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BRITISH COLUMBIA

MINING RECORD.

VOLUME VII.

From January to December, 1900.

PUBLISHED BY

THE MINING RECORD, LIMITED LIABILITY,

VICTORIA AND VANCOUVER.

THE BRITISH COLUMBIA PRINTING AND ENGRAVING CORPORATION, LIMITED, VICTORIA, B.C.

INDEX

VOLUME VII.

British Columbia Mining Record.

The Mining Record.

Vol. VII. JANUARY, 1900. No. 1.

BRITISH COLUMBIA
MINING RECORD

Devoted to the Mining Interests of British Columbia.

PUBLISHED BY

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P.O. Drawer 645, Victoria, B.C

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BUSINESS MANAGER, B.C. MINING RECORD,
P.O. Drawer 645, Victoria, B.C.

THE PROGRESS OF MINING IN B.C. DURING 1899.

TO attempt within the limits of one article a general review of mining progress in British Columbia during the past year is not an easy task, chiefly by reason of the size of the territory to be covered and variety of interests embraced. Nor is it rendered easier by the almost complete absence of reliable statistics. This latter is a very serious matter. No doubt the Department of Mines publishes them too late. There should be a monthly return made and published and its publication should take place no later than thirty days after the month with which it deals. The Province should not wait till March or April to take stock for the previous year. In endeavouring to form some estimate of progress during 1899, it is necessary first to exclude two sources of gold supply, namely placer mines and hydraulic mines. The output from these sources is increasing at a rapid rate, but to what extent is hardly ascertainable; $400,000 is accounted for from the Atlin district, representing probably 50 or 60 per cent. of the total output; how much has come out of Cariboo during the past year; what progress the various hydraulic companies are making there? These are things regarding which the desire for accurate and reliable information is not likely to be satisfied for some time yet. Even in dealing with lode mining throughout the Province, information concering which is more readily available, we are face to face with serious difficulty in presenting an accurate resume of the year's operations. The districts in which lode mining is being carried on throughout the Province might be divided according to the nature of their product into silver-lead, gold-copper and free milling quartz camps. But it will be easier and serve the purpose better if they are divided rather according to their standing as productive districts. A broad and easy distinction may be made between districts in which production has been going on for some years and districts hitherto only spasmodically, or not at all productive. The unproductive districts lend themselves again to another distinction between districts in which development has been going on for some years without great results so far, on account of transportation or other difficulties, and new districts. No apology is necessary for dealing with the Rossland district as first among the productive localities in the Province —1899 has been a year of progressive development in the Rossland mines. It is true that the amount of ore treated has increased from 111,000 tons to over 180,000 tons; but in spite of this remarkable increase, all of which may be credited to the last nine months of the year, the shipment of ore has been given a secondary place to the development of the mines. But that development has been attended with, on the whole, most satisfactory results. The ore reserves in the Rossland camp are incomparably greater than they were a year ago, and in the West Le Roi a new mine has been added to the resources. Equally important as a correlative factor in the prosperity of the camp has been the great decrease in the cost of ore treatment. This has brought bodies of ore within the commercial horizon which may without exaggeration be termed vast, and has given an impetus to the development of numerous prospects, while it has also led to the resumption of shipments from some of the lower grade mines. Although the year closes amid depressing external circumstances the internal condition of the Rossland camp is a sure guarantee of continued and increasing prosperity.

The Nelson district has presented some most interesting features during the year. Productive quartz mines have sprung up all over the district, and next year the output should approximate at least $200,000 from this sources alone. This is the more encouraging as the latent resources of this district have long lain dormant with the exception of the ill-fated and mismanaged Silver King. The district now counts among its productive mines the Molly Gibson, Athabasca, Granite, Poor-

man, Silver King, Exchequer and Fern, a very good showing, as compared with that of even a year ago. In Ainsworth, the oldest mining camp in the Kootenays, a little mining has been going on, but this district has for long been overshadowed by its neighbour, the Slocan, and its low-grade lead ores have met with well night insuperable difficulties in finding a satisfactory market.

The Slocan district has during the year been the theatre of a protracted struggle between labour and capital. The year began with the promise of a most brilliant record of ore production, which was wrecked by the passage of the eight-hour law, whose effects have been twofold. Capital was withdrawn and mines in operation closed down, while the best miners left the country, such of them as were not tied down through being themselves owners of property. The friendly relations previously existing between employer and employed have been broken and a feeling of distrust and animosity substituted, while unrest, indecision and fear have spread over, not only the Slocan, but the other mining districts of the Province. However, under a system of contract labour much useful and necessary development work has been done in the Slocan. The mines present a better appearance than they did a year ago. They are ready as soon as the unfortunate dispute is adjusted to contribute their proper quota to the mineral output of the Province.

The Boundary country, Camp McKinney, the Ymir District, Moyie and Lardeau, while it is possible that Camp McKinney and the Ymir district belong rather to the first category, range themselves naturally under the head of hitherto unproductive or only spasmodically productive districts.

In the Boundary district the evidences of wealth and development have been more apparent during 1899 than in any other portion of British Columbia. A railway has been completed, two smelters are under construction, small shipments have already begun, and the list of mines has grown enormously. The year has been one of great activity. As yet the tangible results in the shape of profits are small, because the full tale of development has not been accomplished, but a comparison of the position of that district to-day with its position a year ago is most satisfactory. In another year it will be self-supporting and will be enriching the owners of its mines with dividends.

Camp McKinney has never attracted the attention it deserves. Still its development as a great free milling quartz camp is certain, if slow. The number of stamps falling in Camp McKinney has been doubled during the past year, and if only present contracts for machinery are carried out will be doubled again in the forthcoming twelve months. In Ymir also the year has been one of steady progress. The Ymir mine is installing forty stamps, bringing its battery up to eighty stamps and enabling the treatment of 250 tons of ore a day. Numerous other properties in that district have been consistently developed during the year and may be expected to give returns within the next twelve months.

The Moyie camp has been placed in a position during the past year to become a steady and large producer of silver and lead. Its activity has, however, been hampered by the operation of the eight-hour law, the company controlling the St. Eugene group preferring to wait until that dispute is settled before commencing active mining operations.

In the Lardeau district more development has been done during 1899 than ever before. But ere any tangible results can be obtained railway transportation must be provided. Fortunately this will not now be long delayed. Impressed with the magnificent results already obtained from opening new and but partially developed mining territory south, the Great Northern and the Canadian Pacific Railway companies are pushing construction into the Lardeau country, and before the close of 1900 railway transportation should be assured. For consideration as new districts, East Kootenay, the Similkameen, the Bridge River district of Lillooet, and the copper deposits of Vancouver Island and the Coast have been reserved. It may seem curious and perhaps unfair to class East Kootenay as a new district. It has one great mine extensively developed and within measurable distance of being both productive and dividend paying. Still, if the territory be looked on as a whole it is emphatically a new district, and in so far as its mineral resources are concerned even yet a *terra incognita*. Until the Crow's Nest Pass Railway was constructed there was little inducement to prospect in East Kootenay. But during the last year prospectors have gone in in great numbers, and one and all have brought out flattering reports of its coming greatness. Severe difficulties were found through the inclemency of the season in prospecting the country. It may be expected that greater and more important discoveries will be made during the coming year. Of the Similkameen the same thing may be said, although from the best reports obtainable this district does not give evidence of the same extent and richness as East Kootenay.

The Bridge River district of Lillooet has already one productive mine, and more will be added to the list during the forthcoming year. It seems one of the most promising gold districts in the Province.

Of the coast of Vancouver Island, and indeed the whole coast of British Columbia it is impossible to say much. It is an enormous territory, full of rich indications of mineral. One or two prospects are partially developed and one mine maintains a matting plant in operations. But these are mere drops in the bucket. When the reserves of mineral territory in British Columbia, still undeveloped and unexplored, are passed in review and compared with the infinitesimal sections in which results have been obtained it is realized that not in a day, nor a year, nor a generation is the industrial conquest of such a country achieved.

It is impossible not to feel encouraged by what has been done even in a period of twelve months. Much has been accomplished towards placing the mining industry on a commercial basis, great sums of money have been invested in the purchase and development of mines and in the construction of railways. Industrial progress taking place in a new country of unbounded natural resources like British Columbia is like a snowball in its course. As it rolls on it gathers volume and momentum. Year by year its boundaries extend, and its activities increase. The great advance of 1899 foreshadows and holds within it the promise of still greater progress in 1900 and in succeeding years

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We have much pleasure in printing in this issue

photographs never before published of scenery in Cassiar, showing at the same time different portions of the railway work executed last season by the Cassiar Central Railway Company. This company is quietly but gradually developing a portion of this country which must be a closed book to all enterprise until it is opened up by capital. The Cassiar Central Railway Company have spent a very large sum of money in prospecting apart from railway work during the past two seasons, and they are well pleased with the result of their explorations. On the 23rd inst., Mr. H. Hirschel Cohen, one of the directors, together with Mr. Alexander Hamfield, the general manager of the company in Cassiar, left for London to confer with the London board as to future operations of the company, and it is more than probable that during the coming season, amongst other expenditures in Cassiar, a complete plant will be installed on one of the company's mining properties which has been thoroughly prospected during the past two seasons.

Glenora, B.C.

In a work recently published in London, the author in his reference to mining in British Columbia, takes great exception to the charge system adopted by smelters throughout the West, and which he describes as being "little short of iniquitous." The evil he complains of is the imposition of a so-called indirect charge, in addition to a direct charge of so much per ton on ore sent to the smelter for treatment. Indirect charges, it is pointed out, are made up in the following way :—

(1) Gold is paid for at the rate of only 95 per cent. of assay value, although practically 100 per cent. is actually recovered.

(2) Silver is paid for at the rate of 95 per cent. of assay value only.

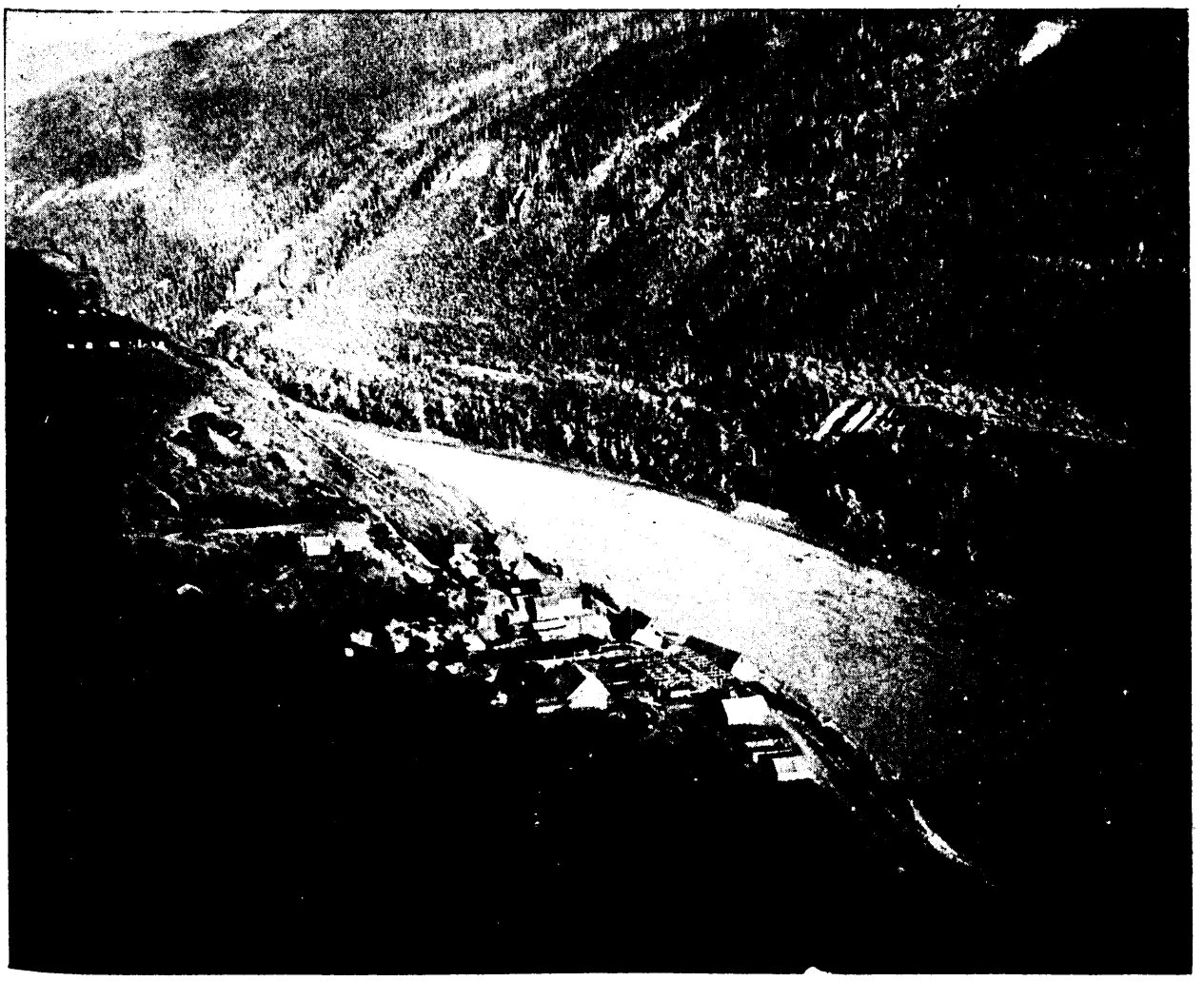
(3) Copper, after deducting about 30 per cent. from the assay value, is paid for at less than half its market value.

(4) Fines are levied in numerous ways should the ores prove not to be of the particular fluxing quality preferred by the management of the smelter.

Now with regard to the first two of the indirect charges mentioned, it is perfectly true that the smelter only makes an allowance of 95 per cent. of the assay value of the gold and silver contents of ore treated. But it is not true that in practice 100 per cent. of the values is recovered. There is always a certain amount of loss in handling, and the richer the ore the greater the loss. Hence, if loss were not provided against in one way, it would necessarily be in another by simply increasing the direct charge for smelting to the mine-owner. But so long as the mine-owner knows that he can only expect to be paid

Glenora, B.C., Showing Railway Grade July 3, 1899.

95 per cent. of the asasy value of the gold and silver contents of his ore, no deception is practised on him, and there is consequently no "unfairness" nor "iniquity" in the "indirect charge" system. The statement that a deduction of 30 per cent. is made on copper which is paid for at less than half its market value, is grossly incorrect and misleading. The smelters make a reduction of 1.3 per cent. on the wet assay value of the copper in ore, which brings it down to the dry assay value. The price paid for the metal itself is, of course, regulated by the New York market; but it is surely not to be supposed—though seemingly in the case of the London writer it is—that copper in ore delivered to a British Columbia smelter is worth as much as the refined product sold on the New York market. The fourth contention is equally as absurd and unfounded. Throughout North America the system is general among the smelters of offering a bonus for certain classes of ore, of which there may be special need for fluxing purposes; or of increasing the regular treatment charge to the mine-owner if his ore contains more than a certain percentage of deleterious or undesirable bye-material. Thus, for example, while an ore containing excess of silica might receive a bonus at one smelter, in whose locality lime was scare or difficult to obtain; at another point an ore of this character would be undesirable for smelter requirements and would consequently be taxed. In the same way a large percentage of iron in an ore might make it more valuable or otherwise, according to whether or not the local smelter could turn it to profitable account in treating other ores of the neighbourhood. The American system in this respect is not only much simpler than that in vogue in England, but it is decidedly fairer. In fact, though not much is heard concerning the indirect charges of the South of England smelters, they bear much more hardly on the miner, and are imposed with so little discrimination that they could, with some degree of justice, be described "as little short of iniquitous."



Telegraph Creek

It is not generally known that a very considerable expenditure of capital has been laid out in the opening up of coal areas in the Quatsino district of Vancouver Island. Yet for some time past extensive development operations have been carried on in this field by a San Francsico syndicate, with Mr. Hallidie, after whom the well-known cableway system takes its name, as the prime mover—the outlay to date amounting to no less a sum than $80,000. In addition to coal deposits the mineral showings in the Quatsino district—though the ore is low-grade in value—are eminently promising, and much of the

land in this locality, is also admirably suited to agricultural purposes. The district is, however, entirely isolated, and but for the unsatisfactory service as afforded by a steamboat calling once a month, would be as completely shut off from communication with the outside world as any mining camp in the wilds of Alaska. The Quatsino coal mines and mineral prospects are, however, so favourably situated as regards ocean transport conditions that when development has proceeded sufficiently far to warrant ships calling regularly for the mine products, no better facilities could be desired; but owing to the present isolation mining and development work is only conducted under circumstances of great difficulty and expense.

Railway Grade at Glenora, Cassiar District.

A correspondent from this district informs us that he has been obliged to pay as much as seven dollars to insure the postage of an important letter, and his is not an exceptional case. He, moreover, assures us that to vastly improve the existing state of affairs, all that is required is the continuation of a waggon-road, commenced by the predecessors of the present Government in 1897, between Hardy Bay and Quatsino Sound. If in addition to this six miles of highway, a wharf were also built at Hardy Bay, the district would receive at the least, a bi-monthly mail service. It is sincerely to be hoped that the small appropriation required to complete this very necessary public work will be promptly provided.

The rapid development of the mining industry in British Columbia, the opening up of such districts as Boundary Creek, Fort Steele, Windermere, and Trout Lake, is necessarily creating a steadily increasing demand for high-class mining machinery. In certain classes of machinery there is no Canadian competition for this trade, and British manufacturers up to the present time have made very little, if any, effort to secure orders from British Columbia. The more enterprising American firms, however, have not been slow to foresee the trade possibilities this field affords, and to provide accordingly with already the most satisfactory results to themselves. In this connection, it may not be out of place to point out that the majority of advertisements in this periodical are those of leading American firms, to whom the MINING RECORD, we are assured, has proved a most profitable medium. Among the gratifying letters we have received testifying to this fact, we quote the following from the widely-known and prominent New Jersey manufacturing establishment, the Trenton Iron Company:

The British Columbia MINING RECORD,
Victoria, B.C.

Gentlemen :—

This being the time when it is customary for us to place our advertisements for the ensuing year, we wish to express our satisfaction with the results of our cards in the British Columbia MINING RECORD, and would say that our desire is to continue occupying the same space.

Yours respectfully,
The Trenton Iron Co.,
WM. HEWITT,
Vice-President.

Trenton, N.J.,
Dec. 13th, 1899.

when development shall have warranted them, but the smelters at present projected and actually building will be able to handle the output, especially if concentrated before shipment, for some time to come. Additional smelters will not be needed, and the money it is proposed to sink in them would be far better spent in development work and concentrating plants. Large amounts of ore will be available, while the dumps in Phoenix, Summit and Deadwood camps are being drawn upon, but so soon as these shall have been exhausted, the output will fall for some months, or until the workings permit the extraction of larger quantities of ore than would be possible at present.

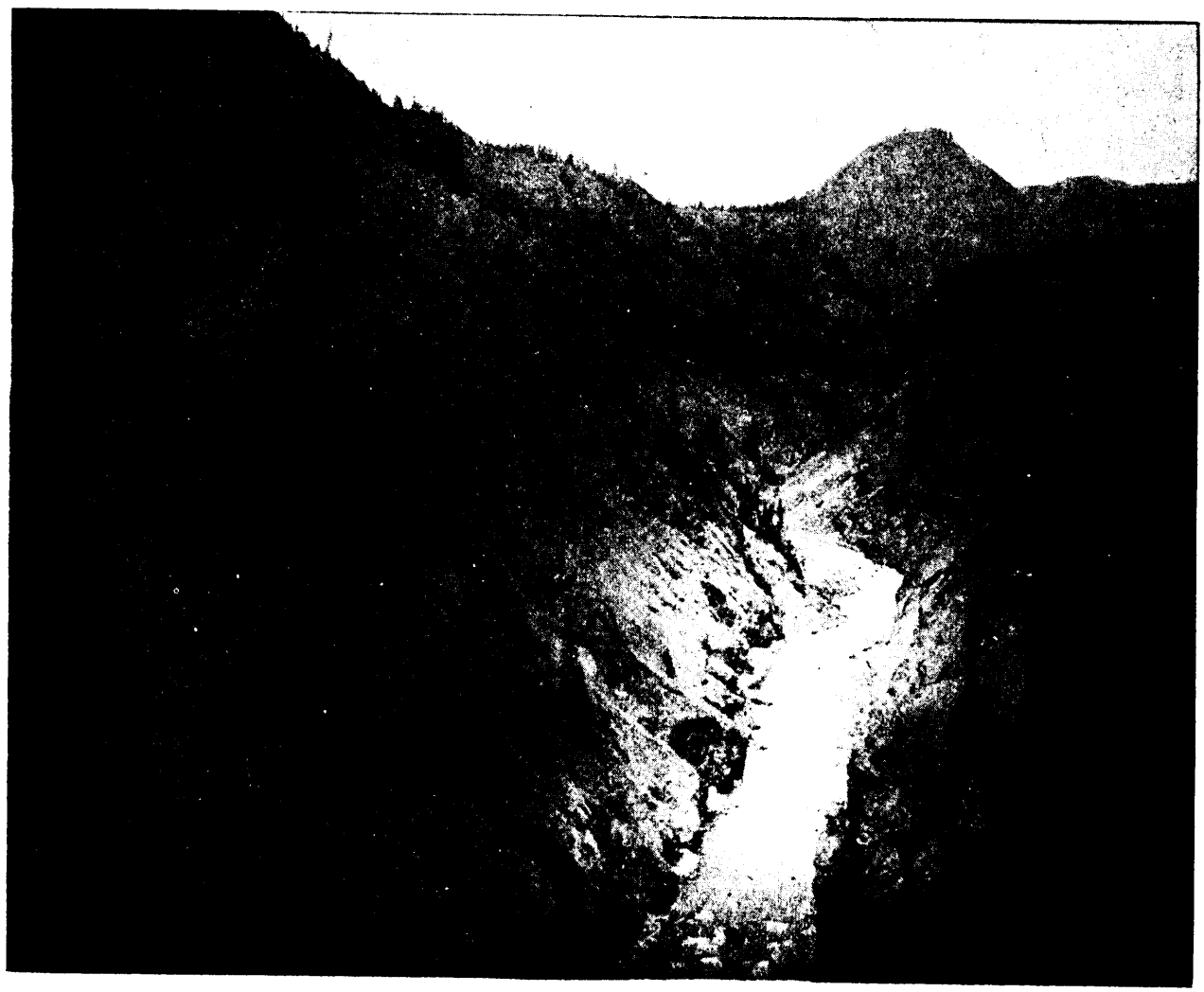
We have pointed out more than once that the estimates of copper values in assay returns are often too

Cassiar Central Railway—Grading on Left Bank of Stickine River.

