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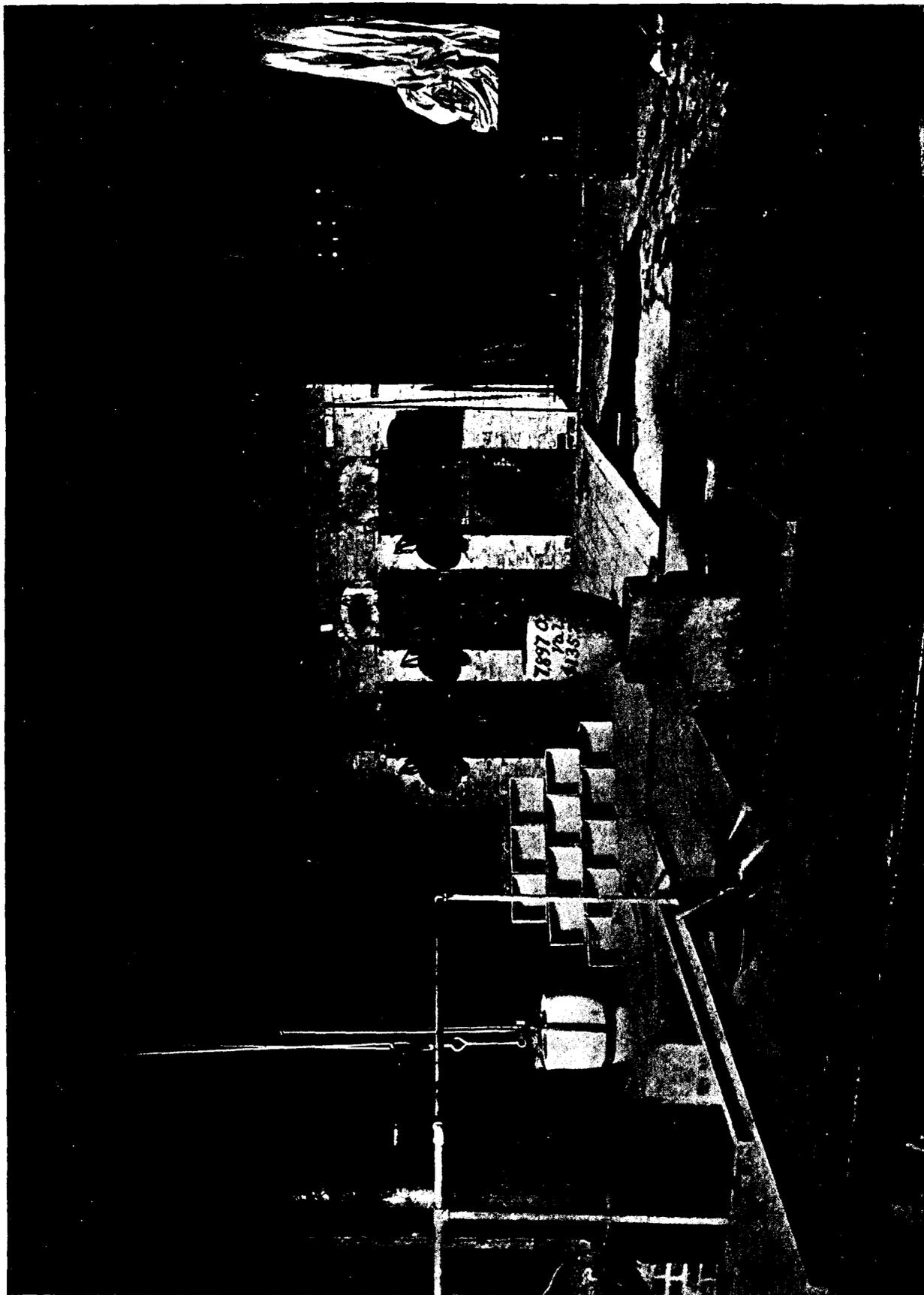
PUBLISHER'S NOTICE.

IN the course of the next two or three weeks we shall issue a special Christmas supplement of the MINING RECORD which we have every reason to believe and hope, will be highly appreciated by our readers. At least no trouble or expense has been spared to bring the number up to that standard of excellence worthy of the occasion and warranted by the present importance of our mining interests and the rapid advancement of our industrial progress. Some idea of the contents of the number may be gained from a perusal of the circular or prospectus enclosed herewith, but to this we should like to be allowed to add a word that with one exception in the way of a short story—and perhaps even so steady-going a periodical as the MINING RECORD may once a year, and at Christmas time, relapse into fiction,—all the articles and literary contributions are the work of local writers; such drawings as have been required are by local artists; the photo-engravings—which we venture to assert are quite equal to plates made by the best firms in New York and Chicago—have been prepared by a local firm in Victoria; and we do our own printing of course. We shall leave it to our readers to pronounce whether the result as a local enterprise is not creditable.

Meanwhile following our usual practice, one copy of the Christmas supplement (price 25 cents on the book-stalls) will be presented free of charge to each of our subscribers in good standing, but those desiring additional copies to send away—and a copy of this supplement will be far more acceptable to most people than the common-place Christmas card—should avail themselves of the special offer contained in the circular already mentioned.

THE MONTH.

THE eminently gratifying results which have attended the operations of the Consolidated Cariboo Hydraulic company in the Quesnel River division this season sufficiently justify the opinion Mr. Hobson has consistently expressed for several years past regarding the possibilities of properly-directed hydraulic mining enterprise in certain localities of the historic Cariboo district. After a run of 68 days' washing with 2,750 miners' inches of water a second clean-up was made at this mine on October 1st, the product, after the process of melting, being a gold ingot, weighing 9,040 ounces, and valued at \$154,765. The returns would, we are informed, have been still better, but for an unfortunate and exasperating loss of time, entailing a suspension of operations for twenty-four days, owing to the non-arrival of explosives due to the impassable condition of the roads between Ashcroft and the company's property. This, notwithstanding, the mine has already produced this year gold to the value of \$290,040, and a period of nearly two months of this season yet remains in which hydraulicking operations may be carried on. It is, therefore, reasonably safe to predict that the gold yield this season will come within measureable distance of trebling the output of any previous year since the inauguration of the undertaking in 1894, and represent considerably more than half the aggregate production made during the preceding five years. According to a statement in the manager's report for 1899, the total expenses up to and inclusive of that year, were \$439,026, and the total gold yield, \$528,000. Consequently a profit was then shown of nearly \$89,000 under the difficult circumstances of performing deadwork in the direction of clearing out old workings, opening up the hydraulic pits for continuous and profitable operation, installing plant and equipping the mine. Operations were, however, commenced this season with the equipment practically completed, and thus for the first time the mine has been worked under really favourable auspices as the returns show. It is possible



Interior of Melting Room, of the Consolidated Cariboo Hydraulic Mining Company, Limited, Bullion, B.C. Amalgam Refining Furnaces in Background, two Melting Furnaces to left. In foreground, 7,897 ounces, valued at \$135,275.00 in Foreground of Photo. Result of First Clean-up for Season 1900, after 62 days washing with 2,500 Miner's Ditches of Water.

to calculate with far greater exactitude the resources of a hydraulic property than it is to estimate the value or to gauge the capabilities of a quartz

lode and the computation that in the area controlled by the Consolidated Cariboo Company are available for washing by hydraulic process five hundred millions

of cubic yards of high-grade auriferous gravel, which with an average gold tenure of twenty cents per cubic yards, places the total gold contents at the enormous valuation of one hundred millions of dollars, may be considered as reasonably reliable. Even with the present working costs, which no doubt will in the future be somewhat reduced, production should hereafter show a profit over expenses of at least a hundred and fifty per cent. From these figures some idea will be gathered of the industrial potentialities of hydraulic mining in a district such as Cariboo where in most localities the existence of extensive deposits of auriferous gravels is known, and the economic conditions are not wanting. Now that Mr. Hobson has practically demonstrated the profitable nature of the great undertaking over which he has charge at Bullion, there is every reason to expect that capital will be forthcoming to engage in enterprises of a like character, though perhaps on not so large a scale, not only in the Quesnel River district, but in Barkerville, where the indications are promising, and also in new territory along the gold-belt to the north-west.

Our Boundary Creek correspondent includes in his news letter, published elsewhere in this issue of the RECORD, such information respecting the causes of failure of the Winnipeg Mining and Smelting Co.,

THE WINNIPEG RECONSTRUCTION
 Ltd., and the proposed arrangement under which it will be possible to continue operations. Last June we referred to the misleading statements that had previously been published in connection with the Winnipeg mine. We then quoted from a report of an interview with Mr. Duncan McIntosh, formerly president and mining superintendent of this company, published in the *Rosland Miner* of October 19th 1899, as follows: "There is 20,000 tons of ore in sight which will run from \$20 to \$30 per ton. There are now 2,000 tons of ore on the dump ready for shipment." In view of the fact that the company has been compelled to suspend operations, after having shipped only 1,200 tons of ore, it is perhaps now permissible to enquire whether Mr. McIntosh really did make the above-quoted statements to the *Rosland Miner*, and if he did so whether they were made in ignorance of the actual condition of the mine, or with the object of influencing the market price of the company's stock, of which he was at that time understood to possess a considerable holding. No reasonable objection can be offered to any promoter making money out of his mining ventures so long as no grossly misleading statements are published to help him to do so. Among the present holders of Winnipeg stock are many who have been so misled, possibly unintentionally, so it will be in the interests of mining in this province generally and in the Boundary district particularly, to have more light thrown on this Winnipeg fiasco, the causes of which appear to have existed prior to the present management assuming control and direction of the company's operations. The Boundary has not hitherto had its fair name greatly besmirched by the operations of money-getting mining schemers, but the glowing statements published some time since respecting the Morrison mine, followed as they were by collapse and re-construction, and now by the Winnipeg, with the probability of others to come, make it imperative in the best inter-

ests of that important section, which has at length entered upon the stage of extensive production, that the dishonest practice of exaggerated booming of mining prospects, especially those having stock on the market for sale, be exposed and unreservedly condemned.

The bonding of the Woodstock and Lorne groups of claims to an English syndicate for the considerable sum of \$225,000 should mean, provided the properties under consideration prove upon further development as valuable as would now appear, a great deal to the Bridge River district. An interesting paper was recently read before the Canadian Mining Institute by Mr. Fritz Cirkel, on the subject of the recently discovered leads in this camp, and in a letter to the last issue of the *Canadian Mining Review*, Mr. Leslie Hill supplements the general information contained in Mr. Cirkel's paper by a particular account of the Woodstock and Lorne group. To quote Mr. Hill: There appears to be two systems of parallel veins in this camp, one of which has a strike of N. 70° E. mag. and dips about 70° to the north, and the other having a strike of N 45° E. and a slight dip to the N. W. One of the former veins was discovered in 1897 and was developed by a shaft sunk to a depth of 70 feet and by some open cuts. The values and the width of the quartz in this vein appear to be irregular; some good ore was found, and when the bond under which this work was done was thrown up, the owners built an arrastra operated by an overshot water-wheel and took out \$800; this was in the fall of 1898. In the same year float from a richer vein was discovered, but the vein itself was not located. The whole hill is covered with wash to a great depth and the float has been carried a long way from the veins, entailing a large amount of surface work in tracing the veins. Two veins belonging to the second system were discovered in 1899, and the owners erected two more arrastras. In 1899-1900 two veins were discovered on the Woodchuck, a claim adjoining the Lorne; one of these veins belongs to the first group and one to the second, and they cross each other near the mouth of a tunnel driven on the second vein. The veins having a strike of N. 45° E. appear to be the main veins on this hill. They are very regular and well defined, averaging about four feet wide, and on the Lorne claim the ore chute on one vein is proved by tunnel for 300 feet in length and 130 feet in height and is traced further by open cuts. The quartz varies from white to bluish grey and very little gold is visible to the naked eye, though careful examination with a glass shows frequent fine free gold. The gold is associated with iron and is free milling, even where the iron is not decomposed by exposure. The quartz is well banded parallel to the dip of the vein and there is a strong heavy gouge between it and the country rock. The three faces on these properties which were being mined and milled in the arrastras at the time of my visit gave the following values in gold and silver from large and carefully taken samples, viz., \$40.46, \$42.83 and \$34.98. The formation is an eruptive granite rock and from all the indications one would expect permanent veins. Mr. Fritz Cirkel in his account of this camp speaks very strongly of the regularity and strength of these veins. But the really remarkable and interesting feature about these properties is the fact that the

prospectors who discovered them have, without any capital and entirely by their own labour, been able to develop them and bring them to a producing and paying position. The owners of the Lorne group have built three arrastras and the owners of the Woodchuck group two arrastras. At the Lorne one arrastra produced in 1898, \$800 from a two months' run on ore taken from the cross vein first discovered. In 1899 they commenced to run on the main veins, and from July 1st to the close of the season in October they produced \$6,564.96 with three arrastras. This year up to August 6th they had worked 204 arrastra days, producing 446 6-16th ounces of bullion. This bullion sold according to the returns from the United States Assay Office at Seattle, where the gold was purchased for \$16.34 per ounce before melting. The duty of an arrastra will average one ton per day, making 204 tons milled, and producing \$7,293.76, equal to an average of \$35.26 per ton milled. During 1899 the ore was picked and only the best was sent to the arrastra but this year they have milled the quartz just as it comes from the stopes and have also milled some of the second-class quartz left on the dump last year. The Woodchuck arrastras have also been worked this season; 9 tons milled and cleaned up during my visit, producing 17½ ounces of bullion worth \$290.03, and averaging \$32.22 per ton milled. The last clean-up from 14 tons is said to have produced \$800, or an average of \$57.14 per ton milled. Considering that these high values obtained at the Lorne mines are from an ore chute of some 300 feet in length, a great future may be predicted for this camp, and I believe it is the only camp in British Columbia where the owners have been able to develop a gold property for themselves and without capital.

Much agitation has been carried on, much has been written and said about the diversion of the northern trade from Victoria and Vancouver to Seattle. Most people are perfectly clear on the injury done to Canadian business and the evil effect of this state of affairs upon the development of Victoria and Vancouver. It never seems to have occurred to anyone to investigate the actual and assignable cause of the difficulty. People talk vaguely about the establishment of a Canadian mint, the establishment of a government assay office and so forth vague remedies for an evil of whose effect they are conscious but which they have never analysed, and specifics of the working of whose remedial effects they are ignorant. Canada does not particularly need the gold. Gold is interchangeable all over the world. Canada can buy all the gold required in New York or London just as easily as in Vancouver. The gold itself is not what we are after. It is the wealth which the gold represents we desire to see circulating in the country in which it is produced, fertilising Canadian manufactures, stimulating Canadian agriculture and invested in Canadian securities. We wish to inject the buying power of this gold into the veins of Canadian trade. Unless the question is presented in this way it is quite impossible to get people living in the East to interest themselves in the matter. Otherwise, under the influence of that bemusing and obfuscating parochial ophthalmia which is the curse of this country east, west, north and south, they are too apt to consider that the establishment of a mint is merely an ingenious scheme to bonus the cities of British Columbia at the expense of the public treasury.

The next consideration is how, if it is merely the trade in gold, not the gold itself which is most wanted, is it that this trade has not been established through the ordinary channels? How it is that we have not private assayers, bullion brokers and banks in Victoria and Vancouver to handle this commerce? Why is it that it must necessarily be a function of government if it is to be established at all? The reason is so plain, so simple, so obvious that it is astonishing that it has not before now been appreciated and the evil remedied. The United States pays at Seattle a premium on gold over its commercial value at any common point on the Pacific Coast. In this way. The mint pays the full value of the gold less a smelting charge, which is not enough to cover the cost of smelting and then transmits the gold at government risk and charges to San Francisco or Philadelphia. This premium amounts to about 1 per cent. of the value of the gold. That is to say, the mint at Seattle pays from 20 to 25 cents more per ounce of fine gold than a bank or private broker in Victoria and Vancouver can pay and resell without loss. Naturally all the gold goes to Seattle and the trade with it. The miners have no greater interest in Vancouver or Victoria than any other class of tourist. The first thing done by the United States government when the Yukon became a great gold producer was to make the point most convenient to the miners the best market in which to dispose of their gold. By this simple means the acute Americans made that point the centre of attraction and thus monopolized the trade. If Canada is not as acute as the United States it cannot be helped. There is always reserved the privilege of admiring what we have not intelligence enough to initiate, nor common sense enough to imitate.

"The Kootenay lead mining companies will shortly find themselves in an unpleasant position if the prediction of J. N. Hill, president of the Spokane Falls & Northern and the Kootenay Railway & Navigation Companies, proves to be correct. To G. O. Buchanan of Kaslo, who was in Nelson yesterday, Mr. Hill stated that the American smelters were overstocked with lead ores, having more on hand now than the supply of silicious ores in sight would enable them to handle. The inference is, of course, that the market for lead ores from this district is cut off, and Mr. Hill's solution of the problem is that the lead miners of the Kootenay must begin to smelt their lead ores irrespective of a dry ore supply. If a supply of coke at \$5 or even \$7 a ton could be secured; a smelter on Kootenay Lake could reduce lead ores at a profit, but the Crow's Nest Pass Coal Company's output of coal and coke alike is not what, in Mr. Hill's opinion, is a reasonable production from their coalfields, and will have to be substantially increased before a lead smelter proposition would be a safe venture."

The above very interesting paragraph is from the *Nelson Tribune*, a paper whose mining news is both accurate and descriptive above the average. It refers to a movement in the silver-lead industry in the United States which must have important and far-reaching effects upon the smelting industry in British Columbia. The growing preponderance of wet ores in the United States is a natural result of the heavy decline in the value of silver which has made that metal less profitable to mine for its own sake and where it was not in conjunction with some other

metal. A great many of the smelting dry ores of the United States are valueless except for the silver they contain. The check given to silver mining by the heavy decline in value has been sufficient on occasion a deficiency in the supply of this kind of ore. The inference, however, that "the lead miners of the Kootenay must begin to smelt their lead ores irrespective of a dry ore supply," is fortunately invalid; and if that is Mr. J. N. Hill's solution of the problem Mr. Hill ought to know more about this country's resources than he does. If the premium on British Columbia wet ores were to disappear, as it is disappearing, in the United States; if at the same time the lead miners were compelled to pay the same duty as they do now to market their product; and if the cost of smelting were proportionately increased by the disappearance of this premium: the outlook for the silver-lead mining industry would be rather blue. Because although silver is improving in price from the very cause bringing to an end this premium, lead for the same reason is not likely to be very long a progressive market: and lead is the predominating partner in the case of the largest mines such as the North Star and San Eugene. No one, however, should know better than Mr. Hill that there is a silicious ore dump at the Le Roi mine which contains no copper worth saving, but from \$6 to \$8 in gold contained partly in a free state and partly in iron sulphurets finely distributed through the rock. This dump contains 120,000 tons now and any quantity of similar rock can be mined any time there is a demand for it. As fluxing material it will keep pace with the silver lead output of British Columbia for some time to come. A considerable quantity of it has already been used at the Trail smelter for the very purpose of smelting with lead ores which is now under consideration. So that out of apparent evil good will come. The loss to the silver-lead miner will be lessened to himself and more than made up as regards the country by the gain on the low-grade silicious gold ores. And a great net gain will be made in this way, that a great industry will be built up in Canada, built up in the best and strongest way by the operation of the natural laws of commercial advantage. It may be a compliment to British Columbia that lead ores are being shipped to Chile to be treated. It would be a more solid advantage if they were shipped to Nelson or Trail. Until the MINING RECORD is much better informed on the special conditions existing than it is, it will always seem to it that a great commercial opportunity is being lost when the owners of such a silver-lead property as the San Eugene, who also control such large bodies of low-grade silicious ore as exist in the War Eagle and Centre Star, do not combine their treatment at a common point instead of working at second-hand in such widely separated localities as the banks of the Columbia River and Antafugasta in South America.

