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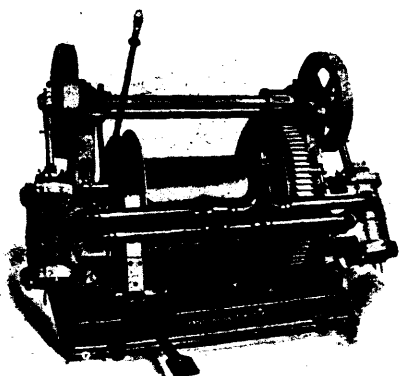
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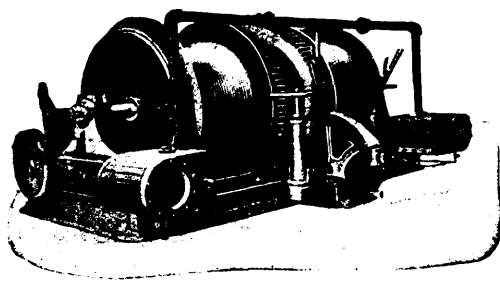
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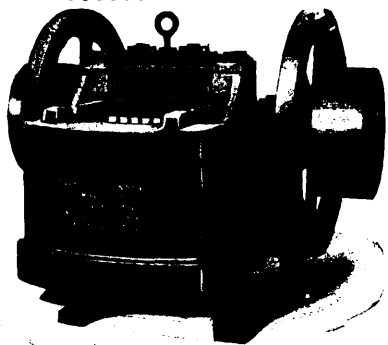
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BACON'S Double Drum Winding Engines.

Earle C. Bacon, Engineer

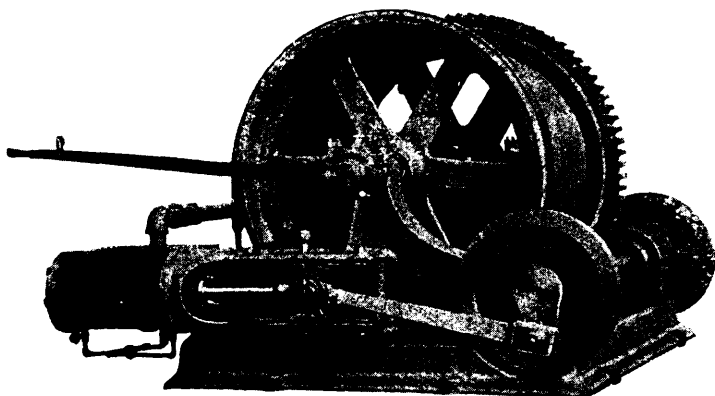
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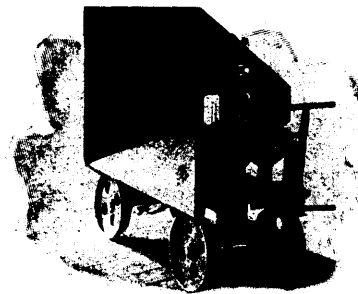
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WM. R. PERRIN & CO., CHICAGO, ILL., U.S.A.

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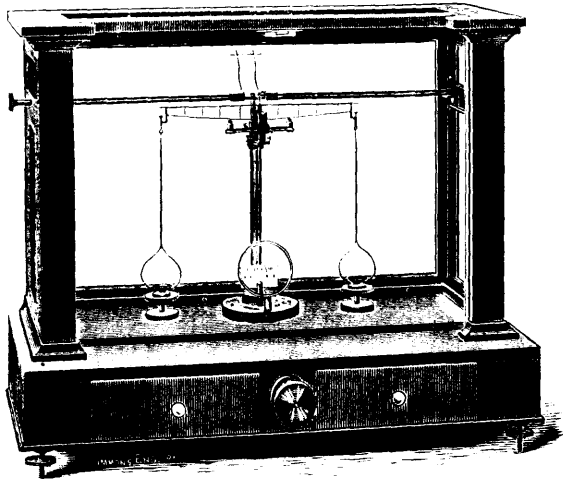
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Successors to

WM. AINSWORTH,

Denver, Colo., U. S. A.

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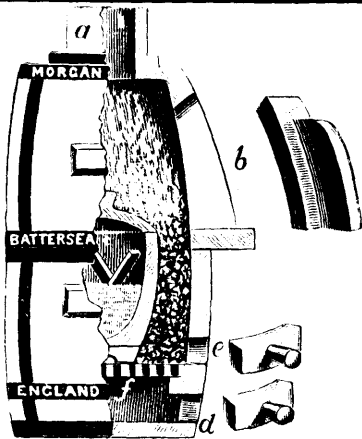
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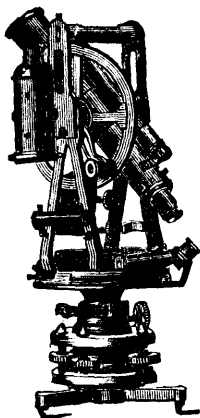
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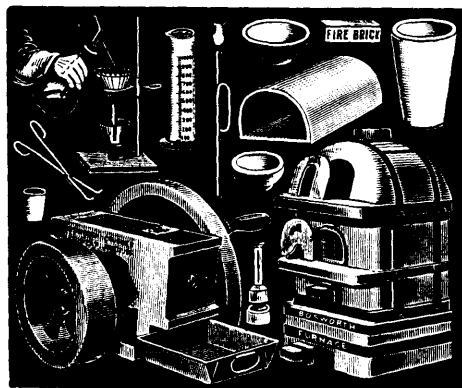
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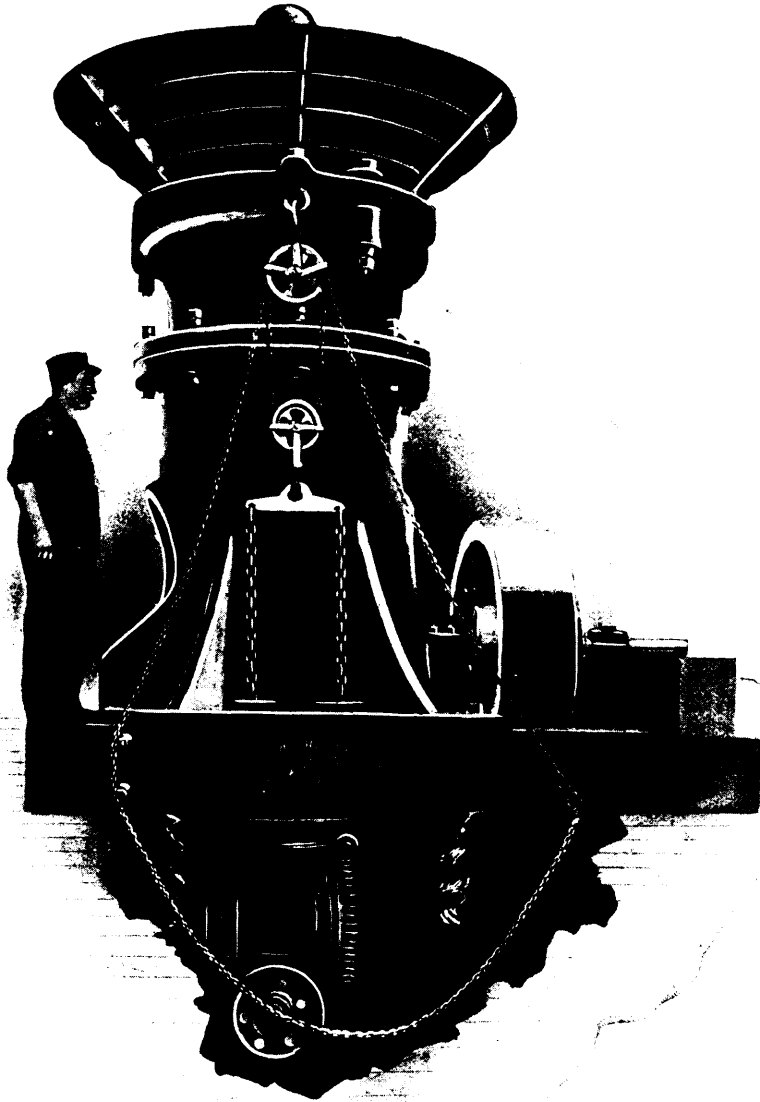
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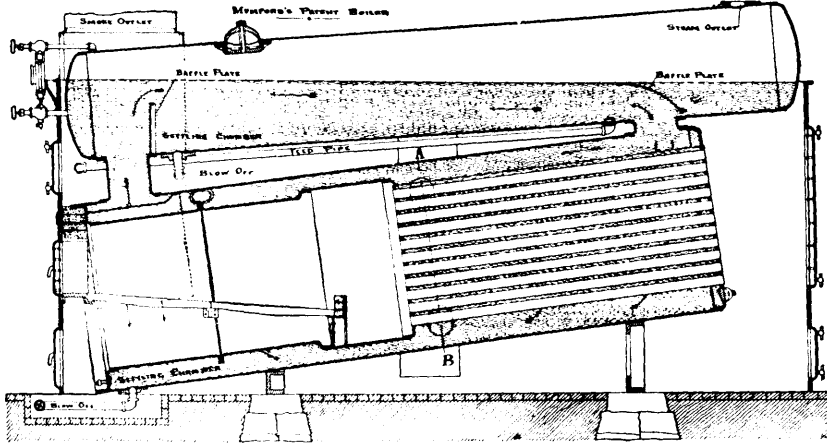
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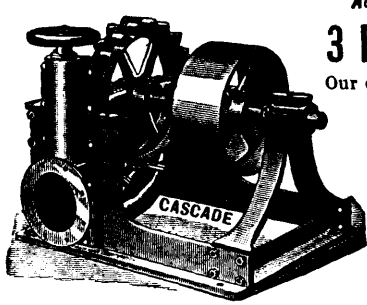
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Gives exclusive attention to the development and utilization of Water Powers by the most modern, economic and improved methods. An experience of more than fifteen years, involving both the theory and practice of hydraulic engineering as relates to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

