSON AND SLOCAN.			
American Boy.....	1,000,000	1	6
Arlington.....	1,000,000	1	6½
Argo.....	100,000	0 10	10
Athabasca.....	1,000,000	1	52
Black Hills.....	100,000	0 10	10
Buffalo of Slocan.....	150,000	0 25	
Canadian M. M. and S. Co.....	2,000,000	1	07½
Channe.....	250,000	0 25	06
Cumberland.....	500,000	10	
Dundee.....	1,000,000	1	35
Dardanelles.....	1,000,000	1	18
Dellie.....	700,000	1	12
Eldon.....	1,000,000	1	05
Ellen.....	1,000,000	1	07½
Elkhorn.....	1,000,000	1	10
Exchequer.....	1,000,000	1	15
Fern Gold.....	200,000	0 25	55
Goodenough.....	800,000	1	15
Gibson.....	650,000	1	17½
Grey Eagle.....	750,000	1	
Hall Mines.....	£300,000	£1	
Lerwick.....	\$1,500,000	\$1	15
London.....	150,000	1	25
Minnesota.....	1,000,000	1	
Nelson-Poorman.....	250,000	0 25	26
Northern Light.....	250,000	1	16½
Noble Five Con.....	1,200,000	1	31
Ottawa and Ivanhoe.....	1,000,000	1	12½
Payne.....	2,400,000	2 50	
Rambler Con.....	1,000,000	1	42
Reco.....	1,000,000	1	1 30
Slocan-Reciprocity.....	1,000,000	1	06
Slocan Star.....	500,000	50	1 50
Santa Marie.....	1,000,000	\$1	05
Silver Band.....	250,000	0 25	12½
Slocan Queen.....	1,000,000	1	10
Star.....	1,000,000	1	07
St. Keverne.....	1,000,000	1	03½
Sunshine.....	500,000	10	
Tamarac.....	1,000,000	1	10
Two Friends.....	240,000	30	11
Washington.....	1,000,000	1	25
Wonderful.....	1,000,000	1	05
LARDEAU.			
Lardeau Goldsmith.....	200,000	1	04
Consolidated Sable Creek Mining Co.....	1,500,000	1	10
TEXADA ISLAND.			
Gold Bar.....	100,000	10	10
Raven.....	1,000,000	1	10
Texada Proprietary.....	250,000	0 25	25

Texada Kirk Lake.....	600,000	1	1 00
Treasury Mines.....	250,000	1	25
Van Anda.....	5,000,000	1	04½
Victoria-Texada.....	150,000	0 25	10
VANCOUVER ISLAND.			
Alberni Mountain Rose.....	250,000	1	09½
Consolidated Alberni.....	500,000	1	5
Mineral Creek.....	500,000	1	05½
Mineral Hill.....	750,000	1	05
Quadra.....	500,000	1	05
CARIBOO.			
Cariboo Gold Fields Ltd.....	£100,000		
Cariboo Hydraulic Consolidated.....	\$5,000,000	1	85
Cariboo M. & D. Co.....	300,000	1	25
Golden River Quesnelle.....	£350,000	£1	1 40
Horsefly Hydraulic.....	\$200,000		
Horsefly Gold Mining Co.....	1,000,000	\$10	1 50
Victoria Hydraulic.....	300,000	1	85
LILLOOET DISTRICT.			
Alpha Bell.....	500,000	1	
Cayoosh Creek Mines.....	500,000	1	
Excelsior.....	500,000	1	
Golden Cache.....	500,000	1	04½
Lillooet Gold Reefs.....	200,000	25	
FAIRVIEW CAMP.			
Smuggler.....	1,000,000	1	8
Tin Horn.....	200,000	0 25	12
Winchester.....	250,000	0 25	13
BOUNDARY.			
Golden Crown.....	1,500,000	1	25
Knob Hill.....	1,500,000	1	90
Old Ironsides.....	1,000,000	1	1 10
Winnipeg.....	1,000,000	1	25
CAMP MCKINNEY.			
Camp McKinney Development Co.....	1,000,000	1	16
Cariboo.....	1,250,000	1	1 75
Minnehaha.....	1,000,000	1	30
Waterloo.....	1,000,000	1	45
Fontenoy.....	1,000,000	1	20
Little Cariboo.....	1,000,000	1	04
Shannon.....	1,000,000	1	03
REVELSTOKE.			
Carnes Creek Consolidated.....	1,000,000	1	10
VERNON DIVISION.			
Hidden Treasure.....	100,000	10	10 00
CROW'S NEST PASS.			
Crow's Nest Pass Coal Co.....	1,500,000	25	52 00

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W. A. BAUER,

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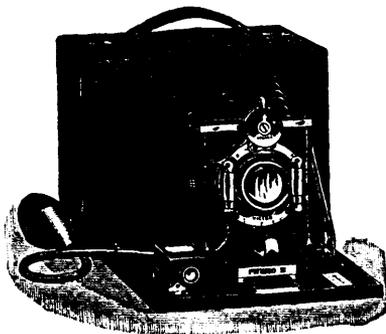
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NANAIMO COAL

(Used principally for Gas and Domestic purposes.)