A number of the financial and industrial newspapers devoted to mining have lately been discussing the relative professional abilities of American and English mining engineers, in view of the fact that the former apparently secure the plums of the profession in all parts of the world. It seems to be a fact that American mining engineers are practically more capable than their English confreres. The reason is not far to seek, indeed it would be most remarkable if it were otherwise. It is certainly not due to an

inherent superiority of mental calibre, but entirely to the conditions under which mining science has been developed in the United States. New problems have confronted the American engineer at every turn both in mining, metallurgy and the handling of ore and rock in far greater numbers and possessed of infinitely greater complexity, than those presented in any other country. Consequently the premium has not been upon thorough knowledge of and careful adherence to the best precedents, but in the initiation and invention of new methods and processes. This difference in environment was once exceedingly well illustrated by an anecdote. At a certain race meeting a young boy had a trotting horse which could run away from anything in the field. An old stager who was to race against him asked him how he drove so well. "Oh!" said the youth; "I read Brown's book on trotting and I always do just what he says I should do." When the next heat came off the old stager whipped up his horse, locked wheels with the boy and tipped him into the ditch. As he passed by he yelled out: "What does Brown tell you to do now?" The objection that this was an infringement of the rules may be passed over as irrelevant. As a matter of fact in mining, nature infringes all rules and does so very frequently, and it is well to have some other resource than Brown's book when the cart is in the ditch. The American mining engineer has to be more than a man who knows theoretically and practically the science of mining as it exists; he must be prepared to add original data to that science to meet new problems. In a country whose mineral resources were hardly touched, and where much of the mineral wealth was not amenable to mining science as it existed the prizes upon successful invention and originality were naturally huge. That is why a body of mining science and practice has been developed in the States with which no other country can hope to compete except one. That country is Canada. But before Canadian science can compete with the States it must go to school there and learn all that is to be known now, just as the engineers of the States went to school in Germany. There are two ways of doing this: the first is by importing the engineers of our big mines who will establish an up-to-date standard of practice, just as the United States imported its first engineers from Freiburg; the second is by sending our budding engineers to the States to learn all that the best science and practice, particularly the latter, has to teach. In connection with this would it not be a patriotic act if some of our Eastern millionaires, who have made large sums of money out of mining, were to establish a travelling scholarship in connection with some one or other of our Canadian mining schools? The hope of winning such a scholarship which would be a passport to the most remunerative occupation our mining industry had to offer would induce more to enter the profession of engineering; and the scholarship would also give young Canadian engineers the opportunity of establishing a mining practice in Canada equal to the best developments in the United States.

For the eight months ending 31st August the United States exported 5,550,960 tons of coal and coke compared with 3,717,004 tons in the corresponding period of last year. Of this amount Canada purchased 3,710,982 tons in comparison with 2,589,039 tons during the corres-

ponding period of last year. That is to say that two thirds of the export trade in coal and coke of the United States is with Canada. Canada's trade in coal and coke is worth twice as much to the United States as all the other foreign countries with which that country deals in these commodities put together. During the same period the United States exported in pig iron and the most important products of iron and steel 616,968 tons. These products vary, some increasing, some decreasing. But a very notable increase took place in the export of steel rails which jumped from 158,737 tons to 256,276 tons. Of pig iron and its products Canada took 87,158 tons in comparison with 40,700 tons for the corresponding period of last year. Canada was therefore a customer for one-seventh of the total exports of pig iron and its products. The reason why the proportion of the products of pig iron taken by Canada is not so great as the proportion of coal would not be at all comforting to ironmasters of the United Kingdom. It is that Japan, Australia and the British Government in Africa are also large customers. The explanation that these are overflow orders may be the correct one but we gravely doubt it. They may bear a small relation to the total of British exports of the same material to the same countries, but they are serious indications of a capacity to compete successfully just the same. Canada, however, took more of these products than any other two countries put together. There is something entirely wrong in this. Canada has as great or greater resources of coal and iron as the United States has. Canada has had as long a time to develop these resources as the United States has had. Canada is as accessible to the markets of the world as the United States is. Canada should be an exporting and not an importing country of the products of pig iron and steel.

Another local company, the Fairview Corporation, has lately, through the familiar medium of a circular to shareholders, announced the fact that it is in serious trouble. The Fairview Corporation has experienced a very checkered career as a more than usual number of unfortunates have reason to know. An effort was recently made to sell out to an English company, but for the present at least the attempt has failed. Mr. W. A. Dier, of Victoria, who appears by-the-way to have been more successful than the majority in securing the few plums the Fairview Corporation has afforded, has meanwhile brought an action against the company to recover an amount of \$3,650 due, or alleged to be due him. Mr. Dier has been asked to stay proceedings for two months to enable the directors to call a meeting of shareholders to consider the situation. In the event of a refusal on this creditor's part, it is stated, that an assignment will be the only course open. On the other hand, it is proposed that an assessment of three cents per share should be levied on shareholders, by which means funds would be provided sufficient to meet the liabilities, amounting to \$21,000, and "furnish all machinery necessary to make the mine a paying concern." The circular further states that "there is ore enough in sight to keep a forty-stamp mill running constantly for three years, and the showing in the faces of the drifts in both values at every point is good, being all in ore." The value of this ore is not mentioned, though it is pointed out that "other companies are paying tremendous profits on ore worth

less than half that of the Fairview Corporation." If this is the case, other considerations being equal, why has not the Fairview Corporation ere this—and it has surely had time enough to make a beginning—paid moderate, let alone "tremendous," profits? The above statement must be regarded as an admission of incompetency or it is misleading.

With the exception of the Cariboo mine, which has declared another dividend of 1½c. a share for the quarter ending September 30th, Camp McKinney is not at present making a particularly good showing; though it is satisfactory to note that arrangements have been made for a resumption of operations at the Waterloo. Meanwhile an extraordinary general meeting of the shareholders of the Fontenoy Company was held this month at the company's head office in Victoria, for the purpose "of considering the position," the concern being in debt and without funds to satisfy creditors or to continue operations. At the meeting only one director was present and he expressed a doubt as to his standing in this regard. This is merely an indication of the utterly irresponsible and unbusinesslike way in which the company has been managed, or rather mismanaged, in the past. In fact the conduct of the directorate is open to the strongest censure. From the very beginning, when by systematic puffing, a boom was created for the shares at fancy prices, up to quite recently, when the company was allowed to get into debt. We shall take an early opportunity of referring to this matter again.

The present month has been particularly disastrous to certain local concerns, which in more than one instance could be not inaccurately described as "wildcats." Whether or not the Okanagan Free Gold Mines, Ltd., comes under this category is an open question, but it is indisputable that the concern was outrageously boomed and some of the methods in which the company's business has been since conducted, particularly in regard to the unwarranted payment of a dividend some time ago, have been little short of disgraceful. Meanwhile the other day the property was seized by the sheriff to satisfy claims amounting to over \$13,000. It is alleged that the concern got into difficulties by the failure of many of the shareholders to pay calls, but it is also asserted that the present trouble was precipitated by Mr. S. Thornton Langley, the promoter and a director of the original Okanagan company. Mr. Langley, it appears, brought an action against the present company to recover an amount of \$1,161 which he claims was due him. This in itself was a justifiable enough course, but if as the directors affirm, Mr. Langley, after first selling out the majority of his shares at remunerative prices, adopted this course as a retaliatory measure for having been asked to resign from the Board by his co-directors, his conduct can only be described as scandalous.

Mr. Gordon Hunter, who we believe represented the Government of British Columbia in a recent important mining inquiry at Rossland, made through the columns of the local press a truly marvellous suggestion for the development of prospects through government assistance. He suggested, if he was not mis-reported, that the government should devote a fund of \$500,000 to the development of prospects

under the direction of skilled experts retaining 10 or 15 per cent. of the property to repay the money so expended. The paid-up capital of the first five development companies taken at hazard from an alphabetical list of those floated in England alone is \$9,975,000. These companies have as a rule retained 100 per cent. of the properties developed to cover risk of loss. Yet in spite of Mr. Hunter's opinion that in their operations they have robbed the prospector of his due, they have not so far made such colossal profits that 10 or 15 per cent. of the developed property would be amply sufficient to cover the risk of loss involved. But to argue in this way is to take Mr. Gordon Hunter seriously, something no one is likely to do except presumably himself. We are willing to do ample justice to his sincerity at the expense of his intelligence.

The Hon. Mr. Turner stated at Rosslard the other day, that so far as he knew, the grant in aid of the local School of Mines was not yet available. As, however, we are now in the winter season, when the chamber work at least of such an institution can well be carried on, the Minister of Mines might certainly do worse than expedite the payment of the grant to the Rosslard institution, on conditions of course securing its use to the best advantage.

During the first two months of its existence as a going concern the Granby smelter at Grand Forks has shipped \$105,000 worth of copper matte. During six weeks of that period the smelter was only operating one stack of a capacity of 300 tons a day. For two weeks it has been operating two furnaces of a combined capacity of 600 tons a day. It is now treating 18,000 tons a month of copper ore. Eighteen thousand tons a month is higher than the average production of Trail Creek has ever been. Grand Forks possesses wonderful advantages from a smelting point of view. It is already beginning to draw ore from the Republic camp in the State of Washington. It has therefore low-grade iron ores, high-grade copper ores and high-grade silicious gold ores to draw from, as well as great natural advantages in the way of flux fuel and power. It would be difficult to exaggerate the possibilities of industrial development here contained. For many a day the problem has been for Grand Forks to get railway connection with other places. That problem has now been changed. Other places begin to figure on the possibility of getting railway communication with Grand Forks. The establishment of a converting plant there for the manufacture of metallic copper is the next progressive step and is already under contemplation.

THE TAXATION OF MINERAL OUTPUT.

(By David B. Bogle.)

THE reason why it pays to mine a large tonnage of low-grade ore may be expressed in the following formula: As the value of ore mined decreases in arithmetical progression the tonnage which it is possible to mine increases in geometrical progression. It is not necessary here to attempt to prove this formula. It is not claimed that the relation between the progressions is exact. This would necessitate the establishment of a unit of decrease in the value of ore per ton. All that is insisted on is that the relation between value and tonnage accommodates itself by an infinite series of gradations to a general principle of which this formula is the expression. This is uni-

versally admitted. The action of this principle may be illustrated by certain interesting calculations, but instead of doubling the total quantity of ore in the mine with each decrease in value let us assume that with each decrease in value per ton of one dollar there is twice as much ore developed as was in sight of the grade immediately higher.

Let us suppose a mine to have been purchased and developed at a capital cost of \$300,000, where the fixed expenditure per ton to extract the value is \$7.50, distributed as follows:—

Breaking and raising	\$1.50
Smelting	3.00
Refining and marketing	3.00
<hr/>	
Total	\$7.50

Here we beg anyone who reads this article and thinks that under the practical conditions of mining ore cannot be broken and raised for \$1.50 a ton to stop and read no further. The article is not for him. The figures have been arbitrarily chosen with a view of illustrating the principle involved. It is the variation of results under them not their actual amounts which is important. Let us further suppose that in this mine the result of development is to expose 100,000 tons of ore of a value of \$10 a ton. Here it is obvious the cost of development has been \$3 per ton. We have therefore the following result:—

Value per Ton.	Tons.	Gross Cost per Ton.	Result.
\$10	100,000	\$10.50	Capital returned minus \$50,000

Now let us suppose that there is also plenty of \$9 ore in sight. Under the opening supposition we get the following result:—

Value per ton.	Tons.	Gross Cost per Ton.	Result.
\$9.33	300,000	\$8.50	Capital returned plus \$249,000.

Observe that neither of these ore bodies would have been profitable in themselves. The first would have involved a loss of \$50,000, the second no loss indeed, but no profit. Combined they show an exceedingly satisfactory profit. Now let us suppose the \$8 ore in this mine to be brought to bear and that there are 400,000 tons of \$8 ore in sight. The result of operations is as follows:—

Value per Ton.	Tons.	Gross Cost per ton.	Result.
\$810.5714	700,000	7.928	Capital returned plus \$450,000,

To go after this body of ore for its own sake would have involved a loss of \$100,000.

For purposes of convenience we now adopt 50c. as our unit of decrease in value. The result under the formula is as follows:—

Value per Ton.	Tons.	Gross Cost per Ton.	Result.
\$8	1,500,000	7.70	Capital returned plus \$450,000

This of course may be easily verified by the very simple consideration that 800,000 tons of ore have been mined and treated for exactly what it cost to mine and treat them. The profit must naturally be the same as it was at the previous stage considered.

Some very important principles in mining finance are illustrated by these calculations. One of these is that it pays to mine all ore in sight which shows the smallest fractional profit over the fixed cost of extracting its value. The treatment of such a tonnage

decreases the average cost of development per ton in a very marked degree. Thus we find in the case given above that the \$10 ore in the mine was burdened by a charge for resumption of capital of \$3 a ton, whereas at the point where the highest aggregate profit is made it was only burdened by a charge of 43 cents per ton. In other words the value of a mine depends much more upon the number of tons which can be mined than upon the net profit per ton over the fixed cost of mining. A practical exemplification of this principle is seen in the well-known fact that the capital value of low-grade mines is nearly always greater than the capital value of high-grade mines. Another very interesting principle is also brought out. It is that the aim in mining is to mine the largest number of tons of the lowest gross contents per ton possible. A mine is successful according to the degree in which the gross value per ton of the ore mined is reduced, provided always, that it covers the fixed cost per ton. Few people grasp this very elementary principle. Those who ought to know a great deal better sometimes shake their heads when they see the gross contents per ton of the Rosslund ores falling steadily year by year. That is the very thing which guarantees the progress, stability and permanence of the district. Another important consideration which follows from the principle illustrated above is that the capital cost of purchasing and equipping a mine is of very small importance. It is worth while spending almost any amount of money to effect a reduction of 50 cents a ton upon the fixed cost per ton. The fixed cost per ton is everything in mining, the capital cost and cost of development comparatively speaking nothing. A reduction of 20 per cent in the former might and frequently does enhance the latter a thousand per cent. The working of this process is obscured by the fact that most mines are overloaded with a false capital at the start. They do well if they live up to the exaggerated value set upon them by greedy promoters.

Some exceedingly valuable laws in reference to the population of mining districts, their industrial prosperity and taxable resources may be deduced from the principle we have been illustrating. It will be readily seen that the country gains the same benefit in the way of supporting a permanent industrial population from the raising of one ton of poor ore as it does from the raising of one ton of rich ore provided the cost of raising a ton of Slocan ore is three times the cost of raising a ton of Trail Creek ore. Then the Slocan with an output of 30,000 tons of ore per annum will support an industrial population exactly one half as great as Trail Creek with an output of 180,000 tons per annum. It may of course be a better "poor man's country" in the way of affording better opportunities to those who wish to invest their labour or speculate with their brains. That is not the point. We are now discussing the number of those who wish to sell their labour who can find a market in the respective countries. What may be called the secondary taxable resources of a country, a mining country, depend directly upon the industrial population which that country is able to support. Therefore the taxable resources of the Slocan under the imaginary circumstance we have assumed would be one-half those of Trail Creek. But the wealth produced from the two districts would, under those conditions, be practically the same. Their primary taxable resources would be equal. From this it may be

deduced that a tax upon mineral output is not only convenient to the revenue, but essentially just in principle.

When, however, we come to consider the incidence of this taxation some very important lessons are taught by the arithmetical calculations we have already made which are essentially true in reference to the facts of mining although cut and dried by the necessary limitations of that mode of illustration. Let us observe the incidence of the present tax of two per cent. upon these cases.

Value Per Ton.	Tons.	Gross Cost.	Result.	Tax.
10.	100,000	10 50	- 50,000	\$ 9,000
9.33	300,000	8 50	+ 249,000	19,999
8.5714	700,000	7.928	+ 450,000	35,980
8.	1,500,000	7.70	+ 450,000	60,000

The want of equity in this tax is that part of the fixed cost per ton of ore is not exempted from taxation. In our examples this has been placed very low, \$1.50 a ton. Consequently the inequality in the tax does not come out in such a glaring way as if it were higher. In order to better exemplify the bearing of the tax imagine a case where the fixed cost of breaking and hoisting ore is \$3 a ton. It is obvious that under the tax this is increased to \$3.16. Now let us imagine that a body of ore is developed in some mine equal in tonnage to all the rest of the ore in the mine where the profit of mining it is only 10 cents per ton over the fixed cost of mining and treating it. That is a very narrow margin to work on. But the tax reduces the margin from 10 to 4 cents. Observe that the working of this ore means a doubling of the population supported by this mine and a consequent doubling of the secondary taxable resources of the district in which it occurs. The effect of the tax is to prevent this from happening. It strikes a blow at population, at the production of wealth, at the taxable resources of the community without adding one cent to the revenue because the ore in question remains in the bowels of the earth. It is not necessary to try to exempt the development cost per ton of ore from taxation. The more ore mined the smaller this becomes per ton. And in any case no conceivable tax short of absolute confiscation would bear any relation to what the owners of a mine place on it as its capital value. The output of the Le Roi mine is taxed to resume a capital of \$5,000,000, at its market price, of \$9,000,000. If it were only taxed to resume a capital of \$8,000,000 and the remaining million paid into the treasury of the country no drawback would have been placed on its productive powers present or to come. Its promoters would have made smaller profits, that is all. Not that anyone outside a lunatic asylum would advocate such measures of taxation. The instance is merely given to show that development cost per ton need not be exempted from taxation. But the cost of breaking and hoisting ore is on an entirely different footing. It is an important item in the fixed cost of mining any increase to which has a vast influence upon the tonnage of ore mined on which, as has been shown, the population and prosperity of the country depend. How this cost is to be ascertained and exempted depends on wholly different considerations outside the present scope. But exempted it must be. Of course a tax of two per cent. is very small. But what guarantee is there that the mineral tax will stay at two per cent. The province must have revenue and mines are its greatest

resource. Once embarked on a wrong principle of taxation, there is no limit to the suicidal injuries which the province of British Columbia may inflict upon itself. Heavy taxes we must have and heavy taxes we must cheerfully pay out of the great resources of the land. But we cannot afford to perform surgical operations upon the domestic fowl which lays the golden egg for the purpose of enhancing our revenue.

MINING MEN OF THE PROVINCE.

MR. JOHN R. GIFFORD, manager of the Hall Mines at Nelson, was born about 50 years ago near Tavistock, Devon, England. At an early age he went to Spain for Messrs. J. Taylor & Sons, assuming charge of iron mines in Asturias and quicksilver mines in Aragon. In 1875 he was sent to Mexico to take charge of La Ley and St. Rosalia copper mines, which were afterwards sold to the Rothschilds and are now known as the Boleo. Later on he became manager of the celebrated old silver mines Rosario in Linaloa, Mexico. Mr. Gifford was also on the Comstock and Bodie in its palmy days and had charge of a number of properties both in California and Nevada. He then spent two years exploring for a California syndicate the mountain ranges of Southern Nevada and Arizona. Ill health, the result of exposure, however, compelled him to temporarily give up active professional work, but later he devoted much of his time to examining and reporting on mining properties in Colorado, Nevada and Canada. In 1899 he resigned the position of general manager of the Ontario Boulder Gold Mining Co. to take charge of the Silver King mine, at Nelson, B.C., and after the re-constructon of the Hall Mines, Ltd., he was given the management of all the mining properties owned by the Hall Mining and Smelting Co.