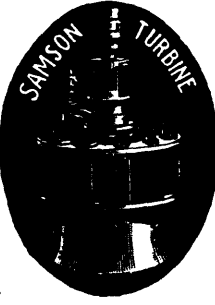
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Our experience of **33 YEARS** building Water Wheels enables us to suit every requirement of Water Power Plants. We guarantee satisfaction.
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Plants Developed and Installed.
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Recent plants installed:—Lachine Rapids Hydraulic & Light Co., Montreal, Que., 12,000 h.p.; Chambly Manufacturing Co., Montreal, Que., 20,000 h.p.; West Kootenay Power & Light Co., Rossland, B.C., 3,000 h.p.

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THE DOMINION COTTON MILLS, Ltd., MAGOG, QUE., JUNE 7th, 1898.
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I am pleased to certify to its successful operation as a most efficient motive power.
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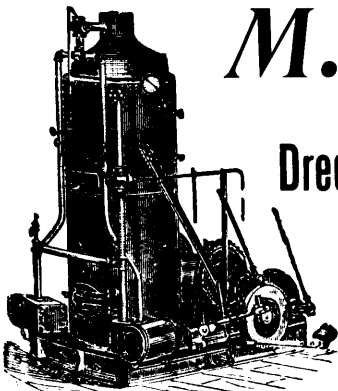
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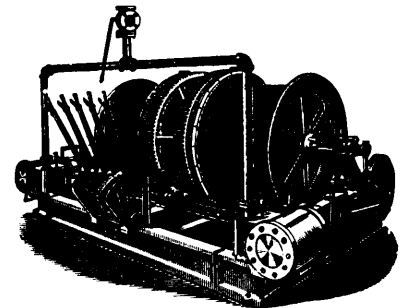
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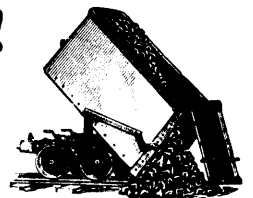
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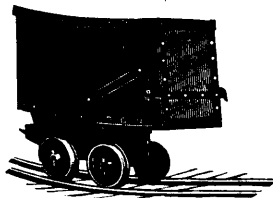
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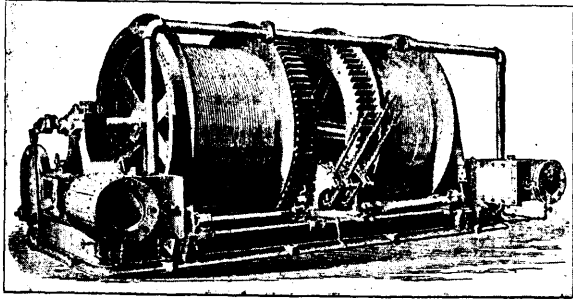
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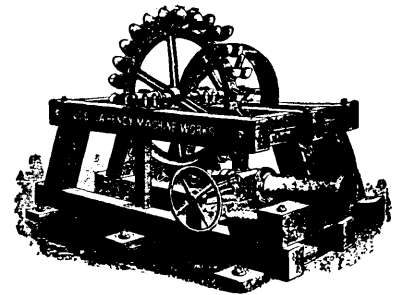
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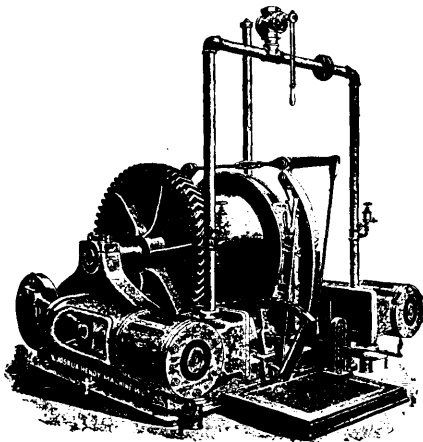
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The Mining Record.

Vol. V.

APRIL, 1899.

No. 4

BRITISH COLUMBIA MINING RECORD.

Devoted to the Mining Interests of British Columbia.

PUBLISHED BY

The Mining Record Limited Liability.

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P.O. Drawer 685, Victoria, B.C.

All communications relating to the business department of the British Columbia MINING RECORD to be addressed to the

BUSINESS MANAGER, B.C. MINING RECORD,
P.O. Drawer 685, Victoria, B.C.

