

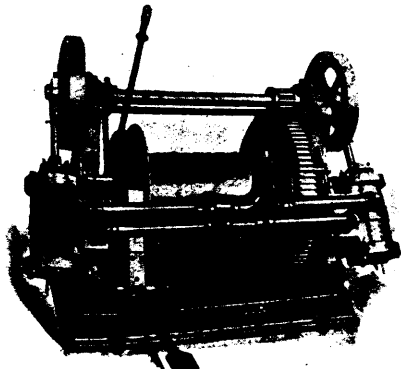
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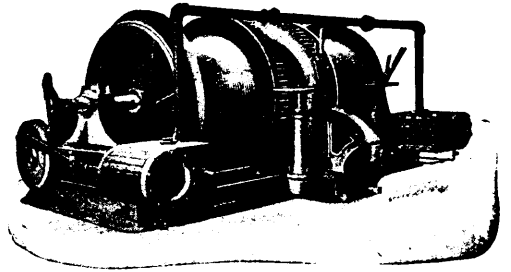
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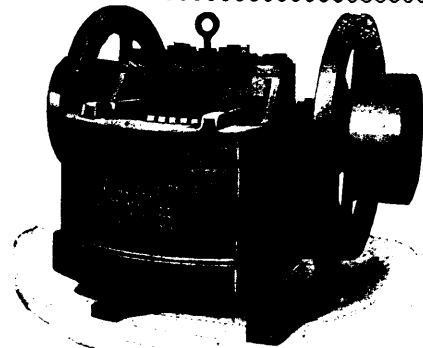
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Mining
Machinery.**



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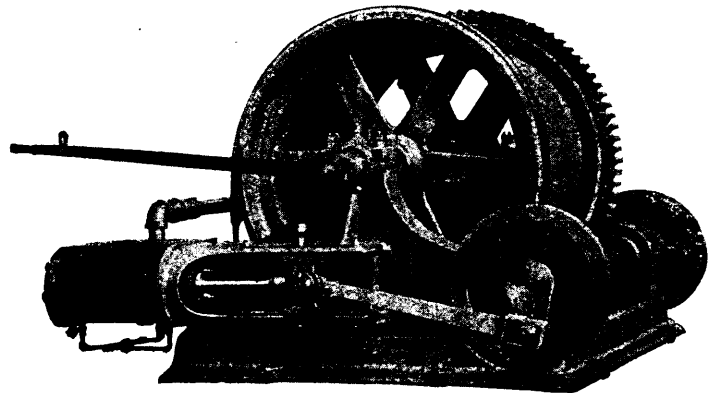
Earle C. Bacon, Engineer

Haveme er Building NEW YORK.



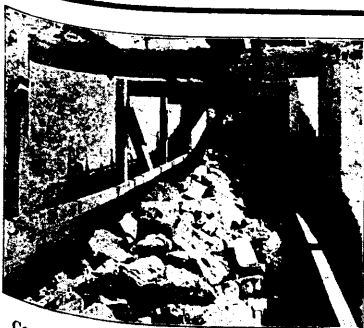
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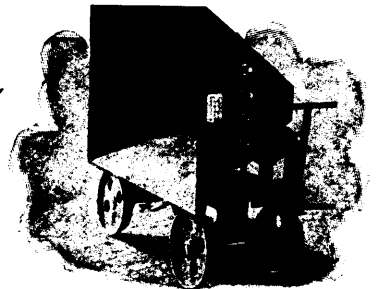
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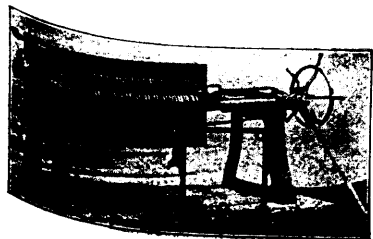
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ANY MATERIAL.
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WM. R. PERRIN & CO., CHICAGO, ILL., U.S.A.

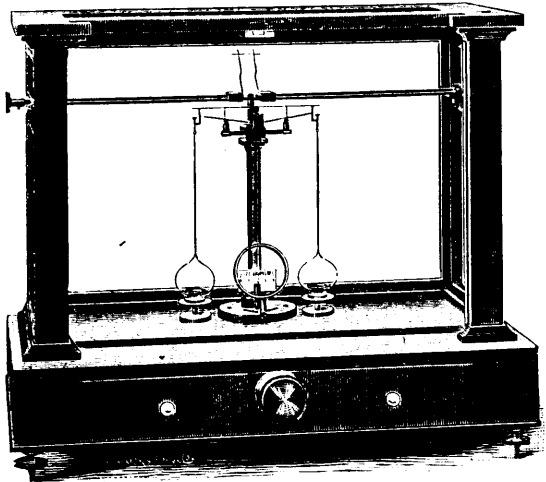
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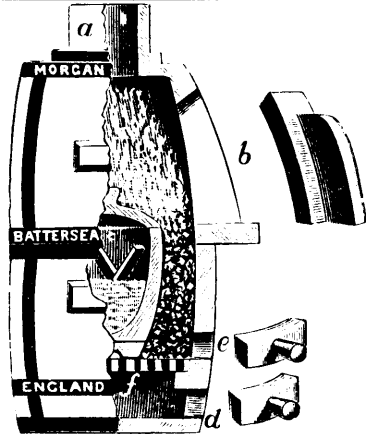
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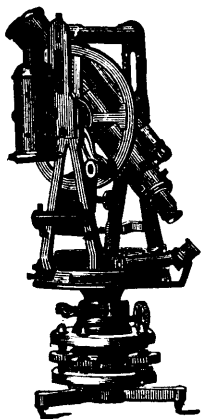
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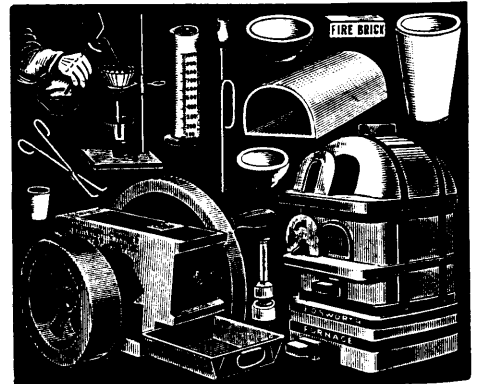
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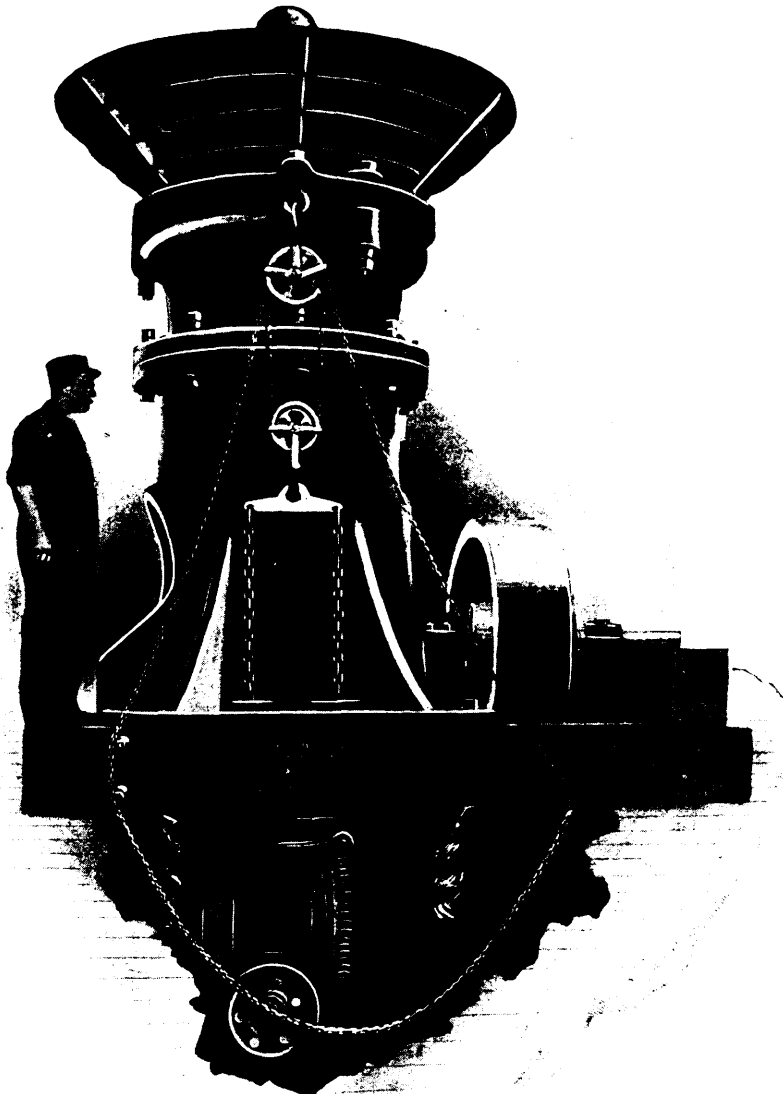
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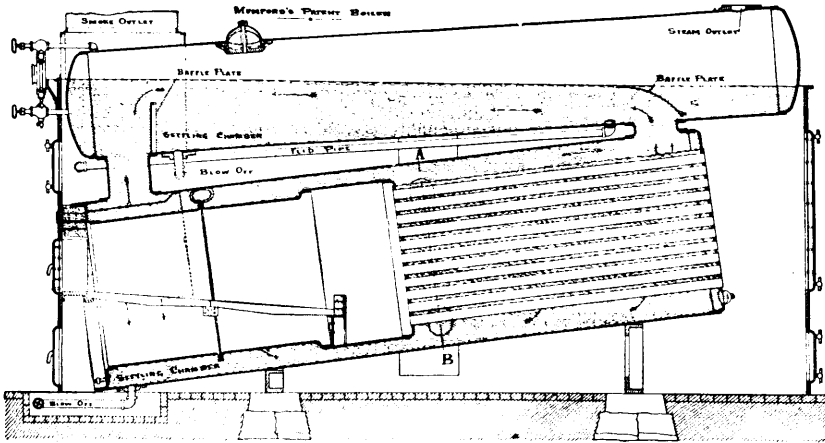
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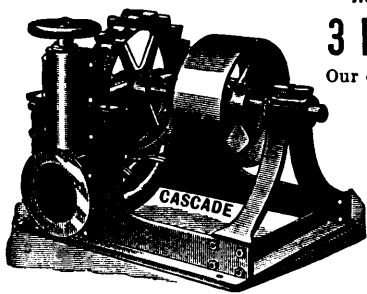
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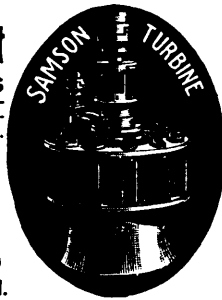


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A HIGH TESTIMONIAL.

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

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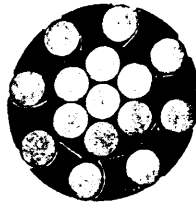
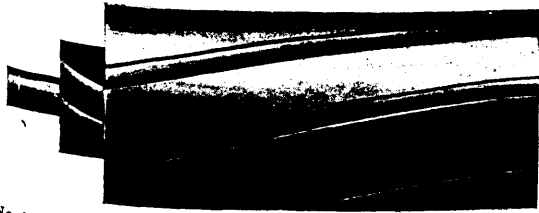
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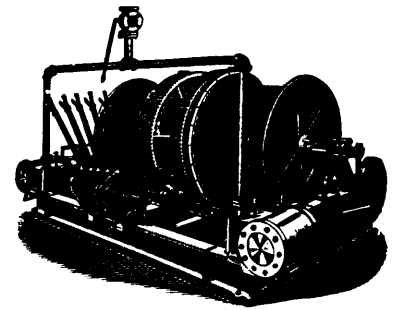
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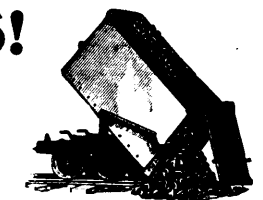


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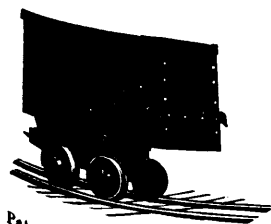
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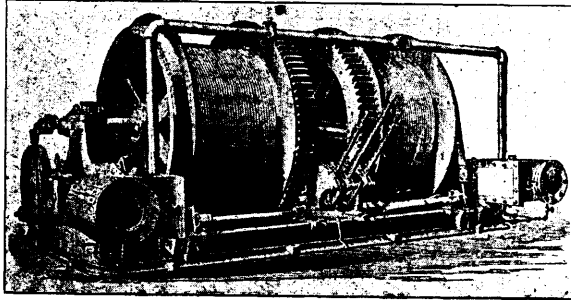
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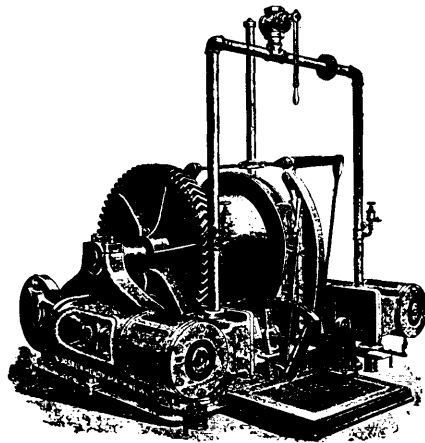
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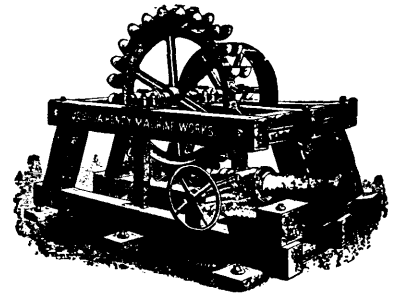
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JAMES D. SWORD, Manager.

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 READY
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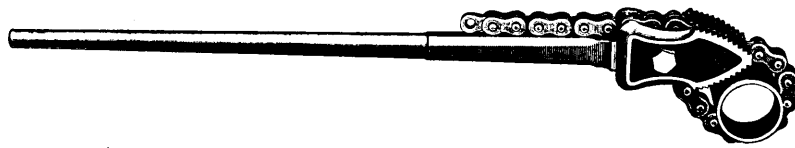
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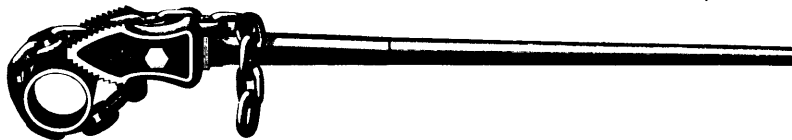
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The Mining Record.

Vol. V.

MAY, 1899.

No. 5

BRITISH COLUMBIA MINING RECORD

Devoted to the Mining Interests of British Columbia.

PUBLISHED BY

The Mining Record Limited Liability.

ADVERTISING RATES ON APPLICATION.

H. NORTIMER LAMB, Managing Editor.

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

ALTHOUGH somewhat late in its appearance this year—a fact doubtless attributable to the demands made on the Government Printing Bureau by the stress of sessional and other work—the report just issued by the Department of Mines, dealing with the progress of mining in British Columbia for 1898, must, nevertheless,

be welcomed as certainly one of the best and most complete official records yet given to the Canadian public; and for the creditable preparation and compilation of this work, the Provincial Mineralogist, Mr. W. F. Robertson, is entitled to the highest commendation. Mr. Robertson, in submitting the report to the Hon. the Minister of Mines, takes occasion to say that in its compilation he has adhered as closely as possible to the system established by his predecessor, Mr. Carlyle, a fact which, in our opinion, by no means detracts from the value of the present work which thus becomes a continuation of the records of the previous years' mining developments, with the addition of valuable data in respect to sections of the country concerning which but scant or very inaccurate information had been alone previously available. Thus, in the case of the 1898 report, much space is devoted to the East Kootenay District, and most of the excellent illustrations, whereof there are nearly fifty engraved from photographs specially taken by the Provincial Mineralogist, are of scenes and places visited by him last summer in the course of his duty.

As usual, the first pages of the Report are taken up with tables of a statistical nature relating to the mineral production of British Columbia from the commencement of mining in the Province brought down to December, 1898. These figures must always neces-

sarily be interesting, but so far as the result shown of our mine output for last year is concerned they are likely at first sight to cause some disappointment. According to Table II. of the Minister of Mines' Report the total mineral production of the Province last year is valued at \$10,906,861, as compared with an aggregate worth of \$10,455,268 for 1897, or a gain for 1898 of rather less than half-a-million of dollars. Without explanation this could hardly, in view of the developments that at the commencement of last year were expected to take place, be regarded as a very satisfactory showing for a country so undoubtedly rich in minerals as British Columbia, more especially, too, as this by-no-means significant gain, must be accredited not to the increased production from our metal, but rather from our coal mines. The Provincial Mineralogist is careful, however, to point out that "while the total Mineral Production of the Province shows an increase, even over last year, the increase is not as marked as it would have been but for the serious dropping off in the output of silver-lead ores," and the reason for this decrease seems to be the unusually low price of silver during the latter part of 1897 and the beginning of 1898, together with the uncertainty as to the future price of the metal. For the time being this paralyzed many existing ventures and prevented new ones being started to work properties of this nature. The drop in price coming, as it did, shortly after a rise in the duty on lead imported into the United States, then our only market deterred many of our mines from starting work last season. When the price of silver increased again, in the latter half of the year, it was then too late to begin operations for this season.

Again, he shows, "that the certainty of the completion this year of the Canadian Pacific Railway's branch through the Crow's Nest Pass, bringing with it cheaper fuel and transportation, and so enabling our native smelters to compete for ores, induced many large producers to confine their attention to development and blocking out of their ore bodies, holding back shipments until such time as the new conditions should have taken effect, and higher net values might be obtained for the products of the mines. Decrease from this cause is a healthy sign, and next year should show a very materially increased output of this class of ore."

How great was the falling off in 1898 of the Slocan mines may be judged from Table VI. of the Report, which places the value of silver mined in 1897 at \$3,272,836 and in 1898 at \$2,875,841, or a decrease in value of nearly a million dollars, whereas the falling-off in lead production last year represents a difference of \$212,936 below the value of the 1897 output. On the other hand, there is real grounds for congratulation in the very appreciable advance made by our gold—both lode and placer—copper and coal mines. In 1897 we produced 106,141 ozs. of gold, valued at \$2,122,820; in 1898 the production was 110,-

661 ozs., valued at \$2,201,217; the value of our copper output for 1897 was \$266,258, for 1898, \$874,781; while our coal production was the best on record, being one-third greater than in 1897, and coke twice as great. Taking these facts into consideration British Columbians have, on the whole, well-founded reasons for being satisfied with this material, though perhaps not particularly striking evidence of the growth of our young but sturdy mining industry. Meanwhile, it is well to remember that the Atlin discoveries, the completion of the Crow's Nest Pass Railway; the construction of the Columbia & Western road, and the consequent opening up of the Boundary Creek district—certainly one of the most promising mining fields in the whole of British Columbia; and last but not least, the strength and seeming steadiness of the metal market, at least give the assurance of increased prosperity for the immediate future.

Passing from the reports of the Gold Commissioners of Cariboo, Omineca and Cassiar—and including an admirable descriptive account of the Atlin fields—all of which districts show a satisfactory increase of gold production from placer mines, we come to Mr. Robertson's report on the East Kootenay District. This report is important, in that it is the first expert opinion that has been made public concerning the mining potentialities of this large section of the Province, the area of which is approximately 7,000 square miles. After reading this report one is at first inclined to conclude that either Mr. Robertson is of a very pessimistic turn of mind or that heretofore the mineral wealth of East Kootenay has been grossly exaggerated. Neither conclusion would be quite correct. Mr. Robertson has given us a report such as was to be expected from a trained mining engineer, who looks at a mineral claim from an altogether different standpoint from that of the oft too sanguine prospector, and throughout we find such comment on the various prospects as: "The work done is not of a class to develop anything, being little more than a hole in the ground, consequently nothing has been shown to indicate the value of the property," or: "The development has not been sufficient to warrant me in forming an opinion as to the value of the property"; or again: "The indications, so far, are promising, but so little work has been done on the property that it is impossible to form any idea of its value." These remarks seem to apply to all the divisions of East Kootenay, with one or two exceptions; Mr. Robertson, in point of fact, thus sums up:

"The mineral development of the district can scarcely be said to have reached the mining stage, with the exception of the Coal Creek collieries and the North Star and St. Eugene mines, yet it is gradually passing from the prospecting to the development stage. For some years past prospecting has been successfully carried on, and a large number of promising prospects have been recorded, more particularly in the St. Mary's River and Wild Horse districts. Some serious development work has been done on the more important of these claims, but the holders of the majority of them have been content—perhaps from necessity—to limit improvement to the amount of work prescribed by law for annual assessment work. The advent of the railway has been looked forward to with great anticipation on the part of those interested. By some it has been the excuse for deferring development work until cheaper transportation became an accomplished fact. Now that the railway is into the District the prices asked for prospects have been advanced, often to

figures which are prohibitory to capital actually seeking investment and willing to risk it on a prospect only slightly developed. Latterly, however, better counsel has prevailed, many prospects have been bonded on fair terms, and the past summer has seen a large amount of work done by the bondholders, the results of which will soon become apparent."

But the most interesting portion of the Report on the East Kootenay District is unquestionably the very full description which appears of the Crow's Nest coal measures. The Provincial Mineralogist dwells particularly on the importance to the Province of this development, and shows that the ideal situation and mode of occurrence of the Crow's Nest coal admits of its being mined and delivered on the cars at a minimum cost, thereby guaranteeing to the mines and smelters of Southern British Columbia a steady supply of first-class fuel at a price very materially lower than has before been possible. At present actual work has been confined to the mining of coal from the Elk River Basin seams, of which there are twelve, varying in thickness from four to thirty feet, or having an average thickness of rather more than twelve feet, traced and found to cut both banks of Coal Creek, for some four or five miles up from Elk River. The coal here is of exceptional quality, and when coked gives a product that has no superior. Thus the superintendent of one of our largest smelters writes to Mr. Robertson: "With the Crow's Nest coke I find I can accomplish as much with 135 lbs. as I could with 150 lbs. of ten other cokes I have used." In order to further demonstrate the fine quality of the Crow's Nest coal, the follow comparative table of analyses of the principal bituminous coals of the world is given:

Locality.	Volatile Matter.	Fixed Carbon.	Ash.	Total Fuel.
Pennsylvania, U.S.A.	29.50	64.40	6.10	93.90
Virginia, "	33.68	57.76	8.56	91.44
Indiana, "	39.00	52.00	9.00	91.00
Illinois, "	36.59	59.47	3.94	96.06
Iowa, "	44.00	48.50	7.50	92.50
Missouri, "	34.06	50.81	15.15	84.87
Newcastle, England	37.60	57.00	5.40	84.60
Staffordshire, "	37.86	59.64	2.50	97.50
Derbyshire, "	35.10	61.65	3.25	96.75
Yorkshire, "	35.67	62.08	2.25	97.75
North Wales, "	36.56	57.49	6.55	93.75
Pictou, Nova Scotia	29.63	56.98	13.39	86.61
Sydney, "	34.07	61.43	4.50	95.50
No. 2 Tunnel—Coal Creek, Crow's Nest, B.C.	21.02	76.25	2.73	97.27
No. 2 Tunnel—Coal Creek, Crow's Nest, B.C.	25.00	72.50	2.50	97.50
Peter Seam—Martin's Creek	34.90	58.30	7.00	93.00
Jubilee Seam, "	31.70	68.30	4.20	95.80

Mr. Robertson concludes: "It is hard to conceive that any coal deposits could be located more advantageously for cheap and economical working than are the Coal Creek seams. Timber is plentiful in the immediate neighbourhood for all mine purposes, and Coal Creek is capable of supplying any water power which might be needed for the colliery's use. The estimated cost of production, as appears in the company's prospectus, of \$1.25 per ton, for "run of mine" coal on cars at the mine can certainly be realized. The amount of coal available in the Coal Creek mines is so great that it will be more than sufficient for a long time to come. I have made no personal estimate of the quan-

tity, but quote from Mr. Smith's report, in which he estimates that the Elk River basin alone has an available tonnage of 16,443,900,000 tons in the twelve seams."

Owing to the fact that the 1898 Report is issued just as we go to press we are unfortunately unable to do more than briefly mention the returns from the Gold Commissioners of the various divisions of West Kootenay, the Lillooet and Yale districts. These returns appear to have been well edited and contain less of the superfluous matter for which they have formerly been noted. The most remarkable advance is shown in Trail Creek, where the output was nearly doubled, although the value of the product was but \$2,470,811 as compared with \$2,097,280 for 1897. This may, however, be accounted for by the cheapening of smelter and transportation costs, which has allowed lower grade ore to be successfully mined. In the Trout Lake and Revelstoke divisions the production was one-third greater than in 1897, the increase being largely due to the returns from the placer mines, while from Lillooet the value of the mineral output for 1898 was \$432,512, as compared with \$226,762 for 1897, the previous year. In the Osoyoos division of Yale district, the very satisfactory showing is chiefly ascribable to the successful operation of the Cariboo mine at Camp McKinney, and further returns show that 100 ounces of platinum were taken from the Similkameen placers. The Report contains excellent special articles on the Slocan City division, Camp McKinney, Boundary Creek and Harrison Lake, the writers being, respectively, Mr. J. C. Gwilliam, B.A., Sc., of Rossland; Mr. Henry Nicholson, of Camp McKinney; Mr. E. Jacobs, of Midway, and Mr. John Brown, of Harrison Hot Springs.