ECONOMIC GEOLOGY IN THE SIMILKAMEEN DISTRICT.

(By W. J. Waterman, M.E.)

THE study of geology from an economic standpoint is becoming more universal, so much so that some of the large mining companies, such as the Anaconda, Calumet and Hecla, etc., find it pays them to employ a geologist as such in the same way they

employ an engineer or an assayer. The days when the cry was "Gold is where you find it," have to some extent gone by as although the aphorism is as true as ever its application can be much amplified by a certain amount of geological knowledge. The truth of the old adage, "A little knowledge is a dangerous thing" being, however, nowhere more pertinently applicable than in the case of mining. A large proportion of the papers in the transactions of the mining associations of the world are on the genesis or enrichment of ore bodies and veins and monographs on these and allied subjects are being published every day.

The mining district of which I am writing includes



Mr. John R. Gifford, Manager of the Hall Mines, Nelson, B.C.

the watersheds of the Tula-meen and Similkameen Rivers, and is tributary to Princeton, which is situated at the junction of these two streams. Both to the amateur geologist and professional miner it is an exceptionally interesting one. It includes most of the formations represented in British Columbia and the variety of its minerals of economic importance within a comparatively small radius would be difficult to beat anywhere. Roughly speaking it may be represented as consisting of many ancient and modern (from a geological standpoint as to time) valleys or lake basins now filled with tertiary measures either of sandstone, coal, fire-clay, etc., or of later volcanic rocks covering these deposits in part, and these valleys having been eroded from the older crystalline rocks which form the ancient floor. The accompanying plan and section will to some extent illustrate this although the smallness of

the scale on which it is necessary to draw and the want of accurate surface surveys render it difficult to make the point very clear. It will be noticed that the mineral areas are indicated by minerals and each district will be briefly dealt with in rotation.

No. 1. This consists of a narrow belt of black slates with impure limestone, probably a continuation of the section exposed on the Hope trail 25 miles from Hope and which is there heavily mineralized with iron oxides, sulphides, etc. At the headwaters of the Tula-meen River, however, the mineralizations consist of lead sulphide and galena ores with some chalcopryrite and blende. Assays have in many cases been high in silver and up to 100 ounces and 65 per cent lead. The blende is sometimes too high for free smelting. Pyrr-

hotite is also present and may increase with depth. A quantity of these ores have been packed out to Hope and providing a good waggon road were built could with advantage be shipped to the coast.

A little further east and abutting on this slate belt is an ancient crystalline mass of very basic rocks (2). This is represented on the river by a rock of coarse crystallization of quartz, lime and pyroxene. At the head of Slate Creek this is almost a pure pyroxenite, is placed shered to a schist and much serpentinized with many small and at least one workable vein of fibrous serpentine unscaled asbestos. Quartz veins are numerous, and in all cases carry values in gold and copper. The country rock is heavily impregnated with chrome iron and magnetite and there is little question but that this is the mother country of the platinum which is found in all the creeks draining this watershed. Numerous assays have, however, failed to prove the existence of this metal in situ on the veins and it is probably scattered through the country rock in fine grains or in conjunction with the chromic iron. The adjoining hill between Cedar Creek and Collins Gulch are as illustrating the curiously broken character of the geology covered with a heavy capping of volcanic breccia and trap which outcrops in the Tulameen River just above the junction of Otter valley and immediately east of this is a considerable basin (part of it possibly underlying the volcanic rocks) of early Tertiary coal measures carrying a very good class of coal with 60 per cent. of carbon (4 on map).

It is quite possible that these measures may overlie the original drainage channel of Granite Creek which is at present undoubtedly flowing in a recent channel. This could only be proved by boring.

The configuration of the ground at the heads of these creeks, which have all been valuable placer grounds, would seem to indicate that apart from later erosion from visible quartz veins there has been considerable concentration going on from some long existing drainage system which has left patches of an ancient valley filled with gravel on the tops of the highest mountains and which it would appear ran in an opposite direction to the present drainage. Parts of this old channel are probably covered both by the coal measures and the adjoining volcanic rocks, which, it is possible, may have been the means of directing the direction of the drainage. This is particularly applicable to area 5, which is largely granitic, and where swamps and small lakes are filled with gravel. In this area, as in 3, numerous quartz veins are found carrying sulphides of iron and copper with varying values in gold. Serpentinization is everywhere apparent, and erosion has been so great that the present quartz veins probably represent a section of the veins thousands of feet below the original surface. Between 5 and 6 the Tulameen River has cut deeply into a series of green stone and dioritic rocks which are capped by heavy masses of porphyritic rocks which show in the river further down towards Princeton as filling the whole valley with very high perpendicular bluffs in the canyon. The green stones, etc., show numerous iron croppings of veins along the bluffs, some of which are being exploited as claims. This portion of the river bed was rich in gold probably due to these veins. The volcanic rocks mentioned above cover both the edge of this series and also of the tertiary basin surrounding Princeton and

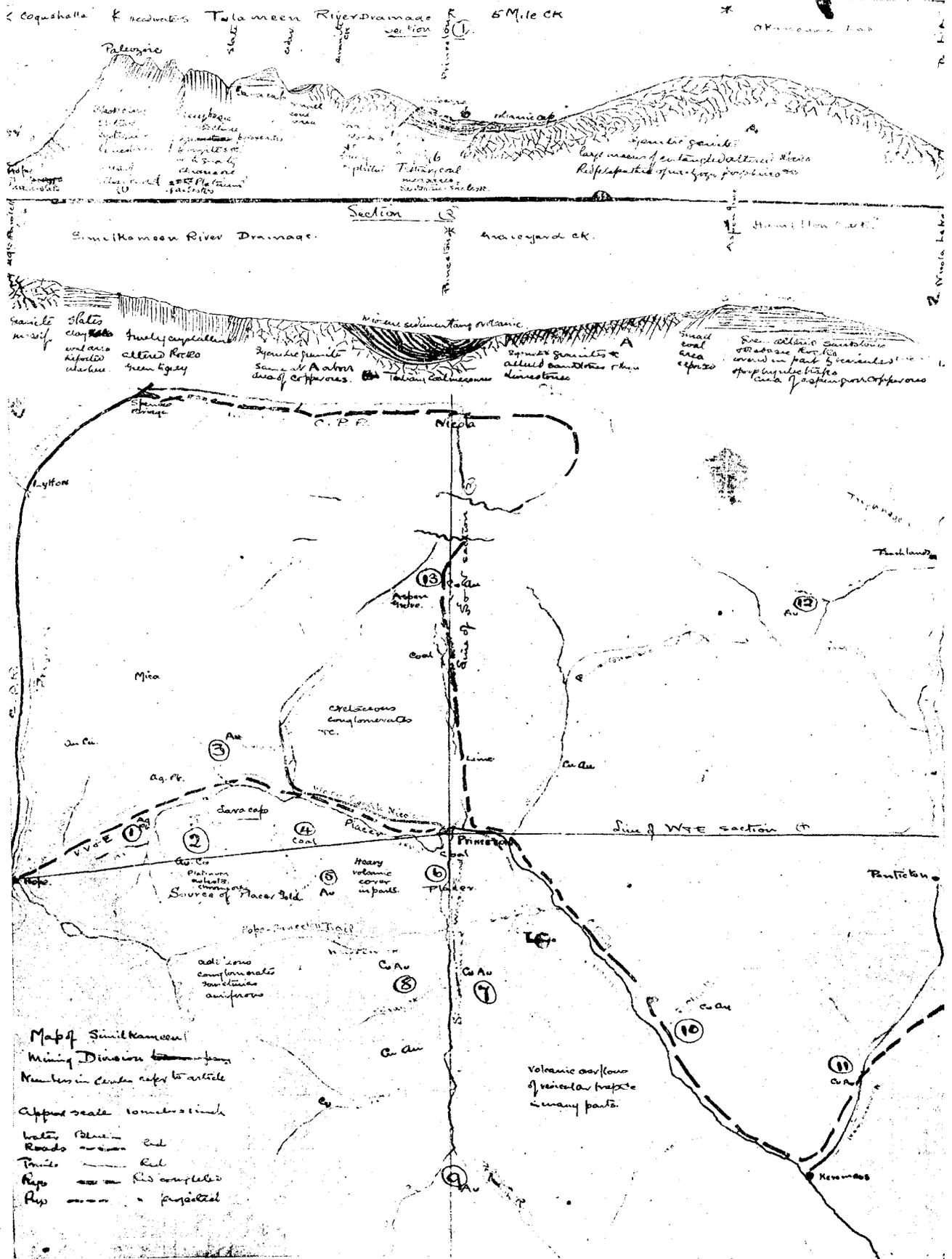
filling the valley of the upper Similkameen. Going down the Tulameen we meet the first outcrop of coal measures about two miles above Princeton in the form of an immense bluff of very highly colored rocks varying from the deepest vermilion to salmon pink, orange, blue and deep black.

The shales of which this is composed are interspersed with thin layers of silicious sinter, evidently due to thermal action. It is from this coloration that the old name of the junction of the Tulameen (Red River) and Similkameen (Yellow River) takes its name of Vermillion Forks. It has evidently been caused by the burning of underlying seam or seams of coal which has oxidized the contained sulphides, something perhaps also being due to thermal action by which the silicious sinter and adjoining volcanic breccia were formed.

It was at one time a source of considerable profit to the Indians who traded it as war paint, etc., with neighbouring tribes, the deepest tint being exactly that of Indian red. It makes very good paint, which has been used locally, but there being no facilities for grinding, it remains gritty. For exploiting on a large scale it would probably be difficult to obtain enough of one tint. On following down stream to Princeton many outcrops of coal are seen in the river bed, their strike approximating east and west. These same outcrops appears in the Similkameen River on going south from Princeton. Immediately at Princeton an eight-foot seam of coal has been to some extent developed by a 60 foot drift and though owing to the proximity to the surface it has probably not reached the extreme of surface oxidation it gives an analysis as follows, an average of many:

Moisture	4.5
Volatile matter	37.5
Fixed carbon	50.0
Ash	7.5
	<hr/>
	99.5

Burnt in an open fire it leaves a small quantity of white and pink ash, throws out a good heat and lasts a long time. It makes a very good blacksmith's coal, giving a good heat, and the small percentage of sulphur not materially affecting the weld. It clinks under the blast and requires stirring. It has made good coke in the laboratory. The outcrops of four seams of workable thickness are exposed in the river banks over a distance of nine miles south of Princeton, though owing to the folding these may be only the outcrops of two seams. The basin in which these coal measures lie is about nine miles long by four broad and the edges being on three sides overlain by later volcanic rocks, it is probably much larger. Owing to its being surrounded on all sides by mountains carrying minerals in paying quantities any question of fuel for the reduction of these ores becomes of great interest and in this connection should be noted the existence of several excellent beds of fire-clay. Some of the sandstone makes excellent building stone. The coal measures are the bedrock for benches of gravel all more or less auriferous. These benches have been and are the subject of exploitation by hydraulic companies. Water is fairly plentiful and the gold content quite enough under ordinary conditions to pay well for hydraulicking on a large scale. The gravel is very heavy and there being no clay or



Map of Similkameen Mining Division.

sand streaks to help the water, it requires a large amount of water to wash a cubic yard of ground, and thus increases the expenditure. The old placer dig-

gings date back to 1859, when the first discoveries were made in the valley and since then more or less work has been intermittently carried on. The ubi-

quitious Chinaman builds many wing-dams every year, and the fact that it is impossible to obtain Chinese labour when river mining can be carried on would seem to indicate that the work is remunerative from their point of view. The benches vary much in value. There appear to be two pay streaks, one right on the surface and one on the bedrock. In one place several thousand yards washed by the Vermillion Forks Mining Company indicated a gold content of $12\frac{1}{2}$ to 15 cents per yard, and in a lower bench nearer the river of nearly 30 cents. This latter would, however, require dredging or elevating, as the channel is below the present river bed. This claim was not worked this summer, as owing to the extremely light snowfall it was not considered worth while clearing ditches, etc., for a very short run. The water supply as at present used being only obtained from two small creeks with a system of reservoirs. Higher up the Similkameen above the coal basin the benches are more easily workable, owing to the existence of heavy seams of clay and sand and the duty of the miner's inch is consequently much heavier. Some of the low-lying flats are eminently suitable for dredging. The existence of gravels underlying these tertiary coal measures is a very interesting question which could only be solved by boring. The question of the origin of this gold which must in the aggregate amount to an enormous sum, is as yet a problem, though it appears probable that the erosion of the immense mass of Copper and Whipsaw Mountains with its quantities of low-grade copper-gold ores may account for it to some extent. The proportion of platinum which amounts to as much in some cases as one-quarter or one-fifth of the weight of gold washed, would seem to indicate that some of the erosion must have taken place from the west, as the only known source of this metal is in the area spoken of above on the Tulameen.

Areas 7 and 8. In following up the Similkameen River the outcrop of the Tertiary measures mentioned above are covered by a thick bed of volcanic rocks apparently of a porphyritic character. Other cappings of a like nature occur on the northern end of Copper Mountain being more andesitic in character and the later floes being very loose tuffs and breccias. Nearly all these floes can, it appears probable, be traced to a mountain situated on one of the tributaries to Wolf Creek near the point marked "volcano" on the map. This mountain is a well defined volcanic crater of which one wall has burst away, leaving a high red bluff, on the other side making it an easily recognized peak from any point. In the bluff layers of ejecta are visible to a great height. Some of these layers carry very fine nodules of chrysoprase and chalcidonic matter. Large trunks of silicified trees are also to be seen and the approach to opal is in many cases so close that perhaps closer search might discover some of gem value.

To return to the Similkameen River. Below these volcanic beds the crystalline rocks of Copper and Whipsaw Mountains appear. As showing that these rocks represent a very ancient massif it may be noted that the decomposition at the original surface has extended for a horizontal distance of nearly 300 yards on the river banks, making it appear almost schistose at a distance. The nature of this rock varies locally, but from a mineralogical point of view both these mountains Copper Creek and Whipsaw Creeks may

be treated as one. The Similkameen has evidently cut its way through a line of rock which was very feldspathic and lent itself readily to the action of the river. Evidences of this are seen by the bluffs of very soft red and gray rock which appear on the river varying in colour according to the nature of the contained feldspar. Otherwise the composition of the rocks is very similar and the nature of the contained ore bodies and their continuance from one mountain to another shows them to be of the same geological age and that the mineralization has proceeded upon the same system. In a paper of this nature it would be impossible to go into technical details of the genesis of these bodies let alone the fact that such would require a very minute geological study by an accomplished petrologist, but it may be noted incidentally that in the opinion of the writer there are two distinct classes of veins, one class being only to a small extent represented on Whipsaw Mountain.

In one class may be placed the bornite carrying dykes of the Sunset Copper Farm, Gardner, etc., which would appear to have a course approximating northwest, and the other the chalcopyritic ores of the other claims and of Whipsaw Mountain, which run more westerly. The first class may be taken to represent a large diabase dyke of unknown width, probably a very long and wide lens whose greatest width is shown on the Sunset where the hornblende of the diabase has been replaced by bornite. Lenses of similar nature but smaller may be seen on other claims, and in one case a vein of feldspar containing nodules of bornite (sometimes of large size) has been opened up. Another is where a dyke of pink feldspathic rock has bornite disseminated all through, apparently replacing hornblende. The second class spoken of seem to consist rather of fissures or breaks in the country rock which have been filled by later infiltrations of feldspar accompanied by the lower grade sulphuret chalcopyrite. Many of these feldspathic veins are visible in the district but not in all cases cupriferous. Both of these systems would appear to be the result of concentration from the surrounding country rock which can be shown on analysis to invariably contain a small amount of copper and a trace of gold. In one place where the rock was of the nature of a porphyritic granite, samples taken over an area of half a mile in length and a quarter of a mile in width gave assays of nearly \$50 in gold and one half per cent. Cu. It is possibly from the concentration of this immense body of auriferous bedrock that the placers of the Similkameen are largely due. The summits of the mountains within the copper belt are approximately 1,500 feet above the Similkameen river and the width of the valley between these summits about one mile.

The general petrological character of the whole massif may be taken to be a porphyritic granite which has become more or less decomposed in its ferro-magnesian constituents, probably through the hot waters by which the metallic sulphides were deposited in replacing these constituents. The rock in places is almost entirely feldspar, the sprinkling of hornblende, biotite, mica and a little quartz being quite small in quantity. The massif is dyked and fissured in various directions by finer textured rocks of varying ages and types, such as felsites, syenites, etc.

It can be taken as extremely probable that veins

occurring in such a country rock as this deeply fissured and in which the hydro-thermal action has evidently been so deep-seated would continue with depth. The river having cut through 1,500 inches of this rock and showing the veins both at the summit of the mountain and in the river bed. The zone of oxidation is extremely limited, in fact hardly existent and although specimens of oxides are brought in occasionally they do not occur frequently enough to be of much economic value.

From the metalliferous point of view these ores vary very greatly in value. Samples are given below, one of which shows a very fair smelting ore, the other two being high in silica. Luckily seams of magnetic iron occur very close. Lime is obtainable in a short distance, and if the smelting operations are carried on as no doubt they will be in the lower part of the valley at or near Princeton, there would be little difficulty in finding all the fluxes necessary within a short distance.

One thing appears to be certain, and that is that any operations carried on on these veins must be of such a magnitude as to enable low and medium grade copper ores to be worked at a profit. Ore is undoubtedly here in immense quantities, but it is no good trying to blind the investor with fictitious reports as to the grade of these ores. Any mining operator will tell you that the best paying mine is not the narrow fissure where the workings are alternately in "Bonanzo" or "Borrasca," but the large bodies of medium and low-grade ores whose continuity can be depended on. It then comes to a question of what can be worked at a profit. It seems that on these mountains enormous deposits of what may be roughly termed \$10 rock are existent and with proper railway transportation such ore, it would only be fair to presume, could be mined, concentrated (by fire) and refined at a good profit if worked on a large enough scale. But unfortunately this cannot be done unless the claim owner will give the claim buyer a good run for his money. It may fairly be assumed that no mine could be made out of prospects such as we see on Copper and Whipsaw Mountains at a less cost than \$500,000, and in order that the investor should see his way clearly to finding such a sum he would naturally wish to be sure of one thing at least, viz.: the continuity both horizontally and in depth of his ore body. This takes time and if enough time be not given by the original owner in bonding his claim the prospective buyer naturally turns elsewhere. Incidentally it may be mentioned that in many cases these bonds are taken at a reasonable figure by an intermediary, but before reaching the hands of the capitalist the bonding figure has increased so enormously that what was a fair mining proposition at \$50,000 becomes impossible at \$250,000.

If the claim owner is certain of the bona fide value of his prospect the fairest way to have a claim developed is to give an interest to the capitalist for a certain amount of work to be done on the claim. But it is only natural after may be several seasons' hard work in the mountains that the prospector should wish to have some money to carry on with till the next season. Of course to the mining engineer many a claim is exceptionally interesting (like a doctor's "case") that has little or no economic value.

One point on Copper and Whipsaw Mountains which may be noted is that there are no well defined

pay streaks or walls, but that in all the veins so far encountered the copper ore appears to be disseminated through the dyke or veins in particles more or less fine following apparently a line of small fractures through which the cuperiferous solutions have forced their way. At the northern end of the mountain, however, one claim developed by an open cut shows a distinctly brecciated structure. The fragments of country rock (in this place nearly all feldspar) being to some extent rounded and the interstices filled with bornite and a little secondary calcite showing evidences of at least two movements on the plane of the fissure. This fracture runs beneath the volcanic cap mentioned as covering a portion of the northern end of the mountain.