WE have been favoured with advance proof sheets of an article on the Hall Mines, which in natural course would have appeared in the London *Critic* of the 17th of March. This article is in general a criticism on the management of the Hall Mines, particular stress, however, being laid on the extravagance displayed in the maintenance of the local office at Nelson. The *Critic*, as a rule, is both outspoken and impartial, but on this occasion we regret to say that while there is some truth in the statements that are made, the article contains many serious inaccuracies, showing clearly that the writer has no intimate acquaintance with the mine, or that he has been badly misinformed by the "B.C. correspondent who is well posted in the matter." The Hall Mines smelter, we are told should never have been built until the claims had been thoroughly proved and it was shown that enough ore had been "blocked out" to keep going for a considerable time ahead. All of which, in the abstract, is quite true. But when it is further stated that "the smelter being able to secure ores from outside mines, has been able to work more systematically than the mining department, which has all along been unable to respond to the demand on it for ore to keep the smelter going," it is time to ask where the *Critic* obtained this extraordinary piece of intelligence, in view of the actual facts, i.e. that only 3.36 per cent. of the ore smelted at the Hall smelter has been obtained from outside sources, the remaining 96 per cent. being the product of the company's Silver King mine. Further on it is stated that the Silver King is an extravagantly managed mine with a large pay-roll of men who are largely employed in getting out of one another's way; at least that was the case last summer, when about 160

or 170 men were employed in or about the mine. "There was work," we are informed, "for less than half that number if the mine had been worked with economy. . . . and it is a fact that at the Silver King there were more 'roustabout' carpenters, blacksmiths, timbermen and such-like supernumeries than there were miners." In reply to these very sweeping statements it is only necessary to say that last summer seventy-eight per cent. of the employees at the Hall Mines were underground workers, mostly miners and muckers; seventeen per cent. surface workmen, and five per cent. shift bosses, clerks, assayer, sampler and manager. Moreover, any man who refers to the blacksmiths, carpenters and timbermen employed at a mine as "supernumeries" is either very ignorant, or—well, deficient in other ways. The Hall Mines may have employed an unnecessarily large force of this class of labourers, but this point is not brought out. Carpenters, blacksmiths and timbermen (in due proportion), it need hardly be mentioned, are quite as necessary about a mine as miners and muckers. The writer of the *Critic's* criticism, after speaking in favourable terms of the Silver King mine as a property which, if well managed in future, will no doubt, make a satisfactory showing, next proceeds to offer a few suggestions of his own in the interests of the Hall Mines shareholders. We quote as follows :

"A few suggestions may be of interest to Hall Mines shareholders. The Nelson office of the company costs probably about \$10,000 a year. There is really little reason for its existence. An additional book-keeper at the smelter at a salary of \$1,000 a year could do all that is necessary. The office of general-manager is quite unnecessary and might be abolished. A good mine superintendent at the Silver King and a first-class man at the smelter do not require a general-manager as go-between in their relations with the board of directors. The superintendent at the mines should be instructed to discharge every man employed by him and re-engage about thirty to forty of the best of them. These he should engage on prospecting and development work, employing three eight-hour shifts in the twenty-four hours. The men should do their own timbering, and the large army of carpenters, blacksmiths, shift-bosses and general "roustabouts" should be passed on to the next English company that has "money to burn." The superintendent, with a day and a night foreman, should be able to do all the work at the mines and to keep what trifling accounts are necessary without expecting more of him than is usual of men in similar situations. Any assay work for the mine should be done at the smelter; and if it becomes imperatively necessary that any odd job must be done, men can always be obtained by the day from Nelson and while awaiting such emergencies should not be retained on the permanent staff."

We regret for a second time to be obliged to charge the *Critic's* writer with ignorance. But, really, what

could be more absurd than the remark that in an undertaking like the Hall Mines a general manager is not required? Those familiar with enterprises of this nature know that a general manager's position is not only essential to ensure success, but it is also a very difficult post to fill. At a mine operated in conjunction with its own smelters, it is natural for the mine-manager, in order to keep up his output and reduce the cost per ton, to send ore so low in value to the smelter that it is not worth smelting. On the other hand, the manager of the smelter not infrequently will attempt to make a better showing for his department by purposely omitting to give the ore he receives full credit for the values it contains. It is, therefore, one of the functions of the general-manager to check both the mine and smelter returns, and do this properly he should have a regular technical training, and not be merely an accountant as is the case at Nelson. As to the other suggestions, we have already dealt with the question of the mine employees, and the others are of minor importance, although we should imagine the mine superintendent at the Hall Mines could occupy his time to better advantage than in keeping accounts, which are not so trifling as one would be led to expect.

In only one respect is the *Critic* writer's criticism just, and that is in reference to the mistake made in installing the costly and unwieldy Hillidie tramway system. Had either the Otto or Bleichert systems been adopted the ore could have been conveyed from the Silver King mine to the smelter for twenty cents or less per ton, or one-half of the present cost. It is well worth considering whether even now economy would not be served by substituting the present tramway by one that could be more easily and economically operated.

During the recent session of the Provincial Legislature, Mr. Helgesen, the senior member for the Cariboo Electoral District, took the opportunity of drawing the attention of the House to the employment of large numbers of both Chinese and Japanese mine workers by the Consolidated Cariboo Hydraulic Mining Co., Limited, contrary to the terms under which that company received its charter. Mr. Helgesen both as a candidate for political honours and as a member of Parliament, has appeared as a strong advocate of radical measures for the exclusion of the Mongolian altogether from the labour market of the Province, and of thus effectively protecting the white worker against unfair competition from this quarter. It is to be presumed that Mr. Helgesen, in taking up the position he has upon this question, voices the sentiment of a majority of his constituents, but it may, nevertheless, be not altogether unprofitable to discuss the labour conditions obtaining at the present time in the Cariboo district for the purpose of discovering why Chinese or Japanese are employed in the mines of that section of the country in preference to white labourers. As, of course, is well known, mining in Cariboo, to-day, is on a very different basis to what it was twenty or thirty years ago. The day of the individual miner has passed, giving place to a time when enterprise to be profitable must be conducted on a large scale, necessitating heavy expenditures and the outlay of capital upon which for a period, probably extending over several years, no adequate, if any, return may be expected.

This is the position of affairs at most of the big hydraulic mines in Cariboo, including the properties operated by the Consolidated Cariboo Hydraulic Mining Company. For the last few years operations in this district have been almost wholly confined to work of a preparatory character, such as the construction of flumes and ditches, the installation of machinery, and the equipment generally of the mines before actual mining could be successfully attempted. Under these circumstances it will be readily admitted that it was of the utmost importance that these preparatory undertakings should be both as economically and expeditiously completed as conditions permitted. In Cariboo there were two classes of labour from which mine owners could draw. One, the worst type of whites, a large majority of whom were aliens,—and the other, Chinese and Japanese. On many of the white workers absolutely no reliance could be placed. They were dissolute, drunken and withal so unmindful of their employers' interests that they would leave their work, without notice, for days and even weeks at a time. On the other hand, the steadiness and skill of the Japanese and Chinese could at all times be depended on, and with them, there was, moreover, never any likelihood of the suspension of work as a result of disputes or "strikes." In this connection it is, however, necessary to point out that the Cariboo mine-owners and employers of labour have not given employment to Mongolians in preference to white workers on the grounds of economy. On the contrary, it has been shown that an experienced white labourer or navvy who earns in that district three dollars per diem is capable of moving nine cubic yards of earth for a day's work, as against four cubic yards the average daily limit of work accomplished by a Mongolian wage-earner, who receives one dollar and seventy-five cents for a like term of labour. The employment of Mongolians may, therefore, be directly attributed to the untrustworthiness of the white labouring classes in the district, and the natural unwillingness of employers to place themselves at the mercy of their employees. That the Cariboo mining centres are so far removed from the railways, the only means of communication being a wagon-road, three hundred miles in length, accounts for the fact that good white labour was not obtainable in the district. Manual labourers in British Columbia of steady habits and of respectable character have, at present, no need to journey so far to seek employment, and in consequence the demand for labourers in Cariboo has caused an influx of the disreputable or worthless members of the labouring class in such numbers that the whole body of white workers in that district suffer accordingly. A case in point was recently brought to our notice in connection with the "closing down" of the Horsefly mine. Here, in addition to a few skilled miners whom the Horsefly Company had engaged in California, a number of men were employed in the locality on the understanding that they were experienced Kootenay mine-workers. These men only succeeded in mining one ton of material per man a day against five tons representing the work of a California miner. Yet, notwithstanding that they were receiving practically five times the wages of the Californians, they struck for higher pay. As the value of the gravel milled was but one dollar and forty cents per ton the company had no alternative but to stop all operations for the season. Under these circumstances it would, we opine, be hardly advisable to place any further restrictions on the employment of the Mongolian in the Cariboo District until at least a thorough

enquiry has been made into the condition of the Cariboo labour market, and it has been clearly demonstrated that the white population is sufficient or may be made sufficient to carry on all the mining operations now in progress or in contemplation.