Vancouver Island is but briefly alluded to in the reports of the Mining Recorders for the Alberni and West Coast districts and apparently the Hayes mine on the west side of Alberni Canal is the only property really entitled to any special mention as having been to any considerable extent developed, while the Lenora mine at Mount Sickar is described as a more or less promising prospect. The Provincial Mineralogist's report on Texada Island and Phillips Arm and Shoal Bay districts, makes exceedingly interesting reading, although those who have confidence in the Van Anda and other Texada mines will doubtless be somewhat disappointed with Mr. Robertson's very guarded statements. The Van Anda is described as "a property that must still be classed as a prospect even though so much development work has been done, as there is 'no ore in sight,' as the term is understood by mining men, nor has the size of the ore chute been determined." It is fair, however, to add that since Mr. Robertson's visit in October last the Cornell claim has been very considerably opened up and from all reports, in this claim, at least, there is now a very fair showing. Of the Shoal Bay district generally and of the Dorothea Morton mine in particular the Report speaks in the most favorable terms.

The portion of the Mines' Department publication dealing with the Province's metalliferous mines closes with the reports of the Inspectors for the year 1898. The officials appointed for this duty seem to have carried out their work in a very praiseworthy and thorough manner. With one or two exceptions the proper precautions appear to have been taken for the safety of workmen in all the mines visited, and as is pointed out the casualties (for the number of men employed) amounting to six fatal accidents, were comparatively light.

Much more attention is given in the present Report to coal mining than has been customary, and this departure is warranted by the importance this industry is fast assuming in the Province. Coal has been discovered in various parts of British Columbia, including Peace River, Omenica, the Skeena Valley, the northwest coast of Vancouver Island, the Fraser and Nicola Valleys and Boundary Creek, but perhaps the most promising of the new fields is on Graham Island, one of the Queen Charlotte group, and near Skidegate Inlet. A coal mining expert of very wide reputation, Mr. H. E. Parrish, C.E. and M.E., late of the staff of the Geological Survey of the State of Pennsylvania, reported on these properties some little time ago for the owners and thus concluded:

"With the knowledge I have of the coal regions of Pennsylvania, acquired there as a mining engineer, and on the Geological staff of that State, it must gratify you to know that in my judgment you have the best coal field I have seen. Until I visited it, I had no conception such a valuable field existed on the Pacific Coast. You possess a number of beds of unusual thickness, containing coals of superior quality, suitable for all requirements. You have anthracite, first-class steam, gas and caking coals, and a bed over 15 feet thick, excellent for domestic purposes."

The report of the Inspector of Coal Mines, for 1898, is deserving of very special mention, for the systematic and thorough way in which these returns are made, the statistical tables, being particularly admirable. In the table on accidents and their causes it is noteworthy that "cheap labour" has been responsible in the Union and Wellington mines for a large proportion of accidents that have occurred in these collieries. The Vancouver Island coal mines are, however, exceptionally well ventilated and casualties to date have been less than in any other coal mining district of America. Our largest Vancouver Island producing colliery is that owned by the New Vancouver Coal Mining and Land Company, Limited, the output from which last year nearly double those of the Wellington and Union collieries combined.

Of the three hundred pages comprising the 1898 Report, some twenty-four are devoted to a very complete index. Indeed, so perfect a system of indexing has been followed that every reference, even to unimportant mineral claims, in the Report may be found at a moment's notice. Accompanying the Report are three excellent maps, one of which, a sketch map of the Province, and engraved from drawings prepared by the Department, is especially clear and perfect. The printing of these maps and of the engravings reflects great credit on the Queen's Printer.

MR. J. J. CAMPBELL, of the Hall Mines, Ltd., has sent us this month a statement of the proposals he has submitted to the South Kootenay Board of Trade, which, if adopted by the Dominion Government will, in his opinion, greatly im-

prove the condition of the lead mines and smelters in British Columbia.

THE LEAD SMELTING QUESTION. Briefly: Mr. Campbell contends that if the Government admitted free of duty all lead which, being mined and smelted in Canada is refined in the United States, the result would not only stimulate the local smelting of lead ores, but also increase the home consumption of lead by securing for the Canadian manufacturer "a favourable market" for this commodity, and thereby, Mr.

Campbell argues, benefit "the mines and smelters alike." That the proposed legislation would prove of immediate and lasting benefit to the lead mining industries of the Province admits of no contention, yet in our view the benefit directly accruing to the mine-owners would rather be dependent upon than co-equal with that enjoyed by the smelter, for reasons we shall presently attempt to show. In the present competition between the Canadian and American smelters the advantage is all in favor of the latter, (1st) because of the higher American duty on lead, contained in lead bullion (the product of the smelter), than on lead contained in lead ore (the product of the mine); (2nd) because of the extra value attached to Canadian lead ores for use in fluxing the "dry ores" of the United States. For this reason the United States smelter can afford to pay the Canadian mine-owner a higher price for his ore than can the Canadian smelter under present conditions, *ceteris paribus*. The demand for pig lead (the product of the refinery) in the United States exceeding the product of the United States mines to a very appreciable extent, it therefore profits the American market to import our Canadian ore at 1½c. per lb. duty on the lead therein than to import either crude or refined bullion at 2½c per lb., and the United States smelters reap the advantage in competing with the Canadian smelter.

In order to offset these material advantages it is rational to strengthen the position of our smelters so far as may be possible without injury to the mine-owner, and this can possibly be effected in the manner proposed by Mr. Campbell. The present consumption of lead in Canada is estimated at 50 per cent. of the product of the mines. Assuming for lucidity of argument, that the United States smelters consume, and will continue to consume one-half of the product of our mines, the lead from which is absorbed by the American market, and that the remaining half—required for home consumption—passes through our own smelters, the removal of the return duty on the refined bullion will have the immediate effect of increasing the value to the Canadian smelter of its product to the extent of the duty removed, or 15 per cent. This will permit the Canadian smelter to offer a *pro tanto*, higher figure, for ore in competition with the United States smelter, whose product will continue at its present value, not being for export. To this extent, therefore, the proposal will raise the value of our ores, assuming that the American smelter does not now return to the Canadian mine-owner the equivalent of his present advantages over the Canadian smelter and can afford to continue competition under the altered conditions. Should such not prove the case the Canadian smelter would naturally advance its price for ore only to the figure necessary to meet the competition—whatever it may be—of the United States smelter; and should this rise in the price of ore not absorb the 15 per cent. advantage given to the Canadian smelter under Mr. Campbell's proposal any balance would benefit the smelter alone and not the mine-owner. It is this view of the question that leads us to consider the mine-owner dependent, for any benefit arising under the proposal, upon the Canadian smelter rather than a joint participant. The American smelter must be in a position to advance his price for the mine product to meet the advantage conferred upon his competitor, and the latter must, and, doubtless, may be

dependent upon to meet the competition to the extreme limit of the advantage so conferred.

By making the proposal cover not only "lead, mined and smelted in Canada," but "lead, the product of Canadian mines," the United States smelter could compete with the Canadian smelter for the Canadian lead market and thus enable him to add 15 per cent. to the two advantages already held, and advance his price for ore accordingly. A proposal that would directly benefit the mine-owner, while leaving the United States' and Canadian smelter upon the same competitive basis as at present.

This, then, is the situation, as we understand it, but Mr. Campbell argues from altogether a different standpoint. He explains the position from his point of view as follows:

"The United States smelters pay the Canadian mine-owners the New York market price for lead less the United States duty, and as all Canadian lead bullion has to be sent to the United States to be refined, the smelters in Canada are required to make the same deductions for duty, that neither in the case of the United States smelter nor in the case of the Canadian smelter was the duty ever paid upon Canadian lead," and that "the lead in the ore shipped direct from the mines of the Slocan to the United States smelters is smelted in bond. The United States smelters in fixing their treatment charges take the profit into account which they make through the export of their Canadian lead and give the Canadian mine-owner a better rate than they otherwise could afford to do. It is," he continues, "a common mistake for the people to assume that the United States smelter makes a clean profit of one and a-half cents per pound upon all Canadian lead smelted in bond. That such is not the case, and that the saving effected through the export of the Canadian ore is taken into account is shown by the rates which American smelters quote for freight and treatment on Slocan ore. A usual rate on high-grade galena charged by American smelters on Slocan ore is \$20 a ton. Of this, the smelter has to pay the railway \$14 or \$16 for freight to the smelter, and again, the equivalent of \$4 per ton of ore in freight on the bullion from the smelter to New York, before the New York price for lead, which was paid in the first place to the owner of the ore, can be realized. It will therefore be seen that there is no margin, excepting the difference between the world's market price for lead, which the refinery usually obtains, on the one hand, and the New York price, less one and a-half cents per pound, on the other. The world's market price, less ocean freight. This difference amount to about \$4.80 per ton, and is all that the smelter receives as payment for smelting the ore."

"If this concession," he argues, "with respect to the free entry of Canadian lead refined in Canada were secured from the Canadian Government, the higher price obtainable for the lead in the Canadian market, in competition with the lead from other countries, would enable the Canadian smelters to offer lower rates than at present to the Canadian miners, in order to underbid the United States smelters. The lead having free entry into Canada after having been smelted in Canada would be worth more to them than the United States smelters, and this advantage could be shared by the Canadian smelter with the Canadian miner. If the Canadian smelters were able to secure the lead production of Kootenay in this way there

would be ore enough offering to keep a furnace at Trail and a furnace at Nelson running steadily. The practical working out of this changed condition of affairs would be that the lower smelting rate charged would encourage the development of a number of low-grade properties which it will not pay to work under existing conditions. This would tend to increase the production of lead, probably to such an extent that in a very short time a refinery might be profitably operated, which would find in the Orient a market for such lead as constituted a surplus in the Canadian market."

But, we contend, it is not the small profit on the export of Canadian lead that induces the United States smelters to offer an exceptionally low treatment and freight rate on the produce of the Slovan lead mines, but the fact to which we have previously alluded, that the wet ores of British Columbia are essential to many of the United States smelters for the economic treatment of the dry ores of the Colorado and of other American mines. But a little further on Mr. Campbell appears to flatly contradict his former assertion, for he states:

"If there was no duty in the United States the price of lead in the United States would drop to the world's market price and the difference gained at present by the evasion of the duty on Canadian lead would require to be added to the present treatment rate."

As Mr. Campbell before very sensibly explained, the United States smelters derive no advantage directly from the duty on foreign lead of $1\frac{1}{2}$ cents per pound, and to show how this duty concerns the American smelters, we will give an instance of the mode of procedure at the Balbach Works, of New Jersey, where the crude lead bullion from the Hall Mines is sent. The United States is represented at these works by a Customs-house officer, who enters in his books on the debit side the duty due on every pound of fine lead contained in the foreign ore or crude bullion imported for treatment to the smelter or refinery. This officer, at the same time, keeps careful account of the refined product of the smelter exported to foreign markets, for which the United States Government allow a rebate equal practically to the amount of the duty on the imported crude ore. Thus a sort of debit and credit account is kept between the smelters and the United States Government, and a monthly settlement is made on this basis. The smelter is debited with the duty on all the foreign ore or crude bullion that it receives, and credited with the rebate on the fine lead extracted therefrom and exported to foreign markets. In the case of Canadian ore smelted and refined in bond neither the United States smelter nor the Canadian mine-owner pays duty on the ore either in its crude state or as refined bullion, but the smelter presumes to pay the mine-owner the New York price, less the duty, which really neither pay, and which is equivalent to the market price of lead in the world's market. It will be seen that there is no such thing as what Mr. Campbell calls the "evasion of the duty on Canadian lead," because the lead practically passes through the United States in bond, and it can therefore not affect the present smelting charges one way or another. We can, moreover, confidently assert that if the United States tariff were amended so that foreign lead might be admitted to that country free of all Customs imposts, the Canadian producers would not, as a matter of fact, be to any noticeable degree, in a better position than they are to-day; but while Canadian lead miners are not affected by the Ameri-

can duty it certainly benefits the lead miners of the United States whose product is not exported but retained for home consumption and who therefore get a higher price for their lead than is obtainable in other parts of the world, for the reason that the consumption in the United States is greater than the production of the mines. Canadians, however, have surely no right or cause to express dissatisfaction on these grounds. Meanwhile, in view of the fact that for many years past much of the product of the Ontario copper mines at Sudbury has been smelted and refined in the United States and returned in the form of refined copper, upon which no duty is paid, to Canada, it is somewhat strange that an arrangement which in the case of copper has proved so generally satisfactory should not also have been applied to lead.

THERE is no valid reason why stock companies properly conducted should not be as successful in their mining operations as either close corporations or individuals, but we know that they are not so, generally speaking. Why is this? The answer is somewhat complicated, but is mainly included in the statement that frequently stock companies do not pursue mining for its own sake, but

look upon it merely as a peg on which to hang their crooked stock operations. The evil flowing from the pernicious proceedings of such companies is often enormous. In the first place, honest mining is greatly interfered with and retarded both directly and indirectly, but what is vastly more important and serious in its direct consequences is that ample scope is afforded for the employment of all those "smart" practices that, by a perversion of ideas, are sometimes looked upon as evidences of ability. This, too, notwithstanding the fact that such practices very frequently involve in serious financial difficulties—perhaps in temporary ruin—their innocent and confiding victims. Money that is won from the earth by the miner—like that produced by the agriculturalist—is a distinct addition to the sum total of available wealth. That which is taken from other men's pockets by the dishonest promoter or company operator is also a gain of a kind, but only to a few heartless schemers, whilst it is a loss—often very serious—to the deluded many. The evil and misery that result to the losers is, as a rule, infinitely greater than any good that accrues to the gainers, so that the effect of the practices alluded to is a serious net loss to the welfare and happiness of the human race. Such practices ought, therefore, to be prohibited, condemned and exposed by everyone who knows of them and who "above himself can uplift himself."

It is sometimes said that mining is all a gamble. When the management of it is in the hands of unprincipled men, such as are above indicated, there is no doubt that mining—so called—is very much of a gamble, the chances of winning, by those on the outside, being much more remote than at either faro or roulette. But honest mining, capably conducted, is no more a gamble than carrying on a grocery store. The sums of money involved are greater in the former than in the latter, but then the possible returns are much greater also.

Let us now glance at a few of the methods of unprincipled promoters and trustees or directors, of what may properly be called "fake" stock companies. The first object of the dishonest promoter is to pro-

cure an invertebrate expert or one who has an elastic conscience and a profound disregard for facts. It is important therefore that the public should see that the properties in which they are asked to invest are vouched for by men of good repute, morally as well as technically. How important the expert's report is to the promoter is partly indicated by the remarks of a London stockbroker to a B.C. option-holder: "Have you any favourable expert reports," asked the broker. "No," replied the man from B.C. "Then I am afraid," said the broker, "I cannot do anything with your properties. We never buy mines; we only buy reports, the mines are thrown in."

Having launched their company the promoters perhaps retire. In their place come the trustees or directors. Their object—if they are among those to whom conscience is less than gain—is to boom their stock regardless of the appearance or prospects of their property, and for that purpose they employ many artifices, some of which may here be mentioned.

Selected samples of the most valuable contents of a vein are submitted for assay and the results published broadcast, without the slightest indication that such results merely refer to an infinitesimal part of the vein, the balance of which may be utterly barren. Such assays are valueless, except to the swindler.

The exhibition, in some conspicuous place, of rare samples—especially those showing gold—is another favourite method of booming. Most people who are interested in mining or in mining investments will be able to recall samples of this kind that they have seen in certain office windows not many miles from Vancouver, and perhaps they have not forgotten the miserable fiasco—from a miner's point of view that followed those glittering exhibitions. Beware of this kind of show. Men who have found, or otherwise come into possession of, such good things don't want to part with them—least of all, to the unknown multitude.

The suppression of unfavourable reports from the superintendent is another way of deceiving shareholders and the public. This breach of trust on the part of directors is now punishable by imprisonment. Had it been so earlier many people in B.C. and elsewhere would now have had what rightly belongs to them, but which unfortunately is in the hands of a few others, who it is too much to suppose will feel they ought to be in prison.

The proposal to erect, or the actual erection of mills and smelters, are also used as "springes to catch woodcocks." It is generally assumed when people propose to erect either or both of such works, in connection with a mine they must have something to justify the expenditure. Alas, there could be no greater mistake. Where was the justification at the Morning Glory, at the Golden Cache, at the Strathyre, at the Lanark, at the Tinhorn and many other mines that might be mentioned in British Columbia. The erection of mills, for which there is nothing to do, is sometimes due to errors of judgment, but in other cases it is part of a boom scheme contrived solely with the object of putting money into the pockets of its designers—no matter from whom that money may be taken. When people talk about putting up mills or smelters don't rush in and buy stock. Try, first of all, to find out from some disinterested source whether there is anything to mill or smelt, or whether the sporting directors are simply fishing for "suckers."

Other snares and traps might be pointed out to the uninitiated, but these will perhaps be sufficient for or-

inary mortals. There are some men so foolish that all the warnings in the world will not prevent them committing acts of rashness. For such these lines were not written. Men of that stamp never profit by the experience of others. They must put their fingers into the fire before they will believe it burns. It is to be hoped they may never know of some of the stock fires that are now being lighted to enable them to experiment.

The representatives of labour in Vancouver, acting on general principles and without possession any special knowledge of the subject, have endorsed the views of the Miners' Union of the Kootenays on the eight-hour legislation. They, therefore, urge its prompt and full enforcement *conté que conté*, and threaten that unless this is done, the fact will be remembered by organized labour at the Coast against the Provincial Government. The more the subject and its grave importance are considered, the more it is to be regretted that legislation of such first importance should have been allowed to pass almost unnoted and virtually all but undiscussed by members of the Provincial Legislature in general and more especially without due consideration and enquiry on the part of the Ministers.

We are informed on the authority of the Hon. the Minister of Mines that the Government has decided to obtain an opinion from the working miners of the Province on the question of the enforcement of the eight-hour working day law for metalliferous mines, and providing the men approve of the change the Government will instruct the Inspector of Mines to see that the law is strictly carried out. We regret to express the view that the Government's action in connection with this matter has been both pusillanimous and ill-advised. The eight-hour clause was in the first place admittedly inserted in this year's Amendment Act without due consideration, and since the Government has had ample time to discover what the effect is likely to be. By a clause in the Mines' Inspection Act an opportunity is afforded of getting over the difficulty and prevention further friction, but instead of taking advantage of this lucky chance to escape the consequence of an indiscretion the Government not merely fail to do so but they shift the responsibility on to the shoulders of the working man. It is possible, of course in this case that the South Kootenay miner, who generally knows on which side his bread is buttered, will take a sensible view of the question; that is, if he is not led astray by the alien labour agitators of the Cœur D'Alene, but it is also not improbable that knowing now that the Government are pledged to back him he will vote in favour of an eight-hour law, compacting at the same time with his fellows not to accept a corresponding reduction in wages. There is, meanwhile, only one thing for the Slocan mine-owners to do, and that is to let it be very clearly understood that sooner than give way to the unwarrantable demands of the miners the mines will be unconditionally "closed down."

Apropos of this question, the action of Mr. Carlyle of the British-American Corporation and Mr. Hastings of the War Eagle mine, at Rossland, is, we think, to be strongly deprecated. On the men's assurance that they could get through as much work in eight hours as they had formerly accomplished in ten, both Mr. Carlyle and Mr. Hastings agreed to try the experiment for one month and to pay the customary

ten-hour wage, or three dollars and a half during that period. The month has not yet expired, but we fully expect to hear that the men have proved their assertion. Why? For the very same reason that railway navvies working under contract will do in a like space of time a third, or perhaps one-half more than the same gang would do working under time conditions. The Rossland superintendents have given the men exactly the sort of opportunity they wanted by which to prove their case to the unsophisticated, but as it happens quite recently an instance was afforded of judging the relative advantage of employing men on shifts of eight and ten hours, respectively, in a well-known Coast mine. In this case a tunnel was being driven under contract, and the contractor who had been employing three eight-hour shifts came to the conclusion that he would make a change to shifts of ten hours each. With the result that he effected a saving of a dollar per foot on his contract.

But apart from these considerations, legislation on the lines of this amendment is to be condemned on economic grounds as mischievous and vicious in the extreme. Instead of benefiting the working man it infringes on his liberty and freedom of action. It tells him in effect that the law does not recognize his capabilities as a wage-earner; it limits his exertions to a specified number of hours in a working day, and allows him to understand that if he exceeds the prescribed bounds as made and defined by Act of Parliament, he is a transgressor. It is this kind of legislation that has paralyzed industry in New Zealand, and has resulted not only in practically reducing the price of labour in that country but it has also had a restraining influence upon the investment of capital. Capital is not timid, but it demands fair-play and freedom. Hedge it about with restriction and irksome regulation and it will seek elsewhere for its opportunity.

It has been announced that Government examinations for efficiency in the practice of assaying will be held on the 14th of May and the 20th of November this year, the Board of Examiners being Mr. Robertson, the Provincial Mineralogist; Mr. Carmichael, the Provincial assayer, and Mr. Pellew-Harvey, of Vancouver. Candidates are to be examined on: Sampling of ores or furnace products and the reduction and preparation of sample for assay, including also the melting of gold dust and sampling of bar for assay; qualitative determination in ores or furnace products of copper, iron, nickel, antimony, arsenic and sulphur; quantitative determination of gold bullion, for gold and silver, copper bullion for copper (gold and silver), lead-copper bullion (for lead, copper, gold and silver); determination of moisture, volatile combustible matter, fixed carbon, ash and sulphur in coal, and in the assaying by fire of gold, silver and lead, by crucible method; gold and silver, by scorification method; and the appreciation of wet assaying to copper, by electrolytic, gravimetric, colorimetric and volumetric (cyanide or other approved) methods; iron, by volumetric and gravimetric methods; nickel, by electrolytic method; lead, lime, zinc, sulphur and silica, by any approved methods. We understand that the nature of these examinations will be such that any candidate of ordinary theoretical and practical knowledge in assaying practice will have no difficulty in securing a license. It must, meanwhile, be understood that these examinations are not instituted with the object of conferring degrees on successful candidates, but merely in order

to protect both qualified men and the public generally against fraudulent practitioners.

Never in this history of this Province has there been such a rush of Mongolians to the county courts—not for litigation, but to qualify as British subjects, the Chinese doing this in such districts as Cariboo, so as to hold placer claims, notwithstanding the recent Act, and the Japanese flocking to become British subjects in order to obtain salmon fishery licenses. The only thing that now prevents our newly-acquired Mongolian-British subjects—many of whom can't speak English and don't, of course, know the first thing about our Constitution—from holding the balance of voting power in at least seven or eight important constituencies of British Columbia is the fact that a Provincial Act debars Chinese, Japanese and Indians from qualifying as electors. But for this deterrent it is not saying too much to aver that we should stand within measurable distance of a time when the Mongolian vote would carry not a few of our constituencies in whatever direction it would. Parties are at present so evenly balanced that whichever side got a fairly solid Mongol vote of several hundred Asiatics might feel assured of winning the day in several constituencies. Under such circumstances we earnestly hope that in order to prevent undue further influx of Mongolians—white mine labour of a good type being rare in Cariboo—Mr. J. B. Hobson, of the Consolidate Cariboo Hydraulic Mines, may wholly succeed in his praiseworthy endeavour to induce the immigration to that district of a colony of French-Canadians well accustomed to mine work in Quebec.

In respect of water supply the cases of the various hydraulic mines in Cariboo differ considerably. Thus while the Cariboo Hydraulic and Horsefly mines desire a winter with much snow on the hills, in order to secure beyond doubt a good water supply, certain of those interested in Cottonwood Creek gold ventures of a like character are somewhat anxious, having a good water supply secured in any case, lest the unusual amount of snow which fell on the mountains last winter may cause some interruption of development work by flooding.

There is keen competition between representative Toronto and Montreal capitalists for the acquisition and working of some of the best mines and claims of the Boundary Creek, and also in the Kootenay districts. On the whole, Montreal seems to be gaining in the rivalry, though Toronto got a good start in the acquisition by the Gooderham and Blackstock syndicate of the War Eagle and Centre Star of Rossland.

Montreal, on the other hand, controls what is still the "banner" producer of the Slocan, the Payne mine—the first undertaking in British Columbia that has well passed the million dollar mark as an aggregate dividend producer to date. Montreal capital also controls the Old Ironsides and Knob Hill in Boundary Creek, which are likely to prove two of the biggest copper mines in the whole of British Columbia, and Montreal capitalists have meanwhile also acquired the Virginia, Monte Christo and other promising claims in Rossland.