Many, perhaps most, of the large copper deposits of the Boundary country, will be most profitably worked as concentrating propositions. There are very large bodies of quartz and calcite carrying from 1.5-3 per cent. cu., which might seemingly be concentrated to advantage before shipping to a smelter. The great need of that district is development, and it is sincerely to be hoped that as large a percentage as possible of available capital will be put into the underground workings of the various lodes. Comparatively inexpensive concentration plants might follow, high. The practice, however, continues. There is an advertisement running in a Rossland paper which contains an assay report by a very prominent mining engineer, in which the copper is valued at 17 cents a pound. Another assay, by a gentleman who has been in charge of one of the largest properties near Greenwood, of the ore of a claim in which the public is to be invited to take stock, estimates the copper at $3 a unit, thereby making ore containing 18.66 per cent. cu. worth $55.98 a ton. These values are altogether fictitious so far as the merchantable value of the ore

is concerned, as no smelter could afford to pay for the copper in an ore the full New York price for refined lake copper. Railways do not carry matter for nothing; refiners as yet do not care to work without pay or profit, and electrolytic copper is not worth as much as lake copper by about one cent a pound. Copper in ore is worth to a mine just what it will net, and this is about seven cents less than the top New York price. Assayers who do not wish to rest under a suspicion of being accessory to imposition should neither give returns based upon copper at 17 cents a pound, nor estimated at $3 a unit.

A recent despatch from Ottawa announces that "the Customs Department is preparing instructions to collectors in regard to the entry of lead produced from Canadian ores refined in the United States. Lead thus produced is taxed 15 per cent. on the cost of refining only. As it costs about one-half a cent per pound to extract lead, the duty on it when re-entering Canada after being refined in the United States would be about six cents per 100 pounds, as against a duty of 60 cents on foreign lead imported." The statements here, both as regards the amount of duty that would be charged on Canadian lead re-entering the country, and also in respect to the impost on foreign lead imported is inaccurate. On the former the duty would be 7½ cents per hundred weight, and on the latter between 50 and 55 cents. But these, of course, are mere details, and the proposal of the Federal Government to tax what may be described as the "actual refining of Canadian lead performed in the United States" in contradistinction to taxing the refined product itself is eminently fair and wise. Before this arrangement goes into force Canadian smelters will be called upon to produce sworn evidence on the cost to them of lead refining operations by the refiners in the United States. If this cost is correctly stated in the despatch which we have quoted, the Kootenay lead miners will have a right to demand why the rates imposed by the local smelters for smelting galena ores are as high as they are.



Tahtlan River where Cassiar Central Ry. Crosses.

The London *Critic* is in many respects an admirable publication, and its editor, Mr. Hess, has certainly earned the gratitude of a large number of people for his sucessful exposures of wild-cat promotions and swindling schemes of all kinds. But sometimes the *Critic* not having any live or original sensation in the way of a clever criticism or exposure in stock—and one can't expect promoters to be ever

acting dishonestly—either goes to work and belabours the director of some unfortunate company that has failed through sheer ill-luck, and can hardly, therefore, come under the category of swindles; or this failing, the necessary "copy" is manufactured on the premises, and not infrequently takes the form of a quite uncalled-for assault of a general character. A case in point is supplied in a recent issue, containing the following paragraph:

"I am informed by my British Columbian correspondent that promoters and claim-sellers in that Colony contemplate a descent upon the London Market. A note in the financial columns of the *Daily Mail* appears to have inspired them to this invasion. The Throgmorton-street prophet professes that the heads of big South African houses have taken him aside and whispered into his ear 'that other gold-mining fields will be more attractive and there are dark hints of migrations to British Columbia and elsewhere.' Men with wild cats and tame cats, with Golden Caches and Ontario Rainy Rivers, have been waiting for any hint that would give them a decent excuse to unload upon the parsons and widows whom the envelope addressing agencies have listed as the best people to whom should be sent prospectuses of the Eldorados of British Columbia. This little hint through *The Critic* may serve to induce people at home to button up their pockets tightly when dubious British Columbia schemes are pressed upon their notice, as they apparently will be very shortly. My correspondent's remarks should not be understood to convey the idea that no good can come out of British Columbia. I believe that, when development work has been done, this Province of Canada will be the crown of the Dominion. But at present there are a myriad holes in the ground between the Rockies and the Pacific which their owners persist in calling mines but which engineers say are merely prospects. The motto which all British Columbian men should keep continually before them is, 'Develop, develop, develop!'"

Now granting (which we don't) that the British Columbia correspondent to the *Critic* has special information which no one else possesses, with regard to an imminent invasion of Great Britain by an army of needy and dangerous "claim-sellers and promoters" from these shores, what right has our contemporary to take the ground that nothing we can offer British capital is worthy of consideration? It is by adopting this sort of policy that the *Critic* has lost status. We are condescendingly assured that in Mr. Hess's opinion British Columbia may have a future, but it is very sapiently added that first we must develop our mines. Very true; and all British Columbians of sense will coincide with this view. But—and this is where the Englishman misses his opportunity—while British capital is waiting for us to develop our mines the American speculator steps in and picks out the plums. That has been the experience of the past, and while the Kootenay mines transformed the village of Spokane into a fine city and made millionaires of many of her citizens, few Englishmen can lay claim to having made their "pile" mining in British Columbia. The American does not wait for other people to prove a mine before he buys it. He goes to work himself after obtaining expert opinion and thus assuring himself that there is a reasonable chance of success attending his efforts, and presently the success comes, and he sells out on his own terms and at his own figure to the cautious and conservative Englishman. It is a very good system—for the American. The *Critic* refers to the "Golden Cache," but the Golden Cache, though a fiasco, could hardly be described as either a wild-cat or a swindle. The principal British loser, a Mr. Oldroyd, suffered for his own folly in following his private judgment concerning the value of the property after inspecting it, and in omitting to secure competent professional opinion. In the same manner Mr. Horne-Payne brought disaster on several of his promotions. The Americans of the Western States not only know a great deal more about mining than does the average Englishman, but in their own way they are more cautious. This is not the sort of cautiousness of which Mr. Hess is an exponent—the deadly apathetic cautiousness which has so stultified British enterprise in all directions; but it is the exercise of ordinary prudential business methods of examination and investigation, to be followed by operations conducted on economical lines. In the few cases where Englishmen or British companies have acquired mines or prospects in this Province they have almost invariably displayed the most woeful ignorance or have disregarded the first elementary and fundamental principles of business. South African "experts" are sent out to report on silver-lead mines in the Slocan or on hydraulic propositions in Cariboo or Omineca, and are asked to pass an opinion on conditions of which they have had no previous experience; money is literally thrown away in the erection of costly buildings and in the installation of elaborate machinery long before it is actually required or utilized; a board of highly-paid directors is appointed in London, apparently with the sole purpose of harassing in every way possible the local management with all sorts of absurd orders and unwarrantable interferences; incompetent outsiders are put in charge of the properties; the mines themselves are, in nine cases out of ten, over-capitalized, and the British public skilfully deluded with exaggerated reports and wild stories, until at last comes the inevitable smash. Neither British Columbia nor British Columbians are responsible for the numerous disasters which so far have befallen British mining ventures in this country. The Grant-Govans, Morris-Cattons, Horne-Paynes and other members of the London promoting fraternity are alone blameable. There are, meanwhile, a few British companies operating in the Kootenays, which were promoted on honest lines and afterwards judiciously managed. These, at least, will not swell the list of British failures, which now, perhaps, number eighty per cent., as against, at the outside, a failure of twenty per cent. of American-promoted mining enterprises in Western Canada. And the moral is—well, perhaps Mr. Hess will tell us that?

The *Mining Reporter*, of Denver, Colorado, a journal of deservedly high repute, criticises very sharply the swindler Hartsfield, whose connection with the notorious National Ore Reduction concern, and whose attempts to injure his successor we referred to last month. Our contemporary evidently thinks well of the present St. Louis Smelter Manufacturing Company, and its management.

A Prospector's Camp in Cassiar.

British Columbia has long asked for and is fairly entitled to Cabinet representation at Ottawa. The importance which now attaches to our industrial and commercial interests sufficiently justifies the demand for a representation of this character, and the recognition of this fact and action in accordance with it on the part of the Federal Government would be regarded as a timely and graceful concession to the new conditions beginning to prevail in the West. The Nelson *Tribune*, the most influential, the most conservative, and at the same time the most radical newspaper published in the Kootenays, commenting on this text, suggests that as "no member of the British Columbia delegation comes nearer voicing the opinion of his constituents than the member from Yale-Cariboo, Mr. Hewitt Bostock ; British Columbia could have no better representative in Sir Wilfrid Laurier's Cabinet." This suggestion emanating, as it does, from a newspaper which was most bitter in its opposition to Mr. Bostock in the general elections three years ago, is significant, as voicing public opinion in the Kootenays; and particularly gratifying inasmuch as it is a tribute to integrity of conduct and meritorious hard work. In Canada, unhappily, the standard of political morality is not as high as it might be, and that a man should assume arduous parliamentary responsibilities as a duty to the State and not for reasons of personal aggrandisement or gain, is incomprehensible to the large majority of us. It is not too much to say that the untiring zeal, the conscientious and unselfish attention to his multifarious duties by which Mr. Bostock's political course has been distinguished since his return to Ottawa as the parliamentary representative of Yale-Cariboo have created as much astonishment as gratitude among his constituents, whose respect and regard he has, however, entirely won.

Packing in Cassiar—After the Day's Work.

The recently issued report of the directors of the Golden River Quesnelle is practically an admission of failure. While the announcement is sufficiently distressing, the success of this enterprise has never been seriously anticipated by experienced miners in this country, who, from the first, have deplored the expenditure of so vast a sum of money as that required in the construction of the dam at Quesnelle Lake, before actual operations for the recovery of

gold from the river bed could be commenced. The dam itself is a triumph of engineering skill, but shareholders in this company will probably consider that such an assurance hardly compensates them for the loss on their holdings. It is, at least, satisfactory to know that the promoters of the enterprise are not blameable on the charge of dishonesty, if they are on the score of ignorance; and that they have until quite recently firmly believed in the future rich prospects of the enterprise, may be cheerfully conceded in their favour. Any old Cariboo miner, however, could have given the information that thirty years ago the river was mined, first by whites, and later by Chinamen, by means of wing-dams; and how thoroughly this work was done is demonstrated by the fact that the only gold recovered by the Golden River Quesnelle Company, has been taken from beneath the large boulders, which, with primitive appliances of former days were too heavey to move.

Meanwhile the directors of this company are about to commence a costly law suit, claiming heavy damages for river bed obstruction from the Cariboo Consolidated Hydraulic Gold Mining Co., Limited. Without seeking to comment on the legal merits of a case that may shortly come *sub judice*, every other indication suggests that the unfortunate shareholders in the Golden River Quesnelle, Limited, will not gain very much in the end by the litigation, which, if pursued as threatened, will mean some exceptionally heavy fees to lawyers and expert witnesses, of which last, there are sure to be not a few retained.

The report of the Hall Mines, Limited, for the year, which ended with September last, shows that although insufficient profits have been earned to enable the directors to recommend a dividend, there was a gross profit for the year of approximately £28,800. From this, however, must be deducted £3,367, written off for depreciation, and £3,470 expended on opening out copper claims which failed to realize expectations. The net profit is, therefore, about £22,000, of which £10,277 have been applied to the cost of development work. A total of £9,000 is consequently now being carried forward in lieu of dividend payment. There should, however, be better times ahead of the concern with good management, especially it, as expected, a sufficiently profitable business can be developed in lead smelting.

Mr. Frank Richards, of *Manauense* fame, is again attempting to organize personally conducted parties of fifty "young Englishmen of some means" with a view to Atlin gold prospecting. We do not, however, anticipate for the enterprising ex-purser any successful rivalry of either the Cooks or the Gazes, especially as his record as a "personal conductor" has by now become fairly well known both in this country and in England. The fewer, however, Mr. Richards "leads" the better for themselves. Atlin is altogether a country of the kind not likely to offer many opportunities to "young Englishmen" of the type of those sought by Mr. Richards. It is a good district for practical men with capital behind them.

The following extraordinary and indefinite announcement recently appeared in several of the Eastern newspapers:

"The Ontario Government has just issued a charter to the Slocan Kito Development Company, which owns 20 valuable claims in the Kootenay district. The company is capitalized at $7,000,000, and the venture is regarded as one of the largest mining undertakings of the year. In addition to its claims in the Kootenay the company proposes to operate in Ontario. The provisional directors are Senator Miller, New York, and Messers. James McNaught and A. McKinney, New York; H. Melville, Boston; and Charles McGee, Ottawa. The head office of the company will be at Ottawa. Arrangements have been perfected for the erection of a 100-stamp mill in the Slocan, and as the men at the back of the project are all well-known capitalists, the undertaking promises to be crowned with success."

Further and more precise information will be awaited wtih interest.

Our Fairview correspondent informs us that the management of the Fairview Corporation has been very seriously handicapped by the action of certain of the company's promoters. It appears that these gentlemen entered into a verbal agreement with Mr. Russell, the President of the Company, with regard to the sale of promoter's stock. On this understanding Mr. Russell proceeded to the East and succeeded in selling a large block of treasury shares at a certain figure in Toronto and Montreal. Shortly afterwards he learned that promoters' stock had been placed on the market contrary to the terms of the agreement at a price lower than that Mr. Russell obtained for the treasury stock. In consequence Mr. Russell felt obliged to make good to the purchasers of treasury stocks out of his own holding, the difference between the two prices. Moreover, in order to restore public confidence in the value of the Fairview properties, Mr. Russell considered it expedient to make a mill test of the Stemwinder ore. This mill test was made under very adverse conditions, involving a quite unnecessary expenditure. To make matters worse these promoters now insist on demanding cash payment for certain amounts in which the company is indebted to them, notwithstanding a previous arrangement that stock was to be accepted for the debt. Prior to the consolidation the properties now owned by the Fairview Corporation, were sadly mismanaged, but there is now a prospect that the large ore bodies in the Stemwinder mine will, if economically worked under the supervision of a thoroughly competent mining engineer, return very handsome profits in the future. Meanwhile it is to be hoped that at the next general meeting of shareholders men knowing more about mining and the conduct of affairs than Messrs. Dier and Davidson will be elected to directorate positions.

The money editors of some influential London journals are throwing out hints that the London and Globe Finance Corporation, the parent of the British America Corporation, the Le Roi and other associated British Columbia ventures, is likely, before long, to be sailing in troublous waters, and consequently, fail to earn such big profits as have been freely promised by Mr. Whitaker Wright and his co-directors. The London and Globe people have lately promoted some nickel and other companies, inflated by exceptionally large allowances for flotation profits. At these issues the British investing public look somewhat askance and their prospects are rendered the more dubious by

the present semi-panicky state of the London money market, consequent on the Transvaal crisis. The London *Morning Leader* even goes so far as to advise the Marquis of Dufferin to follow the example of Lord Loch and resign his directorship of Mr. Whitaker Wright's great financial company.

Mr. Doucet, the engineer in charge of the Canadian Pacific Railway construction in the Trout Lake district, is authority for the statement that early next summer this line between the head of Kootenay Lake and Trout Lake City will be completed. If so the new railway will prove of great advantage to all mining properties in the vicinity of Trout Lake, as well as in the neighbourhood of Ferguson and Circle City. Also, apart from the economy that will result in charges for transportation and supplies the construction of the railway will naturally stimulate development and become the means of interesting capital to a larger degree in the district, which is likely to prove a serious rival to the Slocan in the near future, as the richest silver-lead camp on the continent of America.

That hapless—we had almost written hopeless—concern, the Lillooet, Fraser River and Cariboo Goldfields, Limited, has done very little in the way of productive work on its properties this year, but it has, nevertheless, combined to lose another big sum, amounting to £8,518. It is surely about time for a complete change in the methods of this concern, which has converted what was several years since believed certain to be an early dividend producer, into an undertaking which makes nothing but losses.

We understand that Mr. Edgar A. Bennett, general manager in British Columbia of the Lillooet, Fraser River and Cariboo Gold Fields, Limited, and of the Sunshine, Limited, owning the Silver Cup and adjoining properties in the Trout Lake District, some time ago resigned his position with these companies and is leaving for England on the 1st February next. Mr. Bennett's resignation takes effect on the 31st January.

The Department of Mines, and particularly Mr. Robertson, the Provincial Mineralogist, is to be cordially congratudated upon the institution of a very necessary and important work in the re-definition of the mining division boundaries. The change, which is of a very radical nature, is to take effect from the 1st of January, and while no doubt, at first, it will create some confusion and difficulty, a very short time must elapse before the advantage of the new arrangement is generally appreciated. On what possible system or basis the former division of mining territory was planned it is difficult to conceive, and the only plausible explanation is that the draughtsman responsible for the remarkable definition accepted till now, wishing to save himself trouble and work, took a rule and drew straight lines on his map of British Columbia, as fancy dictated, calling the spaces thus apportioned by the names of respective districts. But whatever the origin, the former division was absolutely arbitratory and ridiculous. The lines neither followed meridians nor were made to conform with natural boundaries, and thus in nine cases out of ten the prospector after loctaing a claim had no means of knowing accurately in which district he should record—confusion worse confounded was the result. Under the present system the mining divisions of the Province have been apportioned according to natural boundaries as defined by water-sheds—at once a common-sense and simple arrangement of division.

The Crow's Nest Pass Coal Company while now opening out two new mines, and having, prior to this, increased its monthly output from 4,000 to 16,000 tons, is still unable to fill all the orders available, and recently were obliged to decline, with regret, an order from the Naval Dockyard at Esquimalt. However, this unfortunate necessity is not likely to last much longer, as the company is working at high pressure with a view to great extensions of output.

There is now another good reason why British subjects will, at least for the present, be well advised to keep away from Cape Nome. It is quite clear that until either by decision of the Supreme Court of the United States on appeal, or by Act of Congress, a recent ruling of Commissioner Herrmann, of Washington, D.C., shall have been reversed, no legal title can be given to Alaskan beach gold claims. Alaska is still a territory, and until it obtains full States rights there is no authority capable of dealing with claims that lie in the domain of State ownership. By general law, land and other rights on foreshores between high and low water mark belong to the sovereign State, and cannot therefore be conveyed by territorial authorities. An Act of Congress could, and perhaps will, provide the necessary powers for the grant of ownership rights over Alaskan foreshore gold claims, but pending this, an event of many months hence at the earliest, the matter will probably be regulated by rough-and-ready local committees of miners. Hence it is anticipated that trouble and disturbance will prevail next season in connection with the ownership of claims, and if it prove true, as freely predicted, that 50,000 men will make for the Cape Nome district, there to occupy ground that will in all human probability not afford profitable scope for more than a tithe of their number, a miniature reign of terror there under mob law is a quite possible contingency.

Mr. J. S. Cunningham, the editor of the Yukon *Sun*, sounds one of the strongest notes of warning yet issued against the booming of "Cape Nome"—without regard to the recently added complexities of judicial decision, which makes all titles to foreshore gold claims doubtful. Mr. Cunningham significantly points out that a Mr. Shepherd, agent for the North American Trading and Transportation Company at St. Michael, Alaska, sent circular letters far and wide, booming Cape Nome as early as February last, though only $1,600 worth of gold had then been taken out. Mr. Cunningham in consequence confidently asserts that much of the exaggeration of Cape Nome gold possibilities is due to the deliberate machinations of American transport company agents, and no doubt he is right.

The extension of the Yukon and White Pass Railway as far as White Horse, will certainly be completed by September next, so rapid is the progress now being made on the construction work by the contractor, Mr. Heney. This means two things worth noting, first the side tracking of the town of Bennett, secondly the supercession of the steamers on that lake.