The veins on these two mountains appear to form good examples of the replacement theory of ore deposits. The metals having been leached from the surrounding rocks by hot solutions replacing probably the silicates originally deposited in the fractures possibly minute which gave them entrance or exit. As an interesting calculation it may be stated that over the area of which we are speaking if the country rock which bounds these veins contained only .0005 per cent of copper it would be sufficient to give in the zones of concentration 20,000,000 tons of 5 per cent. copper ore to 1,000,000 tons of metallic copper.

THE BRITANNIA MINES.

Howe Sound, New Westminster Mining District.

THE accompanying illustrations from photos convey a fair idea of the extent and probable value of this immense mineral deposit at the Britannia mine.

Beginning with Plate I., Britannia Landing, reached by a daily steamer from Vancouver 26 miles distant, it is worthy of note and an encouragement to the prospectors who fear that all the good things on the Coast have been located, that although the land seen in the foreground of the picture was pre-empted and occupied ten years ago, the ore showings from two to four miles back from the shore line were not discovered until '97, and practically untouched until last year.

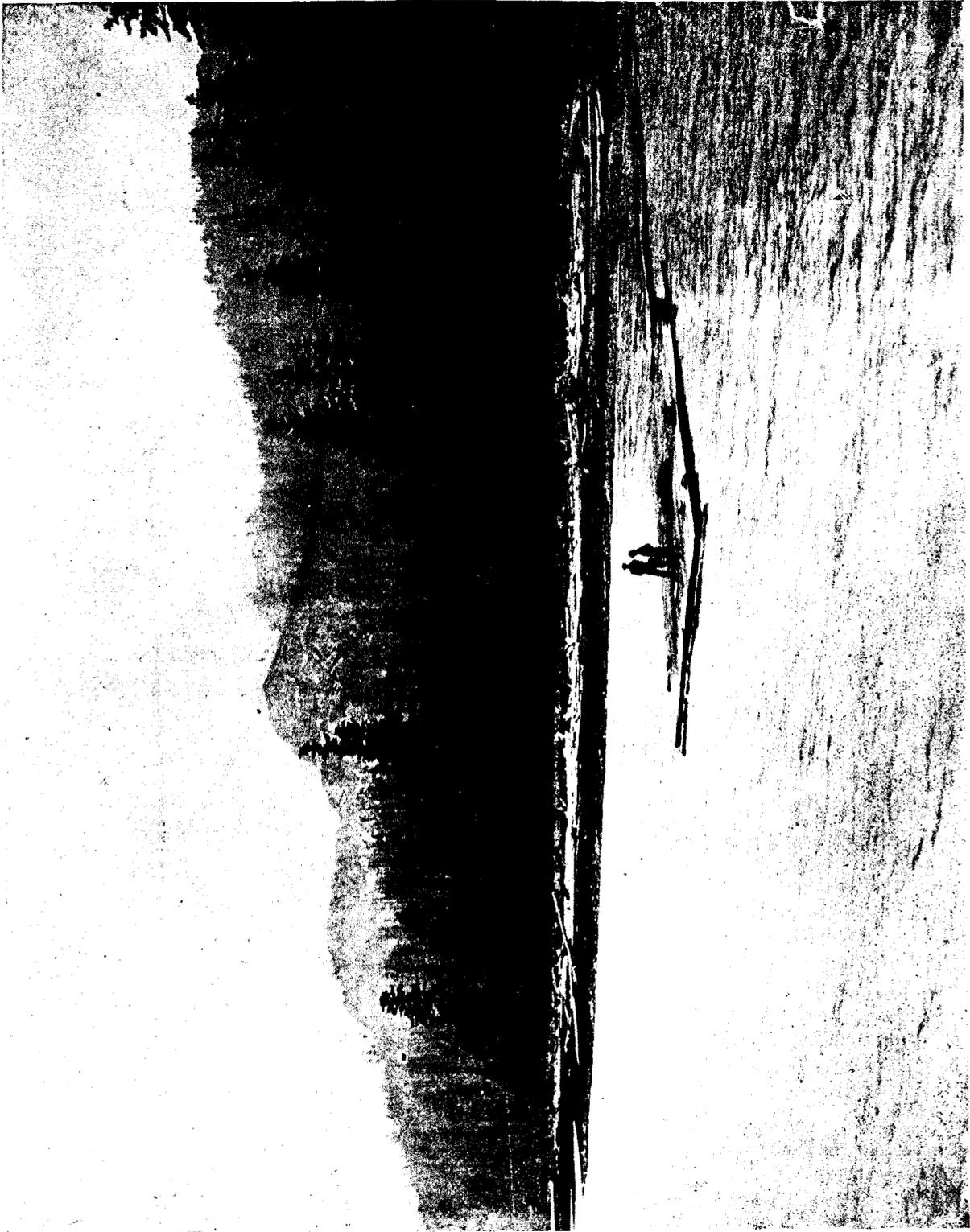
From the landing a first class pack trail, nearly four miles in length, climbs 3,500 ft. from sea level to the mine buildings on the Jane, where a five-acre flat spreads conveniently between the open cut on the west and the Mammoth Bluff on the east.

The open cut (Plate II.) was until the beginning of this year, the principal show place of the Britannia group—a thirty-foot width of solid shipping ore backed up by at least 100 feet of lower grade mineral being visible.

About 70 feet below the cut a tunnel runs south-westerly into the hillside, crossing the end line of the Jane and cross-cutting the vein on the Clifton where the rich ore is 26 feet wide and 120 feet below a second open cut all in ore some 200 feet west of the main cut.

From the point of cross-cutting, drifts east and west about 80 and 40 feet respectively (from memory) are all in ore.

Leaving the Clifton tunnel mouth and going east we cross the flat for some 300 yards, where all solid rock is hidden deep below the debris spread by the erosive action that hollowed out the great crevice on our south. This brings us to Plate III., where the



Britannia Landing, Howe Sound.

hard mineralized schistose quartz rises sharply on our right, and the depths of erosion on our left has laid bare the foot wall for 600 feet in length and a visible height of 200 feet or an actual average height of 300 feet above the cross-cut tunnel in the foreground of the plate.

This cross-cut has been driven about 100 feet, breast, top, bottom and sides all in ore. The full width of this portion of the vein is yet undetermined, but a topographical comparison of the Jane and Fairview ground (on which the foot and hanging wall

sides are clearly marked by a deep gouging of the softer rocks) leads one to conclude that 300 feet will be nearer the mark than 100.

All the rock visible in Plate III. and Plate IV. (a higher side view of the same mass) has been carefully sampled and gives an average and very regular value of \$7 to \$10 per ton throughout. Opinions may differ as to methods of estimating the quantity of ore in sight, but Mr. W. M. Brewer in an article written for the *Engineering and Mining Journal* says: "After making all due allowance for the operations carried on by



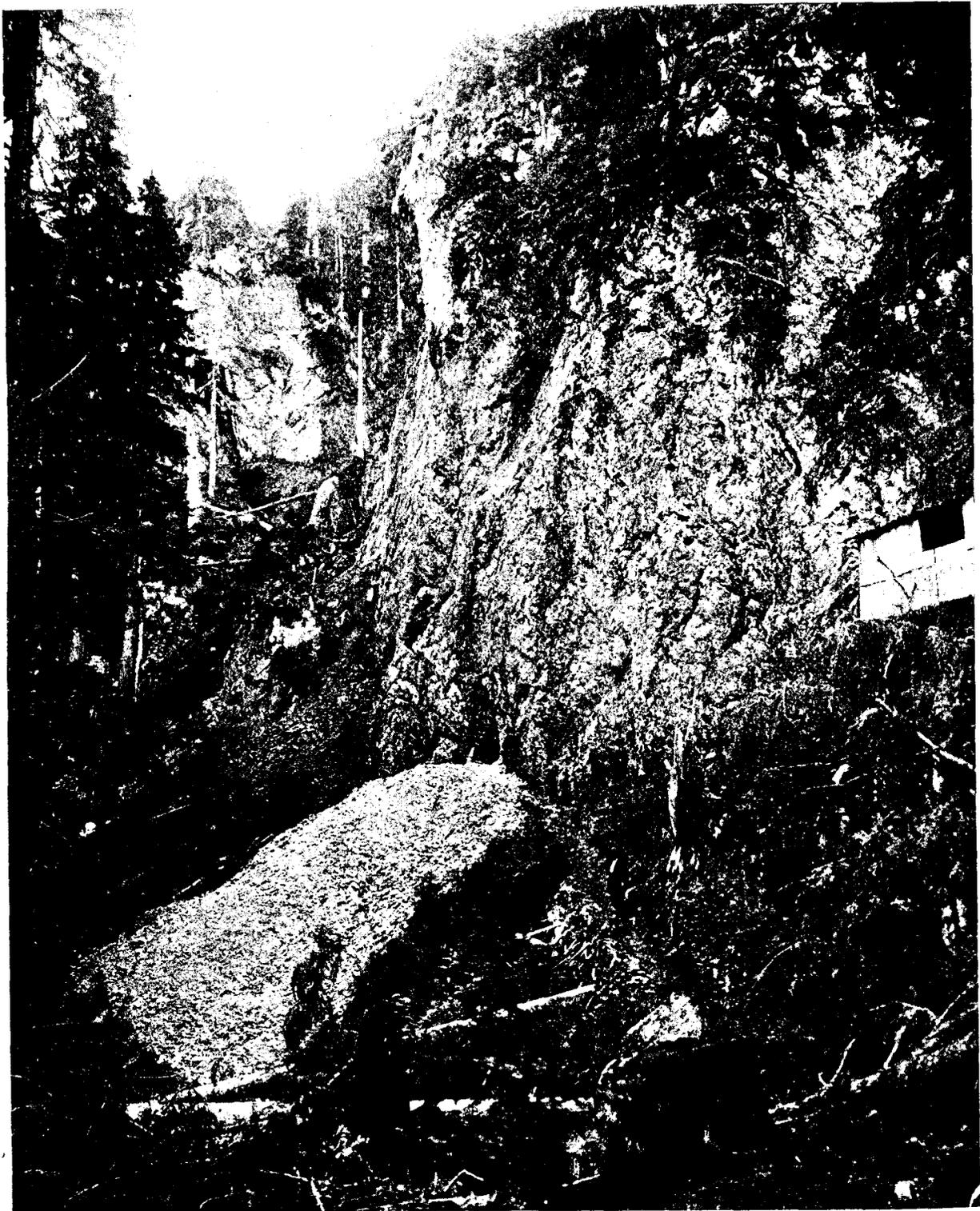
"Jane" Open Cut, Britannia Mine Group.

erosion it would be a safe estimate to place the quantity of ore actually in sight in this bluff at 2,000,000 tons above the adit level."

So much for the Jane. Easterly across the Edith Fraction and 1,500 feet farther through the Fairview the belt of mineral-bearing rock extends, widening to 600 or 700 feet and piling upwards, bluffs over bluffs to an elevation of 1,500 feet above the Jane tunnel. Throughout this great ridge ore bodies have been shown up at almost every breaking of the surface. The mineral appears to be less evenly distributed than is the case of the lower bluffs, but on the other

hand the ore shutes carry higher values, twenty to thirty per cent. copper having been uncovered in several workings.

It is too early as yet to attempt any fair estimate of what the workable tonnage of the Fairview will amount to, but it is probably safe to say that this claim will prove much more valuable even than the Jane and Clifton combined. Given the vast ore bodies and a possible margin of profit, the Britannia mines are fortunate in every detail conducive to economical working. An almost unlimited supply of timber, water power at hand to meet all necessary re-



Mammoth Bluff with Cross-cut Tunnel at Britannia Mine.

quirements, with a reserve force at the Fairy Falls some four miles distant, sufficient to generate electric power enough to run a fully equipped mine, a downhill pull from the farthest end of the claim to the breast three miles distant where deep sea traffic to all points is immediately available, combine to give British Columbia an opportunity of developing one of the great mines of the world.

A considerable amount of prospecting has naturally led to a number of claims being located in the Britannia neighbourhood and the result of this summer's work has given fair proof that the Goldsmith group, the Marlborough group and the Empress group should rapidly develop into shipping mines.

IRON ORE ON TEXADA ISLAND.

ON the west coast of Texada Island occurs a body of magnetite which for purity and extent is comparable to anything of its kind in the world. Upwards of thirty years ago this property of 2,700 acres was purchased by the Puget Sound Iron Company from the original owners, but operations have been spasmodic owing to the fact that the company worked the mine for its exclusive use. Except for the development work of the last two years the mine has not been operated for a decade. A new era, however, seems about to commence, work having been resumed, and we are informed by the manager that between



Another View of the Enormous Ore Exposure at the Britannia Mine, Howe Sound.

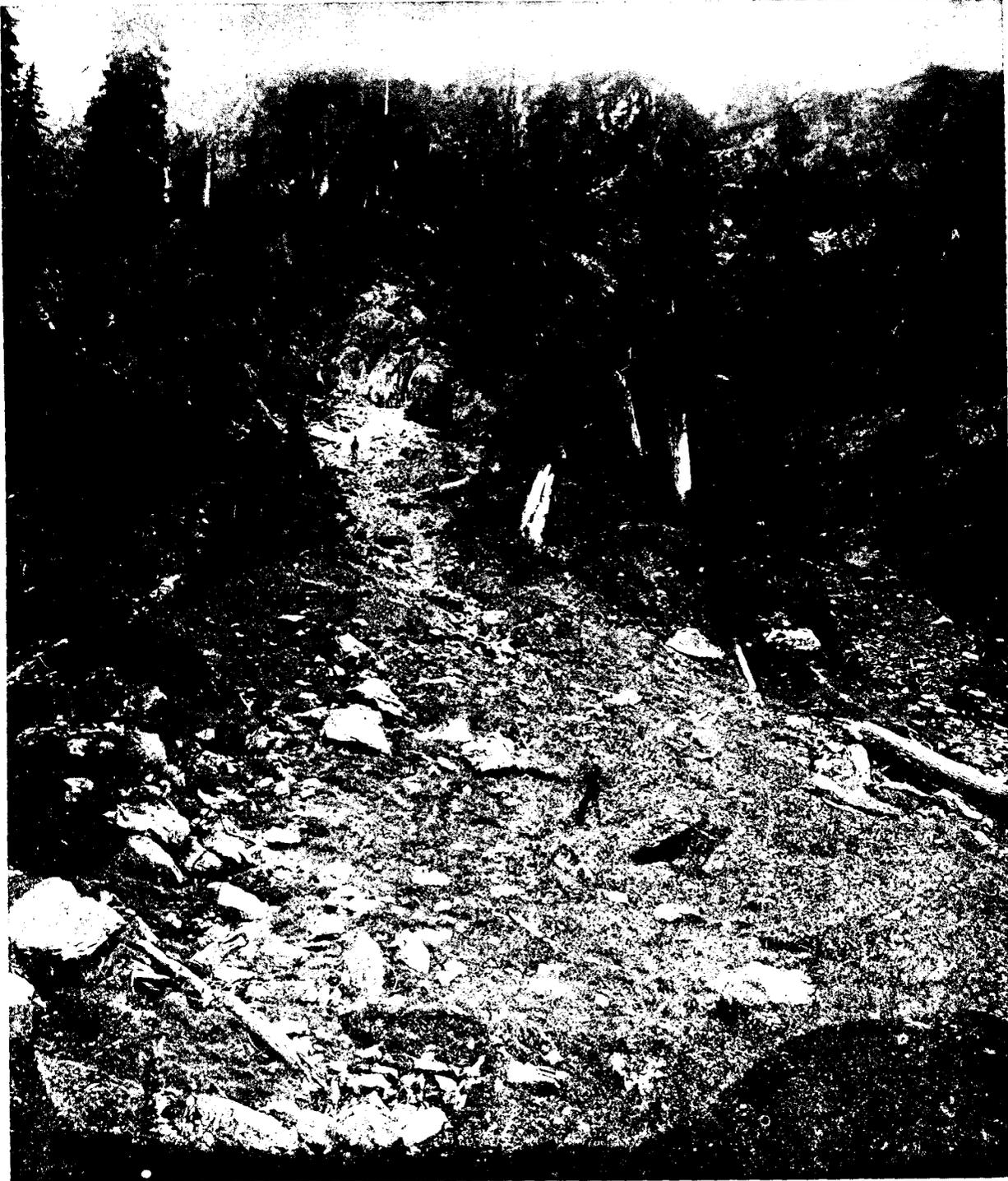
two and three hundred men will be steadily employed. That such a remarkable body of ore has remained so long undeveloped is a matter for surprise but explicable perhaps by the circumstance that rich deposits mined at low costs are located on the Atlantic seaboard. In view of the Chinese relations and of the almost certain opening of new territory in that country and the consequent demands for railways and machinery, the iron deposits on the Pacific Coast are likely to become commercially valuable and their

exploitation and development will be watched with interest.

On the P. S. I Co.'s property the iron forms a ridge said to be traceable for four miles. This ridge follows the coast line, distant from it a quarter to three-quarters of a mile. To it belong the Prescott and Paxton mines where large bodies of ore are in sight. At the former, the development work done has opened up 3,000,000 tons of ore; at the Paxton, experts have figured on there being fully 5,000,000

tons of ore in sight. On the Prescott 246 feet from the foot of the iron dome a shaft has been sunk, and at a depth of 150 feet a crosscut run into the moun-

phorus is low, sufficiently so for the ore to be ranked as Bessemer. The harbor at the iron mine being inadequate, preparations are now under way to move



"Fairview" Claim, Britannia Group, Howe Sound—View of Mineral Deposit from Footwall Side.

tain. This cross-cut passed through 187 feet of greenstone, then struck the ore body, and after running 108 feet in ore work was suspended, the ore body being not then intersected. From the foot of the iron dome to its top is 198 feet. Altitude of top, 575 feet. The ore previously shipped has come from this dome, cars run by gravity conveying it to the wharf. At the surface the ore contains considerable sulphur; but at depth is remarkably pure, containing 77x per cent. of metallic iron. The amount of phos-

the camp to Gillis Bay, where shipping facilities will be vastly improved.

B. C. IN LONDON.

Special Settlements in Le Roi No. 2—The Daily Mail and B. C. Shares.

(From Our Own Correspondent.)

YOU will be glad to learn that there has been quite a revival in B. C. mines on the London market, curiously enough at a time when the Stock Exchange

as a whole is woefully stagnant. The B. A. C., L. & B. C. Goldfields, and the New Goldfields of B.C. groups have all been in the van, the shares in the first named leading the way. Le Roi on talk of a dividend of 10 shillings per share were carried up to about £9, and were predicted by some of the men who are apparently in the confidence of the group which controls this section, to be good for £10. B.A.C.'s—which would of course benefit by a good Le Roi dividend—have been up to about 18 shillings. In connection with this group, however, chief interest has centred in Le Roi No. 2, whose special settlement was ultimately fixed to take place on September 28th. There had previously been a great deal of speculation in the shares of this company, and every effort had been made to check the Special Settlement so as to bring pressure to bear upon the Whitaker-Wright group. When the company was originally bought out the allotments were pretty generous, and this induced some market speculators to freely sell the shares at the small premium which had been engineered, in the hope of being able to easily buy back at a much lower price. The group finding out how matters stood put up the quotation a little bit above the level at which these speculators had sold what they did not possess, and in due course picked up practically all the shares which were thrown upon the market by those who had subscribed to the issue, and were, of course, only too pleased to take a quick and substantial profit. Then the fun began. Meanwhile it is only fair that after the many assaults which have been made upon the interests of the group by the operators who have always singled out Mr. Whitaker-Wright for attack, that the latter should occasionally have a look in, and this time he has undoubtedly scored and heavily too, for having denuded the market of shares, the group of which he is the head had the "bears" at their mercy. The price ascended day after day until £20 and over was reached. All this while those who had sold at about £6 or £7 were wondering how they were going to get back their shares seeing that there were practically none at all on the market. And you can imagine their feelings at their increasing losses of about £1 a share per day. All kinds of threats were used; first they were going to stop the Special Settlement in the shares, secondly, they proposed to take legal action to test the validity of the little arrangement by which they had placed themselves at their mercy. How determined, too, they were to use every effort to scare the group may be gathered from the following advertisement which appeared in the leading newspapers a few days before the date fixed for the special settlement:—

LE ROI NO. 2, LIMITED.