The Iron Mask-Centre Star litigation at Rossland is naturally creating much interest in Provincial mining

circles. Meanwhile the highest authorities in America have been retained by both sides to give expert evidence, and there can be no doubt, we fear, that whichever way the case is determined the legal expense that has been incurred will sadly cripple both mines for some time to come. Meanwhile our Rosslund correspondent sends us the following notes of this interesting case:

"On Monday, April 25th, Mr. Clarence King, a graduate of Yale College and formerly on the Geological Survey of California, and at one time first director of the United States Geological Survey, and more recently prominent as a mining engineer, was placed on the witness stand. Mr. King described the geology of Trail Creek, more especially that portion immediately surrounding Rosslund. He gave a most elaborate history of the geology of this district, endorsing Dr. Dawson's theory of the volcanic character of Red Mountain and immediate neighbourhood. Mr. King's conclusions may be summed up as follows:

"Now as to the veins of this camp, so far as I have seen them—that is to say, such as I have recently studied—I feel very sure that the Le Roi is in the same category, are shear zone veins, that is to say, they occupy this filling, due to parallel fissures. They are fissure veins essentially in particular; they are shear zone veins; that the peculiar mineral combination which here forms the ore and which is a part of these veins is a mixture of pyrrhotite and chalcopyrite and copper pyrites, and it is seen in the neighbourhood of these veins, that atom by atom the crystals which made up this original rock have been replaced by mineral solutions, or in other words, have filled up the whole form and now occupy the area or bulk, the cubical contents of what was formerly the crystalline ingredients of these rocks.

"On Tuesday in the court-room at Rosslund counsel for the plaintiff company called attention to the fact that the injunction obtained by the Iron Mask Company against the Centre Star Company from working in the ground of the former company had been disobeyed, a party of miners from the Centre Star Company having actually begun to drill within the ground of the Iron Mask mine. On Mr. Justice Walkem's attention being called to the matter, it was investigated and found to be true, but the work was not done with the knowledge or consent of the defendant company's management. Mr. J. B. Hastings gave evidence to this effect, and stated that the men were immediately withdrawn when it became known that they were working.

Mr. Clarence King gave his evidence with wonderful coolness and precision. He is evidently very practical, whether consulting his note-book or explaining a complex vein or a geological movement. Mr. King is the first prominent expert so far examined, and the general information he imparts is equal to a course of lectures at a first-class school of mines anywhere.

"The evidence of Mr. Clarence King summed up goes to show that up to a certain point the Iron Mask and Centre Star are two distinct veins, but that they intersect at a certain point, and the question for the court to determine is 'which is the other.' Mr. King gave his evidence in a clear, precise and very able manner. Both veins were traced to a drift at the horizontal intersection, for both, according to Mr. King's evidence, intersect one another, and the Iron Mask disappears in the Centre Star, or the Centre Star vein disappears in the Iron Mask—this point not yet being

fully determined, though that the two veins intersect was clearly shown.

"There are large reference maps of the two mines and their workings, also an engineer's model and several smaller plans of the workings."

Some important changes have been recently made in the Yukon mining regulations. The first of these changes provides for a yearly exemption from royalty charges of claims the gross output from which does not exceed \$5,000 annually; and the second order prohibits any person in Government service from locating or recording mining ground in the Yukon. The new regulations, which will probably come into force early in May, will undoubtedly give great satisfaction in the northern gold-fields, and remove the two principal causes of the dissatisfaction expressed by the Yukon miners against the administration of this territory.

It is to be hoped that the result of trial shipments of Fernie coke which have lately been made to Butte may prove sufficiently profitable to justify the opening up of a regular trade. Butte requires for its smelters, so it is estimated, no less than 500 tons of coke daily—the output of 350 ovens. This being the case, if Fernie can only secure a portion of the coke supply trade of Montana's great smelting town, the coking ovens of the East Kootenay colliery centre will be kept busy all the time. Everything points to a great future for the colliery trade of East Kootenay.

It is a matter for regret that Mr. Corbin has seen fit to postpone his application for a charter for the construction of the Kettle River Valley Railway. We have all along expressed the view that the building of this line would prove an important factor in contributing to the growth and prosperity of the Boundary Creek district, and the appeals to patriotic sentiment which alone has constituted the argument of the representatives of the C.P.R. at recent Board of Trade discussions, have hardly been sufficient to cause us to alter our opinion on this point.

Meanwhile the members of the Vancouver Board of Trade are in general—judging from many present indications—glad to be relieved from the necessity of voting on the Kettle River Railroad issue. Many of them do not understand sufficiently the details of the case, and in consequence are wisely reluctant to vote on the subject. Others, again, were desirous of "keeping in with" the people of the Boundary Creek district, and were by no means anxious to oppose the views of the C.P.R. on which as traders Vancouver merchants are greatly dependent.

Mr. G. McL. Brown, the representative of the C.P.R. at the meeting of the Vancouver Board of Trade this month did indeed intimate that, if Mr. Corbin was permitted to build his projected railway the C.P.R. would abandon the plan of establishing smelters in South Yale, but while this terrible threat might, perhaps, produce the desired effect with some ignorant of the situation, it is not likely to create much consternation in British Columbia mining circles. The affairs of the Canadian Pacific Railway Company are administered by exceptionally shrewd and far-seeing business men, and if a profit is to be made in operating smelters in connection with the railway, those smelters will be erected, whether Mr. Corbin is or is not granted charter privileges. On the other hand, if the competition afforded by the construction of a rival railway is

such—notwithstanding the advantage enjoyed by the C.P.R. being in a position to make the double profit on both hauling and treating the ores in this district, not to mention the present accessibility and cheapness of coke to the Canadian railway—that American smelters could bid higher for the Boundary Creek ores, from Mr. Brown's own premises, one can only conclude that the mine-owners of this district would be the gainers by the building of Mr. Corbin's road. But the best authorities on smelting in British Columbia have shown that while smelters can be advantageously operated in the immediate vicinity of the Boundary Creek mines, the ores in general are not sufficiently high grade to admit of their transportation for profitable treatment at a distance. Moreover, at no very considerable period after the completion of the Columbia & Western road, the probabilities are that the C.P.R. will not have the American smelters to fear so much as competition from rival Canadian works. The building of the Kettle River Valley Railway, which would become the connecting link in the Northern Pacific Company's system, would enable Coast wholesale traders to send supplies in bond direct into the Boundary Creek district; would so to speak, force the hand of the C.P.R. by necessitating the immediate construction of the road through the Similkameen to Hope, and this in our opinion is the principal reason for the opposition of the Canadian Pacific Company to Mr. Corbin's plans.

Next to the Boundary Creek district probably no section of British Columbia has greater undeveloped mineral potentialities than Trout Lake and the Lardeau. The Silver Cup and other mines in that district, from which from time to time small consignments of high-grade ore have been made to the smelters, are now in advanced stages of development, and adequate transportation facilities alone are required to bring the district into prominence. It is, therefore, satisfactory to be able to state that apparently there is every prospect that the C.P.R., stimulated by the project of a rival company, will this summer commence the construction of the contemplated branch line to Trout Lake from Arrowhead. All last year survey parties were in the field, and a feasible route into this district, presenting but few engineering difficulties, was discovered. The only section of the proposed line, so far as we can learn, that will be at all exceptionally expensive to build, is a rocky bluff near Thompson's Landing, the cost of tunnelling and blasting at this point being estimated at \$100,000 per mile. But as the bluff only extends for three-quarters of a mile or thereabouts, it can hardly be considered as a very formidable obstruction in the way of the undertaking. Meanwhile, not only will this proposed railway prove of incalculable benefit to the mine-owners of Trout Lake and Lardeau districts and open up a very promising section of the country, but it will also facilitate travel and traffic between Revelstoke and Rossland to a very great degree. At present no less than eight changes are made between these two places, but when a railway is built to Lardeau, the only transfer will be at this point, over Kootenay Lake to Kuskonook. Apropos of the Trout Lake mines it is to be mentioned with regret that one or two of the London financial papers are still harping on the almost worn-out string of the Horne-Payne mismanagements. The Lanark fiasco was bad enough, it is true, but one would have thought that by this time it was sufficiently ancient history to be forgotten. However, since the matter is again

being discussed, we may say this much, that while Mr. Horne-Payne was undoubtedly guilty of gross extravagance in many ways, the premature erection of the concentrator at the Lanark mine was a matter for which he can hardly be blamed. If a man engages the services of a mining engineer and deliberately disregards the advice or opinion he receives, he must suffer the consequences and accept the full responsibilities of his action. But in the case of the Lanark, Mr. Horne-Payne merely acted on the advice of an engineer from California, well recommended and presumably properly qualified to give an expert opinion on the value of the methods to be employed in the development of the Lanark mine. That the engineer in question formed wrong conclusions and accordingly recommended a course which ended in disaster, was most unfortunate, but, at least, the circumstance is extenuating so far as Mr. Horne-Payne is concerned. Moreover, it is not at all certain that the Lanark may not yet retrieve its past record, for although the ore in the drift "purchased out," there are still good indications of mineral in other parts of the property, and if the directors of the Lillooet and Fraser River Goldfields can be persuaded to spend a moderate sum of money in judiciously exploiting the mine, the failure may easily become a success.

We publish this month a letter from Mr. E. P. Rathbone, the London mining engineer, whose report of certain Omenica properties a month or so ago we took occasion to criticise. Mr. Rathbone admits that the time occupied by him in examining the ground was insufficient to allow him to carry out anything like a full or proper investigation, but he adds that the claims were so obviously worthless that he did not feel justified in spending his time and his principals' money in making tests that otherwise would have been necessary. Under certain conditions a mining engineer is perfectly justified in forming an opinion of a mining property after the most perfunctory examination. If, for instance, he is retained to examine what has been represented to be a quartz mine and he finds upon his arrival on the ground that the property is not a mine, but a mere prospect he would be acting quite rightly in making no examination at all; or if the discovery of coal was reported and the expert sent to investigate found that the formation of the country was granite, he would require no further evidence. But Mr. Rathbone reports on a placer or rather a hydraulic proposition, which is a very different matter. It is, as every hydraulic mining engineer knows, a very difficult, if not, an impossible matter to arrive at the value of ground of this nature from mere casual observation, and the question of formation to which Mr. Rathbone alludes cannot in this case be considered. In his report, as we have already pointed out, Mr. Rathbone failed to give any detailed account of the unsatisfactory tests he did make by "panning," either in respect to the exact spot at which these tests were made or the results obtained therefrom. We are, of course, quite willing to concede that Mr. Rathbone acted according to his belief in a perfectly conscientious manner, but that is hardly the point, and that others considered his judgment to be at fault is fairly well attested to by the fact that a few weeks or months after Mr. Rathbone had condemned the Omenica properties, expert hydraulic miners from California thoroughly tested the ground and demonstrated their high opinion of its value by promptly entering into an arrangement to purchase the claims, with a view to the

immediate commencement of hydraulic operations. Further comment, we think, is hardly necessary.

Operations at the Monitor, near Three Forks, have resulted in the production of six cars of ore since the beginning of the year, which has been consigned to the works on the Manchester Ship Canal in order to evade the heavy penalty consequent on the high percentage of zinc contained. This zinc problem is only just beginning to be rightly comprehended by the mine-owners in the Slocan, and as a consequence it is being attacked vigorously from all directions for a profitable solution. A car of almost pure blende is now on its way to London from the Bosun, its ultimate destination being determined according to the dictates of the directors who have every means of finding out just where the best returns are obtainable. In view of the high character of the ore and its comparative immunity from deleterious ingredients, it is altogether probable that the ore will be found more profitable to treat directly for the extraction of the zinc, and obtain part of the silver as a by-product. This, however, remains to be seen. Should the experiment prove commercially successful, there is practically no limit to the field which might be opened up for this class of ore, as hitherto it has been shunned by all hands, and many claims promising in other respects, have been doomed to failure at the very commencement on this account. The property above mentioned, by the way, has recently distinguished itself on the London market by distributing a 20 per cent. dividend within a year of its incorporation, out of the direct earnings of the mine. More will be said about this, however, at a later stage, it will suffice for the present to state that the shares now stand at a premium of 200 per cent. in London, and hard to get even at that figure.

Dr. Dawson's requests for specimens of British Columbia's mineral products should, if they be satisfactorily met by those interested in our mining industries, result in a very satisfactory display of Provincial mineral products at the Paris Exhibition of next year. The Kootenay and other up-country ores are sure to be well represented, for special efforts are naturally being officially made to secure this. Meanwhile, as suggested by Canada's Mineral Commissioner, those interested in our Coast and Island mines and claims should be careful also to secure their due representation by good specimens. And although our quarrying industries are yet almost in embryo—certainly not advanced beyond the first stage of development—it will be well for those interested to send good specimens of our large and excellent building stone and marble deposits. Care should again be taken, as suggested by the Dominion Commissioner, to send good specimen ores from the lower depths of mines, in order to prove that the richness of our metal ore deposits, in general, holds out with depth, and in some cases indeed markedly improves on the lower levels. Now, should there be any neglect to display very fully the value of our various Vancouver Island and Mainland coal deposits, as our collieries and the allied coking industry are becoming more and more important, in proportion as British Columbia rises in rank as one of the world's great mining and industrial regions. It will be easily possible, if one can be taken literally to astonish the world by a brilliant all-round display of the Province's multifarious forms of mineral wealth, and as a result to attract to British Columbia the fur-

ther capital and industrial skill, of which Pacific Canada still stands so greatly in need.

It is greatly to be regretted that the prosperity of such a promising mining camp as Camp McKinney should, as now seems inevitable, be seriously retarded by the practices of the unscrupulous "wildcatter" which we have noticed during the past few months. On the reputation of the Cariboo, the Waterloo and the Fontenoy very many claims have been sold to new companies floated for that purpose and in many cases the hypothetical presence of the Cariboo vein on the new company's ground has been used to wheedle subscriptions from the pockets of an all-too-gullible public. If the celebrated Cariboo vein were to run into all the ground in which its presence is claimed then Camp McKinney would be a geological wonder indeed, for it is said to be in all sorts of impossible places and the most absurd reasons are given in support of the statement. Besides these claims purporting to contain the Cariboo vein, many other properties unimproved and undeveloped, often staked on the snow, have been unscrupulously foisted on a public which does not understand that there are worthless as well as valuable mineral claims in every mining camp. So far has wildcat work been carried in Camp McKinney that we believe several of the properties thus sold would only fulfil the better half of Mark Twain's celebrated definition, "A mine is a hole in the ground and the owner thereof is a liar."

In spite of repeated requests from the people of the Osoyoos mining division of Yale district, the Victoria authorities still delay the removal of the mining officials from Osoyoos to Fairview. Representations of the advisability and need of this removal have frequently been made to the Government by several of the most prominent residents of Fairview, and it would perhaps be well for us to explain the position. Osoyoos is a pretty spot near the International Boundary line and at the extreme south of the mining division. There is no village but merely a Customs-house and Gold Commissioner's and Mining Recorder's office. There is no hotel or stabling accommodation, and consequently travellers visiting the Government offices are put to great inconvenience and even hardship most unnecessarily, since a building has been erected in Fairview for the purpose of establishing the mining officials there. Fairview is a town with a first-class hotel, with stores of all kinds and lies right in the centre of the Osoyoos mining division. Good wagon roads and trails radiate to all parts of the division from Fairview and since the Government offices are finished and ready for occupancy we fail to see what good reason the Government can possibly have for putting the mining community to any further inconvenience by forcing them to make unnecessary visits to Osoyoos.

It is stated on the best authority—the fact coming as a surprise to most—that the working of the Dorothea Morton Company's Coast silver-gold mines represented workers' wages, amounting last year to no less than \$100,000, most of this big aggregate payment representing capital expenditure on development work needed to convert claims into mines. The results to date are very encouraging, for despite many preliminary difficulties and disadvantages, the Dorothea Morton's mill has produced in the four months ending with the last day of March a total output of \$25,320 in

value. The mine consequently takes pride of place as the first amongst those of the Coast to make really substantial monthly outputs, although up to the present the mill has only worked at half force. This month, however, it is expected that the ore crushed at it will aggregate at least double that of previous like periods. Up to the present time the management of this mine have had a great many mechanical difficulties to contend with in connection with the cyaniding of the ores, and an instance of this may be cited in the fact that the time heretofore required for dissolving the gold in the tanks has been fifteen days, or five times as long as this operation usually takes. It is gratifying to learn, however, that gradually these drawbacks are being satisfactorily met.

THE ATHABASCA MINE AT NELSON.

THE history of the Athabasca property is one of gradual development; the Athabasca claim is the central claim of the group and was located 1895, attention being drawn to it by rich float and surface croppings, from which gold in paying quantities could be panned. The early owners, however, failed to achieve important results, owing to the position of the ledge, and the disturbing influence of faults, which were not understood at that time. The property was then acquired in 1897 by the Athabasca Gold Mining Company, a company of Canadian register whose stock was principally held in Nelson, Toronto and Westminster. A certain amount of development was carried out by this company and several shipments were made to the Hall Mines smelter, aggregating over three hundred tons and averaging about \$60 per ton.

It was evident, however, that, rich as the ore undoubtedly was, it required the deliberate outlay of capital to place the mine on a paying basis, and in April, 1898, the company transferred its property to the London registered company called the Athabasca Gold Mine, Limited, with capital of £200,000, in £1 shares, and offices at 46 Queen Victoria street, London, England.

The property consists of the following claims: Athabasca, Algoma, Manitoba, Alberta, Triangle Fraction and Ruby Fraction, all Crown granted, and of the following mining locations: The Loretto and the Rose Fraction. In addition to the above mining property the company has acquired on Give Out Creek a plot of land about six acres in extent, on which its mill is situated, also right of way for tramway from the mine to the mill, and right of way for the flume; also various timber and water rights. The mine lies on the east flank of Morning Mountain at an elevation of 2,700 feet above the town of Nelson and the mill is on Give Out Creek, about 1,300 feet below the mine. A good waggon road, constructed on a uniform 5 per cent. grade, leads from the town of Nelson to the mill, from which point to the mine the road is steeper in grade and rougher in construction. From Nelson to the mill requires one and a quarter hours for a foot passenger and to the mine two hours.

The formation consists of granite and a diabase porphyrite. A line of contact between the two runs east and west through the group of claims, the porphyrite being to the south and the granite to the north; the latter apparently dipping under the former at a slight angle. Up to the present time only two veins have been worked to any extent. The veins are in a direct straight line with each other, cutting almost at right

angles across the line of contact, but on approaching this line they become broken up and cannot be continuously traced across the line either on surface or below ground. In the absence of any proof that these veins are one and the same and in view of some points of difference which they present they are usually spoken of as being distinct veins; that in the granite being known as No. 1 vein, that in the porphyrite as No. 2 vein. Both veins are developed by the same tunnel; but the lay of the ground is such that in the future No. 1 vein must be developed by sinking wharves; No. 2 can be developed indefinitely by the tunnel. This main tunnel has now been driven about 700 feet, the last 300 feet of which have been on No. 2 vein. At the present face there should be at least five hundred feet of stope between this point and the surface, but as this tunnel is far ahead of the other levels, this ground has not been opened up yet. For the distance of 300 feet, as opened by the tunnel, the vein has been proved to be continuous, varying from 6 to 24 inches in width and carrying persistently gold values varying between \$40 and \$100 per ton. The vein comes away cleanly from both walls, and consists of a bluish quartz gangue, carrying heavily galena, zinc blende and ordinary iron pyrites, which are always more or less banded in the quartz. Gold is freely visible, disseminated in a fine condition, and the more base matter there is contained in the quartz the greater is the chance of seeing gold, not uncommonly imbedded in the sulphurets, especially in the zinc. This characteristic of visible gold does not seem to diminish in depth, so far as progress has at present been made. No sulphides other than those mentioned have so far been detected in the vein and no trace of copper has been seen. The zinc appears to be the richest gold-bearing sulphide in the vein; clean samples of zinc will always assay over \$100 per ton and sometimes run very high. This feature is an important factor in the economical handling of the ore, as this material is easily pounded up very fine, and very small quantities running to waste will produce high tailings.

The general features of the vein are, on the one hand, that it is small, that it lies flat and is frequently faulted; on the other hand, that its values are persistently maintained at a high level throughout the entire length of developments; that it breaks easily from the walls and that as depth is gained it is pitching more steeply. If this increase of pitch should be maintained the cost of mining will be correspondingly diminished. The prevalence of faults was at first a source of continual anxiety; familiarity with them has, however, shown that the displacements are not usually very large and that the direction of the slip can usually be observed. At the same time, they necessarily exert an unfavourable influence on the cost of mining.

At the mine the development has hitherto been carried on by hand, assisted where possible, by the use of steam drills. A small boiler and hoist has been installed, which hoists the ore from the shaft on No. 1 vein and keeps the same free of water. The ore is trammed from the tunnel on a short tramway to an ore bin of a capacity of about 80 tons, which is at the head of the inclined tramway. It is then conveyed on the inclined tramway to a larger ore bin about one hundred feet from the mill, by the action of gravity. This tramway is 2,150 feet long with a vertical fall of 1,200 feet. It is constructed on bents at least four feet high, to obviate the use of snow-sheds, and the grade while not uniform is of such a character that

speeding of the cars is nowhere necessary, and the loaded car is at any point able to start the empty car, even where loaded with several hundred pounds of stores. The cars have a capacity of at least two tons

rope. By a simple dumping arrangement the cars discharge their contents into the lower ore bin without any attention. So efficient and so quick is this tramway that the day's supply of ore is lowered by one



No 1. Kokane Range—Looking north from Athabasca Mine. No. 2. Athabasca Mine—Showing the upper end of Gravity Tramway. No. 3. Athabasca Mine. No. 4. Athabasca Mill—Showing inclined tramway office, etc. The wire tram road is the aerial tramway of the Hull Mine Co. No. 5. Athabasca Mine. No. 6. Employees of Athabasca Mine—Showing Engine House and Smith Shop at Mouth of Tunnel.

of ore and the construction of the ore bins, tramway and brakes is of the most substantial character. The rope used is a five-eighths Roebeing crucible steel

man or another at odd moments and practically the only cost of operation is the wear of the wooden rollers on the brow of the hill.

During its passage from the bin at the lower end of the tramway to the mill the ore is accurately weighed.

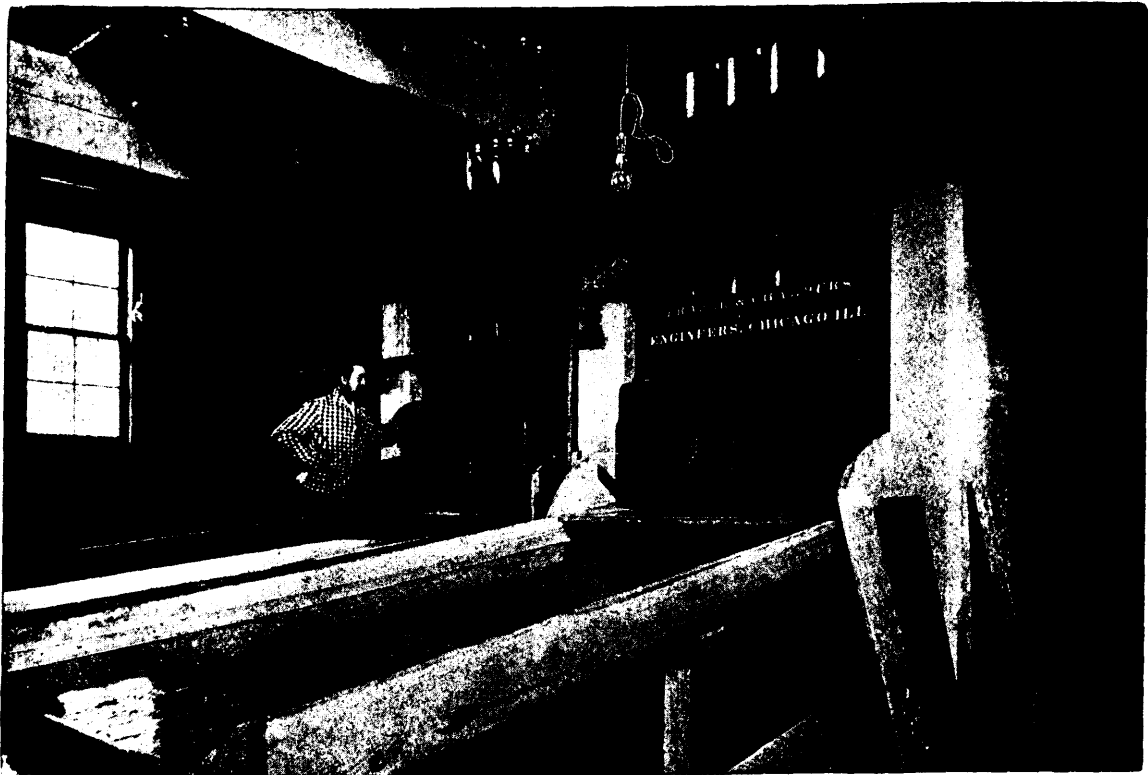
The mill is a ten-stamp Fraser & Chalmers mill; it presents no unusual features, but is of substantial construction throughout. The breaker is a 7 x 10-inch machine of the Blake type. The weight of the stamps is 980 lbs., and all of the wearing parts, including cams and tappets, are of steel. The plates are ten feet long in one section, and the mortars are fitted inside with back plates and chuck-block plates. The screens at present used are No. 30. Below the plates are a three-cone sizer and four Frue vanners. Of these one is a four-foot machine with corrugated belt and the other three are six-foot machines with smooth belts. The mill is lighted by a six kilowatt Edison machine, which lights also the dwelling and boarding houses. The mill is heated by steam. Water power is exclusively used. The water is taken by a dam in Give Out Creek and delivered by a flume 2,400 feet long and 24 inches wide and 20 inches deep at a head of 398 feet.

tory results have, however, been achieved, and a close study is being made of what is needed for a more perfect recovery. As soon as this is clear, additional machinery will be erected. A daily check is kept of the workings of the mill; the ore is accurately weighed, hourly samples are taken: (1) before entering the mortars, (2) after leaving the plates, (3) the tailings, (4) the concentrates, and the results of the assays are returned daily to those responsible for the mill.