Mr. R. C. Clute, Q.C., acting as special commissioner for the Dominion Government, has, during the past month, conducted enquiries in Sandon, Nelson, Rossland, and other mining centres, respecting the operation of the eight-hour law in the Kootenays. The result has ben a mass of useless, confusing and conflicting evidence; but quite sufficient proof has been shown that a good workman cannot perform as much work in a day of eight hours as he can in a day of ten hours, and this is all that was required to demonstrate the untenability of the men's position. It is true witnesses representing the Miners' Union have affirmed to the contrary; but the owners' contentions have been sustained, not by mere affirmation, but by the production of certified facts and figures, the correctness of which can hardly be disputed or gainsaid.

The Boston and British Columbia Mining & Smelting Company started handicapped with a ridiculous prospectus, embellished with grotesque falsehoods and misstatements. However, it is gratifying to learn that a legitimate attempt is now being made to develop the company's properties—mere prospects at present—in the Standard Basin, and that acting upon the advice of Mr. Von Rosenberg, a New York mining engineer, a sum of $30,000 is to be at once expended in proving the claims. But it will take wonderfully good mines to justify the enormous capitalization with which this concern is burdened.

It is with very deep regret that we learn of the sudden death of Mr. Maurice A. Bucke, which occurred at Jardine, Montana, on the 7th inst. Mr. Bucke, although quite a young man, had established for himself a reputation throughout the Northwest as a mining engineer of more than ordinary ability and discernment, and his practice in the Slocan was very extensive. His amiability of disposition and rare goodness of heart won the esteem and regard of all with whom he came in contact; and his name will long be held in the affectionate remembrance by those who enjoyed the privilege of his friendship.

MINING MEN OF THE PROVINCE.

MR. FREDERIC KEFFER, representing very large New York interests, as manager of the British Columbia Copper Company, Limited, owning the Mother Lode group of mines in the Boundary Creek District, was educated at the Ohio State University, graduating in 1882, after taking a six years' course in mining engineering. While still an undergraduate, he held the post at the University as Instructor in Physics, and also was engaged in practical work as a member of the engineering staff of the New York, Chicago and St. Louis Railway. In 1882 he was appointed Assistant Geologist with the Ohio Survey, and in the following years served on the engineering staff of the Rochester and Pittsburg, and the Allegheny & Susquehanna Railways. From 1884 to 1886, he took up electrical engineering and coal mining work, but left these employments to assume the position of Associate Professor of Chemistry at the Ohio State University, resigning this duty in 1892 to accept the post of chemist for a natural soda company in Wyoming. In 1895 Mr. Keffer was appointed superintendent of the "La Mima Mexicana" in Seriera, Mexico, and in 1896 came to British Columbia to assume the management of the properties in the Boundary Creek, owned under bond at that time by a New York syndicate. Under Mr. Keffer's skilful direction these properties, the Mother Lode in Deadwood camp, and the No. 7 in Central, or White's camp, have been systematically developed and equipped with machinery of the most modern type, and both give great promise of becoming important mines. In connection with the Mother Lode mine a large smelter is now being built and a branch line of the C. & W. Railway is laid between Greenwood and the mine workings.

Mr. Frederic Keffer.

We have to thank the Provincial, Canadian and American press for the many kind and complimentary references to the special Christmas number of this periodical. Acknowledgements are also due to a number of our readers who have been good enough to express their appreciation of the issue.

LABORATORY TESTS OF TELLURIDE ORES FROM THE HEADWATERS OF THE KETTLE RIVER.

By A. A. Watson.

SIXTY miles east of Vernon, at the headwaters of the Kettle River, lies a district whose potentialities are among the most promising in this rich country. Twelve months ago this portion of the Province was almost totally unknown, while to-day four different parties of prospectors have proved up rich claims within a radius of ten miles of the old Monaskee claim, to which a waggon road runs all the way from Vernon. One very promising location made last summer, upon which a great deal of work has been done, has a ledge of gold tellurides or calaverite, the gauge of which is a micaceous schist, absolutely identical in appearance with the telluride bearing rock of Kalgoorlie, Australia, and Cripple Creek, Colorado. Samples from the ledge assay all the way from $6 to $300 per ton in gold. With a view to finding out the best method of treating this ore a great many laboratory experiments were undertaken by the writer, the results of which are appended.

About four pounds of the ore were first broken up into pellets the size of a pea and thoroughly mixed and an average sample taken and assayed. The result showed 1 4-10 ounces of gold per ton. The first experiments were upon the method of roasting with subsequent amalgamation and chlorination.

AMALGAMATION.

Varying the Fineness of Crushing.—(1) Two assay tons of ore, ground to a 40" mesh, were gently roasted at a dull red heat for twenty minutes and then allowed to cool. The roasted ore was then mixed to a paste with water and ground in a mortar with mercury, the mercury being afterwards assayed for the gold recovered by dissolving it in nitric acid and cupelling the gold residue. The result showed 30 per cent gold recovered.

(2) Two assay tons, ground to a 60" mesh, and treated similarly gave 45 per cent. gold recovered.

(3) Two assay tons, ground to an 80" mesh, gave 29 per cent. gold recovered.

Varying the Time of Roasting.—(1) As in the previous experiments a 60" mesh gave the best result; two assay tons were ground to that fineness and roasted for one hour and amalgamated. The result showed 46.2 per cent. gold extracted.

(2) Another sample ground to 60" mesh and roasted for two hours gave 48.1 per cent. gold amalgamater.

(3) Another sample roasted for three hours gave 48.2 per cent. gold amalgamated.

By amalgamation then the best result obtained was by grinding the ore to a 60" mesh and roasting for three hours.

TREATMENT OF THE TAILINGS.

Varying the Time of Treatment.—(1) The tailings from two assay tons were mixed with 30 millegrammes manganese dioxide, 40 mgrms. salt and 60 mgrms. sulphuric acid and brought to a thin paste with water and allowed to stand for twenty-four hours in a braker. The gold extracted in this way from the tailings amounted to 46.5 per cent. of the gold in the ore, giving a total extraction by amalgamation and chlorination of 94.7 per cent.

(2) Another sample treated for 48 hours gave a recovery from the tailings of 49.1 per cent., or a total extraction of 97.3 per cent.

(3) A third sample treated for 72 hours gave 49.0 per cent. gold recovered from the tailings.

Varying Fineness of Crushing.—A sample ground to 100" mesh amalgamated and chlorinated for 48 hours gave a total extraction of 93.4 per cent.

It was thought that a cheaper method of treating the ore might be devised and fresh experiments were carried out for treating the ore by nascent chlorine direct.

METHOD OF DIRECT CHLORINATION.

Varying the Fineness of Crushing.—(1) Two assay tons of ore ground to a 60" mesh were treated with manganese dioxide, sulphuric acid and salt, the whole being mixed to a thin paste with water. The mixture was allowed to stand for 24 hours and the ore was then removed to a filter and washed three times with water. The assay of the tailings showed 15.1 per cent. of the original gold in the ore, or an extraction of 84.9 per cent.

(2) Another sample ground to a 90" mesh and treated similarly gave an extraction of 87.6 per cent.

(3) A third sample ground to a 100" mesh gave 87.5 per cent.

Varying the Time of Treatment.—(1) Two assay tons, ground to a 90" mesh, were treated for 48 hours, wtih a result of 94.5 per cent. of gold extracted.

(2) Another sample treated for 72 hours gave an extraction of 97.8 per cent.

(3) A third sample treated for 96 hours gave 97.8 per cent.

Varying the Method of Lixiviation.—Two assay tons, ground to a 90" mesh, were mixed to a thin paste as before in a beatser, but this time kept constantly stirred for twelve hours. The extraction of gold obtained was 97.9 per cent. In 24 hours the result gave 98.0 per cent.

Recovery of Gold and Tellurium.—The gold and tellurium were filtered off from the ore and the gold precipitated by Ferron's sulphate, filtered and recovered by wrapping the filter paper in a piece of lead foil and scarifying and cupelling the lead button.

The tellurium was precipitated in the filtrate by means of zinc.

Conclusions.—The conclusions arrived at were that the best way of treating this ore is by nascent chlorine with constant stirring of the ore, the extra cost of machinery for rotation of the ore being more than counterbalanced by the greater amount of ore that can be put through in a given time.

SUGGESTIONS FOR THE DEVELOPMENT OF MINERAL PROSPECTS.

By Wm. M. Brewer.

(Concluded from last month.)

MANY syndicates and companies when they commence the work of developing prospects, are led by reason of lack of experience in carrying on mining operations, to adopt a system of work which is unquestionably ill-advised. I mean that their operations are confined to shallow burrowing and gouging at several different points along an outcrop, rather than to a systematic concentration of work at the best location on the property.

It must not be understood that I deprecate surface work to ascertain the trend of the ore-body, be-

cause such work is very desirable, but I do protest against such work being carried to the extreme, as is often done. In consequence, too often the funds available for development are expended before such development has demonstrated the continuity or permanency of the ore-body with depth, and has merely resulted in exposing the outcrop on the surface at various points, when, if the work had been concentrated at one point, the possible value of the prospect would have been determined.

Very often this surface work is carried on under the mistaken idea, that "ore in sight" can be measured by exposing the outcrop only. But as an actual matter of fact every conservative expert requires that in order to measure up "ore in sight" three sides should be exposed below the outcrop, or else if only two sides, then that the ore should be measured by angling. To illustrate this, with a shaft sunk in ore from one point of the outcrop, a drift run in either direction from the bottom of that shaft, and an up-raise from the face of the drift, the "ore in sight" could be accurately measured, if a proper deduction had been made to allow for contingencies which are liable to occur in the ore-body contained in the area above the drift, and between the shaft and up-raise. But, on the other hand, where there is only a shaft, sunk from the outcrop and a drift run from the bottom of that shaft, all in ore, the conservative engineer would merely give credit as "ore in sight" for the measurement contained within a right angle triangle formed with the drift for the base, and an imaginary line from the outcrop to the face of the drift as the hypothenuse, and even then, it would not be absolutely safe to estimate without making proper allowances for contingencies.

The average prospector, and a great many of the development companies do not appreciate the fact, that mining capitalists in purchasing mines only calculate to pay for the "ore in sight" unless under very exceptional circumstances. The disappointment felt by so many novices in mining, because they are unable to make sales, is largely due to their own lack of knowlege as to carrying on mining operations, as well as their failure to realize that capital invested in mines should only be invested on a legitimate instead of a speculative basis.

These conditions are responsible for much of the abuse that is heaped on the heads of mining experts by prospectors and promoters who consider, because the expert does not see the same value in the property as the prospector or promoter, that he is incapable or else prejudiced.

In order to insure profitable operations by his clients it is absolutely necessary that the mining expert should not only have had a large field of experience, from which he can draw comparison, but also possess sound judgment, with honesty and conservatism developed in his character to an abnormal extent.

Too often the conservative expert is compelled to report adversely on prospects for the simple reason that so little work has been done that it is impossible to form any estimate as to value, and the prospector or owner of the proposition insists on a certain cash payment with a bond attached, for a purchase price which would be about the value of the property after fifteen or twenty thousand dollars had been expended in development work. The capitalist, who invests in mining propositions, of course, does not do so from purely philanthropical motives. He goes into mining as a business investment, and naturally expects that when he invests his money in performing development work, that, as he is taking all the risk, it is only right that after such work has been done, if the results are satisfactory he should reap a reward.

But the usual argument by the owner of a prospect, appears to be: You spend your money in proving the value of this property, and agree to pay me before you commence, an amount representing what that value will be after you have expended your own money in determining it, or in other words, propose a game, heads I win and tails you lose. If, instead of pursuing such a policy the owners of a prospect would first of all perform sufficient work to determine that the prospect really possesses promising possibilities, and would then go to the capitalist with the proposition, that in return for his expending a sufficient amount of money to develop the property and determine its value as a mine, he could retain 51 per cent. of the property, there would be much more activity in all mining districts.

Many development companies have been organized on a basis of taking up prospects from the original locators, and expending a sufficient amount of money to determine their value, but in the experience of the writer it has been that in nearly all such instances the prospects turned over to the development companies possessed not value, the original locators having merely staked and recorded sufficient area of land to comply with the laws, and as an actual matter of fact made no bona fide discovery of mineral in place.

In such cases the prospector practically asks the capitalist to spend several thousand dollars in ascertaining whether there is any value at all contained within the stakes he has set up, or, in other words, place several thousand dollars against a few days of the prospector's time employed in cutting stakes and posting notices. Often, too, the same prospector has received pay from the company in advance for staking the claims.

The prospector himself is not alone to blame for this condition of affairs, because too often the officers of the companies themselves should receive the most blame, for the reason that all they appear to desire is to be able to represent to the shareholders that interests have been acquired in a greater or less acreage of land located in a mineral-bearing district.

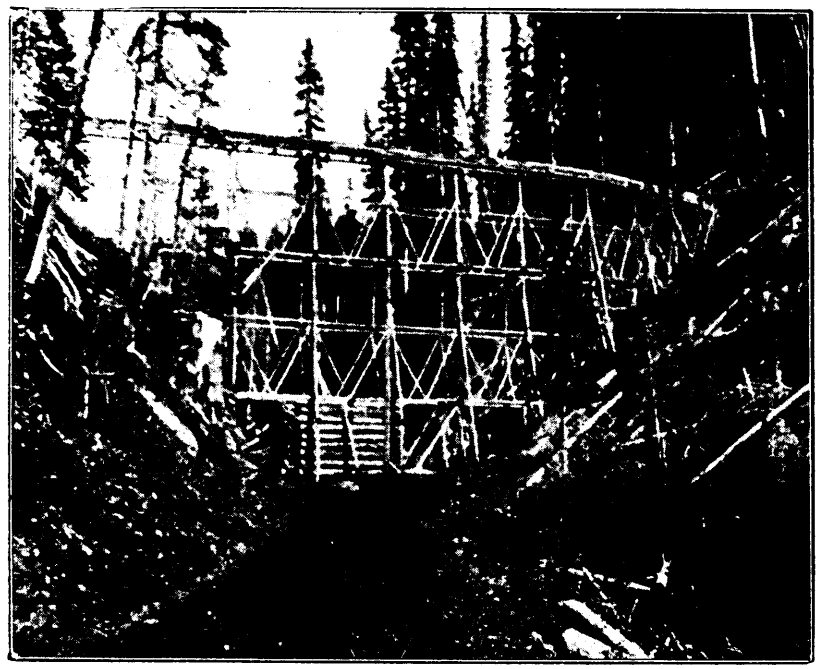
While the above remarks really may be termed a divergence from the lines on which this article was started, yet at the same time, there is so much truth in them, that they need to be taken into consideration in the development of prospects equally as forcibly at the practical work itself.

Another feature which claims consideration, is the fact that too often a man or a syndicate which owns prospects, possibly possessing considerable value, do not use the same judgment in expending funds for development purposes as the same man or members of the syndicate would, in purchasing a suit of clothes. In the latter case a good tailor is sought for, and usually the best is none too good, but in the former case very often the funds are placed in the man's hands for expenditure, who has only heretofore been considered a good fellow, and who may possibly be a good bookkeeper or clerk, but has ab-

solutely no knowledge as to the carrying on of mining operations.

The development of mining propositions is probably the most difficult work that any man ever undertook One of the chief reasons for this statement is, that even when the best judgment is used, nature has played such freaks with regard to the structural geology that the most unlooked-for contingencies occur. Consequently the ore-body may have pinched out, or it may have been thrown over in any direction through faulting, or the grade may have most inexplicably decreased, or in fact a thousand and one occurrences may have happened, which determine that the expert's judgment was at fault. Then is the time when his work can be easily criticized, but on the other hand, there have been instances recorded in the history of mining, where it would appear as though pure and simple bull-headed luck had followed the work of a man whose judgment and experience were not in any respect of the highest order. Such cases though, however, are the exception.

The same rule with regard to mining operations holds good as with regard to the other business enterprises, that is: Honesty, experience, competency and conservatism are the qualities needed to make mining a success, while one of the most needed characteristics to be possessed by the successful mining expert, is the knowledge when to quit and the nerve to do so.



Example of Chinese Trestle Work in Cariboo.

GOLD-BEARING CONGLOMERATES IN NORTHERN B. C.

NEARLY two years ago an immense body of gold-bearing conglomerate was discovered by a prospector near Bear Lake in the Omenica district. Claims were staked out on the showing, but were subsequently abandoned, until last spring, when three separate parties having secured information with regard to the existence of these deposits from Mr. Valleau, the Gold Commissioner for the Omineca district, set out from Vancouver and Victoria, and succeeded in finding the locality and re-staking the ground. A large number of samples of the rock were brought down for assay purposes, and while the returns from a Victoria office were not satisfactory, giving values of less than a dollar in gold, assays made in Vancouver and San Francisco gave results of from six to twelve times greater, showing the rock to average in value from six to eight dollars, the fine grit, in contradistinction to the pebbly conglomerate, being found to contain rather higher values. These Omineca deposits are to be thoroughly prospected this coming season, and if the expections of the discoverers are realized, the operation of the properties will add materially to the future gold production of the Omenica district. The nature of the rock is such that crushing could be performed without difficulty at the rate of five tons per stamp per diem, and the total cost of mining and milling should certainly not exceed three dollars per ton.

Meanwhile, a Mr. K. Ludloff, a Russian geologist, has recently laid claim to having discovered auriferous conglomerate reefs in the Cariboo district, and he expresses the opinion that these are, in point of fact, the principal source of gold of the Fraser river placers. The locality of his discovery is that part of the Fraser river between Quesnelle and Fort George, about seventy miles south of the last-mentioned place, above a group of islands called the Woodpecker or Red Rock Islands, the Indian name for which is Tselkenmuh.

The formation consists of the Crystalline slates of the Archæan, which form the country rock and the bed of the river. These slates are overlaid in certain limited areas by the uppermost strata of the Tertiary, but the whole surface almost everywhere in this part of the Province is covered by immense masses of glacial drift consisting of boulders gravel and sand. In the formation where the gold has been found in place, true veins between regular walls and irregular silicious dykes, both of greatly varying width, intersect and interlaminate, like a network, extensive masses of conglomerate of different structure but similar composition. They are accompanied by chloritic and hydromica schists, the whole irregularly imbedded in the clay slates by the Archæan, forming a belt about one and a half miles in width.

The gold occurs in the form of a fine dust almost everywhere in these rocks, but predominantly in the bright yellow, red, orange or brown-coloured parts of the rocks, superficially decomposed and in their cleavages. The decomposition extends down many feet under the surface; boulders readily crumble to pieces under the blows of a prospecting hammer. Hundreds of thousands of tons of this decomposed ore lie on the surface. In this locality these rocks appear on the surface at many places, forming cliffs, steep walls, round knobs, or hogsback on the river banks and attract the eye of the traveller by their colour and

grotesque shape; they extend on both sides of the river into the unknown wilderness, how far is unknown as yet.

The deeper strata of this formation are rich in fine-grained iron pyrites and traces of gold. There are only faint indications of the presence of other metallic compositions.

The gold is easily detected by using a powerful lens at bright daylight. It can not be seen by the naked eye or with a poor magnifying glass. The surface of certain parts of these rocks, also their interior, is speckled with gold grains. Their shape is mostly globular, only exceptionally flat or flaky pieces are seen. Their distribution is irregular.

It is well known that the gravel beds of the Fraser River are rich in placer gold, renewing themselves every year by inundations, and gold washing is carried on annually along the river by numerous Chinese, using the rocker.

Placer mining will undoubtedly pay at many localities here by hydraulicking out the irregularities of the surface of the bed-rock underlying the gravel beds. The broken strata of the slates standing out from the surface, slanting or perpendicular, from holes and caves in which the gold is caught. Some of the creeks emptying into the Fraser River will furnish a limited amount and sufficient pressure of water by their natural fall to be used for the above-mentioned purpose.

Fine gold occurs abundantly, but coarse gold is rarely found. Rocker washing pays at the average about $3 a day. The working season is about five months of the year, the balance of the time being taken by overflows of the rivers, snow and frost. The gravel bar below the above-described discovery, and covering about sixty acres, contains much fine gold, seemingly originating principally from the conglomerates and brought there by a creek, crossing them in a deep gulch.

About twelve miles distant from the conglomerates, directly in the river bank, Mr. Ludloff has discovered a huge outcrop of red hematite and micaccous iron.

A number of claims have been taken up on the conglomerates and recorded, and many more will be probably taken up next spring.

VERBATIM EVIDENCE IN THE IRON MASK-CENTRE STAR LITIGATION.

HAVING been requested by many of our readers throughout the Province to publish in these columns a verbatim report of the evidence in the Iron Mask-Centre Star litigation, Mr. H. F. Evans, our Rossland correspondent, was enabled through the kindness of Mr. J. B. Hastings to carry out our instructions to copy the official report of the proceedings and evidence taken, and which are in consequence enabled to publish in serial form.

(Continuation of Counsel's Argument, from last month's issue.)

Mr. Davis—I have the argument in which my learned friend says that if a man going down gets out of ore for one foot—and my recollection is he said one inch—but as he says he did not say that, it is sufficient for me; but in the Full Court he disclaimed any such idea of the law as that which he necessarily would, because the American cases are clear enough that a few feet will not cut you off, and my learned friend does not contend that a few feet will cut you off of your vein.

The Court—I know that was the argument, because it troubled me a great deal at the start. This was a case in the first instance, so far as I was concerned, and as far as any of the Court were concerned, and hence I took a great deal of interest in the matter as argued by both parties. There was very full argument.