Meanwhile, one of the large hydraulic companies operating in the district has hit on what promises to prove a solution of the Cariboo labour problem. This company is now making arrangements for the migration of a small colony of French-Canadians now living in the mining district of Quebec to the scene of the company's operations in Cariboo, and will there strive to form a settlement of these hardy people. No doubt if this scheme proves successful the other large hydraulic companies will adopt the same plan and thus at no very distant date we may hope to find in the mining sections of Barkerville, Quesnelle and Cottonwood, a sturdy class of French-Canadian wage-earners, building for themselves homes and becoming permanent residents of the Province in place of Mongolian labourers, who, though possessed of many excellent qualities, rarely become, nor are they desirable, settlers.

At the recent meeting of the Canadian Mining Institute a paper was read by Mr. A. H. Holdich, of Nelson, B.C., upon a subject of undoubted importance in this Province, where all the arts, sciences and manufactures are still in their infancy. We refer to the subject of technical education.

TECHNICAL SCHOOLS.

In consideration of British Columbia's pressing needs in this respect it may be well to call attention to the system of technical education as it exists in Europe to-day, and where, particularly in Germany, the steady growth of trade and the general improvement in the quality of the manufactures is undoubtedly traceable to the influence of the technical schools and colleges.

The schools of technical education in Europe may be classed under several heads. First, there are those known in England as technical universities and on the Continent as polytechnics, which are high-class institutions for the advanced instruction of engineers, chemists and architects in the art and science connected with their professions. Next in importance is the so-called technical school established to instruct young men in the more elementary stages of the various sciences and arts by way of preparation for the higher branches, or as a direct introduction to the trades or business they may wish to follow. Besides these are the classes and lectures carried on in the United Kingdom by the South Kensington Science and Art Department, a Government institution, which provides practically free instruction, chiefly by means of night classes, for workmen in the elementary branches of all textile, mechanical and scientific manufactures. In addition to the South Kensington Departmental classes there are in various parts of England institutes under the direction of which evening classes are held for instruction in the theory of textile manufactures, ore and coal mining, metal working, and many other specific trades and callings.

The object for which all these various grades of schools and colleges are working is to teach the embryo mechanic, tradesman, chemist or engineer the theory of his trade or profession and to make him perfectly familiar with the principles governing the machinery or apparatus with which he works.

In Germany large sums of money are devoted to the establishment of trade schools. In one city as much as \$200,000 was expended in the institution of a school of weaving, but this expenditure has been the cause of raising the standard of work so high in this branch of the textile industry that silk goods which were at one time made only in France and England are now largely manufactured in Germany and exported in considerable quantities even to France and England. All over the Continent schools for teaching the various trades are to be found, schools of lace manufacture, of machine embroidery, of coal mining, of watchmaking, and in fact training schools for almost every trade, profession or industry in which men seek their livelihood. The instruction obtained in these Continental trade schools is considered so valuable by business men that the possession of a certificate or diploma from one of them enables a student to obtain employment without any difficulty.

There can be no doubt as to the vast advantages of a well appointed system of technical education, and surely there is no place where these advantages are more needed and would be more appreciated than in British Columbia, where in the coming years the need of skilful, intelligent workmen will be felt both in mining, metal working and all the other mechanical trades.

The institution by the Provincial Government of evening classes of technical instruction would, we feel sure, be an important aid to the industries now carried on in the Province and would doubtless prove a great boon to the rising generation of workingmen. In time the cities will take this matter into their control, but until that time comes the Government would do well to commence the good work of technical instruction on the lines of the South Kensington Science and Art Department, and so foster amongst our labouring classes that desire and search for mechanical improvements, inventions and scientific discoveries which has been the means of placing Germany in the front rank as a commercial nation.

There is, at present, among the assayers in the Province, some complaint that there is no recognized standard charge for analytical work; that in general the charges are too low to properly remunerate skilled men, whose special knowledge is the result of a long and often an expensive training; and that even in the same locality assayers rarely agree on the question of fees. We have previously suggested the advisability of the formation of an Assayers' Association or Society, which would deal with and adjust such matters as these; and there can be no doubt that sooner or later assayers will recognize the many advantages of co-operation and organization. Meanwhile, the following comparison of fees charged by leading assayers of British Columbia and New York respectively is interesting. In British Columbia the highest charges are: Gold, silver and lead, \$2 each; copper, \$2.50; mercury, zinc, tin, bismuth, antimony, cobalt or nickel, \$5 each; gold and silver, \$2.50; gold, silver and copper, \$4.

For the same work done in New York the fees are: Gold, silver and lead, \$4 each; copper, \$4.50; mercury, \$5; zinc, tin, bismuth, antimony, cobalt or nickel, \$6 each; gold and silver, \$5; gold, silver and copper, \$8.

Thus it will be seen that assay fees in British Columbia are much lower than in New York; and while it is certainly true that when the cost of crucibles,

cuples, muffles, fuel, fluxes, etc., is taken into account, without considering the time employed, or the special knowledge required for the work, assayers in British Columbia are very poorly paid.

When, as is sometimes the case, a liberal discount is demanded from list prices, the assayer may well conclude that, compared with other professions, his offers but few opportunities and inducements.

It is for some reasons to be regretted that the space to be allotted to Canada for exhibition purposes at the Paris Exposition of 1900, is somewhat limited, and that in consequence it has been decided not to classify the exhibits of the Dominion under the heads of the respective Provinces from which they are contributed. But it is, perhaps, better that the space should be restricted rather than unnecessarily liberal, as was the case at the Chicago World's Fair. Canada will send of her best to Paris, and in the mining section, at least, the principal exhibit will be from British Columbia. We are glad to learn that the important task of collecting mineral specimens for the Exposition is to be entrusted to Mr. Robertson, the Provincial Mineralogist, and the work could not be in better hands. Dr. Dawson, will, we understand, have charge of the mineralogical and geological department of the Canadian exhibit at Paris, and it is necessary that all specimens should be sent to him before November of this year. Meanwhile, there can be no doubt but that the mineral display from British Columbia will attract much favourable attention at next year's great Fair, and it is worth noting that already French capital is being largely invested in our mines, and that a leading financial journal published in Paris is devoting a very considerable amount of space weekly to British Columbia mines and securities.