A committee is in course of formation with a view of taking joint action in opposition to the recent dealings in these shares, and with that view a MEETING will be HELD at the OFFICE OF THE COMMITTEE, 2 Copthall Buildings, E.C., on MONDAY, September 24, at 4 p.m., when the attendance of sufferers is invited. Communications to be addressed to the Secretary of the Committee, 2 Copthall Buildings, E.C., or to their Solicitors, Messrs Michael Abrahams, Sons, & Co., 5 Tokenhouse Yard, E.C.

And when one comes to understand the enormous losses which these speculators had incurred it is not surprising that they should use every effort to try and rob Mr. Whitaker-Wright and his friends of their reward. It is said that one speculator had lost as

much as £70,000 at the making-up price, and many others several thousands of pounds each. Nothing sensational happened at the settlement, but the crisis in the history of this little Whitaker-Wright market deal is expected when the buying in day arrives, that is, the date after the special settlement (10 days after) on which those who have bought shares during the account adjusted by the special settlement, can either compel those who have sold them the shares to deliver or else can go into the market and bid for the shares publicly. The seller who has failed to complete his bargain is, of course, practically at the mercy of the group, as the latter having control of almost the whole of the shares in the Le Roi No. 2, they are obviously in the position of being able to dictate the most onerous terms to the now miserable sellers. We are all waiting rather anxiously to see what will be the outcome of this pretty little deal. Meanwhile the price remains at about £20 or four times the issue price of the shares.

There have been various rumours about the B. A. C. companies, it being reported at one time that the Le Roi was to be amalgamated with the Le Roi No. 2, but this seems to have been a purely bear canard and without any foundation. The London and British Columbia Goldfields group have been steady with an upward movement in Ymirs owing to the satisfactory character of the recent reports regarding the crushing results. A good deal of interest has been taken in the New Goldfields of British Columbia group, both the parent company and Velvets and Portlands being in good demand, the former owing to the discovery that their assets work out at present market prices considerably above the price quoted for the parent company's shares. Athabasca have paid 1 shilling dividend and having got through their reconstruction comfortably have advanced in market estimation. Klondike companies have been very dull, and when one comes to think of it the results so far attained have not been sufficiently encouraging to warrant much enthusiasm for Yukon properties.

The first meeting of the reconstructed Hall Mining and Smelting Co., Ltd., was held on October 4th. The reconstruction seems to have been thorough, and it is apparently the determination of the directors to carry on the work of the mine and the smelter separately. They consider that the result will be that "when the mine becomes a producer the smelter will purchase the ore from the mine exactly the same way as it purchases custom ores from the outside mines, so that the accounts of the two companies will not get mixed up. According to the Chairman's statement yesterday the prospects of smelter business "are considerably greater than were anticipated at the time of the reconstruction." He went on to say that "it was doubtful at one time whether the amount of business which would come to us in the first year would be sufficient to employ our smelting works up to their full capacity; but it now appears that the prospects promise to be not only fully up to the capacity of our smelter, but even exceeded—so much so that our manager has advised us that in a very short time it may be desirable to erect an additional furnace." The company having got rid of practically the whole of the old board it will be interesting to see what it will do now that it has included in its directors a noble lord and a pushing stockholder.

A great deal of time was devoted at the meeting to

an explanation by the Chairman regarding the attitude taken by Mr. Frederick Walker, who was the Chairman of the Shareholders and Debenture holders' Committee, which was chiefly responsible for the reconstruction. That Mr. Walker did a very great deal to put the company on its legs again is undoubted, and I am sorry that the relations between him and his friends, and the company should have become so strained, but as Lord Ernest Hamilton pointed out this has not much to do with the new company and is apparently entirely a matter which rests between Mr. Walker and the liquidator of the old company. It can only be hoped that the new concern will go along as flourishingly as the successor to Sir Joseph Trutch anticipated. But it would have been much better if the company's reconstruction could have been carried out without friction. With the three shilling call paid up the shares are now quoted at about 3 shillings, so that the public does not seem at present to be greatly smitten either with the new board or with the prospects held out by Lord Ernest Hamilton, the new Chairman of the company.

Nothing could more emphasize the growing interest in the British Columbian securities than the decision of the *Daily Mail* to devote a special section of its mining column to the quotations of British Columbia mining securities. This significant innovation was inaugurated in this morning's issue of your contemporary, which has, as I need not tell you, the greatest circulation of any paper in the old world.

COMPANIES' MEETINGS.

LE ROI NO. 2.

THE first ordinary general meeting of the shareholders of Le Roi No. 2, Limited, was held in London early in October. The chairman in the course of his remarks said: "I have little to say to-day beyond reporting progress, and the fact that everything in regard to the company is in a very satisfactory condition. As you are aware, the company offered its capital for subscription in June last, and I am pleased to be able to state that it was all subscribed in cash, and the shares were allotted to more than 1,000 applicants. Owing to the success of the issue, your directors paid the purchase consideration to the vendors in cash, and allotted the whole of the shares to the subscribers, who, no doubt, have been gratified with their allotments. The company has been placed in unencumbered possession of the property, which, as you know, embraces over 72 acres immediately adjoining the celebrated Le Roi mine. The mines are being extensively developed, and equipped with necessary plant to work them in a large way, and the Northport smelter is being greatly increased in capacity, so as to treat the ore on an extensive scale. A trial shipment of 786 tons of ore has been made and treated. This shipment yielded over 498 ozs. of gold, 2,317 ozs. of silver, and 46,986 lbs. of metallic copper, the average value per ton being \$24.30. Another shipment of 332 tons yielded over 229 ozs. of gold, 1,091 ozs. of silver, and 19,963 lbs. of metallic copper, the average value per ton being \$25.72. I am sure you will agree with me that these tests are most satisfactory, especially as the value per ton is higher than in the case of the original Le Roi. I do not know what I can say more to-day than that your directors are giving close attention

to your affairs, and will put forth every effort to make this a great and successful company. Your presence here to-day is evidence that you have not been tempted to sell your shares, and the price that you can now obtain for them in the market is your reward for the confidence you have shown in your property and in the house that has made the issue. I think that to be able to sell a £5 share at £20 within four months is not a bad thing. I thank you for your attendance, and hope and believe that I shall have a most satisfactory report to make to you when we next have the pleasure of meeting together."

HALL MINING & SMELTING.

At the first ordinary general meeting of the Hall Mining & Smelting Company, Limited, the chairman, Lord Ernest Hamilton, after remarking that as the reconstructed company had been in existence so short a time there was little information to be laid before shareholders, stated that what information he was, however, in a position to impart, was decidedly good. At the time of reconstruction the ore in the upper levels had worked out; but there were strong indications that the ore would be picked up again at depth, as has been the case in so many mines in the same district. The money which was obtained under the reconstruction was principally subscribed with the view to sinking in order to pick up this ore at depth. This work of sinking has been pushed forward as energetically as possible since the reconstructed company took up the work. The mine has been cleared of water, and the necessary hoisting and pumping machinery has been ordered. However, the time has been so short that it is quite impossible that the workings could in the time be carried to the necessary depth—that is to say, to the depth where it is expected to come in contact with these high-grade ores again. In the meanwhile, the intermediate levels have been developed—the work of development has been pushed forward on these levels at the same time as the sinking has been done, and it will be gratifying to you to learn that the work on these intermediate levels has been by no means barren. The directors had been led by the manager to anticipate that he would, probably in the course of this week or next week, cut veins in levels Nos. 6, 7, or 8, and since a cable was received, which came extremely opportunely for this meeting, announcing that he had cut the veins in two of these levels. The contents of the cable were as follows. "No 7 level west. The ore is 12 inches thick, and continues as rich as ever.—No. 7 level east. The south lode, or vein shows a body of ore 5 feet wide; the ore is good and will pay. No. 6 level west shows a body of ore 7 feet wide, averaging 15 ounces silver and 4½ ounces copper." With regard to the smelter, the company have an enterprise of an entirely different nature. The mine is more or less of a speculation, as all mines are, but a speculation in which the chances appear to be very greatly in favour of success. In the smelter we have an enterprise to which the company can look for a steady and consistent return, which will not be dependent upon chance. It is the intention of the present board to carry on the work of the mine and the smelter as two separate concerns—absolutely separate concerns. This was not the practice in the old company. The result of the practice will be that when the mine becomes a producer the smelter will

purchase the ore from the mine exactly in the same way as it purchases custom ores from outside mines; so that the accounts of the two concerns will not get mixed up. With regard to the smelter itself, it will be satisfactory for the shareholders to learn that the prospects of business are considerably greater than were anticipated at the time of the reconstruction. By business is meant the prospect of business with regard to the smelting of customs ores. It was doubtful at one time whether the amount of business which would come in the first year would be sufficient to employ the smelting works up to their full capacity; but it now appears that the prospects promise to be not only fully up to the capacity of the smelter, but even exceeded—so much so that the manager has stated that in a very short time it may be desirable to erect an additional furnace. If the mine turns out as satisfactorily as is anticipated, it is, of course, needless to point out that the shares will stand at a considerably higher value than they do at the present moment, and if that is the case the company may with tolerable confidence look forward to paying the whole or the greater part of its development expenses in the mine by the returns from the smelter. But if, on the other hand, the mine turns out an absolute blank—which appears far from probable in view of the recent cables—then there is the smelter to fall back upon, and from that smelter the company can anticipate a fair return, and a return which will be steady and consistent, and on a perpetually increasing scale as the country in the neighbourhood becomes opened up, and as the new mines which surround the smelting works become producers.

VELVET MINE.

The first ordinary general (statutory) meeting of the Velvet Mine, Limited, was held on October 11th at Winchester House, London. The chairman, Mr. Alexander Davidson, said:

Although there is no business to be transacted at this meeting, I take it that the shareholders would desire some little information as to what has taken place since the formation of the company. Before, however, saying anything on that subject, I would like to refer to the position of matters when this company took over the Velvet Mine from the old company. In the first place, I would remind you that the old company had spent over £20,000 in developing this mine. For this expenditure they had put up certain machinery and plant; the shaft had been sunk to a depth of 300 feet; levels had been driven at a depth of 100 ft., 160 ft., and 250 ft., for a distance of 360 ft., 250 ft., and 100 ft. respectively; and an adit had been driven 430 ft. In all some 2,000 ft. of underground developments had been completed. That was the position at the time the prospectus was issued. The consulting engineer further stated at that time that the ore available down to the 250 ft. level was upwards of 100,000 tons, of which 20,000 tons, by being sorted, would give a value of from \$40 to \$50 per ton and the whole 100,000 tons would average \$20 per ton. He also stated that the cost of mining, transport, and treatment should not exceed \$10 per ton. The prospectus stated that the working capital of the company would be £50,000, and that amount was fully subscribed and allotted and 10s. per share has been called up. The first thing that the directors did with the money was to pay off the existing mort-

gage of £10,000, which was referred to in the prospectus. At the same time they took immediate steps to have the property transferred, and it was duly transferred on July 9th into the names of the trustees for the new company, Sir Charles Hibbert Tupper and Mr. C. A. Bury. Subsequently to that, on the suggestion of the consulting engineer and manager, we acquired what the Old Velvet Mine had not acquired, namely, the surface rights of the property, embracing timber, etc. And not only that, but our manager has arranged to procure an additional square mile of surface rights at a low cost, which will be sufficient for a long time to supply the mine with its requirements. Immediately after the allotment the directors proceeded to order a considerable amount of machinery and plant. They ordered a complete air compressor plant and two steam boilers for working the same. These are now almost finished, and, according to the latest accounts from the manufacturers, the whole of the plant will be shipped within about three weeks—the boilers rather sooner. At the mine itself the manager has in the meantime made considerable progress with the excavations and buildings necessary for the compressor plant, so that when it arrives there they will be able to proceed rapidly with its erection. I am reminded that the plant includes all the necessary nozzles and rock drills for the working over a considerable area of the drives and shafts. As you will have gathered from the prospectus there is a very large amount of ore available, and it is, therefore, of the utmost importance in your interests that no time should be lost in the erection of such machinery as will rapidly open up the mine so as to get this ore out. I need not allude to the quality of the ore, because I trust that in a very short time this mine will speak for itself. (Hear, hear.)

According to a cablegram received from the other side we shall be shipping ore in the course of next month. In the middle of August, after having settled with the consulting engineer as to the machinery, we despatched him to the other side, and he arrived at the mine on August 31st. Previously to his going out and subsequently to his arrival he made sundry important recommendations to us, coinciding to a large extent with what he stated in the prospectus, but also embracing other points dealing with matters which have arisen since then. In order that you may determine these recommendations I will say a few words about the developments on the mine to which they apply. You are aware that there is a main shaft, and a subsidiary shaft not very far from it. The main shaft had been sunk to a depth of 300 feet. At a distance of 1,450 ft. down the hill from the top of the shaft a tunnel was opened for the purpose of driving in at a depth of 300 ft. or thereabouts, with the view of draining the mine through that adit or tunnel, and with the expectation of meeting the lode on approaching the foot of the shaft, and also for the purpose of forming a ready and easy exit for the ore both above and below the 300 ft. level. I believe it is very commonly the case that the water finding its way into a mine and requiring to be drained therefrom is to be found coming in only for the first 200 or 300 ft. Therefore, if the mine is drained by gravitation at the 300 ft. level we practically shall be able to extract all the surface water that comes through, and shall have only a small quantity to raise

from the lower levels. Mr. Morrish, our consulting engineer, recommends the prosecuting rapidly of the 300 ft. drive from the bottom of the shaft to meet the tunnel coming from the outside, and accordingly a good deal of energy has been displayed in that direction. I notice from the last fortnight's return that we drove some 30 ft. at the end next the shaft and a considerable distance at the other end. These two drives are approaching each other, and in the course of time—I hope it will not be long—they will meet. We have at present driven about 850 ft., and the distance still to drive is about 600 feet. The next thing the consulting engineer recommended was the sinking of the shaft to the 400 ft. level. You have seen, perhaps, the notice in the newspapers of the strike at the 300 ft. level—the admirable body of ore we have got there. This was first come upon at the 250 ft. level, and was found to be 50 ft. wide there. At the 300 ft. level it was found to be even richer than at the 250 ft. level, and the length of the shoot had extended. Mr. Morrish, therefore, very naturally argues that coming on this body of ore in the shape of a cone as it were, if you sink to the 400-ft. level, and find it good and extending in the same manner there you will have, indeed, in this mine a very great proposition. Hence his recommending the rapid sinking to the 400 ft. level. Another thing which he recommended, and which we have almost carried out was the construction of the road to the nearest railway station, about nine and a quarter miles. This was commenced two or three months ago, and you will be pleased to hear it is on the point of completion, if it is not already completed. The manager has arranged for a railway siding at the point where it strikes the railroad. There is one other recommendation by Mr. Morrish which is being carried out, and that is the straightening of our shaft above the 160 ft. level. The sinking of the shaft to the 400 ft. level has been somewhat interfered with and partially stopped for the time being by a very large influx of water at the 300 ft. level. They have had to pump as much as 110,000 gallons per hour from this level in order to keep the mine clear. However, they are succeeding in keeping it under. I think I ought to refer to the similarity or connection of the Velvet bodies of ore with those of the famous Rossland camp. I have before me a report from the manager on the subject, in which he says: "A cursory comparison of these ore deposits with those of the Rossland camp is sufficient to convince one that they are essentially one in their occurrence and origin alike." I think, therefore, we may hope that our deposits will be as good as those in the Rossland camp.

I will conclude by giving you the latest news we have from the mine. It is in the form of a cablegram which came to hand two days ago, and reads as follows: "Road will be completed within next few days. Railway siding now being fixed. Shall commence to ship first class ore next month. Assay value of ore at 300 ft. level \$82 (that is equal to £16 8s. per ton); at the new surface discovery, \$75 (equal to £15 per ton). Buildings for air compressor already in course of erection. The ground at the adit level is improving and shows mineral." That is to say, that as the adit approaches our deposits under the shaft, even though at a distance, he is now getting into ore. The cablegram concludes as follows: "Our mining prospects continue very favourable." Reading this cablegram reminds me of one point which I have over-

looked, and that is that a few months ago a new deposit or reef was discovered closely adjoining the shaft in the neighbourhood of what was called the stable. It has been traced by the manager down to a considerable depth—I think to the 160 ft. level. In one letter I believe he mentions the lower level. With this ore body added to the one which the shaft has gone down upon our prospects are proportionately brighter. I do not know that it falls within my province to say anything about the old company, but I understand that the liquidator has sent or is about to send out a circular announcing that he is able to make a last and final distribution of the shares of this company in settlement of the claims of the old shareholders. I believe the proportion works out rather more favourably to them than was at first anticipated. (Applause.)

Replying to questions, the Chairman said that the further exploitation of the ore deposit at the 300 ft. level must largely add to the amount of ore developed. According to a cablegram, it was of a very rich character. As to the distribution of the shares he was informed that the old shareholders would receive a bonus of 29½ per cent.

ATHABASCA GOLD.

The first ordinary general (statutory) meeting of the Athabasca Gold Mine, Limited, was held on Thursday, at the Cannon Street Hotel, E.C., London, under the presidency of Mr. Arthur Fell, the chairman of the company.

The Chairman said: Gentlemen, this is the statutory meeting of the company, and we, as directors, are extremely glad to meet you. We have no report to present, but I think we can point to the fact that we paid a dividend last week, and to the returns which I am going to read to you, as showing what an excellent position this company is now in. It was registered on June 13th, but we took the mine over from June 1st. For the interim dividend we took in three months' working, the result being as follows: In the months of June, July and August, there were 1,305 tons crushed in the battery. There were 3,116 ozs. of gold recovered, of the value of £12,476. The expenses were, roughly, £6,000, leaving a profit of £6,476 for the three months. The dividend absorbed a little under £5,000, so we have something in hand towards a further dividend. I cannot prophesy when that dividend will be declared, though I may say we shall declare it as soon as we can, for we know that these profits are the property of the shareholders, and our object will be to divide them among the people to whom they belong at as early a date as possible.

You are aware, no doubt, that at the last meeting we said we must put up a cyanide plant; indeed, that was one of the main reasons why the old company was re-constructed. Directly this company was registered and the applications came in we cabled out to the manager in Nelson to immediately order a cyanide plant and to proceed to erect it with all possible speed. We cabled him at the same time £1,000. He went to the Coast and ordered the very large vats that are required. They are ordered from a California firm at San Francisco. The latest news we have is to the effect that the whole of the masonry work is completed, the roofing is going on, and the cyanide plant is to be ready, they say, by November 1st, but we will give them a little latitude and say by

December 1st. The tailings were caught in a catch-pit, and the manager reported that he could keep these until July last. We, on this side, hoped he might go on retaining them in this catchpit until after that date, but it has turned out that he was perfectly correct, for it appears that in August, through the bursting of the dam it would not contain the further tailings that were put in it, and since that date they have been lost. It was unfortunate, but it could not be helped. There was a suggestion made by the manager that, in order to save the tailings, he should close down the battery, but we were obtaining such excellent results from it without the tailings that we did not authorise this, and the battery has been running with the unparalleled regularity that this battery has shown from the day it started. The tailings, which will be treated by the cyanide, should yield between £400 and £500 additional profit each month.