Mr. Davis—But what my learned friend contends here, as I understand it, is, that the flat fault, so-called, does more than displace our vein for a few feet; that it displaces the vein at any rate, for ten or twelve or fifteen feet, and furthermore, that the displacement, however much it may be in feet is so great as to prevent any possibility of identifying the lower part of the vein with the upper part. That, I understand, to be his contention.

The Court—As to ore?

Mr. Davis—Yes. Now, what I say is, "Let us go through and find out just how the vein looks below between the bottom of the winze and the Iron Mask drift, which is fifteen feet. Then when we have that opened up we shall be able to tell whether or not that lower part is a part of the upper part; we shall be able, at any rate, to give Your Lordship a great deal more satisfactory evidence on that point than can be put in before it is put through. Of course, we contend that the mud-seam is the extent of the flat fault, and that it does not displace the ore at all; that you can find ore in the mud-seam itself, but the ore will naturally be changed a little—it has been changed a little; that with water flowing through, together with the crushing you must necessarily find at such a place, you will find a slight disturbance in the ore. But it does not follow that a fracture cuts off a vein, or that a fault cuts a vein off. A fault is only a fracture, together with displacement, that is all. A fracture alone without displacement is not a fault; a fault is something superadded to a fracture, and whether or not a fault destroys the continuity of a vein is a mixed question of law and fact; it is a question of how far it displaces the vein, and whether the vein below can be reasonably shown to have been a part of the vein above.

The Court—Has been really a part of the vein above?

Mr. Davis—Has been really a part of the vein above.

The Court—I know it happens in coal mines.

Mr. Davis—That is where it happens most frequently, and that is a very familiar form. I did not know that my learned friend would call out the typewritten copy of the argument before the Full Court. I referred some time ago to an interjection of the Chief Justice in reference to this question of jurisdiction, and I cited it as nearly as I could from recollection. I will now read it from the notes which were taken by the stenographer. It was during the course of my reply. I said: "All we wish to do is to get the facts of the case. Now, if I am safe in assuming that the Court takes that view that if we are satisfied, that if we are allowed to do this work we can show the exact facts to the Court, which we cannot show without work being done, then there is no necessity of referring to the evidence. I do not know unless Your Lordship says so, that you will assume it." The Chief Justice said: "Impossible to say what the effect might be of that, so far as I am concerned. Mr. Justice Martin said: "I am of opinion we have most

decided authority to grant this order. It is simply a question, is it a proper case for the exercise of our discretion."

The Chief Justice—Mr. Bodwell does not seriously satisfy us whether or not it is a proper case. And that is all Mr. Justice Drake holds, that on the facts laid before him he did not find that it was a proper case to make an order at that juncture.

The Court—But what facts did he want?

Mr. Davis—I do not know, my Lord.

The Court—Neither do I.

Mr. Davis—But apparently the fact he wanted is this fact, which we have produced in this affidavit of Mr. Hastings, that we have a vein about at a certain point and another vein below it.

The Court—All that was before the Full Court?

Mr. Davis—Yes, but the evidence was so voluminous that unless it was specially pointed out to them they would not wade through it, and that particular thing, although stated generally, their attention was not challenged too particularly or to the particular spot where it is set out; and that is why Mr. Justice Drake says: "If they had a little evidence of the vein, both above and below a certain spot" . . . which we now have . . . "and sought to explore the intermediate ground, they would have a stronger case." Well, that is just what we have with this affidavit of Mr. Hastings. We have the vein at the bottom of the Centre Star winze; we have the vein at the top of the Iron Mask drift—there is only fifteen feet between them—and we want to do some work to connect those two veins and show that they are one and the same vein. And that brings it directly within what Justice Drake says. So far as jurisdiction is concerned, there can, I think, be no question but what in the proper construction of this judgment, the Full Court had jurisdiction. From your Lordship's judgment in the application to dissolve the injunction, I take it your Lordship was very much troubled by the great conflict of evidence which you found in the affidavit filed. That conflict is not a conflict of different men who see the same thing; it is a conflict of men who think differently as to something they do not see. In other words, if the winze were continued on down, then the experts on both sides could see just how that vein looks below, instead of theorizing as they now do as to what effect the mud-seam has upon the vein. This is the advantage in having the work in question done. I really think I have said all that I have to say about the advantage of that work being done, and I do not see how the Court can possibly look at it in any other way; that if they have the jurisdiction, they will be in better condition to judge the case if work of that kind is done and the witnesses are in a position to talk intelligently about it.

The Court—Then was that lower east drift of the Iron Mask run?

Mr. Davis—It was done before the suits were begun, or about the time the first one was started, in the fall of 1897, I think. I do not think there is anything I can add to my argument as to the advantages to be gained from doing this work. As to the question of jurisdiction, I think that is settled by the judgment of the Full Court. After having heard my learned friend in that respect I will have a chance to reply to him.

Mr. Bodwell—The position which I take, my Lord, in answer to my friend is this: That the Full Court did enter into the question of whether or not this was a proper case for the exercise of their discretion and decided that point, and that it is binding on your Lordship.

The Court—If there is any decision it is binding, whichever way it goes.

Mr. Bodwell—That is what I propose to show to your Lordship in a very few minutes. I pass with very little comment the remarks my learned friend made about our being afraid to allow this work to go on. When I listened to him I wondered why he objected to a jury in this case. I think we can pass all that; it was just a slight slip of my friend's usually correct method of conducting an argument of this sort. The simple point is this: What was before the Full Court when they gave that judgment? What did they decide and what did they leave to your Lordship? My friend says there was one fact which is now before your Lordship which was not before the Full Court, that that fact is that if he could sink through that winze he would connect his alleged vein with the vein below. Was that fact before the Full Court and was it considered? The application to your Lordship which was appealed to the Full Court was founded upon an affidavit made by Mr. Hastings. The application which is now before your Lordship is founded upon an affidavit made by Mr. Hastings. In the seventh paragraph of the affidavit made by Mr. Hastings, upon which the motion was made to your Lordship ——

The Court—The first affidavit?

Mr. Bodwell—The first affidavit, dated 20th October, 1898, the seventh paragraph is:

"That I have examined the bottom of the winze sunk by the defendant company from the drift run from the said inclined shaft, and that the bottom of the said winze is still in ore dipping in the same direction as the vein, and I believe the said ore is in place and forms part of the said vein."

Paragraph six: "I verily believe that if the defendants were permitted to do a reasonable amount of work for the purpose of obtaining the facts in regard to the said vein all the necessary evidence could be brought before the Court at the trial of the said action and the rights of the parties in and to the disputed ore-bodies finally determined."

In the first of his affidavits he sets out what the contention is, which is that the Centre Star have a vein and that vein goes down through the flat fault and forms the Iron Mask vein; he says that if a certain amount of work is permitted to be done he can prove that. That was the fact before the Full Court. My friend says the Full Court decided they had jurisdiction. Very well, then they would have given him his order unless they had decided that under the circumstances it was not a proper exercise of discretion. They left it to your Lordship. Why? At the trial, it is said, the Judge may allow further work to be done if he sees that it is necessary. My friend would have your Lordship decide that before the trial, that upon the same material as before the Full Court, the Judge can vary the order of the Full Court and allow that to be done as a matter of discretion which the Full Court decided as a matter of discretion could not be done. That is the exact position stripped of all the sophistry with which my friend surrounds it, leaves the bare cold proposi-

tion that upon the very same material before the Full Court your Lordship can now, without any further evidence or any discussion, decide that the Full Court was wrong, and that you ought to exercise a discretion which they said ought not to be exercised under the circumstances. I cannot congratulate my friend on his recollection of the position I took in that argument, or upon his understanding of the judgment of that Court, if he has correctly put it before your Lordship in the argument which he has made. My contention before the Full Court was this, and that is the contention that was sustained in the judgment of the Full Court. We are standing on our rights as the owners of the Iron Mask property; we dispute in the first place, that you have any apex of any vein within the meaning of the Mineral Act; we dispute in the second place that you have any vein following there down into Iron Mask ground. In the next place, we dispute that if you have a vein of any kind the way in which it enters the Iron Mask ground, or the course it pursues is such that you do not get upon it any extra-lateral rights at all. We also say that even if you do establish all these different points (a failure to do so on any of them will win the case for the Iron Mask), then the manner in which the lines cut the ore-body in Iron Mask ground is such that you then do not come anywhere near the flat fault, and even if you get beyond all those difficulties and finally give evidence which induces the Court to believe that you have a vein, then, and not till then, does the question of the flat fault come into operation; and then we say that the flat fault cuts you off and destroys the continuity of your vein. I did not say in the course of my argument to your Lordship, and your Lordship never took that from my argument that a few inches of dislocation would stop a vein under any circumstances. My argument was this: That if you are following a vein in which you find the continuous walls, then the cessation of ore does not cut any figure, because the walls are continuous, but if you are following what you allege to be a vein, simply because you found it without walls, then the minute your continous ore stopped your vein must necessarily cease. There is a clear distinction between these proposition. The one I put before your Lordship, the other I did not. Now, we go back to the proposition where we were when this Full Court decision was pronounced, and I ask your Lordship to read Mr. Justice Drake's decision and see if you do not find in it exactly what I said. Here are, at least, half a dozen different distinct issues. Upon any one of them if the Centre Star fails, the Iron Mask wins and the case is ended; if they are all proved in favour of the Centre Star, then there remains an issue with reference to the flat fault, which has to be decided; and if having got to that point in the trial, the Judge is not satisfied upon the evidence which is produced, then it is a question for him to consider whether or not he will allow work to be done in order to assist his judgment upon the point. But I recollect—and your Lordship will find it from the interpretation of the Judges in that argument—that they said they could not see why it necessarily followed that work must be done in order for the Judge to come to a conclusion. He would have the opinion of men who have sworn that the vein does not continue; he would have the opinion of men who have already pledged their oath to the fact that the vein does continue, and here you have Mr. Hastings, the star witness for the Centre Star people, their manager and superintendent, swearing positively that he finds that vein in place in the flat fault in the very winze where he says he wants to do work to show whether it is in place or not. The Full Court said it is a question not of opinion but of the credibility of witnesses. There are men who are able to give their opinion. If they satisfy the Judge of their credibility all the materials for forming a judgment are there, and it is only, if after hearing all these opinions, if after considering every physical fact which is brought to his attention down to that point in the course of the trial, he finds himself utterly unable, after seeing the men in the witness box, after coming to a decision as to who is to be believed, then it may be necessary, and if he thinks so at that time he will order some work to be done, but up to the present, and on the material which is before the Court on these affidavits where men positively swear to a question of fact, we do not see any occasion at all for doing work to prove that fact or to disprove that fact. It appears to us to be a question of credibility of witnesses, and in any event, having regard to the issues which were before the Court, and in view of the fact that the Centre Star people have an independent action which they are now prosecuting for the purpose of proving this intersection of the ore-bodies, and in view of the fact that this action of the Iron Mask against the Centre Star is simply the trial of an injunction to say whether or not the Centre Star shall stop at that point or shall not. In view of all these circumstances we do not think, at the present state of affairs, it is a proper exercise of discretion to order that work to be done. Now, what fact is before your Lordship which was not before the Full Court when they pronounced that judgment? It is only changing the form of expression to say that the vein as shown in the Iron Mask east drift is the same as shown in the Centre Star winze. That has been the case from the beginning, and when Mr. Hastings undertook to swear last fall that the vein which he finds below the flat fault is identical with that which comes down in the winze he was only swearing to the same fact in a different form of words; that is, that the vein in the Iron Mask east drift is the same vein.

The Court—Where does Hastings say that?

Mr. Bodwell—Paragraph 7 of his affidavit says this: "That I have examined the bottom of the winze sunk by the defendant company from the drift run from the said inclined shaft, and the bottom of the said winze is still in ore and dipping in the same direction as the vein, and I verily believe the said ore is in place and forms part of the said vein."

The Court—But says nothing about the Iron Mask mine.

Mr. Bodwell—Of course, it says nothing about the Iron Mask east drift, but that is not the point. The point I make is that the vein in the Iron Mask east drift is the vein that has always been in question, and when he says in his affidavit, paragraph 6, that the vein below the mud-seam in the winze was the same ore above it, he was only saying that the ore above the mud-seam and below the mud-seam was the ore in Iron Mask east drift, and it is the same way, according to the defendant's contention. There is no other ore in question, there is no other vein in dispute, and it would simply sink the point of discus-

sion twenty feet further down instead of taking it on the same plane, belonging to the same ore-bodies twenty feet further up, and to say that it is a different fact is simply playing upon words and trying to lead your Lordship into a position into which you can not fairly be carried. I will read the whole of Mr. Hastings' former affidavit. What was his argument before the Full Court? The identical argument he makes here to-day, the very same authorities cited, and the same reason stated.

The Court—Was that affidavit used before the Full Court and read?

Mr. Bodwell—The former one was.

The Court—That is what surprises me, that they did not really decide the matter as was expected.

Mr. Bodwell—They did, my Lord. I am going to show it in the judgment in a minute. That was the question that was before them. Mr. Justice Martin dissented. He said it was a proper exercise of discretion, the other two Judges said no. All of the Judges agree, and the quotation which my friend read from the oral argument, the purport of which is, that I did not seriously dispute the question of the absolute jurisdiction of the Court to order that work to be done, does not fully state it. What I said was, and what the Court gave its judgment upon was, that under the circumstances, it was not a proper exercise of the discretion. Now, if that fact has been decided that it is binding upon your Lordship, and that is exactly the position which I take, and I do not want to re-argue the question upon its merits, although I believe I have no reason to change the position which I then took. But now, in the first place, in order to be clear in this case, I want to show your Lordship what was before the Court, or in Mr. Hastings' affidavit on that application before the Full Court. (Reading.) "I am the manager of the Centre Star Mining and Smelting Company."

The Court—That is Mr. Hastings' first affidavit?

Mr. Bodwell—Yes; made in October, 1898.

The Court—That was before me, too.

Mr. Bodwell—That was before you, too.

The Court—I keep saying that I wonder they did not decide it, but you say they have decided it.

Mr. Bodwell—I say they have, my Lord, down to date, and when I read Mr. Justice Drake's judgment, I think your Lordship will agree with me that they have, and, if that is not so, that is the end of the question beyond all human doubt. Now, this was what was before them (reading): "I am the manager," it says there. "That in order to determine the ownership of the disputed ore."

The Court—Really what you mean to say is, that the second affidavit put in by Mr. Hastings is a repetition of the first.

Mr. Bodwell—It is not as strong as the first. It covers the same ground. The only difference is a verbal distinction without a difference.

The Court—That it is a repetition of the first.

Mr. Bodwell—A repetition, yes; in every matter of substance.

The Court—I don't mean to say the same language.

Mr. Bodwell—In every matter of substance it is a matter of repetition of the first affidavit. Now, your Lordship will see it. Let me read Mr. Hastings' first affidavit as it is here to-day and see if I am right.

"I have read over the pleadings affidavits and other material, printed in the appeal books used in the three several appeals before the Full Court in December last.

"The trial of this action has been fixed for the 17th of April instant.

"The defendants desire to show upon the trial of this action that the vein claimed by them herein disclosed in their incline shaft No. 3 and in the drift to the eastward therefrom, and in the winze sunk from the said last-mentioned drift is a portion of the same vein which is disclosed in the plaintiffs' east drift."

Now, your Lordship can see, he says, it is the same vein that is in the plaintiffs' east drift, and that is a distinction without a difference, upon which my friend tries to distinguish these two veins. (Reading.) "In my opinion the vein as disclosed in the plaintiffs' said east drift is portion of the same vein which is disclosed above at the bottom of the said winze, and in the said drift and incline shaft continuously, up to the apex of the said vein, which is upon the ground of the defendants herein. In my belief the decision of the matters in dispute herein will be greatly assisted if the defendants are permitted to connect the two portions of the said vein."

That is what Mr. Hastings says to-day. What did he say last October? (Reading.) "That in order to determine the ownership of the disputed ore-bodies, and before the defendants can safely proceed to the trial of this action it will be necessary that the defendants be permitted to sink through the water course, or alleged flat fault, and do certain work in excavation for the purpose of inspecting and tracing the defendants' vein, the same vein through and beyond such water course, towards and into the disputed ore-body."

Where are the disputed ore-bodies? Down in the Iron Mask drift, where they have always been ever since this case started. (Resuming the reading.) "And also to tunnel, sink or drift through the vertical dike lying immediately to the west of the defendant's incline shaft and referred to in the affidavits in order to locate the defendants' vein on the westerly side of the said dike and trace such vein into the disputed ore-bodies, situated on the west side of said dike. That unless such additional work be done, it will be impossible to ascertain the true facts in regard to the identity and continuity of the said vein, and place the Court in a position to deal with the said action upon its merits at the trial thereof.

"That in case the said trial be proceeded with without such additional work being done, I am advised by counsel and verily believe that although the said injunction should be dissolved there would be nothing to prevent the plaintiffs from obtaining a further injunction, after the trial of such action in case the witnesses should make affidavit to the fact of the defendants being out of ore upon their sinking further in such water course.

"That the expenses of preparing for the trial of this action will be very great, and unless the defendants be permitted to do the necessary work in order to obtain proper and sufficient evidence in regard to the continuity of the said vein, the rights of the parties to the ore-bodies in dispute cannot, as I verily believe, be determined at the said trial."

But although the plaintiffs' injunction might be dissolved at the trial of said action, the real question, that is, mainly, the ownership of the disputed ore-body, might still be undetermined, and the case

might proceed to an indefinite and unlimited extent. (Resuming reading.) "That I verily believe that if the defendants are permitted to do a reasonable amount of work for the purpose of obtaining the true facts in regard to the said vein all the necessary evidence can be brought before the Court at the trial of this action and the rights of the parties in and to the disputed ore-bodies finally determined. That I have examined the bottom of the winze sunk by the defendant company from a drift run from the said enclosed shaft, and I verily believe the bottom of the said winze is still in ore dipping in the same direction as the vein, and I verily believe the said ore is in place, and forms a part of the said vein."

Now, is it possible, my Lord, to say that there is a single thing found in Mr. Hastings' affidavit to-day that was not made and emphasized in the affidavit of last October? That was before the Court, the foundation of the motion. Now what did the Full Court say? Let us read the judgment of Mr. Justice Drake (Reading.) "The Centre Star claim that they have in their land the apex of a vein which dips towards and under the land of the Iron Mask, and therefore they are entitled to follow the vein down to the termination. The Iron Mask deny the existence of a vein, and say if there was one it has been cut off by a flat fault and terminated. The Centre Star say that if you allow us to explore beneath and through this fault it will be demonstrated that the vein we have followed, as we claim, exists on the other side of the fault.

Did Mr. Justice Drake consider the question whether or not the ore in the winze was the same as the ore in the Iron Mask east drift. Here are his words: "The Centre Star say that if you will allow us to explore beneath and through this fault, it will be demonstrated that the vein we have followed, as we claim, exists on the other side of the fault. The Centre Star have been enjoined until the hearing from continuing the work. They now seek for an order to give them leave to explore in the land of the Iron Mask, so as to ascertain whether or not there is any ore below the fault."

What is my friend asking for? To explore in the ground of the Iron Mask to ascertain if there is any ore below the fault. They say, if there is then we are entitled to continue working it as a part of the vein we have followed. The first thing to be decided here are the reasons for the judgment. The first thing to be decided in the action of Iron Mask vs. the Centre Star is whether the Iron Mask can show the Centre Star has no apex and no vein. A preliminary question about which there is no evidence or want of evidence. If they succeed in doing this, then the Centre Star has no use for the order asked for. If they fail, then the question has to be decided whether this fault is a solution of continuity of the vein. This is a question of law and facts; if it is decided against the Centre Star, then again there is no necessity for the order. If it is decided in their favour, then again there is no necessity for the order for they have established their right to continue the work. I am not prepared to deny the Court has power to grant the order asked for, but there is no case that goes to such an extent, based upon rule 514. Lumb vs. Beaumont, is an authority that where a certain fact is known such as an existing drain, the Court authorized the plaintiff to ascertain one other fact, viz., whether this drain was a drain made by the defendant to connect his house with the existing drain which was already known."

I pause there for a moment to answer the "distinction without a difference proposition."

The Court—One is for examining a piece of work which was done, and the other is, as I say, for exploring or excavating and to show whether there is a vein there or not.

Mr. Bodwell—Yes, sir.

The Court—Really, there may be a difference without a distinction or a distinction without a difference.

Mr. Bodwell—In Lumb vs. Beaumont there was no dispute, as to the act of the drain. They had one fact ascertained about the drain, that is that it was—

The Court—No; what I want to know is—without interrupting you—I know pretty well what that case is, as you see, from its being quoted here, but I want you to show me that that judgment simply decides the case, that is all.

Mr. Bodwell—I will go on. The present circumstances are very different.

The Court (continuing)—If it does, there is an end of it; there is no use of my bothering my head about it, but my impression is, perhaps owing to Mr. Davis' argument, that it is left just in the air.

Mr. Bodwell (resuming reading)—"The present circumstances are very different. The defendants seek to ——

The Court—I don't like to use the expression; I thought at first that they evaded settling it; that was about what it amounted to, and wanted the Judge in the first instance to settle that, although they were asked on appeal to say whether he was right or wrong.

Mr. Bodwell—But they shuffled with the question. (Resuming the reading)—"The present circumstances are very different. The defendants seek to establish a theory that the alleged vein exists below the fault, not to prove any connection between two existing facts."