Referring to shipments of ore from Slocan Lake points to the Canadian Pacific Company's smelter at Trail, a correspondent writes: "The Trail smelter is not giving the satisfaction that was expected. In several instances the payments have been made below New York quotations, and frequently there is a shortage in the assay value. . . . Considering that the C.P.R. have the Nelson concern at their mercy and that their own smelter is giving anything but satisfaction, the outlook for a home industry seems to be throttled at the outset." There can be no doubt that the C.P.R. has and is throwing obstructions in the way of other concerns engaging in smelting or ore-reduction enterprises in Kootenay, and the manner in which the company recently treated an application from a Mr. McDowell, who desired a certain site at Nelson on which to build sampling-works, is evidence of this fact. It is, nevertheless, not quite fair to charge the Trail smelter with many inaccurate returns, or with not paying the full market price for the ore sent to the works, except on the very strongest evidence. Smelter men of experience know full well what it is to be constantly badgered with complaints of this nature and in some of the principal smelters of the United States it is a rule that no ore will be accepted for treatment unless the consignor's representative is present at the time the consignment is sampled. In this connection a story is told of one mine-owner who refused to accede to the smelter's terms in respect to sending a representative. A large shipment of ore was consigned to the smelter, but

refused on the grounds that the mine-owner or his representative must witness the sampling. The mine-owner was obstinate and insisted, but finding, at last, that he would either be obliged to send a representative to the smelter or pay the return freight on his ore, he despatched his office-boy. Of course, the boy knew absolutely nothing about ore or ore-sampling, but that was no concern of the smelter's officials, so long as their rule was recognized, hence the ore was duly purchased. Regarding the question of the market value of ore received at the Trail smelter, unless it is specifically stated that New York prices will be paid, *i.e.*, the value of metals when delivered in New York, there may be perfectly valid reasons on the part of the C.P.R. management for fixing another standard—that, for instance, of the St. Louis market, where the price of lead and other metals is invariably lower than in New York.

As a result of the passage of the Alien Exclusion Act a number of Chinese and Japanese claim-holders and miners in Cariboo have, we are informed, recently made application to the Gold Commissioner of that district for naturalization rights. When this Bill was passed it may be safely assumed that such an effect was not contemplated; and whatever may be said for and against the employment of Mongolian cheap labour by industrialists in this country, few, we imagine, would be prepared to go to the extreme of welcoming low-caste Orientals as fellow-citizens, and as such entitled to all the privileges—including the franchise—enjoyed by native-born British subjects in British Columbia. Yet, under our present laws, it is quite within the bounds of possibility that ere long a Mongolian vote will have to be considered in all political contests. It is true that at the recent Provincial general election, naturalized Chinese who appeared at the polls were refused permission to register their votes by the officials, but it is questionable whether this action would have been sustained had the matter been taken on appeal to the courts. The question of allowing Mongolians to become naturalized British subjects is a very serious one, which, unless steps are taken to prevent it, will at no distant date assume much more formidable proportions.

In a letter to the *Toronto Monetary Times* of recent date, Mr. Robert R. Hedley, Superintendent of the Hall Mines Smelter at Nelson, speaks in very high terms of the quality of the coke produced at the Crow's Nest Pass Coal Company's ovens at Fernie. To quote Mr. Hedley: "I have no hesitation in saying," he writes, "that I have never used as good a coke, though at one time I was asked to try what is always considered the highest grade coke in the world, that of Durham, for which the coal is specially prepared before cooking by a system of crushing and washing. Comparing it with coke we have used heretofore, namely, that from the ovens of the Coast on both sides of the International boundary, I find 120 pounds of the former goes as far as 150 pounds of the latter. I had the pleasure recently of visiting Fernie and looking over the plant of Mr. Blakemore, the manager. This was extremely interesting, and great credit is due to the management for the efficacy of their plant. The production of four tons of coke for six tons of coal is unusual, and says much for the prospects of this company. I have no doubt that when they can produce large quantities they will readily find a market

wherever freight rates do not prohibit the use of this coke." In addition to the Kootenay and American markets, there is a strong probability that the product of the Crow's Nest Company's collieries will be used for fuel purpose by the ships of Her Majesty's squadron stationed at Esquimalt, the result of recent tests, we understand, being entirely satisfactory.

During the month it has been announced, apparently officially, from Montreal, that the construction of a branch of the Crow's Nest Railway will at once be begun, leaving the main line at a point five miles southwest of Fort Steele, passing through that town, and thence continued northward to Windermere, where rich discoveries of mineral have been made within recent times. This news is extremely gratifying, for there can be no doubt that the promising mineral-bearing country, of which Fort Steele is the centre, will henceforward contribute largely to the wealth of British Columbia. There are numerous rumours of the early building of a railway from Fort Steele up the valley of the St. Mary's River to afford shipping facilities to the North Star and Sullivan groups of mines. To reach these will necessitate the laying of twenty miles of rails, and beyond this point, and somewhat to the northwest lie the Pyramid-Kootenay mines—gold-copper properties—are of exceptional promise, although the progress of development work has not been very great.

Edward Boyce, the president of the Western Federation of Miners, which includes 25,000 mine-workers in its ranks, has recently visited Rossland, fortunately, however, not with any view to interpose in any labor trouble. In fact the noted labor leader's words while there implied that at Rossland the relations between mine-owners and workers are exceptionally harmonious, which augurs well for a continuance of the present generally satisfactory mining development of the Trail Creek district. Mr. Boyce complimented the Rossland mine-workers on being a fine body of miners, and also congratulated them on the fact that they were in general engaged by a considerate class of employers. Hence, there would seem to be no present fear of labor trouble in and about Rossland, or indeed in the West Kootenay generally. Meanwhile at points in Colorado miners' strike riots have recently assumed such serious proportions as to lead to desperate act of incendiarism and require the intervention of the military forces of the State. British law and order continue to tell in favor of our Provincial mining.

An early winding up of the affairs of the unfortunate Golden Cache Mining Company, Limited, is now expected, as a result of Dr. Carroll's successful action against the company for compensation in respect of services rendered as trustee. There are, it is understood, no moneys available to meet the judgment, and the mine property and appliances will, it is anticipated, be sold to meet this and some other cash liabilities.

In this connection it may be noted that a well-known resident of Vancouver, who recently visited England on mining and other business, reports that so well known to mining men and promoters in the British metropolis is the record of the Golden Cache, that it is sufficient in the opinion of many of them for

a would-be British Columbia promoter of a mining undertaking to have been connected with the Golden Cache, to cause a prompt refusal to look into the property of any new venture in which he may be concerned. Thus our informant states that when he recently submitted a mining proposition to London financial intermediaries, in connection with which there happened to be associated one who had been connected with the Golden Cache, something like the following reply was given. "Ah! I see, Mr. —, is connected with the properties. Was he the man of that name who had to do with the Golden Cache? If so, I can't touch the matter. He may not have been personally responsible for what happened, but to have been connected with the Golden Cache is enough. Can't do anything with it." The words above quoted do not give the exact literal rendering of the significant conversation, but accurately represent its general purport. It is also learnt that leading mining men in London who are interested in Pacific Coast development, are now in possession of fairly accurate information as to the status and antecedents of mine promoters on this side. Hence such as do not here possess fair credit in respect of past mining transactions will probably find future efforts to promote mining concerns in the London money market less easy than in the past.

The Act recently passed by the Provincial Legislature relating to an eight-hour day for miners is likely to lead to serious consequences. It is well known that the measure received but the feeblest support from the class that it was intended to benefit, and it is safe to say that had they ever dreamed that it might result in a reduction in their daily wage it would have been bitterly opposed. At present it is exciting the greatest hostility among mine-owners, it being hardly justice to expect employers to pay as much for eight hours' service as they did formerly for ten. From all indications the act was totally unnecessary and the proceedings of our legislators extremely ill-advised.

As we stated before, in alluding to the matter, it was hardly necessary for Mr. Ogilvie to deny that he was in any way connected with the wild-cat London promotion known as the British-Canadian Goldfields of the Klondike, Limited, as set out in the prospectus of that precious concern. But as he has emphatically and flatly contradicted having entered into any engagement with the English company in question, or in having supplied the promoters with any special information, as implied, it is to be hoped that if anybody was foolish enough to subscribe for the British-Canadian Goldfields of the Klondike, Limited, shares—which, however, in view of the prompt action of the High Commissioner for Canada is doubtful—they will at once demand the return of their money or prosecute the promoters for fraud.