With regard to the mine itself, which is producing the profits to which I have referred, I have looked up the latest letters and taken the following extracts from them: "August 5th, 1900: The ore in the east drift (where it jumped up) is opening out satisfactorily, and is large and of good quality; it is possible that developments in this direction may have important results, as from present appearances we are in new ground." "August 9th, 1900: The ore in the east drift is very fine and about two and a half ft. wide. In the shaft the ore is running in a peculiar manner, and is mixed with dyke matter. It is dipping stiffly at this point. It is not possible to give much information about the ground here, nor do I expect to be able to do so for some time yet." "August 30th, 1900: The excavation for the cyanide is proving to be a work of unusual magnitude, and the character of the ground is such that only the most massive masonry will assure safety. The mine is looking excellent now, although there is nothing to report of especial importance." "September 17th, 1900: My general opinion of the mine is that the prospects never looked so favourable as they do today. As development proceeds in the No. 1 (below) east, the evidence becomes more favourable to the supposition that we shall ultimately have ore all the way through to the old shaft and connect with those workings where we lost them by the large slip in this (old) shaft. Of course, this theory is not proved yet, but all the evidence obtained so far tends towards the correctness of this view. This is a very important factor. We have continued the drift, which we call the 'granite' drift, and have opened up some fine looking ore at this point. We have sunk the shaft a few feet, and the ore has now an excellent appearance at this point. It seems certain now that we need have no fear of the continuation of the vein in the granite, and our experience so far goes to show that it will be larger, more cheaply mined and possibly not averaging quite so rich." "September 21st, 1900: You will be glad to hear that on further sinking of the shaft 15 feet we encountered good ore again, and a general assay from this mine yesterday gave \$52.50."

That \$52 means 2 ozs. 12 dwt. to the ton, and when we talk of good ore in the Athabasca you must remember that it means ore yielding 2 ozs., 2½ ozs., or 3 ozs. to the ton. It is a narrow vein, but, as I have shown you, it is exceedingly rich. The manager, when he was over here, told us it is a contact

vein—a vein running between the schist and granite. Through the country there was this line where the schist and the granite meet, and this mine was opened very close to or just at the point of contact, but after a bit the vein dipped right away into the granite, and our manager reported that of course he could not prophesy, and anything might happen when the vein went into the granite. It was new ground, and whether the vein would continue, pinch out, or become richer could not be foretold. It was an unknown factor, but you will be glad to see from extracts I have read the granite shaft, as they call it, is opening up some magnificent ore, and that "we need have no fear of the continuation of the vein in the granite, our experience so far going to show that it will be larger, more cheaply mined, and possibly not averaging quite so rich." But from the data given it appears to be nearly twice as wide as it was. If so, and it is only half the value, it will produce an equal amount to the foot run. But we have not yet proved it sufficiently to know what the real value will ultimately turn out to be. However, the manager has never been so confident as to the future of the mine as his letters show he is now. The reconstruction has been carried through most successfully. Almost every shareholder in England came in, and the applications from the Canadian shareholders were really quite remarkable; they have unanimously come in and taken up their new shares. There were only 450 shares outstanding altogether, and they belonged to men up in Klondike, and it was perfectly impossible for them to send in their applications; consequently a Canadian company sent in an application on their behalf, and if those gentlemen turn up within a reasonable time they will all get their shares. At one moment it appeared as if the Canadian shareholders were disappointed at the proposal, and some of them even suggested that there was an attempt being made to freeze them out. They have since found out, however, that our whole anxiety has been that every shareholder should not only have an opportunity of coming into the new company, but that he should be literally introduced by us to do so, for we saw what an immense mistake it would be to him pecuniarily if he did not do so. We have spent very considerable sums in Canada in advertising and making searches for all the shareholders because they do not have registered addresses, and they had to be found through the banks and other agencies. We have done all we could to save everyone's interests, and I know that in Canada they acknowledge at the present time that we have done so.

ABSTRACT OF REPORTS.

THE MIOCENE GRAVEL MINING CO., OF CARIBOO, LTD.

MR. R. H. CAMPBELL, manager of this company, has presented a report of operations for the season ending September 30, 1900. A new steam heater, additional pumping machinery and new water column arrived at the mine in March, pumping to under the shaft commencing on April 1st. Some delay was occasioned by the breaking of the plunger barrels of the large sinkers. When the water had been removed the shaft was then sunk 65 feet in the bedrock, which, owing to its nature, worked well with the use of very little powder. Mr. Campbell proceeds as follows: "At this depth, 350 feet from

the surface, a tunnel was driven in the direction of the channel 400 feet, being still in bedrock, an upraise of about 20 feet was made where gravel was encountered, also a small amount of water. This gravel gave excellent prospects in gold, 10 to 20 cents to the pan, but indications were that we were not yet in the main pay channel. Fearing that we might encounter more water than we could handle by opening this upraise more extensively, not having any pumping facilities for handling this bottom water, we decided to stop work in this upraise and extend the main tunnel another 100 feet, which was done and another upraise made and when about 15 feet above the floor of the main tunnel, we suddenly broke through into what appeared to be, and doubtless was, the bottom of the main channel. Water and gravel came in with a great rush. It was necessary to bulkhead this to make it safe. Very little gravel was secured from this upraise, but enough to show that it was very rich. We had placed a small sinking pump in the bottom of the shaft to pump what little water escaped from above to the pumping station in the shaft, and while its capacity was only 80 gallons per minute, we managed to keep the main tunnel dry with this small pump for nearly three days, hoping to make another drive from the main tunnel of about 100 feet, where we intended to make another upraise, tapping the gravel at another point. This tunnel had been driven a distance of 30 feet when the water in No. 2 upraise increased, covering the floor of the tunnel and making further work in 550 level out of the question.

"I then made arrangements for closing down, taking out one of the large sinking pumps, but leaving all the pumps in the pump shaft intact. I also put guides in No. 2 hoisting shaft, which leaves the two hoisting compartments clear, ready for using skips and water tanks so that when the shaft is again unwatered it can be done with much less time and expense, as we will then have the tanks and pumps both to use for that purpose. The shaft is now in perfect condition.

"It may now be considered that all doubt heretofore existing as to the value of the bottom gravel in this enormous dead river channel has been dispelled, and that there doubtless exists an extensive body of high grade gravel. It having been found to be enormously rich on its rims near the surface, but a few hundred feet distant from our shaft in the Ward-Horsefly mine, no other conclusion can be consistently arrived at.

"It will now be necessary to provide a suitable hoist, with cages and water tanks complete for the hoisting of water and gravel. It will also be necessary to provide a pumping plant for handling the bedrock water, and additional boiler capacity should be provided. I therefore recommend the appropriation of sufficient money for further equipping the mine and placing it on a paying basis."

TECHNICAL PERIODICALS OF THE MONTH.

THE ENGINEERING MAGAZINE.

HERE are three articles in the October number of more than usual interest. The first, "The World's Need of Coal and the United States' Supplies," by F. E. Saward, with editorial preface, deals

with the possibilities of coal exportations from the United States, even to the length of supplying fuel to factories and workshops in Great Britain. England is now producing nearly 240,000,000 tons of coal per annum, and as comparatively few new mines have been opened up for ten years, the cost of extraction as it becomes necessary to go deeper into the ground and the thinner seams have to be worked, is proportionally increased. England consequently under these conditions prefers to retain her fuel supplies at home. The vast coal fields of the United States are comparatively speaking untouched, and that this country will, as Mr. Saward puts it, become "the coal seller of the world" at an early date is a matter capable of mathematical demonstration. The question now will England be affected by the decline of her foreign coal trade is well answered in the editorial preface above referred to. It is pointed out that the new development will "prove as life-giving and as little to be considered menaces to England's prosperity as even the wheat of the prairies or the cotton of the Southern States . . . and "if American coals can be landed in European ports at reasonable prices it means simply that the thousands of factories, forges, workshops and ship-yards, which are the framework of Britain's power, are assured against stoppage or decline."

Following Mr. Sayward's abstract discussion of the question is a paper descriptive of the important Connessville coke region of Pennsylvania in which there are in operation or construction no less than 27,000 ovens and the industry represents an investment of \$100,000,000 and furnishes direct employment to 20,000 men.

An article on the use of water power by direct air compression by William O. Webster describes the various appliances in use for compressing air from falling water, among others the device known as the Taylor air compressor, one of which plants has been installed in the Ainsworth district of this province.

THE CANADIAN MINING REVIEW, OTTAWA.

The last number is devoted almost entirely to an account of the visit to Canada of the American Institute of Mining Engineers, together with a reproduction of the many interesting papers read. These together with the numerous handsome illustrations of the mines and localities visited form a most entertaining feature of the magazine. The *Canadian Mining Review*, however, is always worth reading, and has justly earned the high esteem in which it is held by the mining communities of Canada.

MINES AND MINERALS.

In *Mines and Minerals* for October Mr. R. B. Brinsmade, B.S., E. M., contributes the first of a series of papers on mining practice. In introducing his subject Mr. Brinsmade makes the following eminently sensible remark: "A managing engineer entering for the first time a camp whose practice is well established does well to move slowly, and to thoroughly acquaint himself with all the existing obstacles, and with the manner in which they have already been overcome, before attempting to introduce innovations. An old district like Butte is an entirely different problem for the engineer from a virgin camp like

Buffalo Hump, in Idaho, or Republic, in Washington where the methods applied must be for conditions largely novel. The engineer in a newly opened camp, therefore, must first study the actual conditions as far as his time permits, and the methods then applied must of necessity (whatever his previous experience) be largely tentative, and be introduced with the expectation of modification, or perhaps entire replacement by other ones, as the true nature and requirements of the district develop."

Other notable articles are "Limonite Ores of Pennsylvania," by T. C. Hopkins, Ph.D.; "Copper Mining in Northern Wisconsin," by Kirby Thomas, and a paper on experimental ore testing works, by Prof. Arthur Lakes.

MODERN MACHINERY.

"Transportation of Lake Superior Ores" is the title of the leading article, by Waldon Fawcett. Mr. Fawcett, after stating that fully 75 per cent. of the iron ore continued in the United States is derived from the mines in the neighbourhood of Lake Superior, proceeds to describe the methods employed in handling and transporting this product.

"It would be extremely difficult to say," he remarks, "which phase of these transportation plans is the most interesting. Beginning with the shovelling of the ore aboard cars by steam shovels, which will fill a twenty-five ton car in anywhere from two to four minutes, every move in the great carrying enterprise is a revelation. When the mines are situated at a distance from the lake, the ore is laden first on trains each made up of from 38 to 44 cars, which follow each other at intervals of half an hour and thus a single line can, by working to the limit of its capacity, transport upward of a million tons of ore per month. At the point of transference from rail to vessel the trains are run out upon one of the four tracks which traverse the top of the trestle-like structure which constitutes the loading dock. The ore is then allowed to escape through doors in the bottom of the cars directly into the bins or pockets of which the ore dock is made up. In all there are 21 docks built at five different ports, with pockets capable of storing approximately 850,000 tons of ore at one time. The vessels, of which there are several hundred, the larger boats costing from \$250,000 to \$350,000, make the journey down the lakes of nearly a thousand miles at an average speed of thirteen miles per hour, and upwards of 20,000 tons of ore has on occasions been towed on barges moved by one engine. The rate for carrying ore is \$1.25 per ton, and 26c. for trimming and unloading. When the vessels are unloaded a small percentage of the aggregate ore receipts is removed from the vessel holds by means of "whirlers" or revolving derricks, which swing an iron bucket from the hold to the car to be loaded. This method is, of course, serviceable only where it is desired to transfer the ore from vessels directly to railroad cars. The machinery most generally employed for cargo handling is what is known as the bridge tramway system of hoisting and conveying machinery. This permits the transference of ore either directly to the railroad cars, which are to transfer it to the furnaces, or to the stock or storage piles at the rear of the docks. The apparatus consists primarily of an elevated bridge or tramway, which spans the dumping ground and also the railroad tracks upon which are the cars which it is desired to

load. A trolley travels on this bridge and to it, in turn, is attached a bucket capable of holding about one and a half tons of iron ore. These large buckets are lowered through the hatches of the vessel and loaded by gangs of men. The bucket is hoisted and conveyed along the bridge simultaneously, and such is the rapidity of its operation that it is possible for a bucket to make a trip from a vessel to the extreme end of the bridge and return, a distance of 600 feet, in less than a minute. By the employment of this machinery it is possible to unload, 5,000 or 6,000 tons of ore from a vessel in a space of ten or twelve hours. The railroads which carry the ore from the unloading ports to the furnaces are in every respect fully the equals of the remarkable lines in the upper lake regions. They are equipped with steel gondola and steel hopper cars of a capacity of 40 and 50 tons each, respectively, and these are drawn by some of the most powerful locomotives in service in America. At some of the ports on Lake Erie there are yard facilities for upward of 500 cars, and as much as 25,000 tons of ore has been shipped by rail in a single day from one port."

In conclusion Mr. Fawcett remarks: "The season of 1900 is affording an excellent opportunity to fully test the capacity of the transportation interests of the iron ore trade. Unless all indications fail, more than 20,000,000 tons of ore will be moved during the season, and even with dock improvements costing hundreds of thousands of dollars, and a fleet of a score and a half of new vessels costing upward of \$10,000,000, the transportation men are still engaged upon the biggest problem which has yet been presented to them."

THE MONTH'S MINING.

SHOAL BAY.

(From Our Own Correspondent.)

THERE has been a dearth of news in this district during the last two months, though work has been steadily prosecuted on the B.C. Exploration Co.'s property in the Estero Basin, Frederick Arm. Here a four-drill compressor with sixty horsepower boiler has recently been installed, and a working tunnel which should cross-cut the lead at a depth of two hundred feet below their former work is at present being driven.

The Sunset, another promising copper property in Discovery Passage, is being developed, the results of the work done so far being such that the owners are now commencing work on a lower level or working tunnel which will give them a depth of one hundred and fifty feet on the lead. The ore in this property is a high-grade bornite, carrying fair values in both gold and silver. Beyond this nothing of note is being done in this district with the exception of assessment work on some of the prospects.

KAMLOOPS.

(From Our Own Correspondent.)

The attention that is being paid to this district by Eastern investors is steadily improving the mining outlook. Since my last notes were written a good deal of substantial progress has been made. Mr. W. J. Irving's property on Shuswap Lake has been sold to a Toronto syndicate. The showing on this property is a massive ledge of pyrrhotite about 40

feet wide carrying throughout low-grade values in copper and gold. Some lenses of high-grade ore are met with yielding 20 per cent. A SATISFACTORY copper; the whole showing is a most promising one and looks as if it will make a good paying proposition. Its location is also most favourable. The terms of the sale are not made public. The syndicate had an option on the property, which consists of three claims, and had it examined by their engineer and promptly met their first payment of half the purchase money on October 22nd, the balance to be paid on November 22nd. Steady progress is being made by the B. C. Exploration syndicate on both the Lucky Strike and Iron Mask mines. On the Iron Mask an upraise has been made from the end of the old drift to the surface; this has been timbered into two compartments and sinking will be commenced as soon as the 15-h.p. gasoline engine can be installed. Crosscutting at the level of the old workings has shown the width of the ore body to be over 30 feet with good values throughout. On the Lucky Strike good ore is being taken out steadily, most of which is of shipping grade and the management expects to commence shipping from this property next month. New bunk and cook houses have been erected, the old buildings having been converted into offices. Seventeen men are employed at present. The second payment of \$5,000 on the Iron Mask property fell due last month and was accordingly met.

Changes of an important nature have been made at the Kimberly mine. Mr. E. C. Wood who was concerned in the sale of the property and who has since acted as superintendent, has resigned and Mr. W. H. Fowler, one of the former owners, has been appointed in his place. Mr. Fowler has set about actively re-organizing the working of the property; buildings are being erected with all possible speed and everything is being put into shape for active and systematic development of the property. Regular progress is being made on several other properties. The tunnel on the Python is being pushed ahead and some ore is being met the existence of which was not previously suspected. This tunnel looks like showing up better results than the old workings. Messrs. Fowler & Carter are keeping men at work on the Hecla and are endeavouring to consolidate several surrounding claims into one group with the Hecla. Work is being done on several properties. On Jamieson Creek the Mollie Gibson and Homestake are showing up fine bodies of gold-bearing ore. A good deal of prospecting of dredging leases is going on and the arrangements of the Jamieson Creek Dredging Co. for putting on a dredger in the spring are well in hand. On the Tenderfoot mine, Copper Creek, the vein has been met at the 150 foot level and shows good ore; as a result more stock has been disposed of. The management are trying to make arrangements for shipping ore during the coming winter. It is reported that a deal is being arranged with the Truth mine. This is one of the best properties in the district and as such is very likely to change hands.

CAMP M'KINNEY.

(From Our Own Correspondent.)

The management have started work on the new winze from the east drift of the 400-foot level as outlined in the projected plan of development. A strike

of high-grade ore was made in the west drift on the 300-foot level almost directly below the mill and a fine body of ore has also been encountered in the east drift of the same level. The mill was recently closed down for a few days in order to make the connections with the new boiler which has just been installed and to inaugurate a few necessary repairs, but operations have again been resumed.

Waterloo.—Dr. Reddy of Spokane has formed a strong syndicate to take up the extra issue of Waterloo stock and so enable the company to further develop the property. Work will probably be commenced about the 15th of November. It is the intention of the company to either continue the present shaft down 150 feet or sink a new shaft where the upraise from the first level comes to the surface and continue this down to the 200-foot level. It is to be hoped that the new management will thoroughly open up the property before starting the mill and not fritter away resources as in the past.

BOUNDARY CREEK.

(From Our Own Correspondent.)

The most important event to chronicle in connection with the mining industry in the Boundary district this month is the substantial increase that has taken place in the quantity of ore being sent to the smelters. It is not generally known that the aggregate tonnage of ore shipped from the mines of the Boundary country to the end of October is about 54,000 tons.

The respective totals of the several shipping mines are as follows:

	Tons.
Old Ironsides and Knob Hill Group	31,000
B. C.	14,000
City of Paris	3,500
Brandon and Golden Crown	1,800
Winnipeg	1,200
Smaller shipments from other mines	2,500
Total	54,000

During the latter part of October the Old Ironsides, Knob Hill and Victoria mines together sent out an average of 600 tons daily, varying from that quantity on one day only, when 31 cars containing about 930 tons went out, this day's shipments constituting a record. The B. C. mine sent out 100 tons daily, the greater part of the month. The Mother Lode has commenced to send ore to the Greenwood smelter. Outside of these the individual shipments have been and still are comparatively small, nor is there at present a good prospect of other properties soon beginning to make daily shipments. The Gold Drop, Snowshoe, Brooklyn and Stenwinder are sufficiently developed to enable them to ship ore regularly, but it is not likely that they will do so for some time.

Work at the principal mines of the district has continued on the lines stated in previous letters to the RECORD. At the Old Ironsides and Knob Hill ore stoping has had most attention, development work here being far ahead of ore-raising operations. There are now more than 200 men employed at these mines. The B.C. mine is also employing most of its working force in getting out ore, but it is intended to push on with the sinking of the main shaft, now down 272

feet. The Mother Lode will soon be stoping ore, but development work will be continued in this mine to the 500-foot level. Much work was done last month at the 300-foot level, with good results, some of the best ore yet encountered in the mine having been opened up. New machinery is arriving and being installed at this mine. Other properties at work are the Snowshoe and War Eagle, in Greenwood camp; Athelstan and Golden Crown, in Wellington camp; Morrison, Crown Silver and three or four others employing each a few men, in Deadwood camp, and the R. Bell, in Summit camp. Altogether the mining outlook is increasingly promising, especially now that the output of ore is large enough to convince the outside public that there are in the district several mines that have already earned the right to be classed as producers to an extent that is compelling attention to their fast-growing importance.