The following results of the March run are a fair sample of the work of the mine:

Number of days run.....	30 days, 7 hours
Number of tons crushed	465
Approximate value of bullion recovered....	\$ 8,157 46
Gross value of concentrates.....	2,125 65

Total values recovered	\$10,283 11
Value of bullion per ton of ore crushed....	17 54
Value of concentrates " " "	4 57
Total values recovered " " "	22 00



THE ATHABASCA MILL.

From this point the water is conveyed in a ten-inch pipe, to the wheels of which there are two of the Tut-till pattern. The larger is a two-foot motor and drives the battery, the crusher and the electric light; the smaller is a 12-inch motor and drives the vanners only. Nothing could be more satisfactory than the work done by this water power. Since operations commenced on November 2nd, up to April 1st, the only delays (besides the stoppages for the monthly clean-up) have been as follows:

In November.....	11 hours
In December	4½ hours
In January	No stoppage
In February	Five days (severe frost)
In March	No stoppage

From what has been said of the character of the ore it will have been surmised that the milling of ore of this class presents some difficulties. Fairly satisfac-

Of the bullion about 58 per cent. was recovered in the mortars and the average value of the concentrates was as follows:

Gold	2.08 ounces per ton
Silver	4.10 ounces per ton

The amount of concentrates delivered at the smelter was net dry weight 46¼ tons, being exactly 10 per cent. of the ore crushed.

Conveniently located around the mill are the company's office, assay offices and mapping office, also a boarding-house and several residences.

The company has acquired the timber rights around the mill and also the water rights below the mill. The intention is, as soon as the snow is off the ground to erect a water-driven air-compressor to furnish power at the mine for running air drills, hoists and pumps.

The photographs were taken by Mr. C. W. Riley, foreman at the mine, for the purpose of this article.

THE MINING MEN OF THE PROVINCE.

MR. AUGUSTUS H. HOLDICH was born in Northamptonshire, England, in a small country parish, of which his father was rector. He was about eight years old when his family removed to London, where in process of time Mr. Holdich took the usual three years course of instruction at the Royal School of Mines, and obtained very high certificates of proficiency in various branches of science from such teachers as Professors A. W. Hoffman, John Percy, John Tyndall, and several others. At the conclusion of his third year Mr. Holdich was offered and accepted a situation at Swansea, S. Wales, as assayer and chemist to Messrs. Williams, Foster & Co.'s Morfa Silver Works, under Richard Pearce Esq., now of Argo, Colorado. On Mr. Pearce's removal to Colorado, Mr. Holdich took charge of the works for nearly two years, when he accepted a situation in the North of England under the Wigan Coal and Iron Co., as chief analytical chemist. This position he retained for fully seventeen years, during which time the laboratory staff increased from one to six assistant chemists, which will give an idea of the increase in the size of the works.

On severing his connection with the W. C. & I. Co., Mr. Holdich practised his profession in Wigan and the district for about two years, with much success; but hearing of British Columbia, he decided to try his luck out here, thinking in a new and rising country that his special training would be valuable. In the fall of 1892, Mr. Holdich settled in Revelstoke, where he remained until 1895 when his services were requisitioned for the Hall Mines Co. at Nelson. Mr. Holdich had the honour of pointing out to the directors the profit there would be in smelting their own ore instead of selling it, and it is largely due to his advice that the smelter was then erected for the treatment principally of the Silver King ore, but also of any other suitable ore that might be offered.

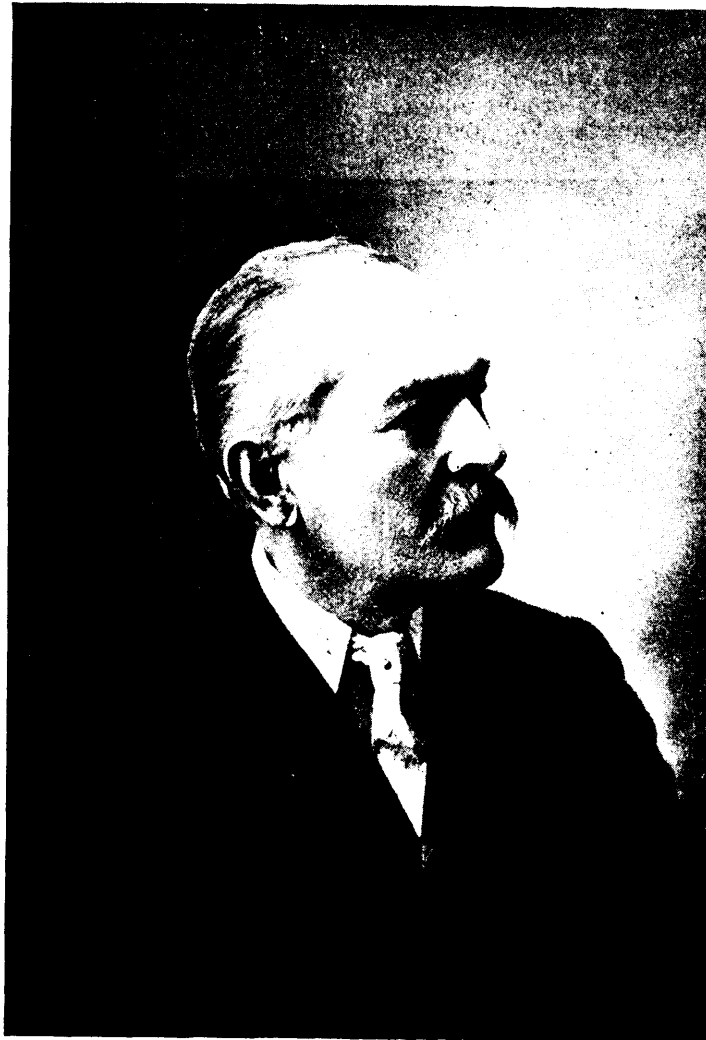
In July, 1897, Mr. Holdich left the service of the Hall Mines Company, and again set up for himself in Nelson as an independent assayer and analyst, which profession he is still practising.

THE SIMILKAMEEN.

(By R. E. Gosnell.)

THE next district, after the Boundary-Creek country which has to some extent passed the era of incipient mining speculation, to call for attention is Similkameen, on a direct line west, and practically in the same great mineral belt which extends almost continuously from the Rocky Mountains to Hope. It is already coming to the attention of capitalists, and only lacks railway communication to be the centre of a feverish excitement such as exists at Greenwood to day.

As is well known, the Similkameen is not a new country. It was first explored in the early days by placer miners and a considerable quantity of gold was taken out from along the Similkameen rivers and their tributaries. Long ago, too, it was known by old timers that very large ore bodies existed there, and it was predicted then that it would some day become a great mining camp. In fact, the hopes of many were nailed to that district long before the ore bodies of Kootenay were known to exist. Twelve years ago, a settler from the Similkameen valley described to the writer the mountains of ore which existed there, and descanted enthusiastically on the wealth that would be taken therefrom. Large hydraulic plants are now being worked in various parts of the district adjacent to Copper Mountain, and within a radius of a few miles of the town of Princeton, which some day will occupy a prominent position in relation



MR. A. H. HOLDICH, OF NELSON.

to the whole of that country. It is situated about 100 miles south of Kamloops, and about twelve miles east of Granite creek, the recording centre of the Similkameen district. It is also on the surveyed line of the Victoria, Vancouver & Eastern Railway, good prospects for the building of which existed before the annulling of the subsidy during the late session of the Provincial parliament. The promoters, however, it is said, have still hopes of carrying out their plans, but sooner or later it is conceded that a line more closely connecting the Interior with the Coast will yet be constructed. There are hopes, too, that a railway will be extended from here to a point on the main line of the C. P. Ry., probably Spence's Bridge.

It is only lately that this district attracted any large number of prospectors. During the summer of 1897 a large number went in, with the result that at Copper and Kennedy Mountains, some ten miles from Princeton, very large copper ledges were discovered. As will be observed later on, these ore bodies also contained very considerable values in gold and some in silver. I am indebted to a friend for some particulars of these claims, given as the result of an examination by a competent and reliable mining engineer, who thoroughly inspected all the properties referred to.

The first location made was the "Sunset" claim, on which several hundred dollars were expended. It showed such prospects of the makings of a mine that prospectors from Rossland and the Boundary District flocked in, and many locations were made, although there still remained a good deal of ground untouched. The little work already done has proved the country to be so rich in copper that the attention of capitalists has already been directed thither. The "Sunset" claim is developed by a 43-foot shaft, and is in solid ore with no walls. An average assay taken from the bottom of the shaft ran 14 per cent. in copper with \$2 to \$3 in gold. This claim is controlled by the B.A.C.

The "Sunrise" claim has two shafts, 10 and 26 feet in depth respectively, disclosing an ore body 30 feet in width running the full length of the claim, average assays running 27 per cent. in copper and \$4 to \$10 in gold.

The "Copper Farm" claim is developed by a 30-foot shaft, with average assays of 20 per cent. in copper.

The "Helen H. Gardner" has an open cut 300 feet in length, showing an enormous copper-bearing ledge, the width of which is not yet determined. There are also two shafts on this claim, 48 and 30 feet respectively in depth, with average assay of 11 per cent. in copper.

"The Primrose Boy," averaging 17 per cent. in copper. The copper bluff has exposed on it one of the best ledges on the mountain. It is a chalcopirite ore with large kidneys of bornite in the shaft, assaying 54 per cent. in copper and 20 oz. in silver.

"Canada Mountain," which is a spur of Copper Mountain, separated by the Similkameen River, has deposits similar in character but is less developed. Few claims have more than one assessment done on them.

The "Brooklyn" has 15 per cent. in copper and \$7 in gold, with a solid body of ore at the depth of 10 feet.

The "Magnetic" returns similar values, while the "Invincible" goes \$12.27 all values.

The "Key West" and "Lela" are also properties of apparently great merit. The "Lela" exposes on the surface a 60-foot ledge, assays showing total values of copper, gold and silver of \$32 at a depth of 10 feet. The ledge is exposed for a distance of 400 feet. The formation is dioretic with ledge matter of porphyritic quartz, impregnated with chalcopirite, showing malachite and arsenic. The "Key West" adjoins the "Lela," but it is crossed by the ledge row opened on Bornite and Princeton claims, assays from which have given 13 per cent. in copper at 10 feet deep.

The nearest railway transportation to this district is the main line of the C.P.R., at Spence's Bridge, a distance of 110 miles. A good wagon road at present connects Princeton with that point. About eight

miles west of Princeton some valuable free gold quartz ledges were discovered in 1896, the character of which is very similar to that of the celebrated Republic mine in Washington Territory.

The "Manila" claim is situated on the north side of the Tulameen River, eight miles west of Princeton. An average assay from thirty different openings across the entire width of 26 feet ledge gives \$30 in gold. At another point on the same ledge it gives \$18 in gold. The ore can be stamped and treated on the ground successfully by the "cyanide process." Numerous coal deposits have been found in the district, the nearest being only three miles from Copper Mountain. Several coal pits have been opened up near Princetown. The coal is lignite, and may probably be underlaid by coal of a bituminous character. Bituminous coal has, however, been discovered in the Tulameen Valley, about thirteen miles west of Princeton, and lime is to be had in the neighbourhood in abundance, supplying all the conditions necessary for successful treatment. Similkameen River also affords excellent water power, necessary for the operation of a smelter. It may also be added that the Tulameen Valley is a good farming country, in which there are a number of valuable ranches, so that until railway transportation is completed all the necessaries of life ought to be obtainable. There are also areas of pastoral and agricultural land distributed throughout, tributary to this section, which will eventually be comparable with the Kettle River Valley in importance.

MINE TIMBERING.

(By Wm. M. Brewer, M.N. of E.I.M. and M.E., etc.)

THERE is no position in the underground workings of a metalliferous mine in which the responsibility, and the chances of accidents are greater than that of timber man. The California mining companies, and those companies superintended by Californians in other states and territories invariably recognize this fact, and in consequence the timber gang receives more wages than the ordinary miners, and greater care is exercised in selecting men, who compose this gang, than in selecting regular miners. In British Columbia, where there are only a few companies carrying on extensive mining operations the necessity for extraordinary consideration being given to the subject of timbering has hardly yet become fully recognized. It is when one examines the deep mine workings in Colorado, South Dakota, Montana and other mining camps of the United States that such necessity becomes impressed on his mind.

Take, for instance, the underground workings in such mines as the Homestake in South Dakota, the Lamartine in Clear Creek County, Colorado, and the copper mines of the Lake Superior district, as well as those in Montana where the depth attained has been from 800 to 2,600 or 2,800 feet below the surface, and where the ore is stoped out for enormous thicknesses, as in the Homestake, where the country rock is of a schistose character; then the question of mine timbering becomes one of the most important which is brought under the consideration of the management.

One of the principal reasons why the substitution of masonry and iron and steel is advocated in the English mines is because of the liability of fire breaking out in the underground workings. In dry mines

the danger of fire is of course very much greater than in wet ones, and after timbers have stood in a dry mine for some years, the danger increases at an alarming ratio. Another reason for the advocating for such substitution is because of the comparatively short life of mining timbers.

A visit to the deep workings in any of the big mines will disclose such conditions with regard to timbering; the different methods adopted; the benefits derived therefrom and the character of work required to be performed by the timber gang, as are instructive and interesting not only to the average man, but also to the technically educated engineer. Usually in the same district the system of timbering varies in different mines.

For instance, in the Black Hills of South Dakota it was the writer's privilege some years since, to inspect the underground workings in the Caledonia mine, where a vertical depth of 700 feet had been attained. The history of this particular mine, from its discovery until it passed into the hands of the Homestake Company in the early '90's, was somewhat checkered. During the days of its early development the shareholders had been assessed to an amount of \$250,000, despite the fact that the ore was of equally as good a grade as that mined in the Homestake, which, during the same period, had paid its shareholders dividends running into seven figures of dollars. By adopting another system with regard to timbering the Caledonia later paid \$250,000 in dividends, and while this difference in the results of the operations was not entirely due to the timbering, yet, a large proportion was.

The change in policy was, from a regular system of timbering to mining without timbers, but leaving on each level a pillar or ore sufficient to support the roof, and when the ore-body had been worked out to the depth of 700 feet these pillars were shot down; several thousand tons of ore saved therefrom, and a few days later the entire roof was also shut down.

In the writer's experience this is the only occurrence of gold-bearing ore, where such a policy could be safely carried out. The reason for it was that the walls enclosing the ore-body, as well as the ore itself, was composed of extremely hard solid material. To a person, who had not actually seen the workings in the condition in which they were in in 1890, it would hardly seem possible that stopes averaging 85 feet in width could be opened and the ore mined from levels with safety, to either the mine or the miners. During one visit to this property, the writer stood on the seventh level and looking up the stope saw men, with torches, standing at every other level above him, demonstrating clearly that every available pound of ore, except that remaining in the pillars, had been mined to a depth of 700 feet. After the pillars had been shot out he was afforded the opportunity of visiting the workings again, and later, after the roof had been shot down. At a casual glance it would seem that the management of this mine had taken extraordinary, and almost criminal chances in pushing such a policy, but when the workings were thoroughly examined it was shown that in reality such an opinion would be incorrect. The best miners in the camp were as willing to work on the different levels of that mine as in any other. The record of accidents, fatal, serious or slight, compared favourably with the record kept in any mine in the States during the same period.

What was really demonstrated in these workings was the superior practical experience, evidenced by the foreman, who had superintended the work as well as his accurate knowledge of the formation in which he was mining.

This illustration is merely referred to in the present article because the work was unique and probably but few engineers even, have had an opportunity to view such conditions in the underground workings of any metalliferous mine.

The systems of timbering necessarily vary in accordance with the conditions encountered, such as thickness of ore-body, country rock, solidity of walls, etc. Sometimes a formation is encountered which is decomposed for a depth of 75 or 80 feet and, because of water, is almost as difficult to sink through as quicksand. Under such conditions, either in sinking of tunnelling, it is necessary to drive spiling ahead of the timbers; otherwise, the decomposed material, such as a mica schist will silt through between the last timbers and the face of the workings, causing the loss of a shaft or the caving of a tunnel. In the writer's experience, where such conditions are met with, the most desirable system of timbering a shaft is by hanging the shaft timbers to the collar timbers, which have been laid so substantially as to permit of the adoption of this system. Where it is possible in timbering a shaft in such a formation, it is advisable to use heavy planking in preference to hewed timbers, because the planks can be set so close together that the soft decomposed material cannot work through the cracks and permit of gradual caving behind the timbering, in which case it would only be a matter of time before a heavy cave-in would occur and burst in the sides or ends of the timbers.

A sufficiently substantial collar having been laid around the mouth of the shaft timbering is started from below by setting either the end timbers or the side timbers far enough into the wall of the shaft to give them some support (the size of the shaft would, to a great extent, control which timbers should be set into the walls); if the side timbers are set in, then the end timbers can be tightly wedged between the sides, or vice versa. The space between this set and the collar is then filled with the plank timbering, and as sinking on the shaft progresses set after set of timbers are put in place until the depth reaches the length of the hanger, usually twelve feet. Pieces of scantling are used for the hangers, two of which are spiked in each corner of the shaft to the collar, and also fastened to each plank in the timbering with sufficiently heavy spikes, and at the bottom the joints are broken so that one hanger will extend three or four planks below the other hanger in the same corner. As depth is attained in the shaft and the decomposed material becomes softer and more of the character of quicksand, it is not safe to sink more than two feet before putting in the timbers, and in order to insure greater safety the usual practice is to drive the spiling two or three feet ahead of the sinking. This spiling is allowed to remain behind the timbers and thus doubly insure safety against caving. This system was adopted by the writer in sinking a shaft in a decomposed mica schist in the State of Georgia, where lumber is cheap and the action of decomposition had extended from 75 to 110 feet below the surface, and where nearly every other system of timbering had proven a failure.

In some formations, in fact, usually shaft timbering is done by placing sets of round or hewed timbers at such intervals as the character of the rock being sunk in, renders most desirable, and afterwards lining with plank in order to make the walls of the shaft smooth and avoid accidents through the hoisting bucket catching against the edges of the sets of timbers.

Timbering a shaft or a tunnel is comparatively an easy matter as compared with timbering stopes of any considerable width. In timbering a tunnel, pillars and caps or cross-pieces, with lagging placed between the caps or cross-pieces and the roof, in order to prevent pieces of rock from falling on to the tram track, are all that is necessary; although it is generally advisable to set the pillars on a sill extending across the floor of the tunnel, because this will practically insure against the butts of the pillars sinking and rendering the roof timbers unsafe.

In timbering stopes, three systems are in vogue, the selection depending entirely on the width of the stope, the hardness and solidity of the country rock, and the pitch or dip of the vein. These systems may be designated as square timbering, stulls and lagging and pillars.

In the first, which is the system that should invariably be used in wide stopes, the chamber or space mined out, is occupied by square sets of timbers built one on top of the other from level to level. In setting these timbers, the work starts from the floor of the level, and as the ore is stoped out to the height, permitting the introduction of a square set eight feet in the clear, one set is built on top of the other until the roof of the level is nearly reached, then a set, cut to the length required, is placed under the sets in the level above, thereby catching and holding solid the timbers already placed in that level. Each set consists of four pillars or uprights, four sills and four caps, the dimensions of the timbers usually being 16 inches by 16, but, of course, in this respect the timber men are governed by the character of the ground in which they are working. The length is sufficient to leave eight feet in the clear, inside measurement. The advantages from this system of timbering in wide stopes are, first, that all ore can be extracted without the necessity of leaving ore pillars between the levels; second, that by placing lagging on the top of the set, the miners have a good floor to stand on while drilling, which can be made sufficiently solid to set up machine drills; while the only disadvantage is that in a dry mine, if from any cause, the timbers should catch fire, of course, the danger is excessive from the large quantity of wood to furnish fuel to the flames. Usually, were this system of timbering is adopted the waste material from the mine is dumped into the worked-out stopes, and sometimes this can be done, so that timbers can be withdrawn and used a second time.

In British Columbia, at the Silver King mine, owned by the Hall Mining Company, near Nelson, this system of timbering had been carried on to the 400-foot level. When the underground workings of this mine were visited by the writer in the spring of 1898 his attention was particularly attracted by the excellent work.

Managements often consider this system as being too expensive, and although it is the only system that should be adopted in very wide stopes, yet, very often in mines, where the stopes are of varying widths, although, the maximum may be even 40 feet, the sys-

tem of stulls and lagging is often employed for economical motives, rather than the square set system.

It has always been a question in the writer's mind, whether in the end, it is not more economical, and certainly insures greater safety, to introduce square-set timbering under such conditions, even though to do so renders it necessary to mine sufficient waste material to make the stopes a uniform thickness or width. Stulls and lagging in wide stopes are always liable to give way, and such accidents invariably result not only in loss of life but in rendering it necessary to incur great additional expense and loss from closing down the mine while new timbering is being put in.

However, in narrow stopes, say, to a thickness of ten feet, the stull and lagging system is the most economical and insures safety against accidents, provided of course, the timber men employed use proper judgment in securing sufficiently large timber to support the ground.

In narrow stopes of three feet and under, where the walls enclosing the vein matter are solid, it is often found that props or posts set at regular intervals between the floor and the roof, or the foot, and hanging-walls, afford ample security to the men as well as the mine. Especially is this the case where the dip of the ore-body is comparatively flat at any angle from up to, say, 45 degrees, provided, of course, the condition of the ground with regard to solidity is favourable. In coal mining this system is the one usually adopted in the rooms.

In order that an article on this subject should be thoroughly comprehensive, greater space and numerous illustrations should be used than the writer has been able to do in the present brief presentment, which he has merely written in the hope that through its publication the mining engineers of British Columbia may take an interest in the subject and present their own views in future issues of the MINING RECORD, because, in the writer's opinion, such discussions will prove both interesting and instructive, not only to the engineers themselves, but to all directly interested in the mining industry.

OUR LONDON LETTER.

THE NEW LOAN.

(From Our Special Correspondent.)

RECENT advices from British Columbia give some particulars regarding the proposed new loan. Powers have apparently been taken to raise something like £560,000, but nothing definite has been, so far as can be learned in the city, decided regarding the methods to be adopted in securing subscriptions. According to one account the Finance Minister has some scheme for placing what he calls "Internal Debentures," and he has already been in "communication with gentlemen in England and in Eastern Canada, who have agreed that it may be possible to place some of the money in debentures, terminable on certain dates in sums of \$10 and upwards at 3 per cent." I wonder if the opinions of these "gentlemen in England and in Eastern Canada" include those of the banks chiefly connected with the Province. I very much doubt it. It seems inconceivable that a London banker at all events could recommend a British colony to raise funds in such a fashion, or countenance an attempt which savours more of the kind of finance one would anticipate in a new piece at the "Savoy" than

the solid procedure to be expected from a Colonial Government. Of course it is the Finance Minister's duty to the Province to raise the money he requires as cheaply as possible, but it must not be forgotten that the new Government has already been freely, if somewhat undeservedly, criticised, and it will not do for it to lend assistance to those detractors, who have been swift to condemn its rather unfortunate display of parsimony. It would be far better for the British Columbian Government to follow in the footsteps of more experienced borrowers and conform to established usage, than to venture on such a novel plan of "raising the wind" as that referred to above. Of course the Minister of Finance will experience considerable difficulty in deciding what is the exact figure at which he should fix the minimum price of issue, *i.e.*, always assuming that prudence prevails and Mr. Cotton does not avail himself of his alternative powers. It may, therefore, be as well for me to set out in tabular form the record of the 1891. 3 per cent. loan (£984,760) which is quoted on the London market, and which is practically the only B.C. Government stock in which there is any dealings, the 6 per cent. and 4½ per cent. loans of 1877 and 1887, respectively being for small amounts, and seldom coming to market.