SOUTHFIELD COAL

(Steam Fuel.)

Protection Island Coal & New Wellington Coal

(House and Steam Coal), are mined by this Company exclusively.

THE NANAIMO COAL gives a large percentage of gas, a high illuminating power, unequalled by any other bituminous coal in the world, and a superior quality of coke.

THE SOUTHFIELD COAL is now used by all the leading steamship lines on the Pacific.

THE NEW WELLINGTON COAL, which was introduced in 1890, has already become a favourite fuel for domestic purposes. It is a clean, hard coal, makes a bright and cheerful fire, and its lasting qualities make it the most economical fuel in the market.

THE PROTECTION ISLAND COAL is similar to the New Wellington Coal. This coal is raised from the submarine workings under the Gulf of Georgia and is shipped from wharves both a Protection Island and Nanaimo.

The several mines of the Company are connected with their wharves at Nanaimo, Departure Bay and Protection Island, where ships of the largest tonnage are loaded at all stages of the tide. Special despatch given to mail and ocean steamers.

SAMUEL L. ROBINS, Supt., Nanaimo, B.C.

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FOR FURTHER INFORMATION, APPLY TO ANY AGENT OF THE COMPANY OR TO

- | | |
|---|---|
| A. H. NOTMAN, District Passenger Agent, St. John, N.B. | M. M. STERN, District Passenger Agent, Chronicle Building, San Francisco, Cal. |
| H. J. COLVIN, District Passenger Agent, 197 Washington St., Boston, Mass. | E. J. COYLE, District Passenger Agent, Vancouver, B.C. |
| E. V. SKINNER, General Eastern Agent, 353 Broadway, New York. | W. R. CALLAWAY, General Passenger Agent, Soo Line, Minneapolis, Minn. |
| O. E. McPHERSON, Asst. Gen. Passenger Agt., 1 King St. E., Toronto, Ont. | ROBERT KERR, General Passenger Agent, Western and Pacific Divisions, Winnipeg, Man. |
| J. F. LEE, District Passenger Agt., 232 S. Clark St., Chicago, Ill. | ARONER BAKER, European Traffic Agent, 67 and 68 King William St., E.C., and 30 Cockspur St., S.W., London, Eng.; 7 James St., Liverpool, Eng., 67 St. Vincent St., Glasgow, Scotland. |

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LLOYD'S AGENCY. HAWAIIAN CONSULATE.

WHARF STREET, - - - - VICTORIA, B.C.

Canadian Pacific Navigation Co., Ltd.

TIME TABLE NO. 36.

(Taking effect September 1st, 1898.)

VANCOUVER ROUTE.

VICTORIA TO VANCOUVER daily except Monday at 1 o'clock.
VANCOUVER TO VICTORIA daily except Monday at 13 o'clock or on arrival C.P. Railway No. 1 Train.

NEW WESTMINSTER ROUTE.

LEAVE VICTORIA—For New Westminster, Ladner and Lulu Island Sunday at 23 o'clock; Wednesday and Friday at 7 o'clock. Sunday's steamer to New Westminster connects with C.P.R. Train No. 2 going east, Monday.

FOR PLUMPER PASS—Wednesdays and Fridays at 7 o'clock.
FOR MORESBY AND PENDER ISLANDS—Fridays at 7 o'clock.
LEAVE NEW WESTMINSTER—For Victoria Monday at 13:15 o'clock. Thursday and Saturday at 7 o'clock.

FOR PLUMPER PASS—Saturday at 7 o'clock.
FOR PENDER AND MORESBY ISLANDS—Thursday at 7 o'clock.

FRASER RIVER ROUTE.

Steamer leaves NEW WESTMINSTER for CHILLIWACK and way landings every Tuesday, Thursday and Saturday at 8 o'clock during river navigation.

NORTHERN ROUTE.

Steamships of this Company leave Victoria for Fort Simpson via Vancouver and intermediate ports on the 10th, 20th and 30th of each month, and for Queen Charlotte Islands on the 10th of each month.

KLONDIKE ROUTE.

Steamers of this Company leave weekly for Wrangel, Juneau, Skagway and Dyea.

BARCLAY SOUND ROUTE.

Steamer "Willapa" leaves Victoria for Alberni and Sound ports the 1st, 7th, 14th and 20th. Extending latter trip to Quatsino and Cape Scott. The Company reserve the right of changing this Time Table at any time without notification.

G. A. CARLETON,
General Agent.

JOHN IRVING,
Manager.