Mr. Wm. C. Gates, better known as "Swiftwater Bill" of the Yukon, has been making his mark in quite a new capacity in London, having there recently been one of the guests of honour at a promoter's banquet, given to Mr. Macdonald, "The Klondike King." A photograph of "Swiftwater Bill," which appeared in a recent issue of the *British Columbia Review*, represents him clothed in the characteristic dressy attire of a successful London stockbroker or other smart metropolitan man of business. "Swiftwater's" best

friends would hardly recognize him in such a garb. Mr. Gates seems in at least one respect to have been fully equal to the supposed necessities of the occasion when in London, for he told a characteristic after-dinner story of a Yukon ten-mile stream, Quartz Creek, which may, so he says, yield seven million ounces of gold, or the equivalent of £25,000,000. After which we can only say "next." The estimate is, however, well on a par with an item industriously circulated in the London press, which credited Mr. Macdonald, the "Klondike King" with the possession of a fortune of £27,000,000, or about seven times the aggregate gold yield of the whole Yukon—where he has made nearly all his money—to date. The story, however, doubtless, aided the successful flotation of a company formed to purchase some of the Macdonald claims in Klondike at a big price.

Among others who are returning to the Yukon this spring is the Ven Archdeacon McKay, of Donald, and formerly of the Northwest Territories. The Rev. Mr. McKay is probably the first Archdeacon on record who has become a working gold miner. He, however, resigned his archdeaconal appointment some years ago, though he has since done, and still, during part of the year, does clerical duty in the diocese of New Washington.

We are authorised to state that the announcements which have been made in the Provincial press to the effect that Mr. Campbell-Johnson has been appointed superintendent of the Queen Bess mine are entirely erroneous.

Vancouver business men are noting with regret the fact that as things are at present Winnipeg wholesalers are securing the larger proportion of the general supply orders of the Boundary mine country. Our coast and inland traders stand greatly in need of improved rail and other facilities in order to enable them better to compete for the Boundary business.

We can very cordially congratulate the Victoria Board of Trade on its recent action in having passed a resolution favouring the granting by the Federal Government of charter privileges to Mr. Corbin for the construction of the Kettle River Valley Railway. In view of the opposition of the Board last year the present endorsement of Mr. Corbin's application should carry much weight with the Railway Committee of the Dominion House, and while there can be no doubt that the C.P.R. will again bring every influence to bear in opposition to the Bill, the question is now regarded by the public from an entirely different standpoint, and there is, therefore, every reason to believe that the application will be granted during the present session.

The consolidation of the principal lead smelters in the United States, resulting in the formation of an altogether colossal corporation known as the American Smelting and Refining Company, will surely rank among the most notable industrial events of recent times. It is another sign of the fierce commercial struggle, engendered by competition, that is taking place all over the world, but especially in the United States, from which relief is sought in combines, and amalgamations. But unlike most combinations, it is authoritatively stated, that the consolidation of the

lead smelters will benefit the public rather than otherwise. Smelting charges are not to be advanced, but it is expected that the combination will obtain from the railways specially advantageous terms for the transportation of ores to their smelters, which would not be granted under other circumstance to independent smelters. Furthermore, the view is expressed that the consolidation will be able to secure an increase of possibly from three to four cents in the market price of silver; and at the same time the company expects to profit by decreasing general expenses which should follow the amalgamation of interests; and by improvements and economics in technical practice as a result of placing the knowledge and skill of the managers of all the works at the disposal of each. It is, meanwhile, reported that Mr. Nash, of the Omsted & Grant Company, and one of the principal purchasers of our Slocan galena ores, will be asked to accept the office of president of the new American Smelting and Refining Company.

The directors of the Fairview Corporation seem to be leaving no steps untaken in order to attract the attention of investors. To judge from the recent exploitation of Camp Fairview in the *Victoria Times* they are great believers in advertisement. As far as we can learn the Fairview Corporation has a very promising property in the Stenwinder mine, but we fail to find any warrant for the statement made in the Tinhorn Company's and Winchester Gold Mining Company's reports, that "it is confidently expected that the Tinhorn mine will prove one of the largest gold producers in the Province." The mill tests of Tinhorn are being hardly so satisfactory as to inspire confidence in the ultimate profitable working of this mine. It is the opinion of most of the local stock-holders that the Fairview Corporation should devote all their energies to the development of the Stenwinder mine and leave such doubtful propositions as the Tinhorn to a time when they have money to gamble with.

The report of Mr. J. H. Campbell on the Smuggler mine of Fairview would seem to condemn that property, but Mr. Campbell advises the development of two other properties belonging to the Smuggler Company, apparently believing them to be very valuable claims. These are the British Lion and Toronto mineral claims, through which a very strong well-defined ledge runs, giving values of about \$12 in gold. According to Mr. Campbell no development work is necessary on this property, which lies on a steep hillside, the ledge cutting the formation so that the ore can be quarried out and shot into waggons at the foot of the hill.

The English language, it has often been pointed out, is made exceedingly difficult for the guileless foreigner by words which, sounding almost exactly alike, have yet totally different meanings. An amusing instance of this occurred recently to a well-known gentleman whose official business it is to issue mining licenses. To him there came a youth, tall and stalwart, but evidently young. In addition to the advantages of youth and health, he possessed an accent which could only have been raised in the north of Germany or in Scandinavia.

"I was vant a licentious," he observed affably to the genial official. That gentleman sized him up and enquired what sort of a "licentious" he wanted.

"I will dig for gold," said the youthful stranger. "I vant a vat you call miner's licentious."

"How old are you?" queried the official.

"Old? Lieber Gott, I vas not old, don'd it? I am big, yes, but I am seexteen."

"Sixteen, eh? We cannot give you a license, my young friend."

"Ach, Gott, but vy?"

"Well, you see you are a minor, and we cannot give licenses to minors."

"For sure I vas a miner; I dig for gold; you gif licentious to miner. I vant my licentious. I am miner, yes, bei Gott."

"My young friend," said the official, "what I mean is that you are a minor, that is, you are not eighteen years of age, and according to the law I cannot give you a license."

"Mein Gott, mein fader is long forty and two year old. He never see eighteen again, Gott bewahr. Yet he miner's licentious got has. You say I miner, and you cannot gif me licentious? I can your English law not yet understand. How am I miner but not miner?"

Fortunately for the puzzled official, a colleague approached, who had been listening with considerable amusement to the dialogue. The colleague knew some German, and contrived to get into the Teutonic intelligence some idea of the difference between "miner" and "minor."

The foreign youth went away thereafter, much grieved and cursing the "verdamnte Englische sprache" in no measured terms.