B.C. 3 per cent. inscribed loan, redeemable 1941:

HIGHEST AND LOWEST PRICES.					
1891.....	£ 86½	£ 86	1892.....	£ 91¾	£ 85½
1893.....	94¾	89¾	1894.....	99¼	88¾
1895.....	99¼	94½	1896.....	104¾	94
1897.....	105¼	100¾	1898.....	104½	98

Extremes—1891 to December, 1898, £105¼, £86.

When we come to remember that while in 1891 the 3 per cent stock at the Province was as cheap as £86 in the London market, its valuation had increased by 1897—or some six years' interval—to over £105, there does not seem much necessity for anxiety on the part of the Finance Minister. To assist him, however, I have prepared another table giving the quotations current here for a similar class of security:

1—To bearer.

NAME.		Redeem- able in	Approx. Price in London.	Yield p.c. at that Price. *
Canada.....	3 p.c.	1938	102	£2 18 3
Manitoba.....	4 p.c.	1928	105	3 15 0
Quebec (Prov. of).	4 p.c.	1834	109	3 11 0
Cape Good Hope.	4 p.c.	1917-23	114	3 1 6

2—Registered and inscribed stocks.

Canada.....	3 p.c.	1938	103	2 18 3
".....	2½ p.c.	1947	92	2 14 3
Cape Good Hope.	3 p.c.	1933-43	98	3 1 3
Natal.....	3½ p.c.	1914-39	107	2 18 6
Quebec (Prov. of).	3 p.c.	1937	93	3 5 0
New Zealand.....	3 p.c.	1945	96½	3 2 6

The steady decline in the value of capital of late years is largely responsible for the appreciation which has taken place in all classes of what are known in England as gilt-edged investments. Colonial stocks may of course be included in this category. While, however, this upward trend of quotations has placed English corporation and county stocks at such levels that they can seldom be bought to yield more than

*These yields per cent. are calculated to the nearest three pence, allowance being made for accrued interest, and also for redemption in cases where the market price is over par.

2¼ or 2½ per cent, investors still look for well over 3 per cent. on Colonial and Provincial Government securities, and only in few instances are content with less. Thus the average rate of percentage yielded on Canadian, Cape of Good Hope, New South Wales, New Zealand, Queensland and South Australian registered and inscribed stocks is £3 1s. 3d.

I see that "the Finance Minister calculates that he should get at least £94 for this loan, which, after deducting expenses, would bring the price to £92¼." In view of the growth of interest in the Province, the knowledge that capital can be well employed in that country for railroads, public works, etc., and the keen demand for this class of investment, I do not see why Mr. Cotton should not be even a little bolder and ask for £96 or £97, or say 5 per cent. or 6 per cent. under Canadian 3 per cent. inscribed, especially when it is remembered that in 1897, the existing B.C. 3 per cent. loan was quoted at the very high price of 105¼, or showing a yield to the investor at that price of less than can now be obtained on the premier security of the Dominion itself. Recent issues and their prices justify me in assuring Mr. Cotton that an issue of a 3 per cent. security by British Columbia at a few points under par would be well received by investors on this side—which is more than I should care to predict for any such scheme as that foreshadowed in the special correspondent's letter for which I have quoted. Anyway, the saving is so inconsiderable if the experiment proved successful, that it is really not worth while incurring the risk that must attend such a departure from the beaten track. England has ample funds to place at the disposal of her enterprising Colonies, and all that she asks in return is reasonable security and a fair interest on her money. Given these and she is prepared to finance the component parts of the British Empire in a generous and Imperialistic spirit.

THE CRITICS AND THE NEW LONDON AGENCY.

According to recent advices from the Province the action of the new Government in regard to the London Agency has been severely criticised by the opposition. Mr. Turner seems to have moved a resolution asking for the correspondence in connection with the dismissal of Mr. Vernon, and in doing so apparently made certain sweeping assertions, which were backed up by Colonel Baker. As I have devoted some attention to the charges complained of by Mr. Turner and his friends perhaps you will allow me to devote a certain amount of space to the subject in this letter. Let me say at the outset that I agree with the late Premier that it is absolutely ridiculous at this juncture in the history of the Province to pursue a policy of drastic retrenchment in regard to the London Agency. I have over and over again contended that it would pay the Government to increase the funds placed at the disposal of the London Agent, provided a careful control in the administration of such moneys was ensured. The Province has too long been neglectful of the opportunities recently afforded it of advertising its mineral wealth, both by means of pamphlet, and statistics, and also by the more expensive, but equally more direct newspaper advertisement. In his time, Mr. Vernon was fully cognizant of the necessity of direct advertising, but I presume the funds at his disposal did not enable him to spend much in this direction. At all events I never remember seeing any advertisements in the press during his time.

But with Mr. Turner and Colonel Baker's joint contention that the old locality was "that in which the greatest good to the Province could be secured, and

infinitely better for British Columbia" than where the present Agent-General is domiciled, I must join issue. Mr. Turner apparently thinks Victoria Street better than Fleet Street, because it is the thoroughfare in which "all the more important Colonies have their representatives." He also, according to the report from which I am quoting, considers that the "present office was in an out of the way locality for the purpose." If Mr. Turner could only bring himself to view matters as a City man he would understand that even if all the more important Colonies do have their representatives in the West End of London, this is not because it is most convenient for those who require to visit the different Agents-General, but because it is most convenient to the latter themselves. The South Australian Government has already recognized this and some time ago removed its office to the heart of the City, and I have no doubt that in time others will follow suit, for it is obviously to the advantage of the public that such offices should be domiciled where business men do most congregate. Meanwhile, as I have pointed out on previous occasions, it means wasting half a business day to pay a visit to any of the agencies in Victoria Street. But I could not, of course, expect Mr. Turner to accept my opinion as against his own, although I flatter myself that I am well acquainted with the needs of City men interested in the Province. May I, therefore, refer him to Mr. George Whitehead's very strong remarks upon this subject contained in the interview which I had with him on your behalf, and which was published so recently as January. Mr. Whitehead, who has an extensive connection among investors and is the head of a very important Stock Exchange firm, in commenting on the action of the Government in connection with the B.C. Agency, said emphatically that "if a change was to be made in the official representation of the Province in London it should have as its permanent head a man of business capacity with offices located somewhere in the City instead of amongst the lawyers and engineers of the West End of London." Again, if Mr. Turner will refer to my letter of 27th September last which appeared in your issue of November, and which dealt fully with the rumour then current that the Agent-General's office was to be closed he will find further evidence in support of the view that if a change was to be made it should be seized upon to transfer the office to the City. Those opinions included several stock brokers, and a number of secretaries of leading British Columbian companies, than whom none better could be in a position to judge from a City point of view. So that when Mr. Turner goes for the Government because it has shifted its London office nearer the City he is undoubtedly flying in the face of leading opinion in the City. Colonel Baker, too, can hardly be regarded as an authority upon the subject when he supports Mr. Turner in his assertions. Although Sergeants' Inn cannot be said to be in the heart of the City it is much nearer than Victoria Street, and therefore, handier for those of us in the City who occasionally want information of an official character. I do not want to be considered as having a brief for the new Agent-General, and still hold the view that it would be better to have the London Agency in the City itself in charge of an independent person, but at the same time it is absolutely ridiculous to use this change of office as a stick to beat the Government with, and in common fairness to Mr. Walter the new Agent-General I must admit that he has shown a desire to do the best with the information at his disposal.

THE MONTH'S MINING.

VERNON.

(From Our Own Correspondent.)

WITH the disappearance of the snow activity has commenced in the Hewitt Camp on Okanagan Lake. You will remember that some time ago a deal was put through by the Camp Hewitt Mining Company for a large block of the company's stock, the purchasers being the Canadian-American Mining and Development Company, of Peachland, and now development work on the Gladstone and some other claims of the Camp Hewitt group is being carried on by a large gang of men. The owners of the Densy have also purchased some adjacent claims, and are in treaty for others. Some stir is likewise being made in the matter of the Bow Diable, and with the new directorate there should be a satisfactory development this summer.

There is also a transaction in prospect re the Copper Queen, on Siwash Creek.

The Blue Jay is not being worked, but will most probably be heard from shortly.

The Grand Times and Hidden Treasure, which were purchased last year by Mr. Howe, of San Francisco, have been closed down, awaiting the arrival of the owner from the South.

The men working on a claim called the Iron Cap, formerly belonging to Mr. Knight and others, but now restaked under a new name, have struck it rich at only a few feet depth. The rock is so rich that the holders have built a house over it to protect it from outsiders. In consequence of this strike a good deal of recording and selling of claims is going on at present.

CAMP M'KINNEY.

(From Our Own Correspondent.)

Since my last letter Camp McKinney has been making great strides towards becoming one of the leading mining camps of the Province. The tri-weekly stage being found insufficient for the travel to the camp the Messrs. Snodgrass have put on a daily stage from Greenwood and when the boat on the Okanagan Lake makes daily trips to Penticton, the daily stage service will be extended to that place. A daily mail service is also in contemplation to commence in May or June, and with the promised completion of the telephone by the 1st of July our camp will be brought in touch with the mining and money centres.

That the camp is well deserving of the increased attention which it is receiving has been amply demonstrated by the great success attending the development of some of the lately incorporated properties, and claims which have hitherto been considered to have little or no values, have rather surprised some of the pessimists, who have been in the habit of classifying every location outside of the well-known developed properties as "wild-cats."

One of the worst features of some of these recent incorporations, is the small amount of stock, in proportion to the capitalization, which is set aside for development, and again, the promoters and vendors being allowed to dispose of their stock, such an arrangement being suicidal to a good property, saying nothing of a property whose merits are still undetermined. One of the finest stocked properties in the camp is the Minnie-ha-ha, with 1,000,000 shares, 525,000 of which are set aside for development, while the remaining 475,000, belonging to the vendor and promoters are "pooled," and not placed on the market. In contradistinction the Spokane company's with the same number of shares, set aside only 200,000, or one-fifth of the total for development, retaining 800,000 or four-fifths for vendor and promoter, with the privilege in mining parlance of "sloughing" them off, it must be obvious that such a system, unless the claim is extraordinarily rich, and the pay ore practically at the grass roots, must prove disastrous to the bona fide investors, and in fact are little better than instruments of gambling, in which the promoter is able to say "heads I win and tails you lose."

Considering the amount of snow the progress made during the last month has been exceptionally good. The old Cariboo keeps on the even tenor of its way and the dropping stamps are like Tennyson's brook. A townsite is to be laid out on a portion of the property, and as the mine is practically the "hub" of the camp, it will doubtless be the business centre. The Little Cariboo, one of the recent incorporations, is making a great showing at the 50-foot level, where a cross-cut shows the ore-body to be 14 feet wide, some samples showing a little fine gold. Mr. Crane, the

superintendent, is very much pleased with the outlook, and is very confident of having a mine. This gentleman is also in charge of the Shannon-Dolphin property, and is pushing the tunnel to cross-cut the ledge, which appearances indicate to be close. The surface showing of this property is one of the best in the camp. Southwest of the Dolphin is the Granite, on which a large force of men, under Supt. Hayes, are at work, the ore body in the shaft is from 6 feet to 7 feet wide, carrying good values, and the foundation for a mill is being put on this claim. The contract to sink the shaft to 200 feet on the Minnie-ha-ha has been completed, and a drift run to the vein between 2 feet and 3 feet wide, well mineralized. Just now only a few men are working, the management awaiting the arrival of a new compressor, when the force will be increased. The tunnel on the Waterloo, between No. 1 and No. 2 shafts, progress steadily, two shifts working. A steam hoist is on the way for this claim.

The state of the roads will delay for a week or two the hauling of the machinery now ordered for the camp. The 80-foot shaft on the Pendenny has been emptied and sinking commenced. A very fine sample of ore taken from the bottom is being shown around camp. The vein is some 5 to 6 feet wide, and apparently sold mineral. The vein on the Warton, which adjoins the Waterloo, was struck yesterday. Superintendent Wing was all smiles, and Mr. Bennett, one of the owners, feeling particularly good.

At the falls on Rock Creek, about three miles east of the Cariboo, Supt. Patterson has had five or six men working during the winter on the Gold Standard, belonging to the Lamen Company, of Ontario. He has a steam hoist in place, and an incline shaft down about 100 feet in a vein of high-grade ore. This vein is dipping into the Ophir claim on the opposite side of the creek, and is in fact one of the veins which run through the Victoria and Old England claims. This portion of the camp is likely to attract considerable attention during the coming season, as the ore generally is of higher grade than in the upper part.

Several deals have been consummated during the past month, among which may be mentioned the Sailor, upon which work will be commenced directly the snow goes; the Kamloops, the "Radju and Gordon, while offers have been given on the other good properties, viz.: Tandue and The Rover.

Some good samples of ore have been brought in from the northeast portion of the camp, but at present the quantity of snow precludes prospecting to any extent. It is needless to say that proprietors are getting most anxious for the disappearance of the snow and any sign of a thaw is welcomed by those eager to get in to the good things supposed to be hidden by winter's covering.

FAIRVIEW.

(From Our Own Correspondent.)

During the month of April two of the most prominent companies operating in Fairview have held their annual meetings.

On April 4th the Smuggler Company's shareholders met in Toronto. The directors' report showed that there was a sum of \$6,000 in the treasury, the proceeds of a new issue of 100,000 shares. It was decided at the meeting to develop the British Lion and Toronto mineral claims, which the superintendent, Mr. J. Campbell, has reported on in most favourable terms.

The shareholders of the Fairview corporation met in Victoria on April 14th and appointed Messrs. Dier, Davidson, Russell, G. Robinson, Judge Spinks and Mr. Levy directors.

In the report of the returns the officers spoke very favorably of the corporation's prospects, particularly of the hotel property, which is now paying good interest on the capital invested. It was decided to push work on the Stenwinder mine as vigorously as possible and it is evidently the intention of the directors to erect a mill on that mine as soon as the development has been proceeded with far enough to warrant such an undertaking. The Fairview Consolidated Gold Mining Company is engaged in development work on the Black Hawk claim in Fairview and also on a claim near Sicamous Station.

It is understood that Camp Hedley, Twenty-Mile Creek, Similkameen Valley, together with the Ashnola River and its tributaries, are to be included in the Osoyoos Mining Division under the new system of natural boundaries, which the Minister of Mines is wisely establishing for the mining divisions in place of the old system of meridians and parallels of latitude. I understand that the new western boundary of this mining division starts at the International Boundary and runs thence along the water-shed, next west of the Similkameen River to a point opposite the mouth of

Twenty-Mile Creek, where it crosses the Similkameen Valley and follows the watershed, next west of Twenty-Mile Creek.

The Government after a strangely long delay have at last, I believe, decided to move the Gold Commissioner and Mining Recorder from Ultima Thule (commonly called Osoyoos) to Fairview, where a fine building has long been waiting their occupancy.

The Government is also likely to construct a very much needed waggon road between Twenty-Mile Creek and Keremeos. This will be a great boon to the miners operating in Camp Hedley, as it will considerably cheapen their necessary supplies.

RICARDO.

CAMP HEDLEY, SIMILKAMEEN.

(From Our Own Correspondent.)

This camp came into prominent notice during the months of November and December last, when it became generally known that properties had been bonded there for such large amounts as \$50,000 and \$80,000. This news caused a rush of prospectors and the country was staked two or three deep with claims, for a distance of a couple of miles from the original discovery. Early in January Mr. W. K. Rodgers, who bonded the Nickel Plate, commenced work with a party of twelve men, prospecting the ground he had thus acquired. On the surface the Nickel Plate ore was of a base character, carrying values of over \$200 per ton, as the work was carried downwards some very fine specimens of coarse free gold were discovered, but as yet there seems to be no definite vein, but merely a very large deposit, the boundaries of which are as yet undefined. Besides the work on the Nickel Plate, Mr. Rodgers is also prospecting on the Rollo and Warhorse claims, which he holds under bond, and which also contain very high-grade ore. The crew of men has recently been augmented and this fact surely indicates an improvement in the appearance of the claims. Hitherto the great depth of snow has retarded the development of this camp, but now with the approach of summer and the disappearance of the snow come the prospectors and lots of them. It is almost certain that very many valuable new discoveries will be made in the Similkameen generally, and particularly in the neighborhood of Camp Hedley this summer. The need of a waggon road along the valley is badly felt and until quite recently hotel accommodation did not exist. Now, however, we have a good hotel within easy reach of the camp and situated on the Similkameen River, about twenty miles from Keremeos and thirty-five miles from Princeton. The enterprising hotel-keeper is also starting a store, so that prospectors will have a base of supplies right at hand, and will so be enabled to extend their quest for mineral deposits. A road is badly needed between Keremeos and the mouth of Twenty-Mile Creek. For the greater part of the distance there is a natural road, but the rest of the way is so thickly strewn with boulders that a considerable amount of work is needed to clear out a waggon track. At present goods are conveyed by pack horse.

BOUNDARY CREEK.

(From Our Own Correspondent.)

Spring is here at last and prospectors are once more entering upon a season's work. This year many intend giving attention to the country about the West Fork and other tributaries of the main Kettle River. Already numbers have passed through Midway en route to this coming and promising part of the country. Not only are prospectors exploiting it, but the irrepressible townsite boomer is hard at work, and enterprising pioneer store and hotelkeepers are locating at the ferry on McKenzie's pre-emption, near the junction of the West Fork with the main river, and on Bell's pre-emption, near the junction of Beaver Creek with the West Fork. Still higher up the West Fork, on land which has been professedly pre-empted bona fide, but which appears to have been staked for purely speculative purposes, others are preparing to establish a store and hotel business, and a townsite is to be laid off. There will be a pretty tangle for the hon. the Minister of Lands and Works to unravel here, and many residents throughout the district are awaiting with interest his action in this matter, which will demonstrate whether the laws relating to pre-empting may be disregarded with impunity by schemers and speculators "with influence," or whether the Minister will insist that the spirit of the law be regarded and so nip in the bud their speculative schemes. It is understood that a horse mail service between Rock Creek and Bell's pre-emption, near Beaver Creek, will shortly be arranged for, and that post offices will be opened at the West Fork Ferry and at Bell's. Mr. F. C. Gamble, Provincial Government en-

gineer, went up to the West Fork last week to choose a site for a bridge over that stream, which, when built, will be of much service to prospectors and others having occasion to cross it. It is to be hoped that this very necessary work will be pushed on with at once, so as to be available when the summer freshets make the stream unsafe for either fording or ferrying.

In several Boundary Creek camps progress continues to be good and results very gratifying. Work at the Mother Lode, in Deadwood Camp, is demonstrating the continuity of the big lode occurring on that property. Since the big station at the 200-foot level was cut out cross-cutting both ways from the shaft and drifting on the ledge has been proceeded with. 6'x8' cross-cut has been run about 80 feet towards the foot wall, and about 120 feet towards the hanging wall. The ledge was proved to be in the old tunnel about 185 feet in width, measured at right angles. At the present lowest level, which is about 300 feet below the old tunnel,—the mouth of the main working shaft is nearly 200 feet below the old tunnel,—the lode is at least 200 feet in width and neither wall has yet been encountered. All the way through the rock is more or less mine, realized, and the face of the cross-cut on the hanging-wall side is now in excellent ore. Good ore is also being met with in the drift, which is now in about 40 feet from the shaft. There are about 24 men on the pay roll, and the prospects of the Mother Lode are improving right along.

The tunnel on the Morrison, also in Deadwood Camp, is now in about 250 feet, and has about 150 feet to run before it will be under the shaft, sunk 115 feet in ore. A point under the shaft should be reached within two months from the time of writing. This tunnel has already passed through a blind lead, showing nine or ten feet of solid pyrrhotite, yielding gold values ranging from \$10 to \$14. There is a very big surface showing on the Morrison, and ore occurs freely in a number of open cuts. Some fourteen men are on the pay roll, and two steam drills are in use. Altogether the prospects of this property are very encouraging.

The Ruby, in Smith's Camp, is reported to be looking well. Some fine-looking ore, yielding good values in gold and copper has lately been cut. It is probable that Mr. Alex. Dick will take up his bond on this property. It is understood that work will shortly be resumed on the Republic group, also in Smith's camp. This group includes the Non-Such, Last Chance, Republic and Hidden Treasure. The Non-Such is the oldest quartz claim on continuous record in this district, and it has had a lot of work, chiefly tunneling, done on it. There is also a shaft over 100 feet deep on the Last Chance and one of like depth on the Republic. The ore from all three claims is free-milling and concentrating, and much of it presents a very attractive appearance.

The Old Ironsides and Knob Hill continue to be the show properties of Greenwood camp, and both appear to merit the praises that are almost universally bestowed upon them. Work is being actively prosecuted on them with results that are decidedly satisfactory. The Brooklyn and Stemwinder, also in Greenwood camp, are, too, developing well. It is stated that these properties will shortly be acquired by companies to be soon incorporated, each with a capital of \$1,500,000, and with its head office in Vancouver. Hon. Senator Cox and Messrs. Mann and Mackenzie are the largest holders in these claims. It is likely that the Brooklyn Mining Company will also acquire the Standard, which adjoins the Brooklyn, and that the Stemwinder Company's holding will include the Montezuma, which adjoins the Stemwinder on the north. All these claims are situate in close proximity to the Old Ironsides. The shaft on the Brooklyn is now more than 200 feet in depth, with solid well-defined ore in the bottom. A cross-cut at the 150-foot level showed about 60 feet of chalcopyrite of fair average value and similar conditions obtain in the drift now in about 75 feet. The new shaft on the Stemwinder entered the ore-body at about 150 feet in depth, at which level the ledge is being crosscut. Some fine ore, assaying up to 17 per cent. copper, and giving small values in gold and silver as well, is being taken out. Both the Stemwinder and the Brooklyn are equipped with steam hoists.

Descriptions of the Winnipeg and of the Golden Crown, both in Wellington Camp, were recently published in the MINING RECORD, so there is not much that is new to say about these well-known and very promising properties. The chief work now in progress on the Winnipeg is cross-cutting work, the object of intersecting the main ledge occurring on the adjoining claim, the Golden Crown, and drifting on the ore-body at the 300-foot level. This latter work is yielding a lot of fine ore, which is making an excellent showing on the dump. It is understood that a

compressor will shortly be obtained for use on the Winnipeg. After getting down to 170 feet in the main shaft on the Golden Crown, the rock was found to be too hard for economical working under existing conditions, so operations were lately suspended below ground, pending the installation of the compressor plant now on the way in from Marcus. Meanwhile the men are employed getting out timbers, cutting cordwood, and doing other top-work. They will probably be back underground before this appears in print. It is intended to sink the shaft to the 300-foot level and to then open up the mine extensively at that depth.

But little information is just now obtainable respecting the B.C. in Summit camp, the Jewel, in Long Lake camp and the City of Paris, in Central camp, but what little news comes in tells of good progress and results that are eminently satisfactory. A new boiler is being placed in position on the B.C., so as to furnish additional power for sinking, the work at present being restricted to drifting. The ore dump, previously a large one, has since the new proprietors took possession of the mine, shown largely increased proportions. There is now little room for doubt that the B.C. will rank among the prolific producers of the Boundary Creek district.

The C.P.R. Co. is pushing on the work of railway construction and is showing its strong confidence in the large extent and permanency of the mineral resources of Boundary Creek, by proceeding with construction of spur lines, notwithstanding that comparatively little ore is as yet blocked out in the several mining camps these spurs tap. This company is certainly doing much to assist in opening up this Boundary country; nevertheless, there is a strong feeling in favour of the granting of the Corbin charter so as to ensure the competition in transportation necessary in the best interests of the district.

Midway, B.C.

PERCY VERENS.

ROSSLAND.

(From Our Own Correspondent.)

With the disappearance of the snow here the magnitude of the projected operations of the Trail Creek mineral industry begins to disclose itself in its correct proportions. Winter's curtain is being rung up to the tunes of the robin and the smaller members of the feathered choirsters which, in addition to the spring warblings are singing requiems and funeral derges to the departed winter. The effects of winter on the activities of Rossland's staple industry has so far been to minimize these, the snow and other interruptions incident to the winter season, furnishing much more friction to progress than the summer when the mining population puts forth its greatest energy. The curtain which is now rising on this increasing stage of mineral industry does, indeed, disclose very much to excite wonderment, especially on the southeast face of Red Mountain, where the greatest activity has prevailed, and where large gangs of workmen have been busy constructing trestle works, laying rails, building granty trams, to say nothing of the great electric hoist of the War Eagle, shaft houses, warehouses, dwellings and a variety of mysterious structures, known only to mining men. Allusion has been made to the music of the robin and his associates. This is indeed acceptable to the denizen of Rossland, but far more acceptable is the harsh and discordant notes which come from the ton tram cars as the ore is unceremoniously dumped into the bunkers of the War Eagle, Le Roi and Iron Mask and thence into the railway cars. This trio of shippers, which has occasionally diminished its shipments, has never allowed its light to go completely out, though during one week there were but the insignificant quantity of 108 tons sent to the smelters, were opened up, for if the Le Roi was taking a rest, the so that production has never really ceased since the mines War Eagle would go on double shift, and vice versa.