Winnipeg, Manitoba, newspapers report Mr. Wm. Whyte, manager of all Canadian Pacific Railway lines west of Fort William, to have said respecting the smelters of the Boundary district: "At Grand Forks a new smelter has just commenced operations and 600 tons of ore besides coke are being turned out daily. Another new smelter is

ready to start work and when this has begun twenty cars per day will be shipped from the place. The smelter at Greenwood, taking the ore from the mother lode, run by an American company, is kept very busy. A smelter at Boundary Falls, west of Greenwood, is doing some interesting work." Now either Manager Whyte went away from the Boundary country after his recent visit with very hazy notions as to the conditions of the smelting works in the district—which is not customary among prominent C. P. R. officials, to whose utterances importance is usually attached—or else the *Free Press* reporter was out of his depth when Mr. Whyte told him about the smelters. Perhaps it is only to be expected that in an agricultural country such as surrounds Winnipeg the newspaper men know little or nothing about mining and smelting, so the references to a smelter which "turns out ore besides coke" and to shipping ore from a smelter, are, under the circumstances, excusable. It will perhaps be as well though to unravel the tangle the Prairie City reporter got into. The simple facts which he mixed up until they were scarcely recognizable are as follows: The Granby Company's smelter at Grand Forks, in the Boundary district, started to reduce ore in August 21st last, on which date one 250-ton furnace was "blown in." Owing to the ore being practically self-fluxing this furnace is able to treat up to nearly 320 tons per diem. On October 13 a second furnace was blown in and a few days later the Old Ironsides group of mines, which had previously been sending 300 tons of ore per day to the smelter, doubled their output, sending down 20 cars or 600 tons daily. As the shipping capacity of these mines, from which this smelter obtains its main supply, is considerably larger than the treatment capacity of the smelter, it is anticipated that more furnaces will soon be added to the smelter so as to provide for its being in a position to reduce a much larger quantity of ore than is practicable under existing circumstances. The other smelters to which the *Free Press* makes reference are not yet ready

to treat ore. The smelter at Greenwood has been erected and is now being equipped for reduction work by the British Columbia Copper Company, of New York, which company also owns the neighbouring Mother Lode mine. It is expected that the mine will be sending down to the latter smelter about 300 tons of ore daily early in the new year, by which time the smelter should be ready for continuous operation. The third smelter referred to is one now in course of erection on a site about three miles south of Greenwood, and near to the Boundary Falls town-site. The Standard Pyritic Smelting Company, an offshoot of the Standard Mining Company, of Quebec, which some time ago acquired the Standard and Marguerite mineral claims, in Deadwood camp, is erecting these reduction works. It is stated that the plant for this pyritic smelter is now on its way in from Denver, Colorado, and that by the time it shall arrive here the preliminary excavations and much of the necessary mason work will be well advanced. It is the intention of the company to complete this establishment by the end of the current year and it is probable this intention will be carried out. The experiment of pyritic smelting will be watched with more than ordinary interest. It is claimed that the process has proved a distinct success in Colorado and the promoters of the local enterprise have had tests made of Boundary ores that have satisfied them that here too, the industry will give equally satisfactory results. The foregoing information relative to the smelters of the district is given both as news of interest and with the object of correcting any erroneous ideas that the publication of statements imputed to Mr. Whyte may have conveyed to those who read both the *RECORD* and the *Winnipeg Free Press*.

The expected has at length come to pass, and circulars have been addressed to shareholders convening an extraordinary general meeting of the Winnipeg Mining and Smelting Company for the 16th of November next, with the object of placing the present concern in liquidation and re-constructing by incorporating a new company to be known as the Winnipeg Mines, Limited, non-personal liability, "with a nominal capital of \$1,250,000, divided into shares of the par value of \$1 each, fully paid up to the extent of 95 cents per share, and to allot to the shareholders of the old company share for share, and place the balance of the said shares in the treasury of the new company." This appears to me to be as good an arrangement under the circumstances as could be effected. These circumstances are meanwhile reasonably fairly set out in a general letter to shareholders, signed by Mr. Richard Plewman, the company's secretary. Mr. Plewman writes:

"The board of directors of the Winnipeg Mining and Smelting Company, Limited, regret to inform the stockholders that their efforts to make the mine a self-sustaining property without re-organization have failed. In February of this year the mine was shut down by the old management and remained in that condition for about three months. About the middle of May, some large blocks of stock having changed hands, all the old directors but two resigned and new ones were elected to fill the vacancies. The new management found the affairs of the company in a very discouraging condition. The mine was by

no means proved and much costly development work would be necessary before it could be a steady producer. There were only \$648 in the treasury—insufficient to meet the cost of unwatering the mine alone—and less than 20,000 shares of treasury stock on hand and its best market price the lowest in the history of the company. The management, however, had great confidence in the property, although not unmindful of the difficulties before them in attempting to make a mine without either funds or treasury stock. Some thought of re-organization at that time was entertained, but after obtaining the services of Mr. N. F. Tregear as superintendent and consulting with him it was finally decided to make a strong effort to make the mine self-sustaining without re-organization. For some months we were in a measure successful, but the compulsory development work and the heavy freight and treatment rates were too much for our resources in the present state of development. An important cross-cut on the 100-foot level has been run 120 feet and should be continued, but at every turn we were hampered by lack of funds, without which no considerable development could be prosecuted. The Winnipeg ground is considerably broken up above the 300-foot level, and it was very desirable to sink, so as to get below the zone of disturbance, but this policy also could not be prosecuted without running the property seriously into debt.

"In Mr. Tregear the company has a first-class superintendent. He has assured the management that the property promises well on further development, and he strongly endorses our re-organization plans. He is confident that the Winnipeg will make a mine, although readily acknowledging that the difficulties encountered have been greater than he expected.

"Many of the numerous ledges on the Winnipeg are low-grade—too low to ship profitably to the Trail smelter at \$7 (where most of our ore went), or even to the Granby at \$5.50, but in December next the Greenwood smelter will give us a \$4 rate. On the ore the Winnipeg has already shipped a \$4 rate would not only have saved the Winnipeg company several thousand dollars, but it would have enabled us to have shipped lower grade ore which a \$7 rate made prohibitory.

"The management has every faith in the future of the property if given a show, and looks to the stockholders for their support on the re-organization scheme submitted. It is believed that the 5c. in assessments will yield enough to make the Winnipeg a mine. It is not intended to put any of the new treasury stock upon the market at present. That will be held in reserve for the equipment of the mine, and if fortune comes our way it may never be issued. Re-organizations are expensive and in several well-known instances the process had to be repeated. Our plans are laid to prevent any fiasco of that kind. The assessment part of the plan was an imperative necessity, because it is so hard to sell treasury stock just now. We believe the stockholders will willingly contribute on a fair pro rata scheme towards the development of their property. At the coming meeting a full statement of the company's affair will be laid before the stockholders."

REVELSTOKE.

(From Our Own Correspondent.)

Although, as mentioned last month, the Big Bend

properties in this division will be practically idle this winter, yet very good reports have been brought down by the men who have been working in the Smith Creek placer claims. They appear to have

SMITH CREEK
PLACERS.

reached bedrock, which is white quartz deeply fissured, and considerable gold has been taken from these cracks. It is not impossible, but hardly likely that work will be resumed there before next year, when the "hope eternal" springs in our "human breasts" that it will be a more prosperous season than this has been. We must notice the recent death of one old Cariboo pioneer, Andy Parkes, who has worked in that special neighbourhood for many years, and always expressed his opinion that the ground was auriferous—unfortunately he did not live to see his predictions fully verified, though they were partially so. His was the ordinary lot of the pioneer and prospector, a long life of hard work with very little to reward him at the end of it.

A third—or is it a fourth?—survey has been made some 15 miles this summer for the long-needed Big Bend waggon road, but the fine weather has probably left us for the season and no progress whatever in the actual work has been made. Some say "politics" are at the bottom of it, and surely "politics" are responsible for many wrongs, but to a non-political individual like your correspondent such things seem nothing short of scandalous in this free country.

Turning now to the southeast, the well-known Lardeau division still holds it own. Perhaps the last remarkable find was on the Cromwell claim near the head of Brown Creek on the South Fork of the Lardeau River. This ore which has a most peculiar appearance, utterly unlike the usual "carbonates," looks

RICH STRIKE
IN THE
LARDEAU.

very much like a conglomerate of white balls cemented together with oxide of iron, though I do not know the composition of the white mineral—possibly decomposed feldspar. The ore, if such it can be called, runs very high in gold value, several assays having given as much as 20 ounces per ton, together with some silver. A small shipment is being made to the smelter, and the future of this property will be watched with the greatest interest. A very rich silver-lead find is reported from the Metropolitan group on the north fork of the Lardeau River; this is said on very excellent authority to carry from 300 to 1,000 ounces silver per ton; and the vein to be a narrow one (as is commonly the case when so rich) lying in a contact between schist and lime. It is reported to be from six inches wide of solid galena and gray copper to three feet of slightly less solid ore, but six inches of 1,000 ounce ore is not to be despised even at the present price of silver.

The lessees of the Triune—that claim which has paid its fortunate owners from the first shot, are doing their utmost to ship 200 tons before the snow put an end to this season's work; and if the remainder of the 200 tons yields as high values as the first shipment, the lessees will be considerably in pocket. The Nettie L., which has been working a small force for the last few months, owing to the expense of shipping ore during the summer, will considerably increase its staff very shortly, and work in the lower workings

will be very actively prosecuted, as well as on the rich vein now so thoroughly shown up in the old or upper workings. The shareholders of this company (The Great Western Mines, Ltd.) should hear something before many months are past that will afford them great satisfaction. The Silver Cup will of course ship heavily this winter, and the owners of that property also can congratulate themselves on the condition of their mine. Another, so far, less known claim will probably ship more or less this season, the Old Gold, where development has shown splendid bodies of very high grade ore. If only the railway were in the district, many other of the lesser lights would shine more brilliantly in the public eye, but in a country where in some places at present it would scarcely pay to bring out solid metallic silver, claim owners have perforce to be contented too frequently with doing assessments and holding on to their ground in the hope of transportation being provided.

Permit me to congratulate your correspondent (at the foot of page 394, last issue) on his remarks about smelting. It has been my lot in this country to see some exceedingly good work in that direction, and some that would disgrace a "pot puller," on the same ore. In this as in most other matters, experientia docet.

ROSSLAND.

(From Our Own Correspondent.)

The announcement that under the amended mining laws of this province the various mining recorders throughout the province will hereafter collect the statistical information relating to the mineral output of their respective divisions will be received with some satisfaction throughout the province as well as abroad. This information is not only necessary but it has become indispensable in connection with the imposition of

the government tax. A government bureau of statistics, especially mineral statistics, is regarded by many as the best method to obtain reliable information, yet there is considerable experience to show that the statistical information prepared by the government is often stale by the time it reaches the public.

It is generally conceded that the ore in sight in the chief producers of Red Mountain guarantees the permanency of Rossland. One hears fabulous accounts of the quantity of ore which has been measured by the eye of the mining engineer, the diamond drill and the divining rod of the enthusiast. Exact figures are given in some cases and the French notation of a billion is even exceeded by these calculators. That the ore reserves of the Le Roi and Centre Star are something extraordinary as to quality seems well established and that the local reputation of other chief producers stands well is equally positive. Nelson has the advantage of Rossland as a townsite situation, but the latter distances the former in the important item of ore production and shipments in the ratio of as 162,000 tons is to 40,000 for the nine months and 20 days ending October 20. The advantage of valuation of the ore is, however, in favour of Nelson—proportionately considered. The Rossland output has heretofore for this year been estimated at \$16 per

ton gross while the Nelson ores are valued at \$20 gross. It may, however, be found after the official revision at the end of the year that in both cases the values have been somewhat over-estimated. But accepting these for the present the gross value of Rossland ores is \$2,592,000 while that of Nelson's 40,000 tons is valued at \$800,000 gross.

For the whole of 1899, 172,665 tons of Rossland ores were officially valued at \$3,229,036 or nearly \$18.71 per ton 58,302 tons of Nelson ores for the same period were officially valued at \$879,185 or \$15.08 per ton. According to these figures the Rossland ores have decreased \$2.71 per ton and Nelson ores increased \$4.92. There is some discrepancy in the Nelson figures as given, and the Rossland ores are at least \$1.00 per ton higher in the official figures than they should be. As the unit value of the ores is something that is now more or less being investigated the returns hereafter made will very likely be nearer the mark than formerly as a more direct system of obtaining these statistics will prevail.

Le Roi No. 4 (Great Western).—A recent discovery in this mine on the 1,000 foot level is reported. The pay shoot has been encountered in the west drift 116 feet from the shaft and another 164 feet from the shaft on the east drift. This mine is being developed by six tunnels. These aggregate about 15,000 ft. and have reached the western end of the property. The strike in the east drift is regarded as the best. About 400 feet of backs have thus been obtained. This mine, according to the statement of the management, will be in a position to ship about 500 tons daily next spring. The ore is self-fluxing and therefore can be treated much cheaper than other Rossland ores.

California.—Operations have been suspended. The pump has been taken from the shaft and all the employees except the watchman discharged. The California is a full sized claim opposite the White Bear and west of the Annie. It is equipped with a ten-drill compressor, a 15 h. p. induction motor and a 30 h.p. hoist. The development work consists of a shaft near the west line and a tunnel running north and south across the property. A good deal of cross cutting has been done. The best indications of ore are near the west line where a shaft has been sunk, but most of the work has been tunnelling without much regard to indications. The California is owned by the California Gold Mining Company and is one of the properties of the Miner-Graves syndicate. When the geological conditions of this property are better understood more substantial results will no doubt be obtained.

The Dominion Geological Survey party which has been working in the vicinity of the Kettle River country under the direction of Mr. R. W. Brock, has completed the field work for the season and have proceeded to Ottawa, where a report and maps of the district will be prepared. The area covered is from Rossland to the North Fork of Kettle River and from the international boundary line north to the head of the chief branch of Kettle River. The map will not, I am informed, be published until next summer.

The ore output from Rossland mines is now worth about 10,000 tons of the entire out-turn for 1899 of the same mines, and by the end of the present month

ROSSLAND AND
NELSON
COMPARED.

last year's output will be fully reached, leaving two months' output to mark the increase over last year's shipments.

NELSON.

(From Our Own Correspondent.)

The growth and progress of the capital of the southern interior afford material for retrospection and consequent comparison. In August 1895 I climbed one of the nearby steep mountain sides and reached the track of the Spokane Falls & Northern. At that time there was no smelter, no electric trams. It was in short a mining camp and nothing more. The advancement since has been truly wonderful. I find Nelson in a flutter caused by the sitting of the Assize Court with the Hon. Mr. Justice Walkem presiding. One of the cases is a mining dispute with a charge of conspiracy—the old story of a galena farm and false representations. A German who lives down by the sea near Seattle paid out \$900 for a galena ledge that proved to be invisible. The Deputy Attorney-General who prosecuted the case is evidently conversant with his duties, for notwithstanding a very plausible, if not ingenious defence, set up by the prisoner's counsel the jury were not influenced and rendered a verdict of guilty. The sentence imposed by the Court was eighteen months in the penitentiary, an attempt to prove that a galena vein had been found by a *post mortem* having dismally failed to shake the determination of the jury.

In the matter of statistical information relating to the mineral industry of the Nelson division, I find there is room for the pathfinder—the trail has been blazed at intervals, but it is not well defined. Now, I must seize this opportunity of stating for the information of the Nelson public that mining statistics to be of any use must be up-to-date for it has been well said that "belated statistics" are "ancient history." Such a progressive and prosperous mining centre as Nelson is cannot afford to lose sight of this fact. The Dominion Government and the Provincial Government are directly interested in a system by which these figures may be assembled and published.

Now and then cases arise in this province suggesting that the business morality in mining circles is open to criticism, and that much injury to legitimate mining is inflicted. The local press just now contains some interesting chapters on this subject. The arrest of Mr. Ernest Mansfield is a case in point which has elicited some comment.

MR. MANSFIELD'S ARREST. Mr. Mansfield is a well known mining promoter of Southern British Columbia. He was arrested at Nelson on October 17th on a *capias* at the complaint of the miners working in Camp Mansfield. The amount due for wages is said to be \$2,000 in addition to other amounts amounting to about \$4,000. The fact that Mr. Mansfield has been instrumental in causing the investment of, at least, \$100,000 in the Kootenays and the circumstance that he is an agent and not a principal, and has means of his own, have invested the case with unusual interest. The difficulties, it is understood, began some time ago when remittances from the company's headquarters in France ceased. As time went on and wages remained unpaid matters culminated by the mines in Camp Mansfield being shut down on October 12th. Mr. Mansfield immediately forwarded cablegrams to Rene Laudi stating the situation and urging remit-

ances. The miners delayed further action until Tuesday, October 16th, the time being further extended until the evening of the 17th, when a *capias* was issued and Mr. Mansfield was arrested. Mr. Mansfield went to gaol, but previously sent a cablegram explaining the situation. He received a cable from Laudi, the French manager, authorizing him to draw on him (Laudi) for funds. Mr. Mansfield refused to do this, but so far he has not given satisfactory explanations of his refusal. The miners did not seek to protect their claims under the Lien Act, because it appears that the property is recorded in Laudi's name and the men were employed by Mr. Mansfield. Subsequent events will no doubt clear up the facts of this case.

So far as I have been able to determine the ore shipment from Nelson mining division from January 1st to October 20th amounted to 40,000 tons. Statistics as to valuation, etc., are wanting, but will be supplied later.

Hall Mines.—The management is installing a new \$30,000 plant in the mine on the 300 and 500 foot levels. The smelter is heating 200 tons daily. Ore purchasing has ceased owing to the lack of smelter facilities. A new Godsal reverberatory furnace is being erected.

Yellowstone.—The mine is shipping about thirty tons daily amounting in value to \$300.

Second Relief.—About 1,600 tons have been shipped, valued at \$75,000.

Granite.—The daily shipments are thirty tons, valued at \$300.

Athabasca.—The shipments amount to fifteen tons daily, valued at \$700.

Highland.—The sale of this property through Mr. Charles E. Parker was recently reported.

B. C. Goldfields (Ymir Mines).—The mill is treating about 240 tons daily, valued at \$2,400.

London and Consolidated.—The management has about 5,000 tons of \$40 ore ready at Crawford Bay for hauling to lake points about twelve miles as soon as the road is completed. About 30,000 tons are blocked out.

YMIR.

(From Our Own Correspondent.)

I am pleased to state that the Ymir mineral exhibit in charge of Mr. Alfred Parr received the following awards at the Spokane Industrial Exposition: Free gold specimens (first prize), gold medal; free milling gold ores (second prize), bronze medal. These two prizes establishes Ymir Camp as a strictly free milling one, and when it should be remembered that those competing for the prizes, were Montana, Idaho, Oregon, Washington and British Columbia, it is a feather in our caps.

The deal reported in last month's RECORD concerning the Wilcox did not mature for the reason that the American holders of stock were opposed to the property being transferred at such a low figure, and I am glad to state that funds are being raised which will enable the Broken Hill Mining and Development Company to instal a mill in the spring on the property. Meanwhile mining activity here is very marked and the indications are that we shall have a very prosperous winter. All the mines are running full time, and many prospects are to be worked throughout the winter months. The contract has been let

for clearing the right of way for the Tamarac Tramway and inside of two months it will be in operation and bring ore to the railroad for shipment to the smelter.