Just as we go to press we are informed that there are grounds for fearing a "strike" among the miners in the Slocan, who refuse to work for eight hours for any less pay than they were accustomed to receive for ten. Should a strike take place, the mine-owners are fully determined not to yield the point, and the mines may thus be closed down for an indefinite period. All this loss and trouble will be attributable to the unfortunate clause inserted during the recent session of the Provincial Legislature, in the amendments to the Metalliferous Mines Act, providing that "No person shall be employed underground in any metalliferous mine for more than eight hours in every twenty-four." This amendment is acceptable to neither the mine-owners nor the miners themselves, but unfortunately passed the House in consequence of the successful "lobbying" of a Cœur D'Alene labour agitator. Allowing for the time workings are clearing of gases after blasts, a Slocan miner does not, as a matter of fact, actually work longer than eight hours a day, and he was quite content with his former conditions of labour. He furthermore is not grateful for legislation that will decrease his earnings. By the amendment a miner is not permitted to work, should he so desire, two shifts of eight hours in the twenty-four, hence the new law, instead of improving his lot, really has a contrary effect. The Slocan mine-owners, on the other hand, do not see why they should be suddenly called upon to increase expenses by paying higher wages for labour, even in cases where they could afford to do so. Eight-hour shifts might be practicable enough in the Rossland camp, where at most of the mines the machinery is of a more elaborate and labour-saving character than that used in the Slocan, but in the latter camp an eight-hour day would mean not much more than six hours of actual labour. As the amendment has become

law, the Government is, of course, powerless in the direction of taking steps to remedy the evil that has been done; the Nelson *Tribune*, however, in a very sensible article, points out that as both the miners and mine-owners do not wish to see the new law put into effect, the matter may be arranged without difficulty, as the thirty-fourth section of the act makes it clear that prosecutions which might arise under this section must be originated by either the Government Inspector of Mines or the Minister of Mines. It recites: "No prosecution shall be instituted against the owner, agent, manager, or lessee of a mine to which this act applies for any offence under this act which can be prosecuted before a court of summary jurisdiction, except by an inspector or with the consent in writing of the Minister of Mines; and in the case of any offence of which the owner, agent, manager, or lessee of a mine is not alleged to be personally the perpetrator, if he proves that he has taken all reasonable means to prevent the commission thereof, an inspector shall not institute any prosecution against such owner, agent, manager or lessee, if satisfied that he had taken such reasonable means as aforesaid."

Although the price of copper is slightly fallen since the beginning of last month, the extraordinary boom in copper is still the sensation of the metal market. If the present price of \$17.50 is maintained, and there seems no reason why it will not be, it means that the value of every copper mine in the world has been more than doubled in the last six months. The stimulating effect of the high price is already strongly felt in British Columbia, and the enquiry for good copper properties has been redoubled. Our Province is undoubtedly rich in this metal, and during the past year at all events the prospector has had his labours rewarded more by copper finds than anything else, leaving out, of course, the discoveries of alluvial gold in Atlin and other districts.

One of our readers, at one time a naval officer, suggests a remedy for scurvy which is now so prevalent in the Yukon and northern gold fields. He states that years ago before steam had taken the place of sails at sea, and long voyages lasting perhaps for many months were the order of the day, sailors were often afflicted with this disease. The best preventative was found to be pickled limes. If large quantities of this fruit were purchased by the Government and sold at the actual cost price to the miners, our correspondent believes it would be the means of not only curing those suffering from the disease, but also save others from falling victims to its ravages.

HOW TO SELL MINES IN LONDON.

(From Our Own Correspondent.)

APPARENTLY the belief is still prevalent in British Columbia that if you want to sell a few claims or a block of stock all that you have to do is to get the name of a London broker, or financier, write stating particulars and price, and in due course exchange title for cash at a local bank or by means of the same bank's head office in London. Or there is an alternative method, namely, the insertion of a small advertisement in some London paper, and when the purchaser appears continue to completion in the same manner as described in the first process. (I am quite

ignoring the plan adopted in 1897 and part of 1898 by certain British Columbian financiers of bringing bags full of scrip over to London with the object of selling same much as a grocer vends tea—this procedure being now quite out of fashion.) At least one is constrained to think so judging from the ample evidence forthcoming in support of the supposition. Only the other day I got a letter from a holder of a group of claims offering the same for \$25,000 in the most off-hand manner possible. This is no isolated case either, but probably the twentieth proposal I have received couched in similar terms since July 1, 1898. An outside broker told me the other day that he had had much the same experience. In his case he had received these attentions owing to the fact that **being an outsider** (that is an unofficial broker he advertised extensively, and his name had thus come under the attention of would-be vendors of prospective Le Rois or Payne Mines in British Columbia. I could send you a dozen cuttings of carefully worded offers of properties and scrip, which are or have been appearing in the London press. Now all these efforts are wasted efforts, for the following reasons:

Although some London brokers, chiefly those who devote themselves to mining shares, may occasionally be found willing—after exhaustive inquiry as to the local standing of a Canadian company—to introduce the shares of such a concern to their clients, it is not their business to deal in mining claims, nor their custom to purchase blocks of shares in locally registered companies. The very fact that there are no facilities for the registration in London of even the leading British Columbia mining shares is an insuperable barrier to public dealings on the London Stock Exchange. I only know of one company, a Rossland concern, which has a London office for the registration of shares on this side, and this property has unfortunately so far been a dismal failure, and has proved a bitter disappointment to the London firm which took it in hand. As for the offer of blocks of stock by public advertisement in the London press, well, I am willing to make affidavit to the effect that the shares sold have not defrayed the cost of the announcements. The fact of the matter is that, first, our investing classes do not understand anything at all about the Canadian method of issuing shares at a discount; secondly, they regard with suspicion the appeals insignificant as to matter, and sadly lacking as to detail, which have been appearing in the financial press from time to time during the past two years; and thirdly, they naturally object to subscribe for shares in companies about which they know nothing, and can learn nothing beyond the brief particulars contained in the advertisements offering the shares for sale.

It is very evident that Canadians in general and British Columbians in particular, have not taken the trouble to study the financial conditions obtaining in the Metropolis of the Empire. There are, no doubt, a few exceptions, chiefly those individuals who came over here a couple of years ago with pockets full of options and scrip, and who were bitterly disappointed because their mission did not prove so successful as they had hoped it would. The experience they then gained will, however, doubtless in time prove useful both to themselves and to their associates. As, however, there are apparently many people who need enlightenment regarding the methods usually adopted

in this country for obtaining capital for the exploitation of mining properties it may be worth while devoting a little space to the subject this month.