His Lordship's judgment there probably reached to existing and admitted or proved facts. That is the point. (Resuming the reading)—"If they had actual evidence of a vein both above and below a certain spot, and sought to explore the intermediate ground, they would have a stronger case. The Iron Mask has rights as well as the Centre Star. There is no doubt that the Court has always exercised the powers of granting inspection of mines and their workings, but it has not gone to the extent of allowing independent work."

That is the judgment of the Court, and I think, if necessary, I can support that with very good reason, in addition to these already stated. (Resuming the reading)—"If the Centre Star can show a clear title down to the fault—(here is the point)—and satisfy the Court that the fault is not such an interruption of the vein matter as to constitute a termination of the vein——

The Court—What Court? The Court of Appeals or me?

Mr. Bodwell—Before your Lordship. (Resuming the reading)—"If the Centre Star can show a clear title down to the fault and satisfy the Court, that is, your Lordship, that the fault is not such an interruption of the vein matter as to constitute a termination of the vein, then they would be entitled without an order to proceed."

Your Lordship will see there is no question of want of evidence as to what that fault is.

The Court—No; I am only wanting to see whether they had dealt with the whole question.

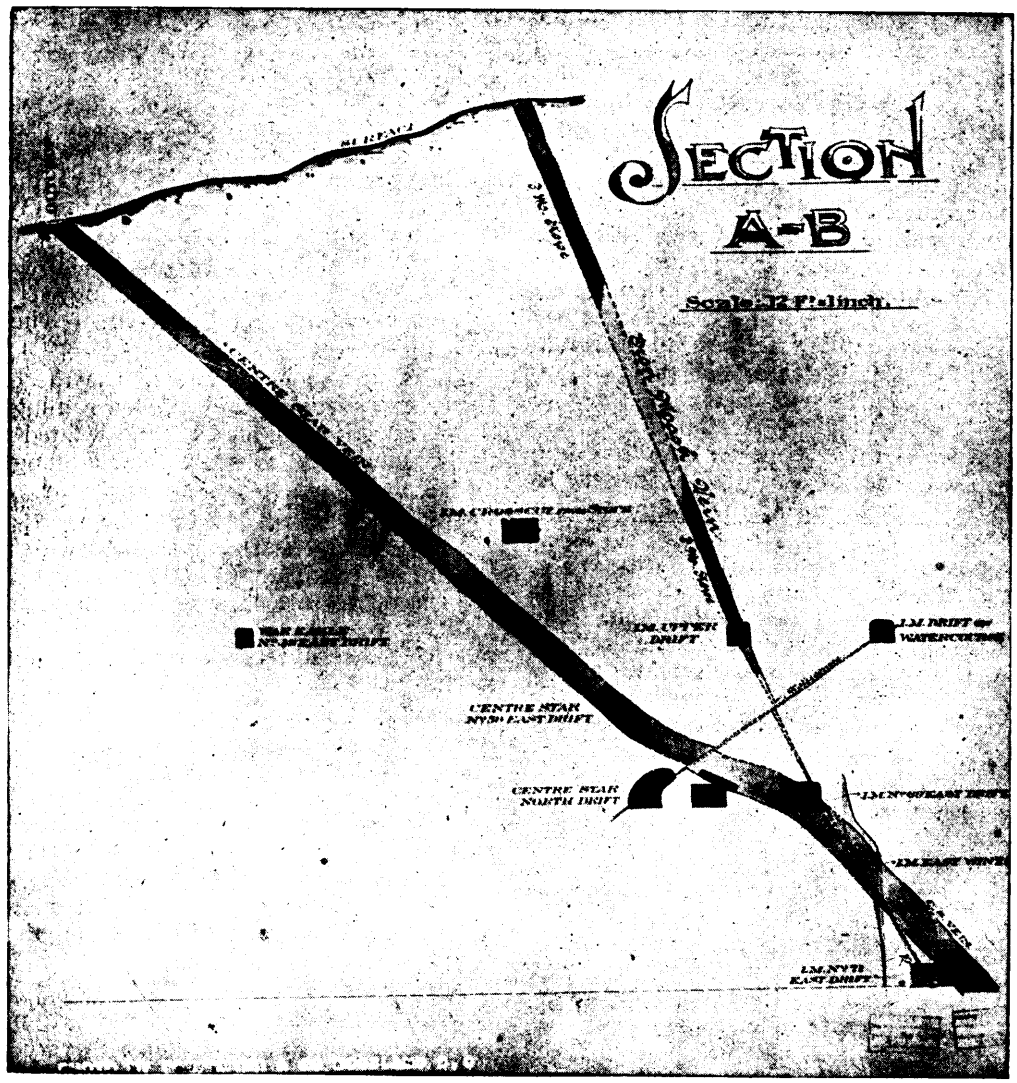
Mr. Bodwell—Here is the point now. (Resuming the reading)—"In the meantime—that is, before this fact is established—in the meantime every step is disputed, and every statement denied. I therefore do not consider that the Centre Star are entitled to the order asked for. In equity the rule is, that when in conscience the defendant has a right equal to that claimed by the plaintiff the Court will not grant discovery.—Milford, Pl. 199.

Mr. Bodwell—No; he says the Centre Star, if they have a vein, have a right to follow it, and the Iron Mask, until the vein is proved—not simply alleged—have a right to dispute that.

The Court—Certainly. Then they would not have an equal right to start on.

Mr. Bodwell (resuming reading)—"I think it should be left to the Judge at the trial to say whether or not actual work should be done for the purpose of elucidating any particular point with regard to the issues raised."

That is to say, not before the trial—not on the material which was before the Court, not as a question of discretion upon which they have passed, but during the trial, or in the course of the trial, or at some stage of the proceedings further on in the case than that upon which the Court now passes, he comes to the conclusion that it is necessary. Why, my Lord, it does not follow at all, although my friend says so with a great deal of emphasis—it does not follow that your Lordship is going to have any difficulty about this case. That is one issue out of the many that will decide the whole question.



"The parties here have equal rights defending, however, on different titles. The Centre Star has a right to follow the vein into the adjoining claim. The Iron Mask, until that vein is proved, has a right to all ore within vertical lines of their claim. I think it should be left ——"

The Court—Then they have not an equal right. He is quoting from Milford's Equity Pleadings?

Mr. Bodwell—Yes.

The Court—Then he says, both parties here have equal rights, and then he says they have not equal rights. Is not that so?

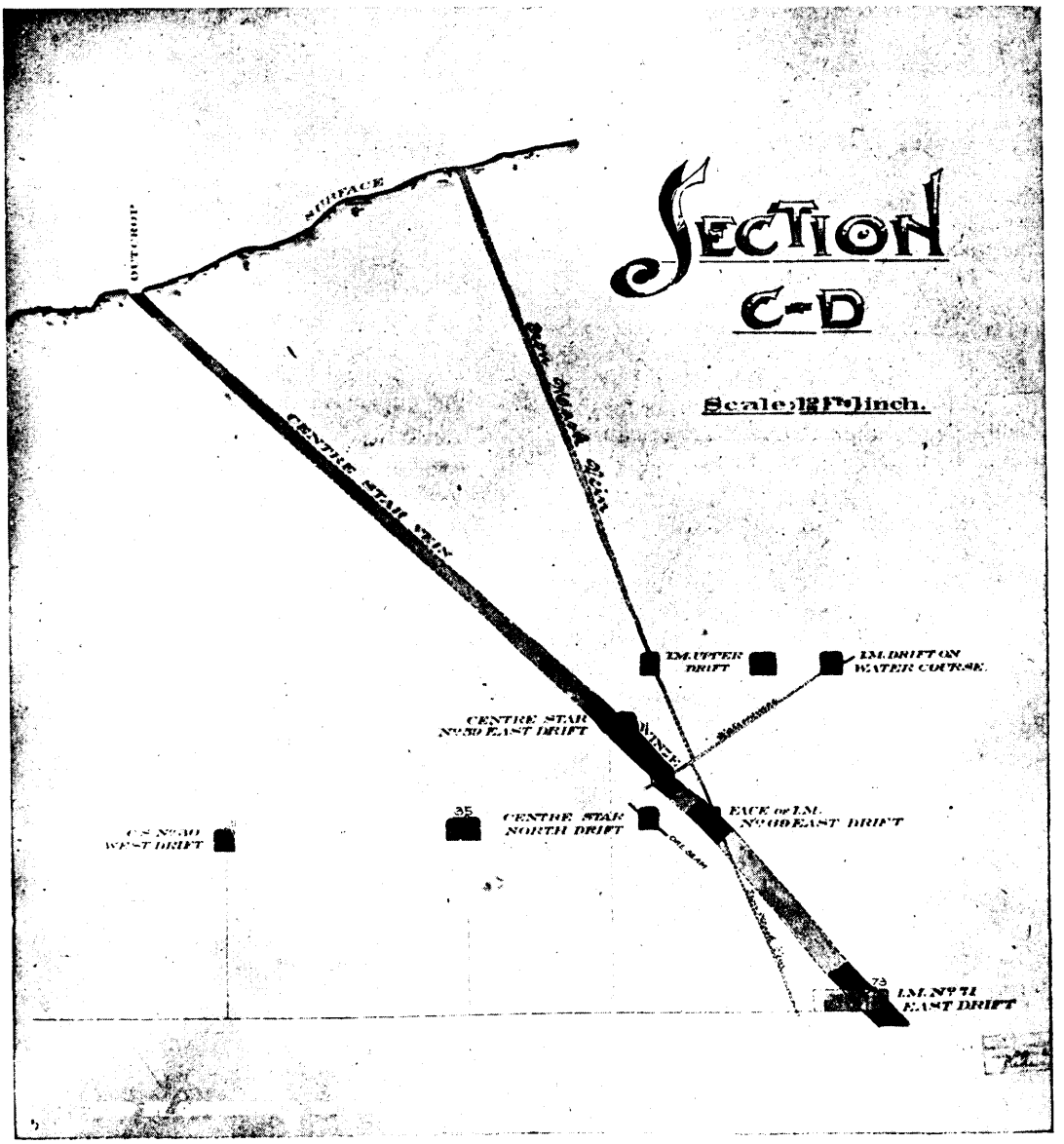
The Court—Apex?

Mr. Bodwell—Yes, but I was going to refer to an-

other. It is the flat fault. That flat fault has been gone through with in different places in the property. Now, is that the kind of an interruption which would stop a vein? There cannot be any more evidence about the flat fault. The rest of it is a legal deduction from that evidence. My friend does not want that, your Lordship.

The Court—Let me see, Mr. Bodwell, without interrupting you. All I have to settle now is as to whether the Full Court decided the Appeal and decided the point—it is one of the points in the appeal that I decided. I decided in your favour, because I judgment decides the points that were appealed, and the appeals were passed upon—that is the point—decided by me, I am bound by the judgment, as being a judgment of the Court of Appeals. If I had been in the Court of Appeals I might or might not have decided differently. That has nothing to do with it, and what I would suggest doing now—I don't know that you can say any more on the point—I suggest here an adjournment, and I will take that decision home with me and read it.

Mr. Bodwell—Yes, your Lordship; and all of the affidavits?



did not see my way to do otherwise, although I expressed a very strong opinion in that in favour of an exploration. That has nothing to do with it; it does not influence me at all now. Men sometimes cling to an opinion, but a Judge is not allowed to do so. Of course, if I entertained that opinion now, I would say so in a minute. I do not say whether it does not influence. I think it has, and it is so reasonable in many cases. But all I have to deal with now is the construction to be put on that judgment, and if that

The Court—I don't want to read all of the affidavits.

Mr. Bodwell—There is another point that I would like to have your Lordship consider.

The Court—Very well.

Mr. Bodwell—The counter-claim.

The Court—I will tell you now—excuse me for interrupting you—I have been listening to you concerning that portion of the judgment which refers to at or about the time of trial, or at the trial. I did not

deliberately order the trial to be called for that purpose, because I knew nothing, and I could not forestall what your argument was, but I would be really in the position, I think, of saying very properly to both of you, that this is really the trial, only it is interrupted by this motion as a preliminary one.

Mr. Davis—Certainly. Our notice of motion is at the trial. I could not have brought it out.

The Court—Mr. Davis, Mr. Bodwell goes a little further than that, and I do not say that he is not right; I do not say that he is, for that matter, and that is the reason I want to look at the judgment. Apparently, the view taken by the Full Court, as expressed by Mr. Justice Drake, was that this matter was, how one in the face of all these affidavits, they were not in a judgment is right—and what he has read would appear to bear him out—but the Judge who tries this case will have a better opportunity than they would have, as the case goes on. He will be in a position to say whether he wants more information or not, and if he wants it in this particular shape, we say that he has the jurisdiction to order it. That is what Mr. Bodwell, as I understand, contends; and what I want to say is, whether his views of the judgment are borne out—and I can't see for the life of me that you would be injured, even if I took his views for the present—I have very strong views about this, and I think there is justice and fair play to support them, but I should want to be fortified when the question comes up with some further cases than that one American case on exploration. I know there are more.

Mr. Davis—No, not reported. It is a matter of practice only. As a matter of course, they are not reported.

Mr. Bodwell—I want to make reference to a quotation of my friend on the case in Barringer vs. Adams. What he read from that is this: "That pending the trial, work of exploration on the vein in dispute will not be stopped, not by injunction, but there is work by the owner on his own ground."

Mr. Davis—Oh, no.

The Court—No, no; it could not happen that way, Mr. Bodwell. No, it is for the purposes of exploration only.

Mr. Bodwell—I know I am right about this: "And injunction will not issue in such a case when neither the bill nor the proofs fix the point where the defendant must stop, hence the Court will not, in terms, enjoin them from working a vein in the complainants' ground.

The Court—That is Bill in Equity.

Mr. Bodwell (resuming the reading)—"For demand of this would require the defendants to ascertain from what acts they are enjoined, nor will the working of disputed veins for purposes of exploration only be enjoined." Now what was the application in the St. Louis and Montana cases? (Reading):

"When this title is in dispute, whether legal or equitable, an interlocutory injunction will be granted, restraining the mining of valuable ores pending its determination." Who is the man that mines the ore? The man that is in possession of the ground upon which an extra-lateral right is claimed. Now following upon that he says this: "An injunction will not issue in such a case, when neither the bill nor the proofs fix the point where the defendants must stop, hence the Court will not in terms enjoin them from working any vein in complainant's claim, for this would require the defendants to ascertain from what acts they are enjoined. Nor will the working of disputed veins for purposes of exploration be enjoined."

Mr. Davis—That is a general statement.

Mr. Bodwell—What case was that cited in support of that—Bluebird and Murray.

Mr. Davis—The Bluebird and Murray does not refer to it; it is another case altogether. My learned friend should not misstate the facts. This is merely a statement of what was held in a certain case.

Mr. Bodwell—If the St. Louis and Montana Mining Company bear my friend out, then I will take it back, but at present I am only able to read this in the way in which it occurs from the language used, and in the only case which I have found or have been cited to on that point, and that is in the Bluebird and Murray case. In that case what the parties seeking to enforce extra lateral-rights there sought to do was to stop the man disputing that extra-lateral right from working the ore upon his own ground.

The Court—Yes; that was it.

Mr. Davis—That is not this case, and there is nothing here to show it. Of course, it is all right for my friend to exercise his own imagination. He can introduce any number of cases.

Mr. Bodwell—And my friend, Mr. Duff, says—and he cited the St. Louis mining and smelting case—that that was not an extra-lateral right case at all.

The Court—I was going to ask that.

Mr. Davis—Dr. Raymond was a witness in that case, and he says it was an extra-lateral right case.

Mr. Bodwell—We will get the case. But, however, that point does not cut very much figure. That case is cited in 5 Fed.

The Court—Wait until you get the case. I was going to ask a question, whether it was an extra-lateral right case, because there might have been two locators disputing about the same ground?

Mr. Bodwell—I know the only other case—58 Fed. I think I have it here.

The Court—That is the only other point you wanted to raise, is it?

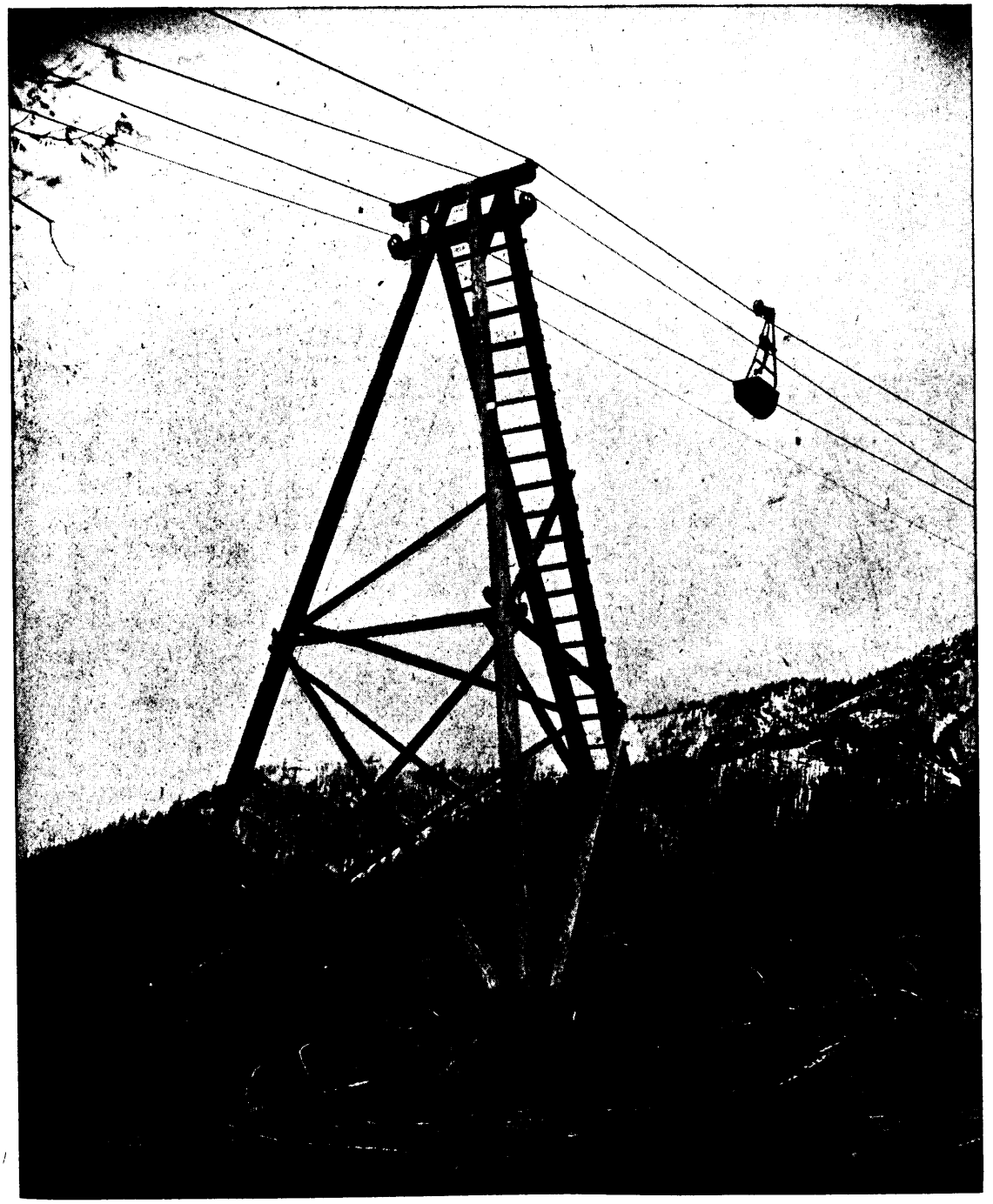
Mr. Bodwell—Yes; I did want to speak of another fact. At the time the matter was before the Full Court the defendants had their counter-claim, in which they claimed this intersection of ores and so on, and they have withdrawn that under leave of the Court, so that whatever figure that might cut in the case——

(To be Continued.)

AERIAL TRAMWAY IN THE SLOCAN.

IN a former issue Mr. B. C. Riblet, the well-known mining engineer, of Sandon, contributed an article, of a general character, to this periodical, on the subject of aerial tramways in West Kootenay. We are again indebted to him for the excellent photographs here reproduced, of tramways of the Finlayson type, in operation at the Noble Five mine. These tramways are of the double rope type, and are designed for long distance carriage and large capacity. The buckets,

suspended by cranes attached to trolley wheels, which run on one-inch cables, have a carrying capacity of seven hundred pounds. Fifty-two of these buckets, drawn by a cable of three-quarter inch diameter, passing through grip sheaves at each terminal, are kept in regular operation, the buckets being loaded at the mine and dumped at the concentrator, automatically. The tramway at the Payne mine, used for the ransportation of the ore from the ore-house to the railway station, is that of the two-bucket, gig-back pattern, designed for a short-distance haul, and has a capacity of one hundred and fity tons in ten hours. The carrying rope is three-quarter inch crucible cast steel of flattened strand and the running rope is three-eigth inch stell of high tensile strength. The difference in elevation of the terminals is four hunded and fifty-five feet, and there is one span, crossing a deep ravine of three hundred and fifty feet.