Even the Iron Mask, with its small but steady shipment, and with an extensive law suit on hand with its neighbor, the Centre Star, and which is on the eve of being settled by the Supreme Court here, has not allowed the rails of its tram to grow rusty with disuse. To be brief: vast preparations for a large production and shipment have been made by the managers of the Le Roi, War Eagle, Centre Star, and the Columbia and Kootenay, the latter two even up to the time of the change of ownership having been partially developed mines and having respectively shipped at least 2,500 tons. The progress which the Rossland mines has made on the surface as well as underground is phenomenal, and the exterior improvements are of such a conspicuous character as to excite attention from far and near. A large percentage of the population is beginning to realize the fact that there is such a business as the legitimate

production of valuable ore, its shipment to smelters and its ultimate reduction to bullion therein.

This is the certain game which creates dismay in the ranks of the host which has learned the art of "how not to mine, how not to do it," as the expert forces under J. B. Hastings, W. A. Carlyle and Samuel Hall are every day proving that there are mining men and mining men.

The calendar year 1898 closed with a total production from Rossland mines of 116,000 tons, of which the Le Roi furnished 60,000 tons, the War Eagle 42,779 tons and the remainder 7,918 tons. The previous year (1897) the figures were officially given at 72,000 tons as the total output, and the preceding year (1896) at about 38,000 tons. The total gross valuation of the ore for 1898 amounted to \$2,842,393. The value of the Le Roi production is officially given for 1898 at 18.36 per ton net, making a total valuation of \$1,111,800. The net value of the War Eagle production for 1898 is officially given at \$11.70 tons, the total net valuation having been \$500,514, the net value of Iron Mask ores is officially given at \$40,960, the Centre Star at \$34,012 net, and the smaller shippers are credited with a total valuation of \$5,320.

At the close of the present calendar year (1899) more light will be shed on the technical and commercial features of the industry that has heretofore been given. One fact seems to be clear and this is that men like Hastings and Carlyle intend to systemize and tabulate their statements with commendable simplicity, what the public have a right to know will be presented in a lucid way, what is really none of its business will not be divulged. The Provincial Government insists on being in the know, because its tax collector wants to get the lowest base centieme to help the Provincial exchequer, and I have no doubt that great vigilance in this respect will be used, the mining man being a fit and proper subject for the taxman's attention. The industry, so far as these mines are concerned, has entered upon a season of vast preparations which must soon be followed by important results. One principle in connection with this industry has been exemplified very fully of late, and this is that trade must and will follow the flag.

The rapid growth of this trade is beginning to foreshadow its potentialities. The outlines of its possibilities must, at present, be measured by the proportions which have been made by railway corporations, manufacturing establishments, mine managers and banking corporations, to meet the requirements of this steadily advancing industry. The forces behind these factors having obtained the best scientific experience that the world could furnish, and having obtained reports and check reports, and having observed all the precautions known to capitalists struck their head balance as readily as if it were an ordinary account, eliminated the gambling feature or reduced it merely to a minimum, and are now advancing along the lines of a permanent and prosperous industry. Their practical skill with its hands thus strengthened, entered into this lawful and defensible combine, and the pace of commercial activity was quickened into the progressive march of continental progress, even as healthy as that which has colonized and quickened into prosperous life many of the great states of America and Australia. One may for a moment pause in contemplation of the wild, mad rush which heralded the birth of the Trail Creek gold fields. Much of the wild work of the early days was due to ignorance rather than wilful dishonesty, and it may be truthfully said that nowhere else do men show more ignorance as well as enlightenment than they do in the first rank of a mining camp. Now, that the 'fiat lux' has been proclaimed by the genuine modern mining engineer, the industry has been placed beyond the control of the gambler, and capital, always timed, has found its true protector in the man who looks up to heaven before he looks into the earth and thus acquires the inspiration which is absolutely necessary to secure confidence.

So far no reliable statistics have been tabulated as to the total value of mining machinery installed in Rossland mines. The task will doubtless soon be undertaken. The information will add materially to the mining literature of Rossland, and it will no doubt do ample justice to the mining man's necessary compeer, the mining machine factor.

On all sides in Rossland one hears the scream of his steam whistle, the swish and rattle of his engines and his cars, the positive vernacular of his steam pump endeavouring to say, "this noisy pump." This noisy pump, the burr and hum of his drills, the mighty detonation of his blasts, the clatter of his trams, and the incessant rattle of his wheels, while the smoke from his long chimneys denotes that the new factor—coke has come to stay.

It is known that until recently mining capital has been timid about coming into British Columbia, especially into

the interior where, whilst the mineral resources are very great, the facilities for transportation, etc., were imperfect and even prevented. When in 1895 the writer travelled through the interior of the Province the route was certainly a very awkward one and tedious in the extreme. Rossland was then known only to the initiated prospector, and it had then only a place on the map as a new mining camp. It has long since passed that stage, and the epithet "camp" is now resented by the new comer who advances along the lines of eastern ways. The influences which have contributed to its marvellous growth are continental rather than local, permanent rather than temporary, and revolutionary as well as evolutionary. Re-enforcing all this is the fact that Canadian energy, backed by British as well as Canadian capital, has come to remain as a potent factor of its progress. Owing much to its continental situation, it has grown from an American mining camp into a substantial British-American town of third-rate importance in the Province. Its people asked for a city charter and got it without question. Its regular population has steadily increased, considerable progress has been made in streets and other improvements, and it has now the most efficient council since its charter was issued. Its people reason that if the mines go ahead so must the town, a logical conclusion, provided the management is honest and enlightened. The city has now a population of from 8,000 to 10,000, which is steadily increasing.

The principle already affirmed that trade must and will follow the flag has materially influenced Rossland's solid growth. The first emphatic affirmation of this principle was the purchase by the War Eagle mine from its American owners by a Toronto syndicate by which J. B. Hastings, one of the most competent mining engineers of the continent, was placed at its head, not only as engineer, but as general manager. He possessed both organizing and executive ability, and began work by a system of management that has been carried out with great success. Mr. Hastings found that his predecessors had run the mine down by the bang and clatter process. The result of his conservative management has pleased no one better than the directors and stockholders of his company.

At the present time the mine is in first-class condition, and its affairs being directed by a highly intelligent staff it will soon begin to compete with the Le Roi for first position. The facilities for making shipments from this mine by the new hoist and tram are on the verge of completion. Shipments, which, up to a few days ago, were nominal, have since been greatly increased. The ore now being shipped is from the 250-foot level, and there is a lack of transportation facilities. The new electric plant, hoist and tram are of course now the centre of attraction. Two or three tests have so far been made, and notwithstanding numerous reports that the plant would not work well, the management seems to be satisfied that all will go well, and that in a few days the entire compressor plant will be tested to its fullest capacity, it being still on the hands of the contractors, who must make it "go" before it will be accepted by the mine management. The new shaft is down 734 feet, and as this shaft has been sunk on or close to the true fissure vein of the property and evidently run to a great depth there are no just apprehensions of "petering." The capacity of the hoist and tram is enormous, and it is not unlikely that an average of 500 tons a day will be the record for some time to come.

Le Roi.—The winter of 1898-99 had almost commenced before Ex-Governor Mackintosh succeeded in placing St. George's Cross on the fortress-like ramparts of the Le Roi mine. As Wolfe gained the Heights of Abraham, so did Mr Mackintosh ascend the steep rampart-like sides of Red Mountain and plant the standard of his corporation where previously the flag of our neighbors' was the triumph of the day. With adversaries, comprising men of first-rate ability, Hon. Mr. Mackintosh maintained his ground with commendable tenacity, and the experience which a gubernatorial of fire confers materially assisted him in his negotiations. These negotiations would make an interesting romance. In these Hon. Mr. Mackintosh was ably assisted by his some time colleague in public life, Hon. T. Mayne Daly, whose legal advice was at times invaluable. Mr. Edwin Durant, the financial agent and manager of the British-American corporation is a man of much natural shrewdness. In direct touch with those whom he represents, Mr. Durant sustained his position with more than ordinary ability, and the negotiations were carried to the focii of success.

When Mr. W. A. Carlyle, as engineer-in-chief for the British-American corporation undertook the management of

the mines belonging to the corporation in Trail Creek, he determined to pursue a policy similar to that adopted by Mr. Hastings in his management of the War Eagle. The Le Roi mine had been run down by the previous management, and it needed to be repaired. This has been very effectively done under Mr. Carlyle's management. Unfortunately a short time ago Mr. Carlyle met with a painful though not a serious mishap. He broke his knee-cap by a fall, but in spite of this accident he has more or less directed the work under his immediate charge. The ore from this mine is shipped via the Red Mountain Railway to the company's smelter at Northport, while that from the War Eagle is sent to the smelter at Trail via the C.P.R., which owns the smelter there, and charges the War Eagle company nothing for haulage. The ore shipments of these two mines for the week ending on Saturday, April 15th, of this year, distanced the record of any previous week. The Le Roi shipped 2,488 tons, or an average of 355 tons daily; the War Eagle shipped 1,015 tons, or an average of 145 tons daily; the Iron Mask shipped for the week 36 tons, making a total of 3,539 tons. The total shipments of Rossland mines from January 1 to the date mentioned were 24,855 tons. Henceforth when shipments are made by the War Eagle hoist, and the Le Roi increases its output, as contemplated, there will be an out-turn of at least 4,500 tons weekly from the mines named, but other aspiring shippers are coming into the field, viz.: the Centre Star, Columbia and Kootenay and probably the Sunset, so that in a few weeks the Rossland mines in ore shipments will have reached the highest figures yet recorded in the history of their output.

On the outside.—On Red Mountain the clatter of the mining industry continues unabated. Le Roi, War Eagle, Centre Star, and Iron Mask activity continues, notwithstanding the great law suit. Mr. Carlyle is once more in his office and the shipments of ore to the present time from the beginning of the year amount to 27,000 tons, with an average weekly output of about 3,500 tons.

The fact that Mr. D. C. Corbin has withdrawn his application for a railway charter to build a railway to Kettle River, was looked upon here by those in the know as a foregone conclusion.

YMIR.

(From Our Own Correspondent.)

Since the last issue of the MINING RECORD the miners here have organized a union, affiliating themselves with the Western Federation of Miners of Butte, Montana. The Ymir miners at present number in the neighborhood of 100 strong and are strongly in favour of the Government enforcing the eight-hour law. In this camp at only one mine has decent accommodation been provided for the men and that is the Ymir. The others mines have no quarters fit for human beings to live in, and in view of these facts the miners say the law should be enforced to the letter and wages remain as heretofore, namely, \$3.50 per day.

The Yellowstone, which is privately owned and operated by Eastern men, is a most desirable property. Much development work has been done on this ground and the result is such as to justify the management in ordering machinery, the ore is concentrating and runs well in values. The operators are very chary of giving any information to the public, but good news is always certain to leak out. The property has, meanwhile, been bonded at \$50,000, and the second payment was made on the 4th of April.

The Dundee Gold Mining Company held an annual meeting on the 5th April, at Rossland, and the receipt of \$2,600 insurance money in connection with their recent fire was reported to the shareholders at the meeting. Mr. J. Parker, who had acted as the company's superintendent since its formation, handed in his resignation, as he was unable owing to his other engagements to give the property the attention it requires. Work will be continued at the mine as before.

The Big Horn group, controlled by the Simcoe Gold Mining Co., has, from all accounts, become a very promising property, and assays are said to have been obtained, ranging from \$6 to \$58, or an average of \$32 across the lead, and \$12 in copper. The returns, be it remembered, are from the surface, only about 13 feet of work having been so far done. Another very promising property is the Great Northern, which is situated on Tamarac Mountain, and is owned by Messrs. McCulloch, Brannan, Savage and Sansum. There are three ledges on the claim, one of white iron and quartz, 1½ feet in width, a ledge of quartz and yellow iron 6 feet wide, another of galena 4 feet in width on which sinking to the extent of 30 feet has been done and a tunnel driven 25 feet. At the commencement of the work

the values were \$4 in gold, but since the better result of \$12.50 in gold is obtained.

A number of transfers of property have taken place here lately, and in many instances at good round figures. The indications are that much development work will be done in this district this spring and summer. The snow is beginning to disappear and many prospectors have already left for the Hills.

Mr. A. B. Irwin, who has acted in the capacity of general manager for the Canadian Pacific Exploration Limited, owners of the Porto Reco group, has, I regret to say, resigned his post, the company losing an officer who was thoroughly capable and who had always his employers' interests at heart. During the whole of the time that he was with the Canadian Pacific Exploration Company he held the respect of all the men under him. Your correspondent voices the sentiment of the community in wishing Mr. Irwin all future success and prosperity. It is reported that Mr. W. H. Coulsued, managing-director for the Canadian Pacific Development Exploration, Ltd. will reach Ymir very shortly, when work at the Porto Reco group will be again started, as there is now ample water to operate the mill, and that he will effect some very important changes in connection with this company's operations.

Sixteen-Mile Creek, or better known as the Cariboo Hump country, is rapidly coming to the front, and it is to be expected that there will be a big rush thither this summer.

NELSON.

(From Our Own Correspondent.)

Natural enough the new eight-hour mining law has caused much surprise in this district as well as in others. On the face of it, it seems a most sweeping change to make in our chief industry without anyone in particular asking for it—certainly not the great majority of those most interested—and without the most ample consideration and discussion. It is certainly to be hoped that this will not be a sample of the legislation we are to expect in the future, and the storm of protest that the measure has already raised will possibly give our wise parliamentary members reason to think twice next time before they unnecessarily interfere with the business that provides the money entrusted to them for the Provinces' benefit. It may be true enough that a man can do as much in eight hours as he usually does in ten, but as a rule he will not; and that is not the only difficulty, because it is useless to expect mine-owners to pay as much for eight hours as they will for ten hours' work. The matter of ventilation—allowing two hours between shifts to clear the working places of bad air—can be managed by increasing sufficiently the fresh air, there can be no real need to lose two hours' work for that reason. However, from advice lately to hand, it is not the intention of the Minister of Mines to press the matter too strongly yet, so it is to be hoped that any conflict between the masters and the men (which looked only too probable) will be averted, as well as the closing down of many mines.

The Silver King mine is going on steadily with development work, but is not at present shipping much ore to the smelter, which has now been shut down for some weeks. It is intended, however, to blow the furnace in again in a very few days for the treatment of a considerable quantity of lead ore which the company has been purchasing for some time. It is to be supposed that unless the Hall Mines saw their way to a profit on this enterprise they would not go in for it, but whether it will help to solve the problem of lead smelting in Canada remains to be seen.

It is most gratifying to read the account of the proceedings at the Athabasca; the superintendent, Mr. E. Nelson Fell, reporting a clean up for March of bullion valued at \$8,150, besides concentrates which were worth some \$2,100 more. This property certainly seems to be intelligently managed, and the stock is very well thought of in this town as well as in England.

The Exchequer, close, by, still looks very well and the main tunnel is being steadily driven. Some assays made recently on the ore from this property gave as high as \$80 in gold, while the average all over the ledge is said to be worth fully \$20 per ton. On Eagle Creek, the Duncan Mines Company intend to erect a ten-stamp mill at the earliest possible date, on their properties the Granite and Royal Canadian; and it is reasonable to assume that this expense would not be incurred unless the managers were satisfied with the quantity and quality of their ore.

From Crawford Creek, the commencement of the trail into East Kootenay, reports come in to the effect that it will be a busy camp this summer, as many very promising claims were developed considerably last season, and it is

the intention of the owners to push work with all speed this year. We may mention among others the Silver Hill group, the Humboldt, the Commonwealth and Emirs groups; and more especially the Big Copper or Bracebridge group, which there is every reason to believe will prove a magnificent copper property. Your Slocan and Ymir correspondents will give you the news from their respective districts, which seem to be remarkably prosperous, and proving their wealth by regular shipments of ore. Both districts send more or less of their products to Nelson, especially the Queen Bess mine in the Slocan, which is supplying the lead ore previously referred to, to the Nelson smelter.

As regards Nelson itself, there is every reason to be greatly satisfied with its continuous advancement and prosperity, and all things as far as can be foreseen indicate a continuance of that desirable condition. Business has been good particularly the building trade, and the new brick and stone blocks that are already and will be shortly erected are proof of the confidence of the owners. A railway is almost certain to be built into the Lardeau country from here, and the Robson-Penticton line is in active construction, which lines will tend both to increase the business of the city and also the output of mines which now cannot ship for want of transportation facilities, and will ensure a steadily prosperous future for Nelson.

A. H. HOLDICH.

SLOCAN.

(From Our Own Correspondent.)

Returns from this district have been phenomenally large the past month, considering that the state of the roads has terminated shipping from many of the prominent producers during the winter. The famous Payne has been exceeding itself in this direction, having shipped a grand total of 1,480 tons in the five weeks, ending April 14th, or an average of practically three hundred tons a week, a result which has rarely been equalled in British Columbia, when we consider the nature and value of the ore. Indeed, for one of the weeks during this period it turned out the prodigious quantity of 470 tons, or nearly seventy tons a day. Such a result speaks far more eloquently than words, and will surely have its effect on the stock market in Montreal, where the shares have recently been placed. The Last Chance, too, is proving what can be done by careful foresight and systematic development; a car a day, representing its regular contribution to the Slocan production. This mine is reported to be in excellent condition, with simply marvellous showings of ore in places. Though not displaying the same regularity in its output, the Queen Bess maintains a high standard, having produced roughly 650 tons of ore during the three weeks that it shipped, this result having been rendered possible by the extensive new discoveries in the No. 5.

Owing to the dangerous state of the roads, the Idaho mines have not figured in the list of shippers for some time past, but they are not to be denied for long, and this week finds them in their old position with a hundred and sixty tons to their credit.

With the re-operation of the Whitewater, Slocan Star and Noble Five concentrators and the largely improved condition of the roads, a substantial increase should be noticeable in the near future. Talking of this subject reminds us that the Ruth, which has not been heard from lately, intends to commence at once on the construction of its tramway and concentrator, the latter to be located within the corporate limits of the City of Sandon, a resolution having been passed exempting the property from taxation for a number of years.

Times are good at Whitewater, over a hundred men finding employment in connection with the property of that name. The Jackson, too, is working a full force and shipping uninterruptedly, while it is announced that the Whitewater Deep will be ready to resume operations with about thirty men at almost any time.

The Slocan Star made its initial shipment for this year, consisting of 120 tons, a few weeks ago, this having been taken out in development pure and simple. As soon as sufficient water is available, the concentrator will be restarted and Sandon's pay-roll thereby considerably augmented.

As evidence of the interest now being shown in zinc propositions, we observe that the Lucy Jim, the ore from which carries a higher percentage than is usually deemed desirable, has recently been sold to A. R. Browne, who represents the company operating the works near Manchester, which are specially adapted to deal with this character of ore. The result will be watched keenly by those having properties similarly handicapped.

Silverton has reverted to its former condition since the roads became impassable, an occasional shipment from the Vancouver and Emily Edith remaining to mark its progress. It is rumoured that a change has taken place in the ownership of the Galena Mines, and reports are current regarding new finds of galena, but these lack confirmation, and had better be accepted warily until such time as corroborative evidence is forthcoming.

The Noonday, which adjoins the Farm, is also said to be looking well, there being a car of ore from this property on the dock at Silverton awaiting transportation. May all the anticipations regarding it be realized—is the fervent wish of all worthy residents of the Slocan.

The Enterprise deal still hangs fire, although there is good reason to believe that one has been partly consummated. With the extremely limited array of facts at disposal, it is idle to speculate on ultimate results, but anything which will tend to re-awaken activity on that creek will be gladly welcomed by those owning property in the neighborhood.

The latest effort on behalf of the Arlington, the well-known claim on Springer Creek, appears to have been more successful than previous attempts to raise capital for development. A party of Boston people are reported to have taken the matter in hand, and stock in connection with the venture is now on the Eastern market. Confidence will, however, hardly be regained until the mine settles down to business, and something more substantial than has been the case in the past, can be shown in return for the money invested.

The eight-hour law has naturally been the main topic of conversation during the month and a satisfactory outcome is not regarded as by any means assured. Capital, always timid, has received a rude scare, and we shall consider ourselves fortunate if we escape without further injury to the industry.

A matter which has received but scant consideration here and yet is of vital concern to the district, is the huge smelter combine which has recently been effected on the other side of the line. If, as reported, it may result in an appreciable advance in the price of silver, we shall have good cause for congratulation, but we are not accustomed to regarding smelters as philanthropic institutions by any means, and there is a shrewd suspicion that any advance will be manipulated as to be of practical benefit to the smelter without improving the conditions of the miner. Let us hope that our attitude on this subject will prove a mistaken one.

TROUT LAKE DISTRICT.

(From Our Own Correspondent.)

Much activity is being displayed in this district at the present time, and it is confidently anticipated that the summer will see large development work being undertaken.

As is well known the "banner" property of the district is the Silver Cup. There are at the present moment about 120 tons of ore from this mine at Thompson's Landing awaiting shipment until the northeast arm of Arrow Lake is free from ice. Recently the developments at this property have been very favorable, disclosing in some new workings, some distance away from the main shaft, high grade ore. The management is to be congratulated on this satisfactory result, all the more as the policy adopted is the conservative one of developing and blocking out ore instead of rushing shipments to the eventual disadvantage of the mine.

Active development is also proceeding at the Nettie L. claim, a property situated not far from Ferguson. Some twenty tons are now in course of shipment to Thompson's Landing, pending further transportation to a smelting plant. It is expected that this shipment will, during the next few months be followed regularly by others of greater quantity.

A freighting outfit is also busy bringing down to the Landing about 125 tons of ore from the Beatrice claim on Mohawk Creek, a tributary of Pool Creek, which itself connects with Fish River. This ore is expected to be sent to the Hall Mines smelter at Nelson.

A point of note is the activity recently displayed by the C.P.R. surveyors, who have finished locating the line (to form part of the projected railway from Arrowhead to the head of Kootenay Lake) across the rock bluff near Arrowhead. The surveying party is now working north from Argenta, on Kootenay Lake, laying out the line, with a view, it is said, of construction work commencing with the departure of snow. It will be remembered that a preliminary survey was made last year. The building of this line will undoubtedly give a great impetus to mining in the district passed through.

WINDERMERE.

(From Our Own Correspondent.)

The Windermere Mining District of North-East Kootenay is attracting a great deal of attention, owing to the new rich discoveries of galena, copper and gold ores. During the season of 1898 over 500 locations were recorded. The principal creeks are Toby, Horse Thief, Boulder, Number Two and Dutch, in the Selkirk range, together with the district lying immediately east of Windermere Lake in the Rocky Mountain range. But during the past season attention was more especially directed to Toby, Boulder and Horse Thief Creeks, and their tributaries. The mineral belt extends from the head of the north fork of Toby Creek in a northwesterly direction to the range dividing Horse Thief from Number Two Creek, is some twelve miles long and apparently about four miles wide, and should development work demonstrate that the values obtained on the surface increase or even hold their own as depth is obtained there is the prospect of a great mining camp.

The Canadian Pacific Railway, it is reported, will be built from Fort Steele Junction via the most direct route to Windermere to connect with the Arrowhead branch via Toby Creek Valley. The Kootenay and North West Railway Company has already started their survey, it being their intention to build a railway from the boundary north via Steele and Windermere to the Canoe River country.

In the Delphine mine on Toby Creek, the shaft is now down 125 feet. A drift has been run on the lead at a depth of 100 feet for a distance of 40 feet. The shaft and drift is in ore for the entire distance. The ledge on the surface was about 6 inches wide and has gradually widened until at a depth of 125 feet it is nearly 4 feet. The ore is a sulphide carrying grey-copper and galena. The clean ore will assay very high, an average sample giving 385 ounces in silver and 70 per cent. lead. The lead can be traced for over 4,500 feet. The mine has been worked throughout the winter by a force of men under Geo. Stark, one of the owners. Meanwhile a shipment of ore will be made as soon as navigation opens.

The New Golden British Columbia Syndicate, of London, England, represented by Mr. W. G. Mitchell-Innes, has acquired some thirty claims, which they are now developing. On the Pretty Girl group considerable work has been done during the past season and a sample shipment was made to Swansea with good results. A tunnel of over 200 feet has been run, and they are now sinking a shaft on the ore body. The character of ore is a grey-copper, which assays very high.

The McLeod group, on Boundary Creek, owned by J. R. McLeod, John Borman, and Sinclair Craig, is one of the most promising prospects in the district. It has a well-defined ledge, averaging from 4 feet to 35 feet in width, with 4 feet of solid ore on the surface. The ore assays high in silver, lead and grey-copper.

The Swansea, situated east of Windermere Lake, is extensively developed. It has been acquired by the Derby Syndicate, who will resume work immediately. The Union group, near the Swansea, is being developed by West & Washburn, the owners.

Several properties have been bonded for large figures, namely, the Red Line group, on Horse Thief Creek, for \$50,000; White Elephant group, on same lead, for \$50,000; Sitting Bull group, for \$40,000.

It is reported that the Golden smelter will be blown in at an early date, to handle ore shipped from this district, as good shipping facilities are afforded via the Columbia River.

FORT STEELE.