SLOCAN.

(From Our Own Correspondent.)

If the prospective value of any field of operations is to be judged by the efforts put forth to open it up, then the Lake District is certainly entitled to well merited attention, for no fewer than four important waggon roads have recently been completed. It is encouraging to note that they are not confined to any one section, being pretty well distributed over the known mineral area. First of all we have the road up Silver Mountain from New Denver, then that to the Hewitt connecting with Silverton and at the foot of the lake two more up Springer and Lemon Creeks respectively, the former tapping the rich district in which the Arlington is situated, the latter serving to open up a part of the country which may eventually belie the appellation conferred upon the "Silvery Slocan" by becoming famous as a gold producer. Public works of this description are not without significance and in this instance they merely indicate that the initial prospective stage—though prolonged until many had given up hope of ever arriving at anything better—is passed and that mining on a legitimate basis is begun in earnest with something substantial to show in the nature of returns. The reproach that Slocan Lake properties lived on the reputation of those situated around Sandon is heard no more, for with an output of 3,500 tons already this year which should easily be increased to 5,000, worth roughly half a million dollars, by the first of January, and such producing mines as the Bosun, Enterprise, Arlington and innumerable others which have long been awaiting transportation facilities, there is every confidence in the future.

I have more than once in these columns drawn attention to the statement that although the Slocan is primarily a silver-lead camp, the possibilities in the way of a limited gold production and even of a small copper output are not altogether to be despised.

Putting aside the fact that some few of the galena ores carry gold in quantity which renders it a more or less valuable accessory constituent, it is well known that in the majority of the dry quartzose ores gold plays a no inconsiderable part in meeting the treatment charges, in addition to which we have the Lemon Creek district before mentioned where gold values largely predominate, occurring very often in a condition which will admit of their being successfully milled on the spot. It is not, however, so generally understood that there exists on what is known as Red Mountain lying between Silverton and Ten Mile a territory in which gold is found, not associated with silver as one would naturally expect, but more or less intimately disseminated through the baser sulphides of iron and copper; in other words, closely resembling the Trail and Boundary product. It is this which induced Mr. Graves, so well known in the latter district in connection with the Granby smelter, to undertake the development of the Rockland, a large proposition of this nature with an excellent surface showing. Without committing myself on the subject, I may say that so well have preliminary operations pro-

gressed that government assistance in the construction of a waggon road to the property has already been tendered. Like many another possibility, however, the development of the mining industry along these lines in the Slocan may be merely a dream for the future, but one at any rate which it is well worth keeping an eye on.

The chief subject of interest around Sandon at the present time is the contemplated starting of the machinery at the Ivanhoe concentrator. This mill, though differing but slightly except in the matter of daily capacity from previous efforts in this direction, marks another step forward in the utilization of the immense bodies of lower grade ore which it is impossible to ship profitably under present conditions. I may be allowed to reiterate in closing what I have many times before insisted on, that the permanent progress of the Slocan in common with all mining districts, though in a lesser degree perhaps than many, depends as much upon the proper economic preliminary treatment of the poorer classes of ore as upon the development of the richer and higher grade chutes, and we cannot hope until such time arrives to see the Slocan attain to its maximum output.

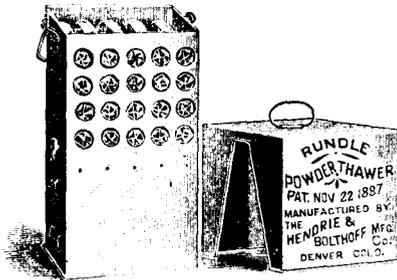
THE RUNDLE POWDER THAWER.

BY far the greater percentage of mine accidents are due to the careless handling of high explosives, and more particularly to the dangerous methods so commonly employed by miners to thaw frozen powder. Hence the use of a simple and inexpensive device such as the Rundle powder thawer is to be most strongly recommended. For several years this thawer has been extensively used in the iron and copper mines of Michigan with wonderful success. It is constructed of galvanized iron, is strong, durable, compact and convenient. The tubes, twenty in number, are entirely surrounded by water, thus keeping the powder in constant working order. As these tubes are open at both ends the powder is less confined and there is no danger of a part of the stick being left in the tube. Owing to the fact that the powder lies on its side there is no danger of its melting and running into a mass as is often the case where the powder stands on end, as in some types of thawers. Where conveniences are such that warm water can be poured in from the start, a single candle snuff three inches long will hold the temperature for from six to eight hours. This warmer holds one and one-half gallons of water, and tests show that two three-inch snuffs will heat the water to 120 degrees. One valuable feature is the fact that in order to place the powder in the tubes the cover must be removed and this exposes the water reservoir, hence there is no excuse for not knowing the amount of water contained in the thawer. The device was introduced into the West by the Hendrie & Bolthoff Manufacturing Co., of Denver, Colorado, who among other testimonials received the following letter from Mr. H. A. Lee, the Commissioner of Mines for Colorado:

"Gentlemen:—The Rundle powder warmer, left by you with this Department, has been subjected to series of tests under conditions both favourable and unfavourable. As a result, I can most heartily recommend it to all consumers of nitro-powder compounds. It reduces the risks incurred in thawing frozen powder to the minimum and its universal use

in accordance with your instructions would save the lives of many miners annually."

With reference to accidents from "the dangerous custom still prevalent in the mining camps in the handling of nitro-powder or dynamite" Mr. Lee also writes: "The records show . . . a total of twenty-two casualties from powder explosives in two months. The cause of these accidents are picking out missed shots, the use of iron or steel tamping bars and the warming or thawing of frozen powder. It seems strange that the almost daily reports in the press, detailing the powder explosions and their sad results, do not stop practices proven unsafe. That it does not is evidenced by the above showing and can only be accounted for on the ground of ignorance or carelessness bred from familiarity. At this season of the year explosions from thawing powder are most prolific. They are caused by thawing powder in front of a fire or blacksmith forge, on boiler walls and previously heated hot sand, by dipping in hot water, thawing, in can heated by candles or by holding in flame of the candle. Investigation demon-



strates that but comparatively few nitro-powder consumers are aware that quick thawing or the application of dry heat of high temperature is the cause of explosions. To state this in another manner: Frozen nitro-powder heated quickly to 120 F. is liable to explode at any time, but may not. Investigation further shows that the real danger lies in the fact that in a great majority of cases powder heated quickly does not explode and for this reason methods absolutely dangerous are accepted and considered safe. Of the twenty-two accidents above noticed, all of the men injured or killed were old miners and were pursuing customs which they had followed for periods varying from five to twenty-five years without fatal results."

We would strongly recommend to mine owners and others the advisability of writing to Messrs. Hendrie & Bolthoff for a more detailed description of the Rundle appliance.

TRIPLEX ELECTRIC SINKING PUMP.

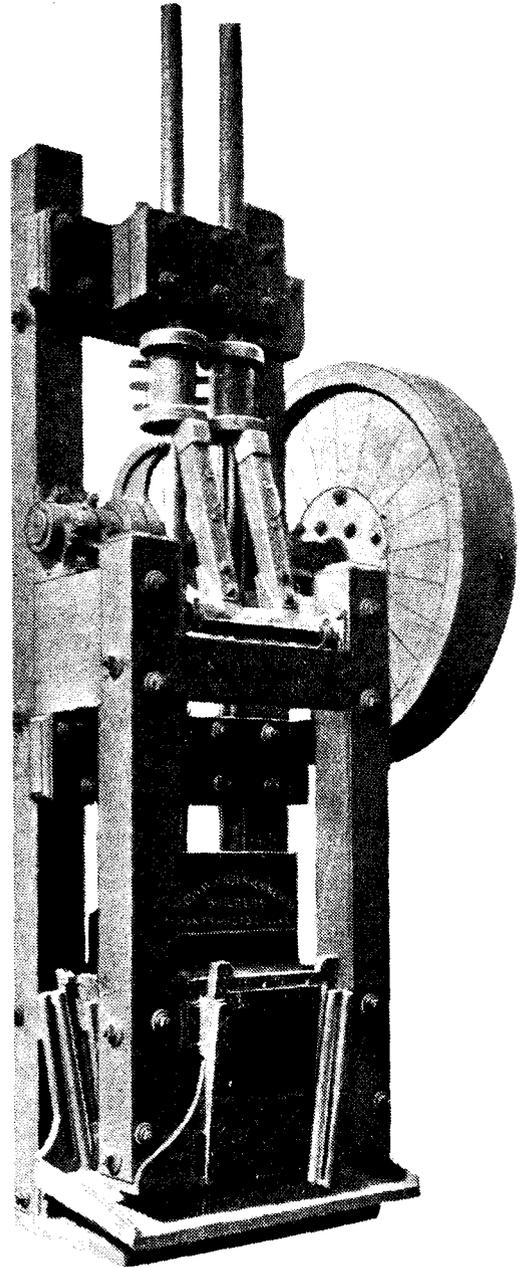
THE new triplex electric sinking pump illustrated herewith by the Jeansville Ironworks Co., of Jeansville, Pennsylvania, U. S. A., is claimed by the manufacturers to be satisfactorily susceptible of operation by an electric current direct from a water power situated miles from the point of application; that it produces no heating effect in the shaft—the steam pipe being entirely eliminated, and when in use current is consumed in the exact proportion to the work performed.

The design contemplates three single-acting plungers operating from a common crank shaft, with crank pins placed 120° apart, the resultant action of these

three plungers being to produce a continuous and constant stream to the column pipe, and tend to reduce to a minimum the shock and jar thereon.

The steel crank shaft is driven by two gears, fitted over the discs, which form the outside checks of the two end cranks, thus designed to relieve the shaft of one-half the strain that would be brought upon it if driven by a single gear at one end.

The motor is on top of the pump frame, and is



connected to the crank shaft by gearing to give the desired speed to the pump. The pump frame is made to receive any make of motor which is adapted to this kind of work, either direct or three-phase current.

The Joshua Hendy Machine Works of Nos. 38 to 44 Fremont Street, San Francisco Cal., are the Pacific Coast agents for the Jeansville pumps, and will be pleased to furnish catalogues and detailed information.

TRADE CIRCULARS AND CATALOGUES.

MESSRS. A. LESCHEN & SONS issue an interesting and comprehensive catalogue of their manufactures of wire rope and cordage and special attention is directed to flattened strand ropes, which instead of being made up of strands of circular form in cross-section, are constructed with strands, each of which has one or more flattened surfaces, so that one flattened surface is exposed on the outside of the full length of the rope, with the result that a plurality of wires in each strand must at all times take the wear instead of there being only one external wire in peripheral working in each strand, as is the case with ropes of ordinary or of "Lang's lay" construction whilst new. Until the wear has greatly advanced and consequently, a considerable diminution of strength has taken place in an ordinary or "Lang's lay" rope, the friction is borne in a very marked manner upon the crown of the one wire nearest the periphery of the rope in each strand; and in cases where small wire is used it is rapidly worn through, whilst heavier wire has a tendency to fracture where the abrasion has taken place. Owing to the number of wires that are at all times exposed for wear in a flattened strand rope for a considerable distance along their respective lengths, a smooth or comparatively smooth surface is presented even whilst new, and the wear is consequently light upon any one individual wire, and the tendency to become brittle is minimized. These ropes are exceedingly flexible and are less liable to the crushing action which frequently takes place in other ropes. We shall be glad to forward copies of this catalogue to our readers, or application may be made direct to Messrs. A. Leschen & Sons Rope Company, 920-922 North Main Street, St. Louis, Mo.

We are in receipt of a handsomely illustrated catalogue and price list of hoisting machinery from Messrs. the M. C. Bullock Man'g Co. of Chicago. Descriptions and photographs are here given of standard hoisting drums, geared multiple-drum plants, direct-acting hoists, single and double-drum hoists and geared reel hoists, and reverse engine. Embodied in the catalogue are numerous very complete tables for calculating allowable strain on rope, etc. Copies of this catalogue will be forwarded upon application.

MINING RETURNS AND STATISTICS.

NELSON.

THE customs returns for September place the value of bullion exported at \$55,126 and the value of ore at \$4,730. The result of operations at the Athabasca for the month of September was as follows: Period of run, 26 days and 8 hours; number of tons crushed, 410:

Value of bullion recovered \$11,583 36
Value of concentrates recovered 4,680 00

Total values recovered \$16,263 36

This shows that the value of the ore milled was \$39.76 a ton. Corrected returns for the month of August place the total values recovered for that month at \$17,872.24.

During September, the Granite Mill crushed 835 tons of Poorman ore, producing 300 ozs. of bullion, of the estimated value of \$6,050, or with 27 tons of concentrates, \$6,750.

SLOCAN.

The following are among the exports from Kaslo for September:

Ore, pounds	4,137,000
Value	\$176,392 00
Lead, pounds	1,839,000
Silver, ounces	196,430
Valued at	\$117,858
Coal, tons	1,946
Valued at	\$3,897 00

The shipment of ore from Slocan Lake points from the 1st of January to the 20th of October inclusive aggregate 3,489 tons.

The *Kootenain* presents the following returns of ore shipments over the K. & S. railway for the year to the end of September:

Month.	Pounds.
January	1,498,000
February	794,000
March	1,717,000
April	1,550,000
May	3,036,000
June	4,573,000
July	3,331,000
August	2,488,265
September	4,011,000

Total 22,998,265

In detail the September shipments via Kaslo were:

	Pounds.
Payne to Everett and San Francisco	638,000
Whitewater to Kootenay Ore Co.	1,506,000
Last Chance to Kootenay Ore Co	970,000
Slocan Star to San Francisco	240,000
Rambler to Everett	278,000
Ruth to Kootenay Ore Co., Kaslo	360,000
Noble Five to Kaslo Ore Co	64,100
Cork to Kaslo Ore Co.	40,000
Trade Dollar to Kaslo Ore Co.	80,000
Bismarck to Kaslo Ore Co.	34,000
Mountain Con to Kaslo Ore Co	41,000

Total 4,267,000

EAST KOOTENAY.

In September the North Star and Sullivan mines shipped 2,620 tons; the St. Eugene Consolidated of Moyie making also shipments of 16,051 tons of concentrates.

CARIBOO.

The Consolidated Cariboo Hydraulic Mining Co., Ltd., of Bullion, completed on Oct. 1 the second run of the season, producing as a result of 68 days' working operations, a gold ingot weighing 9,040 ounces, valued at \$154,765.

ROSSLAND.

In the Rossland camp the Iron Mask has recommenced shipments at the rate of about 70 tons weekly; the War Eagle is making occasional shipments, and the Velvet has entered the productive class, with a beginning of 25 tons daily. To the end of October the shipments from this camp are shown in the following table:

Mine.	Tons.
Le Roi	130,598
Centre Star	23,130
War Eagle	10,663
Le Roi No. 2	2,207
Iron Mask	1,735
Giant	389
I. X. L.	420

Mine.	Tons.
Evening Star	351
Monte Christo	273
Iron Colt.	80
Spitzee.	20
Total	169,866

The following is a detailed report of the Le Roi output for August:

The shipments made to the Northport Smelting Works totalled 19,302 dry tons from various sections of the mine, as follows:—

	Tons.
From the 200 ft level.	827
From the 300 ft. level	280
From the 450 ft. level.	196
From the 500 ft. level.	1,988
From the 600 ft. level.	6,904
From the 700 ft. level	6,791
From the 800 ft. level.	2,316

Total 19,302
 the estimated value of which was \$238,427. There was further shipped from the second-class ore dump during the month to the Trail smelter 3,512 tons, netting \$15,730, making the total shipments for the month 22,814 tons. It is interesting to note during the three months ended August 31st, there were extracted from the mine and shipped to the Northport smelter 53,283 dry tons of ore, having a gross value of \$702,412.74. This is considerably more than the combined shipments of the mine during the previous six months. In addition to the above there have been shipped to the Trail smelter from the second class ore dump 4,817 dry tons, making the actual output 58,001 dry tons.

BOUNDARY CREEK.

The Granby smelter, which was blown in two months ago, has thus far shipped 22 carloads, or 600 tons, of matte to a New York refinery. This matte is estimated to be worth \$10 per ton. This would give the value of the total shipments to date as \$105,600.

COAL EXPORTATIONS.

THE exportation of coal from the Vancouver Island collieries for September were as follows:—

	Tons.
New Vancouver Coal Co.	31,997
Ladysmith.	24,237
Union	10,013
Total	66,247

For the three weeks of the present month the New Vancouver Coal Co. shipped:—

Date.	Vessel and destination.	Tons.
1—SS.	Condor, San Francisco	942
4—SS.	R. Adamson, San Diego	4,455
8—SS.	New England, Alaska.	42
9—SS.	San Mateo, San Francisco	4,364
13—SS.	Titania, San Francisco.	5,764
16—SS.	Ruth, Seattle	21
16—SS.	New England, Alaska.	41
20—Ship	Cyrus Wakefield, Manilla.	2,700

Total 18,329

THE METAL MARKET—OCTOBER.

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

SILVER.

ON the 5th of October the price of silver was quoted in New York at 64 $\frac{3}{8}$, the highest point reached for several years, the mint order for bullion being, however, satisfied the market gave way and declined several points. Recent advices are to the effect that there is again much enquiry for the metal, which is not likely to be satisfied without another advance. Our latest quotations are 63 $\frac{1}{2}$ @63 $\frac{1}{2}$.

COPPER.

The market has been quiet but fairly firm, there being few European purchases and little American business. Some of the heaviest producers are, however, reported to be sold out to the end of the year and it is believed that shortly a heavy buying movement may set in. Lake copper is quoted at 16 $\frac{1}{2}$ @16 $\frac{3}{4}$ c.; electrolytic in cakes, wire bars and ingots at 16 $\frac{1}{2}$ @16 $\frac{3}{4}$ c.; in cathodes at 16@16 $\frac{1}{4}$ c.; casting copper at 16 $\frac{1}{4}$ c.

LEAD.

There is little change in prices though business is more active. The New York quotations are 4.32 $\frac{1}{2}$ @4.37 $\frac{1}{2}$; St. Louis, 4.25@4.32 $\frac{1}{2}$.

SPELTER.

The conditions remain unchanged, 4c. being quoted from St. Louis and 4.15c. New York.

THE LOCAL STOCK MARKET.

WE are indebted to Messrs. Foulkes & Co. for the following report:

From the shareholders' point of view there has been very little improvement during the past month in the local mining market, though it is to be hoped that the large amount of work being done on some of the Kootenav properties will brighten prices before the close of the year.

The most important movement in the "bull" direction was the sudden rise of Crow's Nest Coal shares, some of which were sold as high as \$49.50. Buyers having been satisfied, the stock declined rapidly and it is expected that it may go below \$40.00 before it again recovers.

Rambler Cariboo also had a rapid rise from 32c. to 29c., but it was only very temporary and doubtless caused by the "ring" who control this stock for the purposes of unloading at the top of the market and then bearing the same to recover their holdings.

Noble Five has been inactive and the anticipated improvement of the market value of this stock has not yet taken place though it may be looked for.

The feelings of the ordinary shareholder of Van Anda are not to be envied, but it would be nothing less than throwing money away to attempt to realize under existing circumstances.

An endeavour is being made to pay off the debts of the Fontenoy Company and until this is done no movement can be expected in the stock as the property is idle for want of funds to renew development work.

Athabasca is quoted at \$5.75 as against \$6.50 a month ago, and there has been generally speaking a flat tendency over the whole market during the past month.