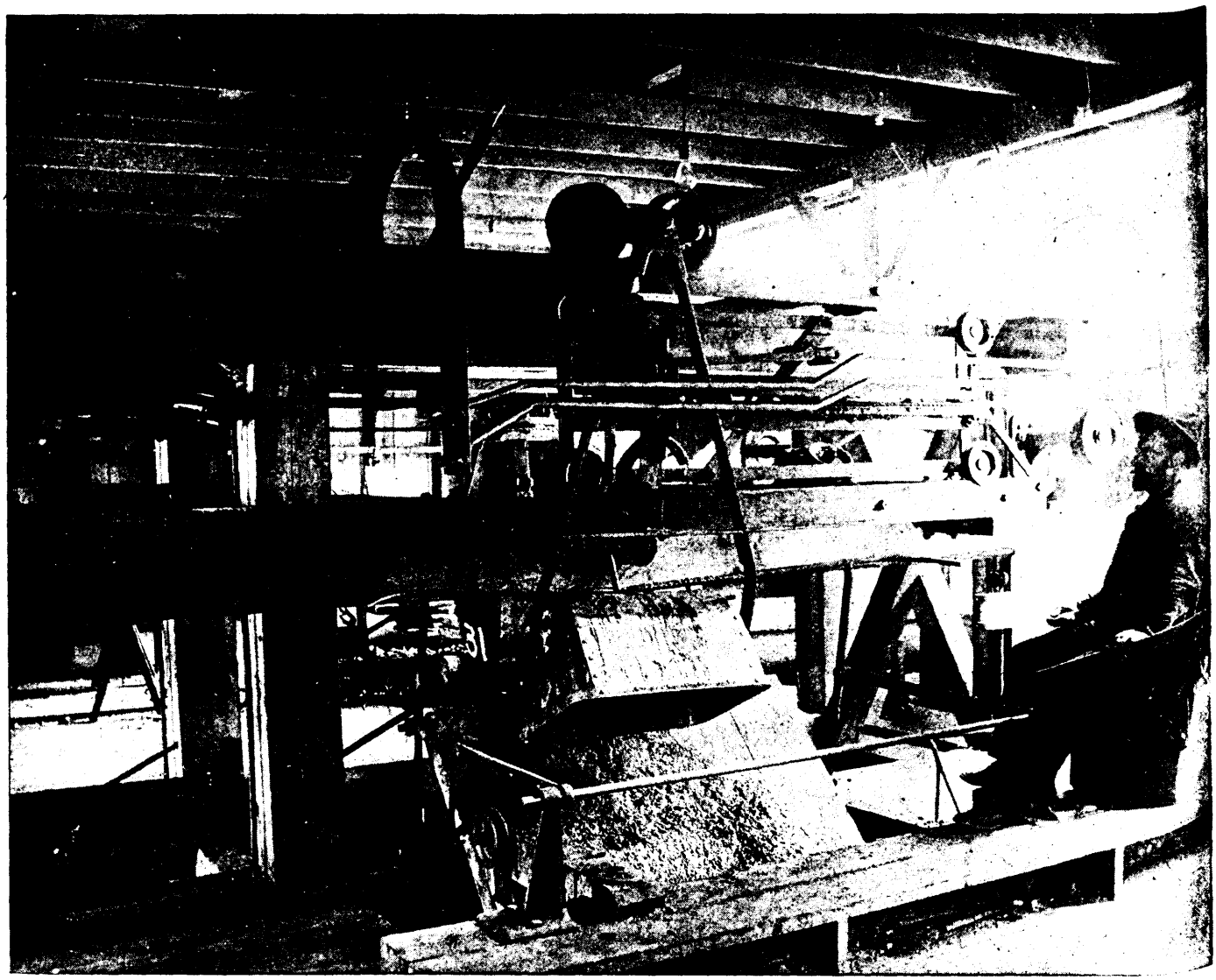
Aerial Tramway at Noble Five, Cody, B.C.

TECHNICAL PERIODICALS.

THE ENGINEERING MAGAZINE.

FROM the point of view of the miner, the most interesting article in the *Engineering Magazine* for December is contributed by Albert Williams, jr., entitled "South Africa Questions from an Engineering Standpoint." The writer briefly sketches the his-

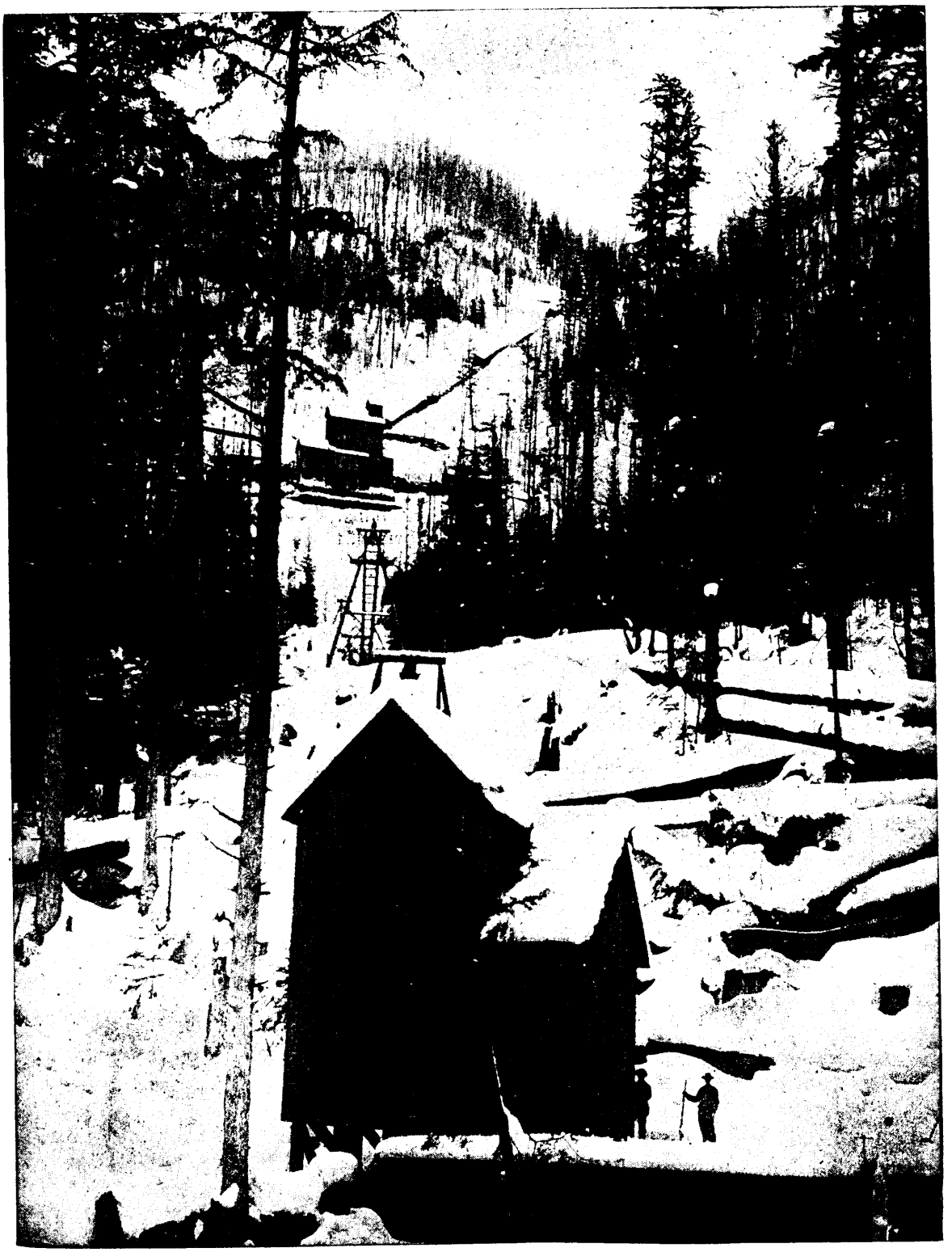
tory of South African settlement, and colonization to the point when the discovery of diamonds in Cape Colony and in the Orange Free State, and also the gold fields in various localities of South Africa, attracted the first great inrush of adventures, prospectors and speculators to the country. In 1885 the gold-bearing conglomerate beds of the Witwatersrand, in the Transvaal were discovered, but it was not until some time later that the almost fabulous richness of the region was fully appreciated. At first the Transvaal Boers, who had "treked" to this wilderness for the sole reason of avoiding the hated Uitlander, bear, to frame a double-acting policy which should promote mining to a certain extent and then restrict it." But if this explanation is the correct one, it is evident that very soon after the inauguration of the policy the Boers found that they were unable to control the march of enterprise and progress which the development and operation of the Rand mines determined. But if they could not control, they arranged to check and retard by exactions natural development, and "while investors stood ready to extend greatly the workings and to increase the plant, the political uncertainties and doubt as to the financial



Lower Terminal of Tramway, Noble Five, Cody, B.C.

thought by restrictive and prohibitory laws to discourage prospecting and mining within their boundaries, but recognizing at length the futility of opposition, a reversal of this policy ensued, and doubtless in the hope of replenishing an empty treasury, the Transvaal Government actually went to the length of encouraging the young industry, by offering a bonus for the discovery of payable gold deposits. It is thought that by this action "the Transvaal authorities expected not only to augment their revenue, but also by taxing gold mining up to the limit which it could policy of the South African Republic and its position towards the mines have deterred them; so that, although there was a prospect of a substantial addition to productive capacity by opening new ground and adding to the mill plant, progress has not been what it might." Notwithstanding, favoured corporations have secured authorized monopolies—which have borne most heavily on the mining industry in the form of indirect taxation on it—have been the chief gainers by the Boer policy, and the Government itself has in consequence profited to a far lesser de-

gree than would at first appear. The present war in the Transvaal is largely the result of long-standing tyranny and vexatious exactions to which the Uitlanders have been subjected, and while the argument of the Boer, that the country is theirs, the mines within their territory and subject to their regulations, and that if the Uitlander does not like those regulations why does he remain? seems conclusive enough to the superficial observer, no country rightly claiming to be civilized now maintains a system like that of the Boers, who but for the enterprise and intelligence of the Uitlanders in opening the mines and in establishing industries would now be in a state of poverty instead of affluence; for previous to the gold discoveries their land barely sustained them, and its imports were most insignificant. It is, meanwhile, gratifying



Lower Tramway, Payne Mine, Sandon, B. C.

to learn that Americans, of which there are a considerable number employed in executive consulting capacities in the Transvaal, generally acknowledge the righteousness of Great Britain's cause in the present war. "Men of this stamp (American engineers and metallurgists), who can always find profitable occupation at home or elsewhere, are entitled to credit. It will not do to denounce their opinions as those of mere sordid speculators and adventurers. What these opinion are is well known." Perhaps if they had not come into personal contact with the Boer system, and had no direct experience and no opportunity for observation, they, too, might join with the unthinking at home. They have found it less easy to sympathise with the Boer at close quarters than at a distance." In view of recent criticisms which have appeared in some of the American newspapers, on the subject of Great Britain's motives in "forcing war on the Transval," this statement of fact from an impartial and authortative source, is worth remarking. The subject is now considered: What is the material interest of the world as a whole in the South African question. Evidently, we are told, as a dictum of common sense in economics, "it is for the interest of all to develop to the utmost the resources of a part." In this case these resources, so far as now known, consist, first, in the gold mines of the Transvaal, and, in less degree, in the gold mines of contiguous territories; and next in importance the coal deposits, the diamond mines, the railways, telegraph and telephone lines, power and light plants, "and all the purveyors of supplies in the mines and miners." The Rand gold mines had produced approximately 19,000,00 ounces up to the outbreak of the war, and the estimates of the total value of the gold still remaining and available are placed by conservative engineers at about $3,000,000,000. Though these calculations are necessarily based on more or less inexact data, it is perhaps—owing to the uniformity, thickness and regularity of the conglomerate beds—less difficult to form some tolerably accurate idea of the resources of the Rand mines than of those in any other country. The depth to which mining may be prosecuted in the Rand is very great, as the increase of temperature is slight and water gives comparatively little trouble, and it is believed that under these circumstances vertical shafts may be sunk to as great a depth as 10,000 feet, the difficulty, if any, hinging more on the financial than the engineering problems envolved. Under British rule the dynamite and railway monopolies would be suppressed, and thus two heavy items of expense would be largely cut down, and altogether a considerable margin of reduction in mining costs may be looked for if the district comes under a liberal government, or if the Boers are compelled to make concessions. This excellent article concludes as follows: The number of persons who have a direct and tangible stake in the fortunes of South Africa is increasing, and their interest is most keen, and the world is watching with eager attention the march of events, military and political, in that far-distant theatre of action, but all the word does not realize how serious is its less obvious indirect interest in the welfare of the territory in question. It is, perhaps, unknowingly, witnessing the working out of one of the most impressive evolutionary changes in economic as well as in politics."

Other articles in this magazine are: "The Strength and Weakness of the Trust Idea," by J. G. Brooks; "Works Management for the Maximum of Production," by J. Slater Lewis, "The Revolution in Machine Shop Practice," by Henry Roland; "Electrolytic Processes in Industrial Operations," by Dr. W. Berchers; "Standardizing in Engineering Construction," by Sir Benjamin C. Browne; "Mechanical Transport Applicanes in Engineering Work, by A. J. S. B. Little; and "The Steam Engine for the Electric Traction Power House," by C. A. Hague.

THE JOURNAL OF GEOLOGY.

Interest in the Sept.-Oct. issue of this periodical centres in glacial periods and carbon dioxide. Joseph Le Conte, University of California, contributes an article on "The Ozarkian and Its Significance in Theoretical Geology." The Quaternary period may be divided into two great epochs—Ozarkian and Glacial; the Ozarkian preceding the ice sheet and being of longer duration. The name is derived from the Ozark Mountains, because the gorges of that region were formed at this time. The Ozarkian was a period of great elevation and erosion—a "lost interval"—*i.e.*, deviod of stritified rocks and their included fossils.

In the sierras, the Ozarkian erasive work is sharply marked off from Tertiary and Present. Tertiary troughs are wide and shallow; post-Tertiary, deep and narrow; glaciation is the line of demarcation between Ozarkian and Present. The Ozarkian epoch being thus conclusively proved to belong to the Quaternary period, to what era, or primary division of time, does the Quaternary belong? Critical periods are periods of changes in the earth's crust, climate, and organic forms. Such, and last of all such, was the Quaternary. In it were the Basin Ranges, Sierra Nevada, Coast Ranges of California, Mt. St. Range elevated; temperature diminished culminating in the Glacial epoch; a new type—greater than all that preceded—man, was introduced. As the Permain closed the Paleozoic era, so the Quaternary closed the Cenozoic. Already a new era has begun—the Psychozoic, characterized by changes greater than the earth has yet seen—"it alone gives significance to that which preceeds." Mr. Chamberlin attempts to form "a working hypothesis of the cause of Glacial periods."

Carbon dioxide and water vapour of the atmosphere have a remarkable power of absorbing heat-rays. An increase of carbon dioxide raises the average temperature; a decrease lowers it.

That Glacial periods have been due to a decrease of carbon dioxide in the atmosphere was urged by Tyndall fifty years ago. Mr. Chamberlin deals particularly with the causes of depletion or enrichment of the carbon dioxide of the air.

A continuation of the article in the next number of the *Journal* will apply the hypothesis to known Glacial periods.

Mr. Tolman continues the discussion in "The Carbon Dioxide of the Ocean and Its Relations to the Carbon Dioxide of the Atmosphere." He shows that with a decreasing temperature the ocean will dissolve carbon dioxide from the air; and offers this as the most important factor in causing the great extent of the glacial invasion.

THE MINERAL COLLECTOR.

The *Mineral Collector* for December publishes a descrpition and list of new minerals discovered since 1892. Under this classification no less than one hundred and sixty-eight new species and varities are named. That

well-known text-book, Dana's "System of Mineralogy," published in 1892, was at that time as complete as possible, but seven years have added much that is new to the science, and rendered the appendix, which has been recently issued, necessary.

CUPEL MACHINES.

THE Calkins' cupel machines, for which patents have recently been applied, are in many respects superior to any other appliance or device of this description, at present on the market. The machines are made in three designs, namely, the automatic, the table pattern, and the wall pattern. The automatic is made with interchangeable discs and dies for manufacturing five different sizes of cupels, and it also has an automatic device for feeding the bone ash into the mold.

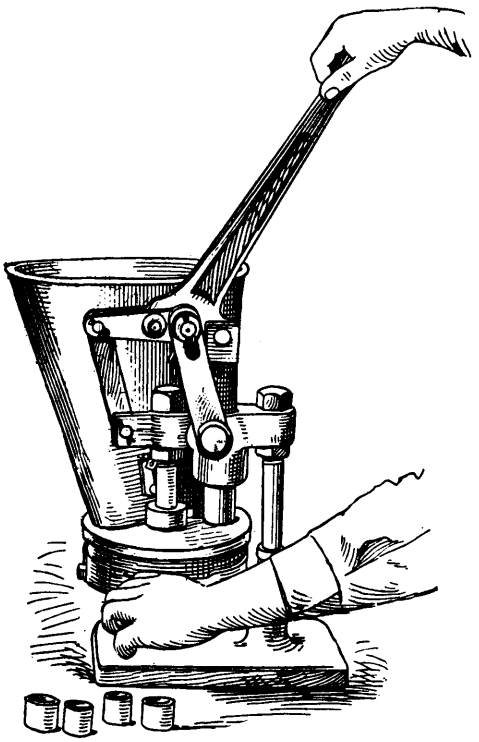


Figure 1.

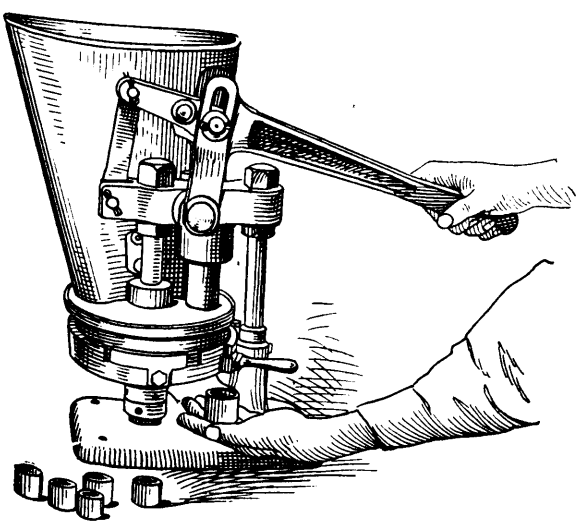


Figure 2.

Figure 1 shows the machine at the beginning of the compression.

The bone ash, properly moistened is put into the hopper which feeds the machine. hTere is a strong wheel in the hopper which bears on the top disc and is thus rotated as the machine is worked. It prevents the moist bone ash from bridging in the hopper and insures absolutely perfect feed. The machine consists of a compound lever of ingenious construction, a plunger or die and two discs. The top disc contains the holes in which the cupel is compressed, and the bottom disc is a plane plate with but one hole, somewhat larger than in the disc above. After making the compression the bottom disc is rotated until the hole is in line with hole in the disc above, in which the cupel has been compressed. The machine is provided with automatic devices for stopping the disc at the proper point.

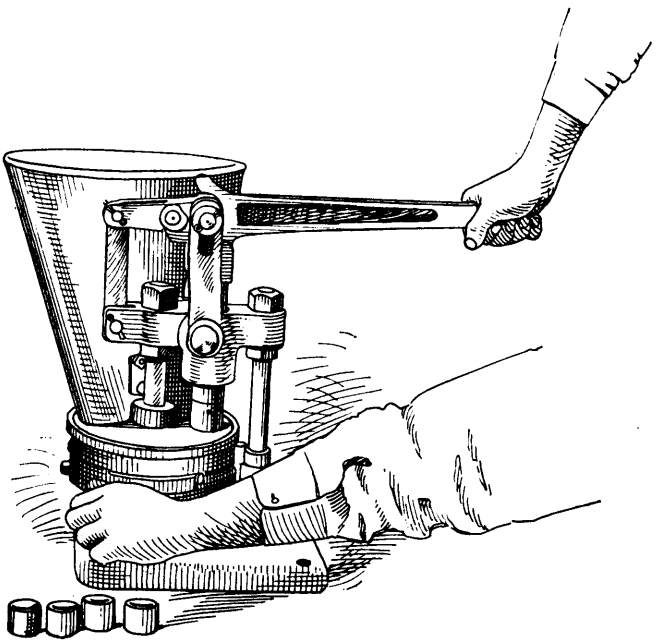


Figure 3.

Figure 2 shows the position of machine and hands of operator on downward stroke as compression is being made.

Figure 3 shows the machine when the cupel has been discharged. The machine is compact and powerful and of good workmanship, and is so constructed as to admit of more or less compression by simply adjusting the jam nuts holding the lever apparatus in place.

With this machine the assayer can easily make six hundreds cupels of perfect shape, uniform in size and density in one hour.

Discs and dies for making cupels of the following diameters are supplied:

One inch, 1¼ inch, 1½ inch, 1¾ inch, 2 inches.

All parts are interchangeable and readily adjusted to the machine.

The Calkins' Cupel Machines can now be obtained in this Province, from the B.C. Assay and Chemical Supply Company, of Vancouver.

THE MONTH'S MINING.

SHOAL BAY.

(From Our Own Correspondent.)

THERE is rather more than usual of interest in mining affairs to record this month. Since the December issue of the MINING RECORD, another lead has been discovered on the property known as Cobledick's, in Estero Basin. It is a very fine lead of chalcopyrite ore, about 20 feet wide at present, for they are not yet through it. The owners are, of course, very much pleased, and are pushing work vigourously.