(From Our Own Correspondent.)

Moyie.—This month the Lake Shore mine made a shipment of 100 tons of ore, which returned a profit of \$3,158, after deducting freight and treatment charges, amounting to \$2,050. The total value of the shipment was thus \$5,208. This consignment, therefore, nets the owner of the property a very handsome profit, for the cost of running would not at most have been more than from \$5 to \$6 per ton.

At the St. Eugene ore is being hauled down and another shipment will shortly be made. Hitherto the condition of the road has interfered with shipments, but there are some 2,000 tons of ore on the St. Eugene dump in readiness to be hauled down to the C.P.R. track when the roads are in a more passable state.

Elk River.—The coal fields of the Crow's Nest Pass lie in a southeasterly direction from Fort Steele. The distance to the nearest available coal from Fort Steele is sixty miles. This coal field has acquired a world-wide reputation on ac-

count of the quality and quantity of the product. The western outcrop is on the side of a mountain in the valley of the Elk River, one of the largest tributaries of the Kootenay River. On the eastern side of the mountain the coal seams have been traced for a distance of forty miles. The lowest seam is about 1,500 feet above the drainage of the valley and is 30 feet thick. One hundred feet higher there is another 30 feet thick, then another 15 feet thick, then a small 3 foot one, then another 30 foot seam and above these five more untable seams from 4 feet to 10 feet in thickness. There are eleven seams in all, having a total thickness of 145 feet of coal. These seams dip at an angle of 30 to 35 degrees, the upper seams having the least dip. The coal company has now in entire operation fifty coking ovens, while 50 more are under contract, and still further additions will be made as the demand for coke increases.

North Star.—The double compartment shaft is now down 215 feet and a station has been started at the 200-foot level to cross-cut the lead. The drive is now in 30 feet, and it is reported that 3 feet of solid galena has been encountered.

Stem Winder.—The main tunnel is now in 95 feet and the management will cross-cut the lead at this point. The ledge is from 50 to 100 feet wide, judging from the surface indications.

Sullivan Mine.—Sinking is progressing rapidly, and the manager, Mr. E. C. Smith, speaks in enthusiastic terms of the showing.

Sullivan Hill.—The Gem and Stoney claims, situated due north of the Sullivan group, have been sold to a large Spokane syndicate, composed of Col. Turner, Col. Redpath, W. Harris, C. Theis, W. C. Wakefield and G. Foster. These gentlemen were nearly all associated with the Le Roi mine. Work will commence on the property as soon as possible.

Tracey Creek.—John L. and J. H. C. claims, situated on Tracey Creek, some sixteen miles from Fort Steele, have been stocked for \$100,000. Mr. Cowley, of the Trader's National Bank, of Spokane, is president, and Mr. Knox secretary.

The Montana claim, a short distance from the above has been stocked for \$50,000.

Wild Horse.—The Hughes group will shortly be stocked by a Spokane syndicate for \$3,000,000. The group consists of fourteen claims, and is distant some fourteen miles from Fort Steele on a tributary of Wild Horse Creek. The claims are on a contact, which is traceable from Elk River to Wild Horse. The formation consists of slate, granite, porphyry, quartz and lime. Bodies of copper ore, covered by a heavy iron cap have been found and many locations made. The width of the ledges on these claims varies from 6 to 40 feet, and the ore assays high value in gold, copper and silver. At present the development done consists only of stripping a few open cuts, but the showings are very encouraging. Wild Horse will take another boom as it did in 1864, in the old placer days.

Railway.—Messrs. Watson, Caldwell and Natron have now been two days at Fort Steele awaiting instructions to commence the survey on the Hammersely road from the Boundary Line to Golden via Fort Steele and Windermere. They are utilizing their spare time in making notes of the mineral and agricultural resources of the country. The party expect to start for the Boundary Line on Saturday to commence active survey work.

THE IRON MASK-CENTRE STAR CASE.

(From Our Rossland Correspondent.)

THE chief interest this week centres in the trial now proceeding here before Judge Walkem in the Supreme Court for this division, the parties to this suit being the Iron Mask Mining Company, plaintiffs, and the Centre Star Mining Company, defendants.

The principle involved in this action is a question of extra lateral rights, claimed by the Centre Star Company under the old location since abolished.

The proceedings, though somewhat lengthy, recite pretty clearly the facts of the case, and preliminary proceedings on the merits of the action commenced on Monday last when the court opened.

Counsel for the plaintiff company is represented by E. V. Bodwell, Q.C., A. H. MacNeill, Q.C., and L. P. Duff, and for the defendant company by P. D. Danes, Q.C., and A. C. Galt and T. P. Galt.

Mr. Bodwell opened the case by filing and otherwise placing before the court certified copies and other docu-

ments intended to establish the identity of the plaintiff company.

The real contention of the plaintiff company is that the defendant company have wrongfully entered the Iron Mask claim underneath the surface and have constructed an incline shaft, tunnel and other workings therein and have taken away ore therefrom. Damages are asked for the wrong done and an injunction is prayed for restraining the defendants from further trespassing on the plaintiff company's ground.

This injunction was granted on June 27th, the plaintiff company then having obtained an order restraining the defendant company from doing or performing any further or other work by way of drilling, blasting, driving, sinking or carrying on any other mining process at the bottom (as it existed on June 25th, 1898.) of the winze which had been sunk from the uppermost drift, and run in an easterly direction from the inclined shaft of the Iron Mask ground, or from sinking, drifting or carrying on any other mining operations through, upon or along a certain fault in the said ground, and the fault is described as a flat fault or water course. This injunction is now being held on its merits.

About three weeks ago the plaintiffs were permitted to amend and add to the statement of their claim. The effect of this amendment is the contention on the part of the plaintiff company that the re-recording of the Centre Star and Idaho claims, as alleged by the plaintiff company, was virtually an abandonment of the claims as recorded on July 7, 1890—the wording of this contention being, "that the location of the claim in 1890 was invalid in any case, as contrary to the claims of the Mineral Act of 1888, which prohibits a free miner from locating more than one claim upon the same vein or ledge, and the same objection holds good to the re-recording in 1891, and that if the re-recording did amount to an abandonment, then the Iron Mask claim, located on the 23rd, and recorded on the 28th of July, 1890, is a prior location, and further, that the title, if any, to the Centre Star only runs from the time of the application for the Crown grant in the fall of 1893, at which time extra lateral rights were abolished, or in other words, as stated by the counsel to the court on Monday, April 17, if the title runs from July, 1890, then the defendants acquired certain definite extra lateral rights, if from July, 1891, restricted rights of the same description, but if from September or November, 1893, when the Crown grant issued, then no extra lateral rights at all. Plaintiffs' counsel has also raised some other objections respecting the survey of the claim. It will thus be seen that in addition to denying extra lateral rights on the part of the defendant company plaintiffs' counsel has actually attacked the validity of the Centre Star company's claim to the ground it holds, a very important contention, indeed.

Mr. Davis, in opening his case for the defence, put in a model showing main portions of the workings of the Centre Star, War Eagle and Iron Mask of the ground especially in dispute.

In the mining part of the suit the counsels for the defendant company allege that there are only three chief points of contention, viz.:

(1) Is there an apex of a vein on the Centre Star ground at the point where defendants claim it?

(2) Is there a vein continuing down from that apex (assuming that there is an apex) continuously into and through the Iron Mask ground, or, as it has been put in the affidavits, is there a continuous vein or any vein whatever in the No. 3, that is the inclined shaft?

(3) Assuming the apex and the vein is that vein, as all other veins which meet the flat fault, cut off entirely and its continuity destroyed by the so-called flat fault?

This was not disputed. Mr. Davis made no reference to the amended pleadings of the plaintiff company, which certainly would put him out of court if these pleadings were sustained by the court.

What appears to be a strange application was that made by J. B. Hastings on behalf of the defendant company, viz.: for the court to permit an examination of the ground of the Iron Mask to determine the question of continuity. As the Iron Mask has already an injunction to prevent the defendant company from trespassing on its ground, this application was only another variation of a petition to dissolve the injunction. The learned Judge did not directly throw this application out, it was in parliamentary language laid on the table for future reference.

A few days ago, in conversation with Mr. Roniter W. Raymond, of New York, who is here as an expert entrers on behalf of the Centre Star Company, I was informed by Mr. Raymond that he was never friendly to litigation in

such matters, but it was often impossible to avoid it. He said there were no two cases alike, and in order to get at the facts it was necessary to have them sifted by counsel before a court. Mr. Raymond is regarded as one of the best authorities on mining law on the continent. He is a special contributor to the *Engineering & Mining Journal*, of New York, especially on complex questions, involving rights, whether extra extra, lateral or otherwise.

Mr. Clarence King, who is here also on behalf of the Centre Star people, seems to be in good form, and as is also Louis Janin, Jr., who is here on behalf of the Iron Mask Company. The presence here of these eminent consulting mining engineers has created quite an interest in the entire question of our mining laws, and this interest is not in the least diminished by counsel—the legal talent being considered as very able and representative. As to Judge Walkem all parties have confidence in his ability and fairness. In all probability the learned Judge may reserve his decision after hearing all the evidence. The attendance at the trial—it is held in the Miners' Union Hall, shows that the case has attracted a great deal of attention.

NELSON'S NEW SAMPLING PLANT.

At a point where the tracks of the Canadian Pacific, with those of the Nelson and Fort Sheppard Railroads join, right on the shores of the Kootenay Lake, the Slocan Ore Purchasing Company is erecting a custom sampling plant, an undertaking of very great importance to the mines of the Kootenays. The promoters of the sampler have selected the location with a view to permit the ores to be hauled to the sampler by rail or water lines and to ship their ores over both of the forenamed railroads. The works, now under construction, will be equipped with all modern machinery, the seller of the ore will have the option of either automatic sampling by the Bridgeman automatic sampler, recognized to do the work as thoroughly as can possibly be done, or by the old method, the so-called split or quarter shovel insuring the seller the greatest possible care and fairness in the preparation of the pulp or assay sample.

It is gratifying to note that the new company has ordered their entire machinery from Canadian firms, and will continue to do so, whenever new additions are needed, the contract for erection of all piling and buildings have been let to Nelson firms, the lumber used in the construction being also supplied from British Columbia saw mills. The gentleman who has charge of the affairs of the company, Mr. G. M. McDowell, is a man of recognized ability in the organizing, erection and the running of sampling mills, coming from Colorado, where he had extended and valuable experience and training in the mining, milling and smelting of minerals. It is asserted by people of intimate knowledge with the affairs of the new company, that unlimited capital is at the disposition of the resident manager and that some of the greatest smelting concerns on the continent, bidding for the output of the B.C. mines through the medium of Mr. McDowell and the plant he is erecting.

Mr. Otto M. Rosendale, who came to B.C. with Mr. P. Johnson, of smelting fame, four years ago, and who until recently has been in the service of the Hall Mines, will be the ore purchasing agent for the new concern. Mr. Rosendale's accomplishments are too well known to require mention; it is sufficient to say that this gentleman is eminently fitted for the position he now occupies. The establishing of a plant for the buying of all ores which may be offered so centrally located, with more than ample capital, under the capable management of thorough business people, should receive the patronage and encouragement of mine-owners and mining people all over the province. It simply means that the ore seller has at home a market for his products; it will do away with tiresome and unbusiness-like delays in the settlements for the ore; it will give the man who has a few tons only as fair a market as the big mine-owner with so many hundreds of tons per week, and will afford the seller the easy overseeing of the sampling of ores. In the case of any disagreements between buyer or seller, tiresome delays will be avoided and complaints of unfair treatment adjusted on the spot without resorting to the mails or middlemen. Another point which speaks in favour of such a plant, is the fact that the money on the values contained in the ore will be paid to the seller so soon as settlement is made. This may mean the saving of a good many dollars to the seller, as the fluctuation in the price of metal when the ore is sent to long distances and by the producer direct, may mean a heavy loss to the mine-owner. We wish the new enterprise every success.

PUBLICATIONS.

OUR COAL RESOURCES—At the Close of the Nineteenth Century.—By E. Hull: Spon & Chamberlain, London and New York.

The matters treated of in this work include the classification of British coal fields, including those of England, Wales and Scotland; foreign coal fields, including countries under the British Crown, and countries not under the British Crown.

A useful and interesting chapter is that relating to the average value of coal at the pit's mouth in various countries, and the percentage of coal consumed in various countries. There is a chapter on progressive coal areas, stationary coal areas and retrogressive coal areas. It is worthy of note that the author of the work has obtained very full and complete statistics relating to British mines, but has failed to mention the rapidly developing coal areas of Vancouver Island and the Crow's Nest Pass.

Practical Notes on Hydraulic Mining, by G. H. Evans, M.E.: John Taylor & Co., San Francisco.

This is a work intended for the use of mine superintendents and managers. It relates to water facilities and methods of measuring the water available for hydraulic purposes. Another important point is the construction of ditches, flumes and pipe lines, and the most approved methods for obtaining the proper grade for the flow of water. Of other matters treated, are the amount of water that pipes of different size will carry and the friction and loss of head caused by the use of pipe of unsuitable size, are most important. Hydraulic motors and water wheels are fully dealt with, and a number of very useful hints on calculating strength of materials, including beams, ropes, bolts, chains, etc., are also given.

Small Accumulators, How Made and Used. This is a hand-book containing about 80 pages, prices 50 cents; published by Spon & Chamberlain, New York, U.S.A.

It is one of a series of popular scientific hand-books published by this firm for students and electric engineers. The volume will be found a practical and trustworthy guide to persons seeking information on the subject. Full directions are given for making accumulators, i.e., storage batteries, and at the end of the book there is a useful glossary of electrical terms that will facilitate the comprehension of the subject by the non-technical reader. Among the interesting forms of accumulators described is the "pocket accumulator," which is but four inches square and 2 inches thick— for supplying a current to a bicycle lamp. There is also a very convenient form of portable light for use in mines, and so arranged that in case of the outer glass being broken the light is instantly extinguished.

The Transition Curve, By Offsets and by Deflection Angles, by C. L. Crandall, C.E., Professor of Railway Engineering, Cornell University. New York, John Wiley & Sons; London, Chapman & Hall, Limited.

This work of Professor Crandall will prove of great assistance to the railway engineer as well as to the student of that subject. The tables of co-ordinates, deflection angles and arc excess are thorough and accurate, and are fully explained in the text. The chapters on field problems and on formulæ, present many improvements on the systems now generally in vogue among practical engineers, while the articles on deflection angles and the transition curve, under various given conditions, contains much original matter, which will be found to simplify to a considerable extent the methods formerly adopted. The addition of a table of natural sines, cosines, tangents, etc., makes the work a complete companion to the engineer engaged in laying out railroad curves of any description.

Hints on Amalgamation and the Care of Gold Mills, by W. J. Adams. Published by Modern Machinery Co., Chicago, Ill., U.S.A. Price \$1.50.

This book of 111 pages contains a large amount of information of a very practical character. It deals fully with a variety of subjects that are of interest to the millman beyond those indicated by the title, such as retorting and melting, concentration and sampling. There is a little want of care in editing, some of the illustrations being placed over the wrong numbers, and there are one or two errors in the letter press. Otherwise the book has been carefully prepared, and we can recommend it to everyone interested in stamp mills and the amalgamation of gold ores.

The so-called practical man would especially benefit from its perusal.

Inorganic Chemistry, According to the Periodic Law, by E. P. Venable and J. Lewis Howe: The Chemical Publishing Co., Easton, Pa. 1898.

This work enters the field already occupied by innumerable text-books on inorganic chemistry, offering as its chief 'raison d'etre' the necessity that appears to exist for an exponent of the so-called periodic law that is apparently visible among the atomic weights of the chemical elements. The periodic law is stated by the writers to be "that relation among the elements that exists when the elements are arranged in an ascending series, according to their atomic weights."

It is stated that "when the elements are thus arranged they fall into groups of seven, and in every eighth element there is a recurrence of the properties of the first, etc. This would then enable us to arrange all the elements in seven groups or columns of analogous elements. The chief reasons for accepting the table are the manifest natural law underlying it, and its simplicity, as well as the fact that several elements have been predicted to exist by means of this table."

It is admitted by the writer that "in the present state of chemical science, any table is necessarily imperfect and incomplete. This table therefore presents some difficulties, which, however, need not prevent its full acceptance for our present purposes."

The author further explains that "the first period of seven contains the group elements. These are also known as the bridge elements, since they show many cross-analogies to the elements of the immediately neighbouring groups, and serve to bridge over from one group to another. The second group gives us the typical or type elements. These give us in most pronounced form the characteristic properties of the group, and so on."

In fact the writer bends everything to fit his own particular theory. Old established ideas, and the usages of chemists throughout the civilized world are thus set aside, because certain numerical relations have been discovered to exist among the atomic weights of certain of the chemical elements. In the work before us there are undoubtedly several useful sections, as, for instance, those relating to latent heat and the valance of elements. A number of minor points that are sometimes insufficiently explained in text-books, are here clearly set forth. This, however, cannot be taken as a sufficient excuse for many far-fetched relationships and analogies which crowd the pages of the work, and must certainly tend to confuse the student.

In treating of the elements, we find our old friend oxygen removed from first place and only appearing in group six, while several elementary bodies, such as antimony and arsenic, instead of at a later period, as is usual.

Great reformers, who make sweeping changes in established systems are always met by a storm of opposition and even ridicule. It may be that the writers of this work are destined to figure among the heroes of scientific progress, yet we fail to see the present necessity for the sweeping changes proposed by the writer of periodic law.

CORRESPONDENCE.

The Editor does not hold himself responsible for the opinions which may be expressed in this column. No notice will be taken of communications unless accompanied by the full name and address of the writer.

AN ENGLISH MINING EXPERT AND THE OMENICA DISTRICT.

TO THE EDITOR:—The British Columbia *Review*, of London, publishes in its issue of March 25th a letter from Mr. E. P. Rathbone, the English mining engineer, who last year was sent out by a London syndicate to report on a number of hydraulic gold mining claims in the Omenica district. Mr. Rathbone's letter, I may say in passing, was written to explain a paragraph which appeared in the *B.C. Review* of October 22, 1898. This paragraph ran:

"The absolute stagnation which is observable in the British Columbia market will not be relieved by the result of Mr Rathbone's recent trip to the Omenica district. This well-known engineer was sent out a few months ago by the North-West Exploring Syndicate, in which Sir Ashmead Bartlett and others are interested, to report on certain properties which had been offered to them by a man whose reputation as a purveyor of sound mining properties does not

stand very high in the Province. The bargain he wished to dispose of to an unsuspecting London syndicate was another of his bad eggs, and appears to have had absolutely no features which would warrant its examination by any qualified engineer."

Now, as Mr. J. Weaver Bridgeman, of Victoria alone represented the owners of the Omenica properties in the negotiations with the North-West Exploring Syndicate, he naturally assumed that this libelous insinuation was aimed at him, and consequently wrote to Mr. Rathbone asking that gentleman if he was responsible for its publication. Mr. Rathbone replied in the *B.C. Review* as follows:

"The party referred to as being 'a man whose reputation as a purveyor of sound mining properties does not stand very high in the Province' is most certainly not Mr. Bridgeman, but a certain retired land surveyor, whose very limited knowledge of mining has proved most disastrous to many in Victoria, and might have done to English mining investors but for my timely warning."

Now, if Mr. Rathbone did not refer to Mr. Bridgeman, I take it that in his allusion to a "retired land surveyor" he alludes to me, though, doubtless, if he were asked to make that charge direct, it would turn out that after all his reference was to somebody else. However, if he wishes to charge me with wrong-doing and will do so in British Columbia, he shall have every opportunity of proving his assertion before a jury. Meanwhile, first allow me to emphatically state that I had no dealings or correspondence whatever with the North-West Exploring Syndicate, or with any person connected with it, and as a matter of fact I did not know the name of the syndicate until I saw Mr. Rathbone's report in October of last year. Now, presuming that Mr. Rathbone intended to attack me in his reference to the "bad eggs," I fail to see how, as I had carried on no correspondence and had no interview with the prospective purchasers. I could have acted in this case as the "purveyor of mining properties," good, bad or indifferent. The *B.C. Review*, while on this subject, commiserates with Mr. Rathbone on his "journey on horseback from Ashcroft to Omenica, which is a long and tiresome one." Well, it may be, but Mr. Rathbone did not make such a journey. The first 170 miles—from Ashcroft to Soda Creek—he took very leisurely in a private carriage. The next stage being by comfortable steamer to Quesnelle mouth, a distance of sixty miles, and the rest of the distance to Manson Creek (some 300 miles) occupied seventeen days of easy travel, travelling at the rate of about eighteen miles a day. Coming back he travelled on horseback from Manson to Stuart Lake, a distance of a little over a hundred miles, from here by canoe to Quesnelle mouth. I do not think this an exceedingly hard trip, although Mr. Rathbone took up the greater part of his fifteen pages of report in recounting his adventures and hardships on the trail and devoting about one-half a page to the business on which he was sent. Now, a little figuring will convince anyone that how much of Mr. Rathbone's estimate of the value of the property which he was supposed to examine is worth. Arriving at Manson on Sunday, June 12th, Monday he walked with me a distance of about three miles, over a good trail, and climbed a hill which lies half-way between the two creeks (Manson and Germanson), from which hill can be seen the lay of the country and the ground belonging to the company, and also the water courses. In fact, the whole surrounding country can be viewed, as from a map. He had my sketch map with him (which map I have now in my possession) and filled in some details with red pencil and marked this particular hill 750 feet above the surrounding country. We probably had about half a mile to travel through the woods to get to the peak of the hill. He complained bitterly of this half-mile walk and the hardships of it, because we had no trail cut for him, and he made the remark that the sale of many a good mine was lost by taking an engineer over such rough country. This occupied all of Monday. On Tuesday, we went down Manson Creek to where three or four Chinamen were shovelling into sluice-boxes. The Chinamen panned out several pans for us out of the face of the bench, showing a good prospect in every pan. We asked the Chinaman how much he was making a day, and he told us from \$8 to \$15 a day to the man. On Wednesday Mr. Rathbone accompanied me to Lost Creek, about two miles distant and visited a claim owned by a local miner named McKinnon. This man washed for us several pans, showing good prospects. McKinnon then accompanied us down to the company's ground. I asked McKinnon if he thought he could get a good prospect without much work. He said that he could and started to take a pan, but Mr. Rathbone stopped him, instructing him to take a pan half way up a bank out of a slide. McKinnon told him that he could get nothing there,

and he did not. This was the only panning Mr. Rathbone superintended on Lost Creek. Mr. Rathbone spent between breakfast and luncheon on Thursday panning on one of the claims (for perhaps four hours). On Friday, Mr. Rathbone went down again to Manson Creek as far as the Chinamen's workings. On Saturday he accompanied me to Manson ditch, taking the elevation with an aneroid, going as far as the saw mill on the ditch. On Monday following he moved to Germanson Creek, and on Tuesday panned for perhaps three or four hours on one claim on Gold Hill. On Wednesday he went down the creek a couple of miles or so with a prospector named William Kekuton, but it rained a little and they turned back after washing a few pans. On Thursday Mr. Rathbone returned to Manson Creek without having set foot on the most of the Germanson Creek claims. The next day he started on the return journey.

This is a liberal estimate. Twenty hours would cover all the time that Mr. Rathbone spent in prospecting. Allowing ten pans to the hour, which is considered fast panning, and allowing one hundred pans to the yard, he would have altogether have panned two yards. Yet he says in his report: "I carefully inspected all the claims." Again in the report he says: "Goods can only be transported during the summer months" (referring to the Cariboo road). Again he says:

"I have therefore no hesitation, so far as Germanson and Manson are concerned, in stating that these creeks are absolutely valueless and that whatever gold there is must certainly be looked for in the gravel deposits on either side of them."

I cordially agree with the last remark, as it is in the deposits on both sides that I have been looking for gold and found it. I supposed that it was for that purpose that Mr. Rathbone was sent out from England, as we had no creek claims to sell, for the simple reason that they had been worked out over twenty years ago.

I think it is hardly necessary for me to go any further. For the present I shall ignore Mr. Rathbone's insinuations with respect to myself, except to say they are utterly and entirely unjustifiable, and when at a recent meeting in Victoria the Omenica Consolidated Company, the paragraph from the *B.C. Review* was read the following resolution was unanimously carried:

Moved by Captain Grant, seconded by Mr. J. Taylor: "That this company is satisfied that the property secured for them by Captain Black in the Omenica is very valuable, that he was greatly handicapped as manager in carrying out his arrangements for the development of the company's property by reason of shortness of funds."

Meanwhile Messrs. More and Richards have made an offer on behalf of the St. Anthony Company for the purchase of the Omenica Company's property and rights on Manson Creek. This offer has been accepted. The property includes all claims and water rights, piping and electric light plant.

The St. Anthony Company's machinery has already gone north and will be taken up the river by the first boat leaving, about the 25th inst. It will be remembered that the Germanson Creek property was sold to the St. Anthony Company last November, and that the Victoria alleged victims have already received \$20,000 as a first payment on this "absolutely valueless property."