ESTERO BASIN.

From a survey recently made of the Monte Cristo, it appears that only a portion of the work lately done by H. W. Treat is on the Monte Cristo, the balance being on the Bonaparte, a claim of exceptional surface showings, having a lead of pyrrhotite about 2½ feet wide, and traceable through three claims, and a supposed lead of rich chalcopyrite three feet wide, but which has not been traced elsewhere, and yet another lead about fifty feet wide, the ore and quartz of which resemble very closely Douglas Pine rock, and is traceable for about 1,000 feet. Unfortunately no assays have been made from the latter lead, but the other two give good values, in gold and copper.

BONAPARTE.

The work done on the Young Australian claim by the Fairfield Syndicate has disclosed some exceptionally fine ore, and it is a matter of much surprise amongst those who know the properties on this lead that work should have been so suddenly, notwithstanding the fact that the lead on their own claim is supposed to have pinched out.

YOUNG AUSTRALIA.

Work on the Sunset, a bornite property, just north of Seymour Narrows, and owned by three prospectors, is being steadily prosecuted, several hundred feet of work having been done by them. These men certainly deserve to be rewarded for their energy, for they have been steadily developing this property for the last two years.

SUNSET.

Were all prospectors to follow the example set by these men, there is small doubt but that the Coast would hold a more prominent position in the mining world than it does at present.

CAMP M'KINNEY.

(From Our Own Correspondent).

During the last two months work on the different properties has been progressing steadily, most of the machinery is already in place and there is every indication of a busy winter. There are at present ten mines with pay rolls and three stamp mills running, while a fourth is nearing completion. In particularizing the work we may pass over the Cariboo, which keeps its twenty-stamp mill running with the regularity of clockwork. The Waterloo, which started its five-stamp mill some six weeks ago, has been doing exceedingly well, so much so that another five stamps will be added early in the new year. The ore, which is similar to the Cariboo and about the same value, is being taken from the west drift, where the vein is about six feet wide. On the adjoining claim, the Fontenoy, development work is being pushed ahead in drifting from the bottom of the No. 1 shaft to cross cut the Waterloo vein, which runs through this claim. The Minne-ha-ha is having a ten-stamp mill put up, which is all but completed and should be running shortly. A working shaft is being sunk in the Kamloops. The work has been somewhat delayed by the tardy arrival of the hoisting and pumping machinery, but that is now in place and sinking will proceed without further delay. The development work in the Sailor is proving very satisfactory, a fine body of ore having been encountered in drifting from the bottom of the shaft. The Pander is another claim which is making a good showing, the shaft, thirty-five feet deep, being in some good ore. The Granite claim is at the present moment closed down, it being rumoured that a deal is pending. To the east of the camp is the Lemon Company's property, the Gold Standard, in which is an incline shaft 200 feet deep; at the 125-foot level a 100-foot drift has been run; a saw mill is being put up to get out the necessary lumber for a five-stamp mill, which will be erected in the spring. A very rich strike was made a few weeks ago on a claim called the Dayton, assays going over $800 to the ton. The vein appears to be from six to ten feet wide, and gold is easily panned from almost any part of the surface. The strike has caused considerable excitement in camp. The Dayton is situated between the forks of Rock Creek, about four miles east of the camp. For a long time this section has been looked upon as most likely to produce a big mine, as mineral is found over a large area and carrying good values. Already the fortunate owners have had some tempting offers made for the property, but so far no deal has been consummated. Unfortunately there is a great deal of snow on the ground, so that would-be purchasers are unable to form any very intelligent idea of the extent of the ore-body, but those who are well acquainted with the ground claim the whole of what may be called the "hog's back," between the two forks, as being well mineralized, and that a big camp will be established there by spring.

RECENT DEVELOPMENTS.

BOUNDARY CREEK.

From Our Own Correspondent.

The year 1899 has been the most progressive in the history of the Boundary Creek district. Doubtless the year now opening up will witness progress far beyond that of the period now under review, yet the prospect of a year of development far in excess of anything yet experienced in this district of big possibilities in no way takes away from the truth of the assertion that the results achieved during 1899 are greater than those of any other years since the work of opening up of the big mineral deposits of the Boundary Creek mining camps was first entered upon. In no part of this extensive mining field is the effect of development more evident than in what is now generally known as Phoenix Camp. Here a marked transformation has taken place, both in the activity displayed on at least a dozen mineral claims, some of which may now fairly be classed as mines, and of the camp with its fast-growing town of Phoenix. Here the properties operated by what are known as the Graves companies—the Old Ironsides, Knob Hill and Granby companies, which are practically under one management—easily lead in point of underground work, power equipment and building improvements. The three claims upon which attention is being concentrated adjoin, the Knob Hill being on the south and the Victoria on the east of the Old Ironsides. From No. 1 shaft on the Old Ironsides much drifting

THE YEAR'S PROGRESS.

and cross-cutting has been done at both the 200-foot and 300-foot levels. No. 2 shaft is sunk on the boundary of the Old Ironsides and Victoria claims. A 320-foot cross-cut connects these two shafts at the 200-foot level. No. 2 shaft is down 350 feet. Cross-cuts have been run from it east into the Victoria, about 500 feet at the 200-foot level and 175 feet at the 300-foot level. Drifts are being run at both these levels to connect with the Knob Hill. An aggregate of more than 1,800 feet of drifting and cross-cutting has been done at these levels. The main tunnel of the Knob Hill is in about 1,000 feet, besides which there are drifts and cross-cuts totalling another 1,000 feet. There is one air-shaft 140 feet in depth, and another is being sunk to connect with the main tunnel at 170 feet from the surface of the hill above. A shaft from the east drift is now down 110 feet and this will later meet the drifts from the Old Ironsides No. 2 shaft. Most of these workings are in ore, and it is claimed that the ore-zone is 700 feet in width. The plant includes three boilers, hoists, pumps and a 10-drill duplex Rand air-compressor. An additional 40-drill plant is to be installed, also a 50-horse power hoist, capable of raising three tons at a time from the 1,000-foot level. The buildings include large shaft and machinery houses, two commodious buildings that will accommodate between 200 and 300 men, and nice houses and cottages for mine officials and miners with families. More than 100 men have for some time been employed by these companies, whose operations will be enlarged immediately the Granby Company's smelter, now being erected at Grand Forks, is ready to receive ore for treatment.

In the same camp are four claims owned by the Dominion Copper Company, Limited, of Toronto. The Brooklyn has a double compartment shaft 275 feet in depth, with about 500-feet of drifting and cross-cutting at the 150-foot level, and about 400 feet at the 250-foot level. Not much work has yet been done on the Idaho, on which there is a big ledge, but on the Rawhide, the fourth of this company's claims, a tunnel is in more than 400-feet. The 5-drill plant at present on the Brooklyn is to be removed to the Idaho and a 40-drill plant for the Brooklyn and Stemwinder will be installed in its stead.

Among other properties in Phoenix camp that have power plants installed to expedite their development are the Snowshoe and Gold Drop. Both have big ore showings and are promising properties. A plant for the War Eagle has arrived and will shortly be at work. This camp will soon have rail connection by a branch line from the Columbia and Western main line, with which it junctions at Eholt.

In Deadwood camp are several properties also under development. The most important of these is the Mother Lode, owned by the British Columbia Copper Co., of New York. A special article descriptive of this mine appears in the September number of the RECORD. Its double compartment main working shaft is now down 320 feet, and the face of the north drift at the 200-foot level is 520 feet from the shaft. Good progress is being made with the upraise from this level to connect with the winze from the old workings above. This upraise is all in ore of good value. When it is completed there will be about 260 feet vertical of stoping ground opened up between the new 200-foot level and the old cross-cut tunnel. As the ore outcrops some 286 feet above the old tunnel there should be more than 500 feet of backs to yield ore. This does not by any means include all the ore available for the main shaft is in ore all the way down to its depth of 120 feet below the drift at the 200-foot level. The rails are already laid on the branch railway line to within a mile of the mine. As soon after the track-layers reach the mine as the railway company will accept ore for shipment about 100 tons of Mother Lode ore will be shipped to a smelter, probably to Trail, for a bulk test. A good margin of profit will, it is anticipated, be shown by this test, the systematic plan of assaying followed in connection with this mine giving a good idea of the average value of the ore mined. Mr. Paul Johnson, manager of the British Columbia Copper Co.'s smelting department, is now in New York conferring with the directors of the company regarding purchase of plant for the Mother Lode smelter which will, it is expected, be got in readiness by next summer to treat ore from this mine.

The Sunset group, adjoining the Mother Lode, owned by the Montreal Boundary Creek Mining Company, is preparing for extensive development. A plant, consisting of an Ingersoll-Sergeant air-compressor, capable of operating 20 drills, a 300-horse power battery of horizontal tubular boilers and complete pumping and hoisting appliances, is being installed. About 1,500 feet of tunnelling and nearly 300 feet of shaft sinking comprise the development work done on the Sunset. A spur from the C. & W. Railway at Greenwood crosses the Sunset close to the mine workings. An English syndicate recently purchased 100,000 shares in the company owning this property.

Other properties in Deadwood camp which have been under development during the year are the Morrison, which is said to have four parallel ledges, the Buckhorn and the Gold Bug. The Morrison attracted attention for some time, much publicity having been given to reports of good strikes of ore. Lately the Gold Bug, one of a group of claims owned by the Boundary Creek M. & M. Co., has had prominent notice given to it, a carload of ore sent to the Trail smelter having yielded good values. The smelter returns show the net weight of this ore to have been 28,897 pounds, with a value of $111.55 per ton, or a total for the shipment of $1,611.73 net to the company. The freight and smelter charges amounted to $12 per ton. The values contained in this ore were divided as follows: Gold, per ton, 2.22 ounces; silver, 131.20 ounces, and lead, 14.40 per cent.

There are still the Winnipeg and Golden Crown, in Wellington camp; the City of Paris, Majestic and No. 7, in Central camp; the Jewel, Enterprise and Anchor, in Long Lake camp, and others, but these cannot now be dealt with in detail. The Winnipeg and Golden Crown are both being opened up at the 300-foot level, at which depth the Winnipeg, particularly, has a fine showing of good ore. Both these mines will ship ore immediately after the branch railway line now in course of construction reaches them. The City of Paris has also been extensively prospected below ground, and the presence of much ore has been disclosed down to a depth of 300 feet, the lowest depth yet reached in this mine. At the Majestic a 400-foot tunnel has been run on the ledge, which, where cross-cut, shows the ore-body to be 20 feet in width. Particulars of work on the Jewel were published in the RECORD for October. Since then more development has taken place and more plant been received. The Oro Denero is reported to have a fine showing of ore

at the 200-foot level, and on one of the Rathmullen claims results have proved encouraging.

The B.C. mine is stated to have $600,000 worth of ore in sight and on the dump. It is claimed that this value has been arrived at after carefully estimating the contents of the ore body as disclosed by the work done to date and calculating the values at an average it is believed the ore will run in the bulk. The ore is a copper sulphide and the drifts run have opened up three distinct shoots of pay ore. The lode varies in width from 10 feet to 27 feet. The main shaft is now down 260 feet and crosscutting at the 250-foot level is now in progress. The intention of the company is to sink as rapidly as is reasonably practicable to the 1,000-foot level. A 20-drill compressor plant is being obtained and it is proposed to increase the number of men from the 30 now employed at the mine to 75, as work can be advantageously found for an increased force. The present daily output of shipping ore from the mine is about 50 tons. An ore bin of a capacity of 450 tons is being constructed, it being anticipated that eventually, when the mine shall have been extensively developed, a daily shipment of 400 tons of ore will be found practicable. It is understood that arrangements are about concluded to ship ore regularly to the C. P. R. smelter at Trail, and that the necessary rail connection with the mine has been established. As there are 10,000 or 11,000 tons of ore now on the dump, of an estimated value of $25 per ton, there is this lot to start shipping from.

The year's progress also includes the practical completion of the C. & W. Railway from Robson on the Columbia River to Boundary Creek; the extension to the district of two telegraph systems; the establishment of three telephone systems, extensive building improvements, and a large increase of population, there being now fully 10,000 people in the Boundary country. Much Eastern capital has been interested in the district, Toronto, Montreal and the Eastern Townships all swelling the total. Altogether there has been much and gratifying advancement during the past year, and the New Year is by with promise of still greater results.

Midway, B.C. PERCY VERENS.

ROSSLAND.

(From Our Own Correspondent.)

With the close of 1899 the statistics of the mineral industry for the past and preceding years should claim attention. Though the MINING RECORD in its reports from the mining division has not failed to give statistical information from time to time as to the progress of this trade, especially as to tonnage and value, yet it will not, I trust, be regarded as a dull repetition if these facts and figures are given in this report in a more tabulated form than heretofore. Much interest is taken in the progress of British Columbia's mineral industry, especially in the gold mining branch thereof, and as the close of the year is the right time to make comparisons, as well as resolutions, no further explanations are perhaps necessary in presenting the statistics of the mineral industry of Rossland, for the years 1894 and 1899, inclusive.

THE YEAR'S WORK.

As early as 1894, I find that ore production began in Trail Creek division so that the period covered in the valuation is, six years.

	Tons Ore.	Gold Ore.	Value	Silver Ore.	Value	Copper	Value	Total Value
1894.....	1,856	3,723		5,357		$ 106,229		$ 75,520 64
1895.....	19,693	31,497		46,702		840,429		702,359 00
1896.....	38,075	55,275	$ 104,500	89,285	39,830	1,580,635	79,030	1,243,360 00
1897.....	68,804	97,024	1,940,480	110,068	65,821	1,819,586	90,979	2,097,280 00
1898.....	111,282	87,343	1,746,361	170,804	94,359	5,232,011	629,411	2,470,811 00
1899.....	185,000 estimated	105,000	2,000,000	275,000	175,000	7,800,000	1,115,000	3,390,000 00 (Estimated.)

According to Mr. W. A. Carlyle's first reports the average value per ton of Rossland ores amounted to $40.69. In 1898 this is given at $22.80 per ton, and this year it is estimated at $18.00, though it may reach $20.00, as the smelter returns will not be completed until February.

Now a trade beginning with a production of only 1,856 tons in 1894 and ending with 186,000 tons in 1899, with a value of only $75,510 in the beginning and now possessing a volume measured by nearly $9,980,000 in 1899 must be regarded as a phenomenal advance, and it is, moreover, suggestive of future possibilties. When we consider that about 9⅞ millions of dollars of ore have been extracted from the mines of Trail Creek in a period of six years is it not reasonable to hope that in another period of six years this trade will have reached at least 30 millions of dollars? It is, meanwhile, a satisfaction to know that a considerable portion of the capital employed in this production belongs to the people that live in the Dominion and who are directly interested in the prosperity of Canada. Much of the interest on mine investment is, therefore, being paid in the country. This fact is an agreeable feature in a contemplation of this subject

The dividend account of Rossland mines now stands as follows:

DIVIDENDS.

Le Roi—$825,000, up to Aprial, 1898; $250,000,000, in 1899; total, $1,075,000.

War Eagle—up to October, 1896, $187,000; since then and up to December 15, 1899, $305,750; total $492,750.

The nominal capital invested is Le Roi, $5,000,000;

War Eagle $2,000,9000. Total nominal capital, $7,000,000, and total dividends, $1,567,750.

DEVELOPMENT WORK.

It is yet too early to obtain any reliable information as to the amount of mining development carried on in Rossland during 1899. It is, however, well known that there has been a very large amount of drifting, tunnelling and cross-cutting done, and the total will show at least double that officially reported last year. The increase in the machinery has been very marked. When it is considered that the War Eagle Company have begun three actions to recover money on account of machinery purchased, and that this alone aggregates $225,000, a fair idea may be obtained as to what progress has been made in this respect by other properties. At least 1½ millions of dollars' worth of machinery has been ordered for Rossland, and other mines tributary to it, and at least 12 millions of dollars of nominal capital have been added to the capital account of Rossland and tributary mines. On the whole the outlook is very promising and the prospects of a phenomenal output in 1900 are excellent. At no period in the past in Trail Creek division was the outlook better than it is now.

Of the 185,000 tons of an ore output from Rossland mines for 1899 the Le Roi contributed about 95,000, the War Eagle 66,000, the Centre Star 16,000, the Iron Mask 5,500. These four named mines are the regular products of Trail Creek mining division, and their total shipments amount to about 182,500. The occasional shippers are the Evening Star, which is credited with 1,088, the Columbia and Kootenay with 111, the Virginia with 100, the Monte Christo with 260, the I.X.L. with 75, the Deer Park with 18, and miscellaneous about 850 tons.

Some of the occasional shipments have been mere samples, but the great increase of $73,718, equal to 62.30 per cent over the ore production of Rossland mines for 1898 must be conceded. Prediction as to what will be the additional regular shippers for next year are more numerous than are likely to be realized, but it is not unlikely if the Evening Star, the I.X.L., the Columbia and Kootenay, the Sunset, No. 2, the Virginia, and White Bear, Josie and No. 1, and Giant will form the list. These properties are all looking well. They are known to possess at least pay ore shoots if not ledges, and ore more or less situated in the direction of the strike of the main ledges, which according to Mr. Clarence King traverse the country for a distance of at least five miles, having Red Mountain as a centre.

Last year official reports of the condition of about thirty-two mining properties were sent to Mr. John Kirkup, Mining Recorder for Trail Creek division. These reports were embodied in the report of the Minister of Mines. This year similar reports are being made, but of course, there will be a great increase in the number of working properties with from 75 to 100 per cent. increase in the account of development work.

THE LABOUR QUESTION.

Mr. R. C. Clute, Dominion Special Commissioner, especially appointed by the Ottawa Government to inquire into the local conditions of labour, particularly as regards mining labour in this Province, opened his court here on December 21st. As your readers well know, the object of this court of enquiry is to obtain information for the Dominion Government, not only on the operations of the eight-hour law, but also with regard to the alien labour phase of the question. One of the chief witnesses before the Commissioner has been the Secretary of the Miners' Union, of Rossland. According to this gentleman, Mr. Denne, the union has a membership of 1,500, and of these fully 70 per cent. are British subjects. It has not been shown so far, at least, that alien labour has been imported to work in the mines under contract.

YMIR.

(From Our Own Correspondent.)

Since the last issue of the MINING RECORD the Dundee mine deal has been consummated, and the property will be energetically worked after the 1st of January, so I learn from a reliable source. A consolidation of the following properties has taken place: Sarah Lee G. M. Co., Utical G. M. Co., and the Wild Horse G.M. Co. The new company will be known as the North American Mining Company. The new directorate is a strong one, and it is believed that sufficient funds are available to prove the properties, all of which have good showings. The Ymir mine is steadily working, and at the time of writing in the neighbourhood of 160 men are employed in the mine and mill. The addition to the new mill is nearly completed, and as the machinery is ordered we may look for its installation and consequent operation shortly. On the Big Horne property the management are busily driving the cross-cut tunnel. At the present it is in 100 feet. The ore-body, which it is calculated to strike, is still estimated as distant some 200 feet. When the drift is finished a depth of about 250 feet, will be gained. Mr. McRoberts, secretary-treasurer of the company is in Boston on company business.

SANDON.

(From Our Own Correspondent.)

A GENERAL SLACKNESS.

All the shipping mines still remain closed down owing to the labour troubles caused by the eight-hour law, and a settlement, I am sorry to say, seems as far off as ever. The Dardanelles and Rambler-Cariboo, however, continue to work and the latter mine will be a large shipper this winter. With the exception of the aboved named and a few properties which are under bond, and some small contracts, mining in the Slocan is at a standstill. The Silverite group, a property near Sandon and supposed to be on the Queen Bess ledge, has just been bonded at a large figure to Eastern capitalists, represented by Mr. Moffat, of Nelson. Preparations are being made for active work this winter and the employment of about twenty men. The Ruth mines concentrator, is now completed, and taken over by the company. It is one of the most compact and best equipped mills of its size at the present time in the Slocan. The Wakefield mines concentrator at Silverton and its 7,000-foot aerial tramway is nearing completion. The firm of White & Rogers, of San Francisco, have the contract for the mill, and announce that this mill will be superior to any in present use in the Province for its value-saving properties. The tramway is under the sole supervision of Mr. B. C. Riblet, the well-known engineer, who has installed all the tramways in the Slocan to date. A

steam heating and electric plant is being installed for heating and lighting the new bunk-houses at the Payne mine. Everything at this property is in readiness for the beginning of heavy shipments directly the labour troubles are settled and work can be resumed. This also applies to all the Slocan properties at the present time. On the Queen Bess a small compressor has been lately set up and a lower level is to be run. There has been a large amount of outside work done here this summer. The American Boy has a fine showing of clean ore for a distance of nearly 150 feet, the grade of the ore is very fair and it is expected that shipments of 50 tons per month will be made during the winter. The Hartney group is looking well under development, and if the showing continues the mine should shortly be in a position to ship ore. This property is now under bond to East ern Americans. The Marion, a property now under bond to Eastern Canadians, is looking very well, and it is rumoured that the price of the bond is already "in sight." This property is situated on Silver Mountain, between the California and Hartney groups. The rawhiding is very late this year on account of the light snow fall. The snow-fall has never been so light at this time of year.