C. H. BLACK.

MR. RATHBONE'S CASE.

TO THE EDITOR:—In your issue of March I note you devote some of your valuable space to some rather severe comments upon me professionally. Now, as I am sure the spirit of British fair-play is fully as well recognized in British Columbia as it is in the Old Country, I know that you, Mr. Editor, having heard others, will not condemn me unheard.

After an experience of over twenty-five years devoted entirely to mining, more especially in recent years, to gold reef and alluvial mining, I cannot allow anyone to imply that I do my work in any but a thoroughly conscientious manner, and in fact in the best interests of those who employ me.

Let me at once admit that no engineer could thoroughly examine such a large number of claims as those staked out by Captain Black in and around Manson and Germanson in the time I devoted to the work, had such claims borne the slightest pretention to being of a true alluvial gold-bearing nature.

Apparently, simply on the grounds, that a very limited area in this district had been proved to be more or less gold-bearing, Captain Black has staked out a large number

of claims on ordinary gravel banks, resulting from washed down granite areas absolutely innocent of all gold veins. Since it did not require anyone of great mining experience to at once grasp this simple proposition, I went to work to test those claims, some two or three in number, where the river systems had cut through certain schistic strata, containing pockets and veinlets of quartz carrying gold. In the gravel banks on these claims a certain, or rather very uncertain quantity of gold was found. After testing this ground, panning every few feet from top to bottom, on clean sections, and getting very poor results, I did not feel justified in spending my employers' capital in making pits, driving tunnels and sluicing, more especially as I was engaged at a handsome fee of so much per month or part of a month. It is evident that it would, under such conditions, have paid me well to put in time, but I preferred to be decently honest and clear before letting them in, as the wily prospector so frequently does under similar conditions.

It is quite easy to appreciate the indignation of the Government Mining Agent against reporting which gives the game away, since his position depends on such novices as the worthy captain, staking out unlimited territory, as gold claims, which, by the way, frequently change hands at a good profit to other innocents back in Victoria. This process, whilst it undoubtedly pays the Government; seriously damages the country in London financial mining circles.

I can also feel for the long-headed but honest prospector, who, like my second abuser, Kavanagh, after infinite trouble, dragging beans and bacon into the country and taking a "lay" on Captain Black's best ground, finds, to his great disgust, that it contains only certain patchy areas which cannot be worked economically under present conditions. Surely his rightful indignation should rather have been directed against the noble warrior who induced him to go into the second Klondike. It is indeed strange that Kavanagh should be annoyed at the engineer who warned him before he started that he was likely to be disappointed. It would be interesting if the prospector Kavanagh would kindly publish the result of his "clean up." Did he and his friends make a fortune or did they not all come out wiser, but poorer men?

In conclusion, let me say that I have never condemned the Omineca as a whole, but merely the claims in which Captain Black was interested, and which I was engaged to inspect, and found to be first-class river gravel, after travelling hundreds of miles for the purpose. I am, sir,

Yours, etc.

EDGAR P. RATHBONE.

18 Bishop's Gate Street, Within
London, E.C.,

March 28, 1899.

SHIPPING MINES.

ROSSLAND.

The ore shipments from Rossland for four weeks, March 25 to April 15, inclusive, were as follows:

	Tons
Le Roi	9,847
War Eagle	1,903
Iron Mask	282
Evening Star	36
Total	12,074

SLOCAN.

The following shipments of ore were made from Slocan mines for the three weeks ending April 15:

	Tons
Payne	650
Last Chance	360
Ivanhoe	19
Slocan Star	122½
Treasure Vault	57
Total	1,208½

THREE FORKS.

	Tons
Queen Bess	255½
Monitor	160
Idaho	20
Total	435½

WHITEWATER.

	Tons
Whitewater	80
Jackson	82
Wellington	11

Shipments from above for three months, from January 1 to April 1:

SANDON.	
	Tons
Payne	3,120¾
Last Chance	920
Reco	200
Treasure Vault	111
Ivanhoe	60
Ajax	40
Sovereign	20
Trade Dollar	18
Sapphire	18
Madison	12
Total	4,519½

THREE FORKS.

	Tons
Queen Bess	984½
Idaho	640½
Monitor	62
Wild Goose	15
Total	1,702

WHITEWATER.

	Tons
Whitewater	750
Jackson	335½
Bell	30
Wellington	11
Total	1,126½

M'GUIGAN.

	Tons
Rambler	290½
Dardanelles	80
Great Western	48
Total	418½

SLOCAN LAKE POINTS.

	Tons
Bosun	300
Martin, N.D.	20
Wakefield	580
Vancouver	320
Comstock	120
Emily Edith	60
Fidelity	3
Total	1,403

TOTALS.

	Tons
Sandon	4,519½
Three Forks	1,702
Whitewater	1,126½
Lake Points	1,403
McGuigan	418½
Grand total	9,169½

FOREIGN COAL SHIPMENTS.

Following were the foreign shipments to 31st March, 1899, by the New Vancouver Coal Mining and Land Co., Limited:—

Date.	Vessel.	Destination.	Tons.
1—	Str. Titania.....	Los Angeles	5,104
2—	SS. Siam	San Francisco	4,374
5—	SS. Amur	Alaska	210
11—	SS. Wyefield.....	San Francisco	4,684
13—	SS. San Mateo.....	Los Angeles	4,307
16—	SS. Siam	Los Angeles	4,253
17—	SS. Mineola	San Francisco	3,186
18—	SS. Titania.....	Los Angeles	5,080
23—	SS. Amur	Alaska	190
24—	SS. Wyefield.....	San Francisco	4,691
28—	SS. Mineola	San Francisco	3,195
30—	SS. San Mateo.....	Los Angeles	4,273
Total			43,557

Shipments of same colliery to April 20th:—

Date.	Vessel.	Destination	Tons.
1—	SS. Amur.....	Alaska	152
2—	SS. New England.....	Alaska	36

2—SS. Siam.....	Port Los Angeles.....	4,394
4—SS. Titania.....	San Francisco.....	5,068
6—SS. Wyefield.....	San Francisco.....	4,822
9—SS. Mineola.....	Los Angeles.....	3,280
13—SS. San Mateo.....	Los Angeles.....	4,290
16—SS. Titania.....	Los Angeles.....	5,131
16—SS. New England.....	Alaska.....	42
17—SS. Fearless.....	Ounalaska.....	103
18—SS. Wyefield.....	San Francisco.....	4,911
20—SS. Siam.....	Los Angeles.....	4,400

Total..... 36,629

Following were the Wellington shipments for March:—

Date.	Vessel.	Destination.	Tons.
1—SS. New England.....	North Seas.....	50	
1—SS. Bristol.....	San Francisco.....	2,500	
1—Str. Wanderer.....	Port Townsend.....	20	
10—Str. New England.....	North Seas.....	50	
10—SS. Wellington.....	San Francisco.....	2,550	
10—Str. Angeles.....	Port Townsend.....	60	
12—SS. City Topeka.....	Mary Island.....	250	
14—Sp. Lancing.....	San Francisco.....	3,320	
17—SS. Al-Ki.....	Seattle.....	250	
17—S.S. Bristol.....	San Francisco.....	2,500	
22—Str. Tyee.....	Chemainus.....	100	
24—SS. Willametto.....	San Francisco.....	2,850	
25—SS. Wellington.....	San Francisco.....	2,550	
26—SS. Cottage City.....	Victoria.....	100	

Total..... 17,150

Following were the Union shipments for March:—

Date.	Vessel.	Destination.	Tons.
4—SS. Manuense.....	Victoria.....	580	
4—Str. Santa Clara.....	San Francisco.....	2,200	
4—Str. Sea Lion.....	Port Townsend.....	50	
4—Sp. Indiana.....	San Francisco.....	2,200	
4—SS. Miwera.....	Vancouver.....	1,200	
11—Str. Czar.....	Mary Island.....	43	
11—Bk. Shirley.....	Skagway.....	1,650	
18—Bk. Colorado.....	Juneau.....	1,709	
18—St. Pilot.....	Mary Island.....	85	
31—SS. Warrimoo.....	Vancouver.....	1,500	

Total..... 11,208

Following are the Comox shipments ending April 20:—

Date.	Vessel.	Destination.	Tons.
30—SS. Warrimoo.....	Australia.....	1,393	
4—Sp. Glory of the Seas.....	San Francisco.....	3,370	
8—SS. Tartar.....	San Francisco.....	1,400	

Total..... 6,263

THE METAL MARKET—APRIL.

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

The month opened with a great activity in all branches of the metal market, which continued throughout the first week and then became somewhat quieter. The demand for moeay has been sufficient to keep the rate of interest steady.

SILVER.

The market in this metal opened at 59¼ and continued steady throughout the month, our latest quotation by wire, April 27th, being 59¼ to 59½. These prices are per fine ounce at New York, and are a fair average of the value of silver during the past two years. During that time, silver has reached 60 or over only six times, the highest being 64¾, and the lowest 54½. This indicates that the metal has reached its true commercial value at those figures, and it is remarkable how small a variation in price there has been in so lengthened a period. In an ore averaging 50 oz. silver and 50 per cent. lead, such as is often found in the mines of this Province, it will be noted that lead at the present price is by far the more valuable product. The prime importance of the lead question to the miners of this country is thus clearly indicated.

COPPER.

Our latest quotations by wire from New York for lake copper are from 18 to 18½, and these prices have been maintained steadily during the past month. The market is strong and the tendency upward. The London demand is increas-

ing, and in view of the small stocks of the metal on hand the price will in all likelihood experience a continued advance during the present month. It would not be surprising to see it touch the 20 mark, and when it is remembered that a year ago it was selling under 11 cents, the point that has now been reached is simply marvellous. The demand seems to have gone beyond the producers' capabilities.

LEAD.

The disturbing feature in the lead market is the uncertainty as to the policy of the American Smelting and Refining Company, which has not yet been clearly defined. The tendency, however, is upward, and we quote \$4 to \$4.32½ at New York, and \$4.08½ at St. Louis. The market during the month has been dull.

SPELTER.

Our New York quotations by wire are from 6.00c to 6.70c, only a slight improvement on last month's figures.

STOCK MARKET.

Undoubtedly the feature of the month has been the rise in Van Anda shares from 4 cents to 8½ cents.

In Slocan stocks the price of Wonderful has risen from 4 cents to 12 cents, but since this stock has declined to 10 cents. Payne has been very active in Montreal, and is selling at \$3.85 to \$3.00. Noble Five has been selling at 30 to 31 cents. Rambler at 30 cents, Athabasca at from 45 to 47 cents, Dardanelles at 10 cents.

Rossland stocks have been quiet for several weeks past, with enquiry for Evening Star, Monte Christo, Iron Mask, Iron Colt, Iron Horse and War Eagle.

Boundary stocks have been more in demand, Winnipeg selling at 30 to 31 cents, Brandon & Golden Crown 29 to 30 cents, Morrison 16 to 17 cents, Knob Hill is quoted at 97 cents asked with 92 cents bid. Old Ironsides \$11.2 asked, \$1.09 bid.

Camp McKinney stocks have been quieter, with some enquiry for Cariboo, Waterloo, Warton, Fontenoy and Little Cariboo.

Fairview Corporation, in Fairview Camp, has been somewhat in demand at 12½ cents. Smuggler is quoted at 4½ to 5 cents.

There are now strong indications that the dullness which has characterized this market during the six weeks will ere long give place to a renewed activity, although the eight-hour law and other causes continue to exercise a depressing effect.

THE ROSSLAND STOCK MARKET.

(Special Monthly Report by Messrs. Dickinson & Orde.)

During the past month the stock market has due to one cause and another been quieter than in any preceding month this year. The sensation this month has been Wonderful, in the Slocan district, which, starting at 3 cents rose to 12½ cents, and is now quoted at 10 cents. At this figure, however, there are more sellers than buyers, the latter preferring to wait further developments in the shape of shipments or thoroughly authentic information about the property. Besides the Wonderful, there has been a very fair amount of trading in Brandon & Golden Crown and Winnipeg, in the Boundary country, both of which properties are showing up very well, and in our humble opinion we consider them among the best investments on the market at the present time. Athabasca and Rambler Cariboo there has been some trading in also, but for both the demand has fallen off somewhat of late. In the Rossland Camp Evening Star remains firm, the demand for Novelty and Giant has fallen off, for Iron Mask there are plenty of buyers, but almost no sellers. Monte Christo is strong at 11½ cents. For Rathmullen also there has been a steady market. In Republic stocks, the trading has been chiefly in Princess Maude, Lone Pine, Morning Glory, Republic, Mountain Lion, Jim Blaine and Summit. There is a rumour current to the effect that a considerable block of Mountain Lion sold in Montreal a few days ago.

Abe Lincoln.....	\$ 31	Athabasca.....	\$ 51
Commander.....	11	Brandon & G'n Cr'n..	31
Deer Park.....	7	Cariboo (C. McKinn'y)	1 53
Eureka Con.....	10	Cariboo Hydraulic....	1 45
Gertrude.....	11	Cayoosh Creek Mines.	60
Giant.....	5	Dundee.....	32
Gopher.....	4	Dardanelles.....	12
Grand Prize.....	3	Goodenough.....	11
Iron Colt.....	20	Knob Hill.....	97

Iron Horse.....	18	London Hill.....	15	Rossland Homestake..	5	Tamarac (pooled).....	18
Jumbo.....	39	Nelson Poorman.....	26	Rathmullen ..	8	Tinhorn.....	8
Le Roi.....	8 00	Old Ironsides.....	1 15	Silver Bell.....	5	Two Friends.....	7
Lily May.....	20	Reco.....	90	St. Elmo.....	8	Van Anda.....	5
Monte Christo.....	14	Salmo Con.....	20	Victory Triumph.....	11	Victoria Texada.....	10
Mugwump.....	5	Smuggler.....	6	Virginia.....	49	Waterloo.....	13
Novelty.....	5	Slocan Star.....	1 15	War Eagle.....	3 50	Winnipeg.....	31
Poorman.....	13	Sable Creek.....	5	White Bear.....	6		

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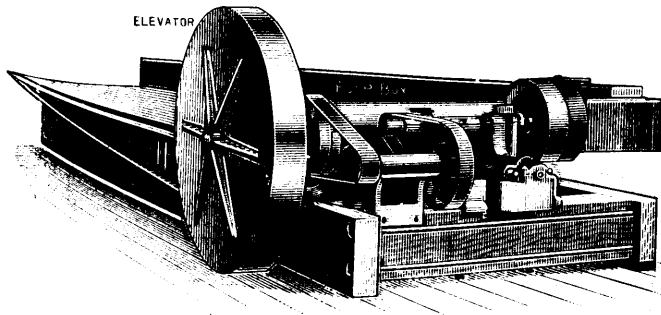
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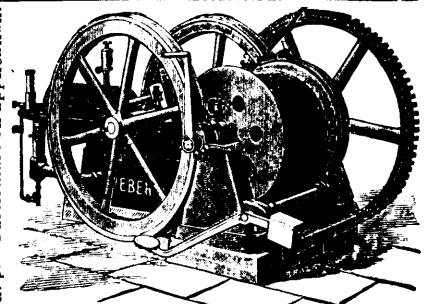
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Mining Stocks.

Prepared by A. W. Moss & Co., Mining Brokers, Victoria, B.C., Apr. 24, '99.

Company.	Capital.	Par Value.	Price.
TRAIL CREEK.			
Alberta.....	\$1,000,000	\$1	\$ 4½
Big Three.....	3,500,000	1	27
Bruce.....	1,000,000	1	10
Butte.....	1,000,000	1	02
Caledonia Con.....	1,000,000	1	5½
Centre Star.....	3,300,000	1	11
Commander.....	500,000	1	06
Deer Park.....	1,000,000	1	20
Enterprise.....	1,000,000	1	11½
Evening Star.....	1,000,000	1	02
Georgia.....	500,000	1	15
Gertrude.....	500,000	1	04
Golden Drip.....	1,000,000	1	03
Gopher.....	1,000,000	1	05
Hattie Brown.....	500,000	1	6
High Ore.....	1,000,000	1	18
Homestake.....	1,000,000	1	80
Iron Horse.....	500,000	1	10
Iron Mask.....	1,000,000	5	20
I.X.L.....	500,000	1	40
Iron Colt.....	1,000,000	1	40
Jumbo.....	500,000	1	40
Le Roi.....	£1,000,000	£5	£6
Lilly May.....	\$1,000,000	1	\$0 20
Mabel.....	1,000,000	1	15
Mayflower.....	1,000,000	1	10
Monita.....	750,000	1	19
Monte Cristo.....	2,500,000	1	12
Nest Egg-Firefly.....	1,000,000	1	05
Northern Belle.....	1,000,000	1	4½
Novelty.....	1,000,000	1	5½
Palo Alto.....	1,000,000	1	05
Poorman.....	500,000	1	14
R. E. Lee.....	2,000,000	1	5
Red Mountain View.....	1,000,000	1	3
Rossland, Red Mountain.....	1,000,000	1	13
St. Elmo.....	1,000,000	1	07½
Silverine.....	500,000	1	6
Silver Bell Con.....	500,000	25	6
Victory Triumph.....	1,000,000	1	10
Virginia.....	1,000,000	1	60
War Eagle Consolidated.....	2,000,000	1	3 65
White Bear.....	2,000,000	1	4½
AINSWORTH, NELSON AND SLOCAN.			
American Boy.....	1,000,000	1	11
Arlington.....	1,000,000	1	6½
Argo.....	100,000	0 10	10
Athabasca.....	1,000,000	1	50
Black Hills.....	100,000	0 10	10
Buffalo of Slocan.....	150,000	0 25	—
Channe.....	250,000	0 25	06
Dundee.....	1,000,000	1	33
Dardanelles.....	1,070,000	1	10
Dellie.....	750,000	1	12
Exchequer.....	1,000,000	1	13
Fern Gold.....	200,000	0 25	50
Goodenough.....	800,000	1	11
Gibson.....	650,000	1	17½
Hall Mines.....	£300,000	£1	—
Lerwick.....	\$1,500,000	\$1	10
Leviathan.....	2,000,000	1	05
London.....	150,000	1 25	25
Minnesota.....	1,000,000	1	66
Nelson-Poorman.....	250,000	0 25	25
Northern Light.....	250,000	1	16½
Noble Five Con.....	1,200,000	1	31
Ottawa and Ivanhoe.....	1,000,000	1	12½
Payne.....	3,000,000	1 00	3 90
Rambler Con.....	1,000,000	1	31
Reco.....	1,000,000	1	1 00
Slocan-Reciprocity.....	1,000,000	1	06
Slocan Star.....	500,000	50	1 10
Santa Marie.....	1,000,000	\$1	05
Silver Band.....	250,000	0 25	12½
Slocan Queen.....	1,000,000	1	10
Star.....	1,000,000	1	07
St. Keverne.....	1,000,000	1	04½
Sunshine.....	500,000	10	—
Tamarac.....	1,000,000	1	25
Two Friends.....	240,000	30	11
Washington.....	1,000,000	1	25
Wonderful.....	1,000,000	1	11
LARDEAU.			
Lardeau Goldsmith.....	200,000	1	04
Consolidated Sable Creek Mining Co.....	1,500,000	1	10
TEXADA ISLAND.			
Gold Bar.....	100,000	10	10
Raven.....	1,000,000	1	10
Texada Proprietary.....	250,000	0 25	25
Texada Kirk Lake.....	600,000	1	1 00
Treasury Mines.....	250,000	25	25
Van Anda.....	5,000,000	1	08½
Victoria-Texada.....	150,000	0 25	04
VANCOUVER ISLAND.			
Alberni Mountain Rose.....	250,000	1	09½
Consolidated Alberni.....	500,000	1	5
Mineral Creek.....	500,000	1	05½
Mineral Hill.....	750,000	1	05
Quadra.....	500,000	1	05

CARIBOO.			
Cariboo Gold Fields Ltd.....	£100,000		
Cariboo Hydraulic Consolidated.....	\$5,600,000	\$5	1 50
Cariboo M. & D. Co.....	300,000	1	25
Golden River Quesnelle.....	£350,000	£1	1 40
Horsefly Hydraulic.....	\$200,000		
Horsefly Gold Mining Co.....	1,000,000	\$10	1 50
Victoria Hydraulic.....	300,000	1	85
LILLOOET DISTRICT.			
Alpha Bell.....	500,000	1	
Cayoosh Creek Mines.....	500,000	1	
Excelsior.....	500,000	1	
Golden Cache.....	500,000	1	03
Lillooet Gold Reefs.....	200,000		25
FAIRVIEW CAMP.			
Smuggler.....	1,000,000	1	13
Fairview Corporation.....	1,000,000	25	13
BOUNDARY.			
Brandon and Golden Crown.....	1,500,000	1	33
Knob Hill.....	1,500,000	1	1 00
Old Ironsides.....	1,000,000	1	1 15
Winnipeg.....	1,000,000	1	32
CAMP MCKINNEY.			
Camp McKinney Development Co.....	600,000	1	21
Cariboo.....	1,250,000	1	1 55
Minnehaha.....	1,000,000	1	28
Waterloo.....	100,000	10	11
Fontenoy.....	1,000,000	1	17½
O'Shea.....	50,000	10	02
Waterloo No. 2.....	50,000	10	02
Mammoth.....	50,000	10	03
Little Cariboo.....	100,000	10	04
Shaunton.....	50,000	5	03
REVELSTOKE.			
Carnes Creek Consolidated.....	1,000,000	1	12
VERNON DIVISION.			
Hidden Treasure.....	100,000	10	10 00
CROW'S NEST PASS.			
Crow's Nest Pass Coal Co.....	2,000,000	25	45 00

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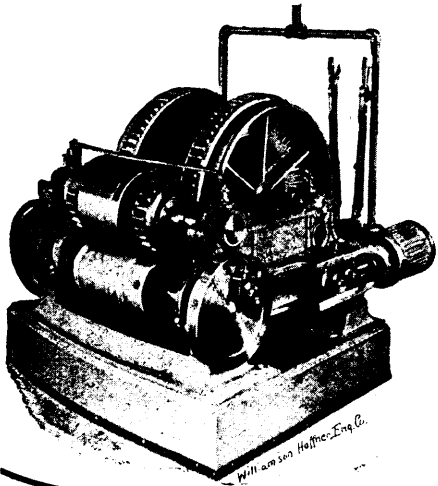
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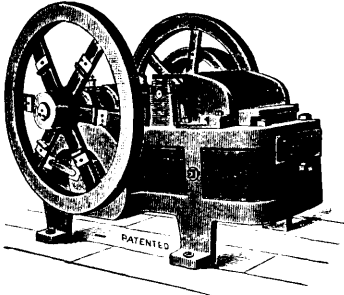
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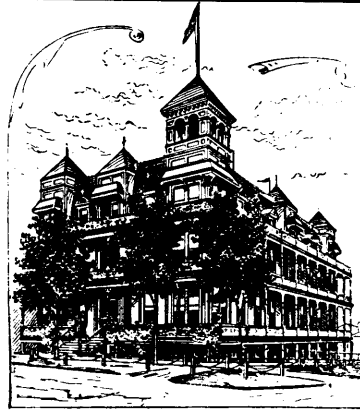
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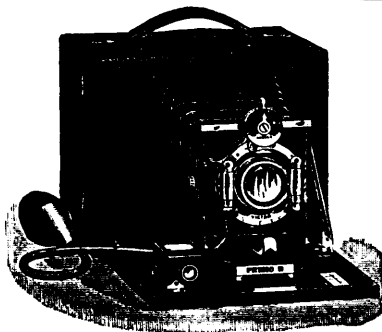
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E. V. SKINNER, General Eastern Agent, 353 Broadway, New York.
C. E. McPherson, Asst. Gen. Passenger Agt., 1 King St. E., Toronto, Ont.
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Canadian Pacific Navigation Co., Ltd.

TIME TABLE NO. 36.

(Taking effect September 1st, 1898.)

VANCOUVER ROUTE.

Victoria to Vancouver daily except Monday at 1 o'clock.
Vancouver to Victoria daily except Monday at 13 o'clock or on arrival C.P.R. Railway No. 1 Train.

NEW WESTMINSTER ROUTE.

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

For Plumper Pass—Wednesdays and Fridays at 7 o'clock.
For Moresby and Pender Islands—Friday at 7 o'clock.
Leave New Westminster—For Victoria Monday at 13.15 o'clock. Thursday and Saturday at 7 o'clock.
For Plumper at 7 o'clock.
For Plumper and Moresby Islands—Thursday at 7 o'clock.

FRASER RIVER ROUTE.

Steamer leaves New Westminster for Chilliwack and way landings every Tuesday, Thursday and Saturday at 8 o'clock during river navigation.

NORTHERN ROUTE.

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

KLONDIKE ROUTE.

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

BARCLAY SOUND ROUTE.

Steamer "Willapa" leaves Victoria for Alberni and Sound ports the 1st, 7th, 14th and 20th. Extending latter trip to Quatsino and Cape Scott.

The Company reserve the right of changing this Time Table at any time without notification.

G. A. CARLETON,
General Agent.

JOHN IRVING,
Manager.