Mr. R. C. Clute, Q.C., the Dominton Government Commissioner, held an enquiry last month in Sandon as regards the importation of alien labour, and also as to the way the miners are treated. He visited some of the leading mines and saw the food and sleeping accommodations of the men, and was both surprised and pleased with the arrangements at the big mines, for the comfort of the men. No evidence was produced before the Commissioner regarding the importation of alien labour. Mr. Clute held a very impartial and explicit investigation when in Sandon, hearing evidence from both mine-owners and representatives of the Miners' Union. He expressed the hope that the difficulty would be speedily adjusted, and, I believe, advised the union to accept the compromise offered by the Mine Owners' Association. The "close down" has now lasted seven months.

" RAWHIDER."

REVELSTOKE.

(From Our Own Correspondent).

With the advent of snow—though considerably later than usual and very much softer—the various claim owners who have been sacking ore during the fall, are now preparing to ship it to the smelter, and one hears on all sides of contracts being made to rawhide the material down to transportation. In the immediate vicinity of Revelstoke, as remarked some time ago, there are no mines as yet, although it seems reasonable to think that more extensive prospecting might discover at least a surface showing, as the main formation is much the same as in more favoured localities. However, Revelstoke is certaily the centre from which most of the mining districts are easily reached, and it is to Revelstoke as a rule that the latest information is brought, continually during the summer and from time to time during the winter, according as it is possible to make the trip. This winter the Big Bend will have at least a show for that class of mining entitled quartz mining as distinguished from placer work; as the Boston and B.C. Copper Company seem determined to push work on their claims, and according to the last accounts received from their mine, are "pushing" very successfully. By spring this company certainly ought to know how they stand, and the hope is generally expressed that they will come out all right, as they are not afraid of spending money to accomplish their object. But little else will be done in that locality (the Big Bend) this winter, as the Adair group has shut down for the winter, although they expected to work steadily. The owners claim they have a very large lead of copper ore—all the better for all concerned, if they have.

THE BIG BEND.

The Rosebery, in Carnes Creek, will be working very few men, as few as they can do with to keep the workings in order, and with the exception of a little placer work about French Creek, very little else will be done.

Nothing is going on in and around Illecillewaet, no fresh work having been taken up since the closing down of unfortunate Tangier.

But south of us, in the Lardeau, all is activity, and the new townstie of Ferguson—some four miles from Trout Lake—should be a pretty lively town this winter, being the headquarters of so many mines that are working steadily. The Silver Cup is working with some forty men; the Old Gold and Primrose are busy developing; and at least a dozen more properties will be working all the winter with more or less men, but probably with great success. The Nettie L. will be very busy and is now quite ready to ship 70 or more tons of high-grade ore to the smelter as soon as there is sufficient snow, which at present is hardly the case owing to the warm weather experienced lately. Truly all things seem to have their uses, only it is not always easy to see just what those uses are—(mice, for instance, unless it be to teach one to pray fervently when they wake you at night with their infernal row!) —and while snow has been considered distinctly a disadvantage to the country, yet many a mine can hardly ship its products economically without it. It is gravely reported that the result of one shot in the Nettie L. recently, was one ton of solid grey copper! It is easy to believe that one shot brought down a ton, but I fancy the weight was in galena more than grey copper, although there is plenty of that present. The lower tunnel—now in over 500 feet—is expected to cut the ledge within 30 or 40 feet more, and if it does the value of the mine will be something enormous, as it will give nearly or quite 250 feet to the surface of very good ore.

LARDEAU.

One matter may perhaps be touched upon in conclusion, and that is the necessity of appointing more mining inspectors; it is simply impossible for any one man to examine all the mines in Kootenay, say, in a year, and to inspect them properly. But when a man is supposed to examine all the mines in B.C., the abusudity is evident. Whether one well qualified man in each district could accomplish the task is doubtful, that is if he did the work as well as he ought, but less than that would seem quite useless, and by its very absurdity would neutralize the good intended to be done. Let us hope that the Government will be able to see their way to improve this state of affairs, and incidentally to try and remedy some of the very unconsidered and hasty legislation accomplished by them durlng the last year.

MINE INSPECTION.

TROUT LAKE DISTRICT.

(From Our Own Correspondent.)

Development work is being steadily prosecuted in this district. Rawhiding has commenced from the Nettie L. property, a considerable quantity of ore already being staked under the ore-shelter at the foot of the hill, about three-quarters of a mlie from Ferguson. The contract for moving the ore from the Shelter to Thompson's Landing has been let, and a shipment to a smelting point will be made before the Northeast Arm of Arrow Lake is closed, by ice, to navigation. Stoping and development work are proceeding without interruption and there is every prospect of this property proving very valuable. The rawhiders have also begun to move ore from the Silver Cup and Sunshine properties. From the foot of the hill at Eight Mile, the ore is conveyed towards Thompson's Landing for a distance of eight miles on toboggans, and then transferred to sleighs. Shipments from these properties to a smelting point will also be made before the close of navigation.

RAWHIDING AT THE SILVER CUP.

Work is proceeding at the Ethel property, close to Trout Lake City, and it is said that the individuals who have a lease of this claim, are meeting with every encouragement in prosecuting their operations. All necessary supplies have been taken up to the Silver Chief, on Great Northern Mountain, where it is expected work will proceed all winter. It is also probable that a force of men will be put to work on the St. Elmo, from which last winter a trial shipment was made with very satisfactory results. Activity is displayed on several properties in the Fish River District, those, amongst other, on which work is proceeding being the Mohawk and the Beatrice. Some 200 or 300 tons of high-grade ore should be shipped from the latter during the winter..

GENERAL ACTIVITY.

It will be remembered that some time ago the Towser claim, adjoining the Sunshine property, was bonded to some Chicago capitalists tor $36,000, since when development work has been carried on by means of a cross-cut tunnel, the object of which was to cut the vein exposed on the surface at depth of some 150 feet. It is with much satisfaction that we are now able to report the intersection of the vein and solid ore, of a high grade character, some 12 inches in thickness, apart from considerable quantities of concentrating ore.

PUBLICATIONS.

MOLESWORTH'S METRICAL TABLES: Third edition; by Sir Guilford L. Molesworth, K.C.I.E., M.I.C.E., M.I.M.E. Price 80 cents. E. & F. W. Spon, Ltd., London: Spon & Chamberain, New York.

This useful little "pocket-book" is too well known to require any further recommendation. In this third edition several necessary tables have been added. Since the first edition of Molesworth's Tables appeared the metric system has gained greatly in popularity, and it can only be a question of time before the cumbrous and out-of-date methods of standardizing money, weights and measures in vogue in Great Britain and her colonies will be discontinued in favour of the more scientific and convenient metrical system. Already the British House of Commons has legalized the use of the weights and measures of the metric system, and the Associated Chambers of Commerce in London have for several years past regularly sent deputations to wait on the First Lord of the Treasury for the purpose of urging the compulsory adoption of the metric system—as adopted by no less than thirty-five countries, representing a population of more than 445,296,000. The metre, as is pointed out in the preface of the work before us, is nominally one one-millionth part of a quadrant of the circumference of the earth from the equator to the pole at sea level, but as the earth is an oblate speroid, the absolute measurement of this dimension is a matter of dispute and difficulty. The question, however, is one of no practical importance, so long as no alteration is made in the legalized standard. That value was determined by an International Committee to be 443,296 Parisian lines; or 39.3707904 inches, and the gramme= .00220462 lb. avoirdupois; and these equivalents have been universally accepted by scientific writers.

GRADATION FOR MINE MANAGEMENT: Price 1s. 6d; by Myles Brown. Thos. Wall & Sons, Wigan, England. 1899.

The colliery worker in British Columbia, as a general thing, is a man of intelligence and tolerable education He avails himself of every opportunity to acquire technical knowledge and strives thus to improve his condition. We have many notable instances where effort in this direction have been crowned with well-merited success, and men have risen from being diggers of coal to positions of responsibility and influence, as managers and superintendents. In the preface to the present work, the author tells us that his book is intended for the use of practical coal miners, "who are pressing forward to a 'mark' which may ultimately give them a 'higher calling'," and he also expresses the hope that it may be found useful to readers who require common practical information on the subject whereon he has written. In attempting to accomplish these aims, Mr. Brown has given us in "Gradation for Mine Management" an excellent little text-book dealing with problems which are constantly met with in colliery work, and also much valuable information, from which everything unessential is eliminated. The book is divided into chapters on: Advanced Arithmetic; Gradients; Practical and Theoretical Mechanics; Boring for Coal and Minerals; Shaft Sinking; Rules, Standards and Definitions; Arrangement and Construction of Surface Plant; and concludes with a general treatise on coal, the mode of its formation and occurrence, classification and systems for testing.

HOW TO RUN ENGINES AND BOILERS; with a new section on Water-Tube Boilers. Price $1.00. Fourth edition. By Egbert Pomeray Watson, Spon & Chamberlain, New York. 1899.

Messrs. Spon & Chamberlain are to be congratulated on their "Series of Practical Hand-books," in which the above-named work is included. To the fourth edition of "How to Run Engines and Boilers" twenty-eight pages of valuable information and illustrations have been added, and the subject of water-tube boilers, their management, maintenance and efficiency for marine and land service is therein treated concisely, and, at the same time, thoroughly. The additional information contained in this edition considerably increases the usefulness of the work to mechanical engineers.

THE B.C. GUIDE, a monthly publication, is now being issued by the British Columbia Printing and Engraving Corporation, Limited, at the moderate price

of 50c per annum. It contains, in addition to two lithographed maps of respectively the Province and the City of Victoria, a great deal of useful information, such as time tables, stage and rail distances, postal rates, the Dominion mining laws and the British Columbia placer mining laws. A number of definitions of mining terms are also given, but as these are both inaccurate and quite unnecessary, they might with advantage be omitted in future issues.

PRODUCING MINES.

NELSON.

The following is the mill run at the Athabasca for the month of November: Number of days run, 29 days, 3 hours; number of tons crushed, 338.

Value of bullion recovered	$9,203 03
Gross value of concentrates recovered	2,385 25
Total	$11,588 28
Value of bullion recovered per ton of ore crushed	$23 72
Gross value of concentrates recovered per ton of ore crushed	6.14
Total values recovered per ton of ore crushed.	29.86

The Custom returns from Nelson for November include the following exports:

	Value.
Coke	$ 339
Lead bullion	36,513
Gold bullion	48,095

The result of the Hall Mines smelting operations for the five weeks ending December 1st, are as follows:

Smelter in blast 19 days and 13 hours, during which time 128 tons of Silver King ore (containing approximately 1,540 ounces of silver) and 368 tons of purchased ores were smelted; 103 tons of lead bullion were produced, containing (approximately) 102 tons of lead, 11,330 ounces of silver and 387 ounces of gold.

The output of mines of East and West Kootenay for the eleven months ending November 30th approximates in value $5,500,00 in gold, silver, lead and copper. The total for the year will be in the neighbourhood of $6,000,000.

SLOCAN.

The exports of ore from the port of Kaslo during November make a very insignificant showing, and the aggregate tonnage was less than during any similar period since the construction of the railway in this district. The returns are as follows : 570,585 lbs., containing 298,798 lbs. lead and 16,926 oz. silver.

ROSSLAND.

Our Rossland correspondent telegraphs:—

In consequence of Le Roi shutting down for a few days while the Jeansboro pump is being installed, ore shipments of this division for 1899 will not exceed 185,000 tons and may fall short of this about 1,200 tons. There are numerous reports current as to labour complications, creating much uneasiness in some quarters, but there is nothing to justify the belief that a strike is impending.

For the month of November 9,260 tons of ore, valued at $260,068, and 705,422 lbs. of matte, valued at $189.158, were exported from Rossland.

LILLOOET.

During November the ten-stamp battery at the Ben D'Or mine was in operation 24 days, 35 minutes, and crushed 455 tons of rock, yielding 277.83 ounces gold.

COAL EXPORTATIONS.

November.	Tons.
New Vancouver Coal Co.	36,448
Wellington Mines	22,932
Union Mines	4,678
Extension Mines (Oyster Bay)	4,678
Total	72,314

The following are the New Vancouver Coal Company's foreign shipments for the three weeks ending December 20th:

Date.	Vessel.	Destination.	Tons.
2—	SS. San Mateo	Port Lost Angeles.	4,289
2—	SS. Tyee	Port Townsend	27
5—	SS. New England	Alaska	48
11—	SS. R. Adamson	San Francisco	4,427
10—	SS. Mineola	Port Los Anegeles.	3,242
14—	SS. Sea Lion	Port Townsend	24
14—	SS. New England	Alaska	41
16—	SS. San Mateo	Port Los Angeles	4,323
19—	Bark C. D. Bryant	Lahiana, H.I.	1,468

THE METAL MARKET—DECEMBER.

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

WHILE general business has been remarkably active for this time of year, money stringency has had a depressing effect in the speculative market. The bank rates are still high and are likely to continue so for some time yet.

SILVER.

The silver market has remained very steady during the month, the demand for China absorbing all offerings for both present and future delivery. Prices have fluctuated between 59 and 59¼, while the average price last month was 58.67.

COPPER.

Copper has been very quiet for the last four weeks and very few transactions are reported. The disturbance in the financial market has, no doubt, affected prices, which are lower than for some time past. Holders have shown a disposition to realize, while on the other hand manufacturers, owing to the approach of the New Year, are reluctant to buy. The lastest quotations are 16⅜ for lake, 15⅞ for electrolytic, in cakes, bars or ingots, and 15⅝ for cathodes. Meanwhile it is believed that the inflated prices of the last few months have been too high for the best interests of all concerned, and the present decline, or perhaps a still further one, would leave the price nearer its normal and healthy level. There is no occasion for any feeling of alarm tive interests, is perfectly sound. Demand for consumption is good, and all the copper offered can be placed without difficulty.

LEAD.

The market continues firm and the demand is unprecedentedly active for this season of the year. If

this state of affairs continue it is likely to create a shortage of supplies, which may bring about still higher prices. The New York price is 4.65, with St. Louis 10c lower.

SPELTER.

There has been a very active demand in this market, with quotations at 4.75 to 4.80c, New York; and 4.55 to 4.60c, St. Louis.

THE LOCAL STOCK MARKET.

THE market has been generally dull and apathetic, and with few execeptions, prices have declined all round. There are, however, promises of a revival after the New Year.

BOUNDARY CREEK.

Among Boundary Creek shares, Old Ironsides, Knob Hill, Winnipeg and Brandon have remained fairly steady at 100, 80, 29 and 29, respectively, but Morrison has fallen to 7 and Rathmullen to 6½.

CAMP M'KINNEY.

Cariboo is offered at 1.05, Minne-ha-ha 14, Fontenoy 14, but Waterloo has been in good demand at 12½ to 13½. Some transactions in Sailor are reported at 10c, and Mammoth at 1½; Little Cariboo at 1c.

TEXADA ISLAND.

Van Anda has declined very considerably, sales taking place as low as 5c.

FAIRVIEW CAMP.

Fairview Corporation were active at the beginning of December, but closed dull at 5 asked and 3 bid.

CARIBOO DISTRICT.

Cariboo Hydraulic has been selling as low as 90, and Horsefly Gold Mining Co. (Ward's Co.) are being offered at $1.25.

EAST KOOTENAY.

Some Crow's Nest have sold during the month at $36 to $37.

North Star is offered at $1.05, and Sullivan has advanced from 9 to 12.

SLOCAN.

Payne has been in demand at $1.02 to $1.05, Dardanelles at 11½ to 12, Rambler-Cariboo at 56 to 58, Noble Five has fallen to 19.

NELSON.

Athabasca has sold as low as 33½ and Tamarac is offered at 10½, and Fern as low as 6.

ROSSLAND.

War Eagle is quoted at 2.56, Virginia 6½, Deer Park 2, Monte Christo 7, Iron Mask 62, Iron Colt 13; whilst I.X.L has been boomed up to 23.

Mining Stocks.

Prepared by A. W. More & Co., Mining Brokers, Victoria, B.C., Jan., 1900.

Company.	Capital.	Par Value.	Price.
TRAIL CREEK.			
Alberta	$1,000,000	$1	$ 4½
Big Three	3,500,000	1	10½
Bruce	1,000,000	1	10
Butte	1,000,000	1	02
Caledonia Con	1,000,000	1	5½
Centre Star	3,500,000	1	1 70
Commander	500,000	1	10
Deer Park	1,000,000	1	2
Enterprise	1,000,000	1	20
Evening Star	1,000,000	1	9
Georgia	1,000,000	1	5
Gertrude	500,000	1	9
Golden Drip	500,000	1	15
Gopher	1,000,000	1	03½
Hattie Brown	1,000,000	1	03
High Ore	500,000	1	05
Homestake	1,000,000	1	04½
Iron Horse	1,000,000	1	6½
Iron Mask	500,000	1	71
I.X.L.	1,000,000	5	23
Iron Colt	1,000,000	1	13
Jumbo	500,000	1	25
Le Roi	£1,000,000	£5	£7
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	8
Nest Egg-Firefly	1,000,000	1	05
Northern Belle	1,000,000	1	4
Novelty	1,000,000	1	4
Palo Alto	1,000,000	1	03
Poorman	500,000	1	14
R. E. Lee	2,000,000	1	3
Red Mountain View	1,000,000	1	3
Rossland, Red Mountain	1,000,000	1	10
St. Elmo	1,000,000	1	6
Silverine	500,000	1	6
Silver Bell Con	500,000	25	2¾
Victory Triumph	1,000,000	1	5
Virginia	1 000,000	1	6½
War Eagle Consolidated†	2,000,000	1	2 60
White Bear	2,000,000	1	4
AINSWORTH, NELSON AND SLOCAN.			
American Boy	1,000,000	1	8
Arlington	1,000,000	1	6½
Argo	100,000	0 10	10
Athabasca	1,000,000	1	35
Black Hills	100,000	0 10	10
Buffalo of Slocan	150,000	0 25	—
Channe	250 000	0 25	03
Dundee	1,000,000	1	19
Dardanelles	1,000.000	1	12
Dellie	750,000	1	12
Exchequer	1,000,000	1	12
Fern Gold	200,000	0 25	6
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	3
London	150,000	25	25
Miller Creek	1,000,000	1	08
Minnesota	1,000.000	1	66
Nelson-Poorman	250,000	0 25	20
Noble Five Con	12,000	1c. par	20
Ottawa and Ivanhoe	1,000,000	1	12½
Payne	3.500,000	1 00	1 08
Rambler Con	1,000,000	1	57
Reco	1,000,000	1	1 00
Slocan-Reciprocity	1,000,000	1	—
Slocan Star†	500,000	50	1 25
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	5
Sunshine	500,000	10	
Tamarac	1,000 000	1	10
Two Friends	240,000	30	06
Washington	1,000,000	1	25
Wonderful	1,000,000	1	4
LARDEAU.			
Lardeau Goldsmith	200 000	1	04
Consolidated Sable Creek Mining Co	1,500,000	1	5
Lardo-Duncan	1,500,000	1	05
TEXADA ISLAND.			
Gold Bar	100,000	10	10
Raven	1,000,000	1	6
Texada Proprietary	250,000	0 25	25
Texada Kirk Lake	600,000	1	1 00
Treasury Mines	250,000	25	2
Van Anda	5,000,000	1	5½
Victoria-Texada	150,000	0 25	02
VANCOUVER ISLAND.			
Alberni Mountain Rose	250,000	1	05½
Consolidated Alberni	500,000	1	5
Mineral Creek	500,000	1	05½
Mineral Hill	750,000	1	05
uadra	500,000	1	05
Mount Sicker & B.C. Development Co	£125,000	£1	4 85
CARIBOO.			
Cariboo Gold Fields Ld	£100,000		
Cariboo Hydraulic Consolidated	$5,000,000	$5	$ 90
Cariboo M. & D. Co	300,000	1	25
Golden River Quesnelle	£350,000	£1	
Horsefly Hydraulic	$200,000		
Horsefly Gold Mining Co	1,000,000	$10	1 25
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	
Lillooet Gold Reefs	200,000	25	
FAIRVIEW CAMP.			
Smuggler	1,000,000	1	02½
Fairview Corporation	1,000,000	25	05
BOUNDARY CREEK.			
Boundary Creek M. M. Co	1,500,000	1	10
Brandon and Golden Crown	1,500,000	1	30
Dominion Copper Co	5,000,000	1	75
King	1 500,000	1	28
Knob Hill	1,500,000	1	85
Morrison	1,000,000	1	7
Old Ironsides	1,000,000	1	1 00
Pathfinder	1,000,000	1	16
Pay Ore	1,000,000	1	07½
Rathmullen	2,500,000	1	7
Winnipeg	1,000,000	1	30
CAMP MCKINNEY.			
Camp McKinney Development Co	600,000	1	23
Camp McKinney Mines Co	600,000	1	10½
Caribou†	1,250,000	1	1 06
Minnehaha	1.000,000	1	14
Waterloo	100,000	10	13
Fontenoy	1,000,000	1	14
O'Shea	50,000	10	02
Waterloo No. 2	50,000	10	02
Mammoth	50,000	10	02
Little Cariboo	100,000	10	02
Shannon	50,000	5	03
Sailor	1,250,000	1	13
Silver Bell, Consolidated	500,000	25	2¾
REVELSTOKE.		1	—
Carnes Creek Consolidated	1,000,000		
EAST KOOTENAY.			
Crow's Nest Pass Coal Co	2,000,000	25	$37 00
North Star	1,500,000	1	1 05
Sullivan	1,000,000	1	12