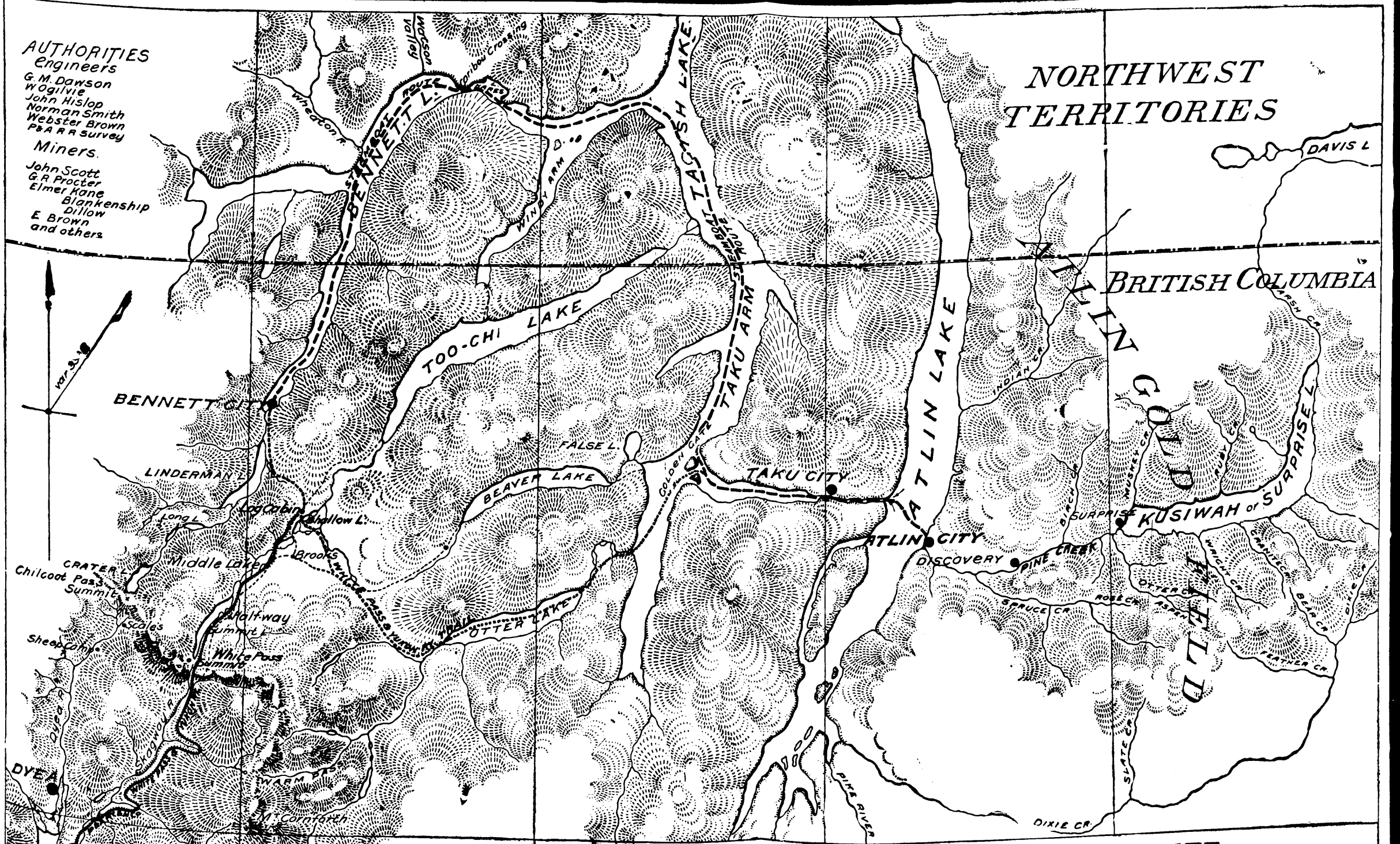
Let us assume that capital is required to develop some particular British Columbia property. The first thing to do is to obtain introductions to leading financial houses, or promoters, who pay particular attention to British Columbia mines, or who favourably regard the Province, and are disposed to lend their assistance in its development. Having obtained the necessary introduction it is next in order to produce full particulars regarding the property offered for sale. These should, of course, include full reports of the development work, certificates as to results, assays, ore available, dividends paid, etc., or capital already laid out on the claims. Then the price or consideration can be stated and what proportions of cash and shares to be accepted in a company or syndicate, if it is contemplated to form either the one or the other, or what would be taken outright in cash. As a general rule the middleman who introduces the vendor of the property to the prospective purchaser, will demand a substantial commission to be paid him on completion of the sale by the vendor, in such proportions of cash or cash and shares and at such dates as the seller may receive the same himself. But occasionally matters are simplified by the vendor getting in touch with the purchaser direct, thus saving the middleman's commission, although in nine cases out of ten the vendor and promoter are brought together by means of the useful but much abused middleman. Having carefully considered the papers of the vendor, the financier will—usually after a period varying from a day to a fortnight—announce his decision. If favourable, negotiations will proceed and in due course a company will be formed, with a capital in accordance with the ideas of the promoter and the vendor. The prospectus will be then issued to the public. If the results are unfavorable the papers will be returned and the would-be seller will be obliged to approach other parties. The negotiations for placing even a high-class property on the market often take months to consummate. To imagine that all that is required in order to sell mere prospects, or tentatively developed properties in London outright for cash, is to approach some broker in the city betrays a woeful ignorance of the conditions prevailing here and can but lead to disappointment to the holder of the property. Negotiations will have to proceed in the way I have briefly indicated above, and the vendors who require foreign capital to assist them in the development of their claims will have to show their faith in their own properties by giving options thereon to responsible negotiators for any period that may be necessary at purely nominal figures. They must, furthermore, give evidence of their *bona fides* by agreeing to take a part at least of their purchase money in the shares of the company that the particular group may subsequently float to operate the property in question. To ask for all cash looks too much as if the vendor has little faith in his own property, and wishes to cut himself from it entirely. A refusal to continue to hold an interest under new management would hardly encourage capitalists in this country to very favourably regard such a concern, and the vendor would find extreme difficulty, even if the property were a good one, in getting his papers considered seriously, or even read.

AUTHORITIES
 Engineers
 G. M. Dawson
 W. Ogilvie
 John Hislop
 Norman Smith
 Webster Brown
 P. A. R. R. Survey

Miners.
 John Scott
 G. R. Procter
 Elmer Kane
 Blankenship
 Dillow
 E. Brown
 and others

NORTHWEST TERRITORIES

BRITISH COLUMBIA



THE WHITE PASS & YUKON ROUTE

— MAP OF THE —
ATLIN GOLD FIELDS
 AND CONNECTIONS OF
SKAGUAY WITH INTERIOR WATERWAYS
 FOR YUKON & KLONDIKE MINING DISTRICTS

- White Pass & Yukon Ry.
- White Pass & Yukon Ry. Trail. From Shallow Lake to Atlin City. 50 Miles
- Steamboat Route from Bennett City to Atlin City 80 Miles



THE YUKON & WHITE PASS RAILWAY

AND THE ATLIN DISTRICT.

CERTAINLY one of the most daring and successful achievements in railway construction work of recent years is the ascent of the White Pass on the road from Skagway to the Yukon country, which was accomplished last month. The summit of this now famous Pass, some 2,850 feet above sea level at Skagway, is reached by a line of rail only twenty miles long. The chief obstacle in the way of the miner in his adventurous journey to the gold fields of the Yukon is thus overcome, and a world of hardship to future travellers in that country has been changed to what will be a short and not uncomfortable railway journey through mountain scenery of indescribable

"Yes," he said in reply to a query of mine, "our first annual meeting was most successful and satisfactory. There was only one expression of opinion and that was that we should drive ahead with the work at all possible speed. I was, of course, naturally gratified to find our company in a spirit of such hearty approval of what had already been accomplished. And, indeed, considering all the difficulties we had to encounter, our progress could scarcely have been more satisfactory. First, there was our charter, which gave us a peck of trouble to obtain. We had, of course to apply to the Government at Washington for powers to traverse that short strip of Alaskan territory from Skagway to Log Cabin; then from the British Columbia Legislature it was necessary for us to obtain a charter for our line passing through



THE HEAD OF SKAGWAY BAY.

grandeur. Railway passenger trains are now running from Skagway to the Summit, while the work of construction beyond is being vigorously prosecuted with a force of about 2,000 men.

Mr. S. H. Graves, general manager of the White Pass and Yukon Railway, recently visited Victoria, and I thus took the opportunity (writes a representative of the *MINING RECORD*), afforded me of learning from him something about the enterprise which he and his colleagues are now conducting with such remarkable energy and success in the far north. Mr. Graves had just returned from London, where the first annual meeting of the company had been held in February. Brisk in manner, direct and incisive in conversation, he is the typical man of business all over.

the northwest corner of your province, and lastly, the Dominion Parliament must be petitioned to grant us permission to continue the line into the Northwest Territories. As it happened, all three legislatures were sitting at the same time, which made it awkward work, but it came through all right after all.

"Then, before the actual work of construction was begun," Mr. Graves continued, "no less than five surveys were made of the line from Skagway to the Summit of the Pass, and the one that was finally adopted called for the most expensive work. But the most economical line in the long run is not always the cheapest to build, and we believe in permanent and substantial work, and on this basis the work has been carried on."

The illustrations accompanying this article will give

some idea of the difficulties of construction that had to be overcome. From salt water at Skagway to Lake Bennett the road-bed is blasted out of the solid rock, practically for the whole distance. From Skagway to Fort Selkirk (the present objective point) is 312½ miles, divided as follows :

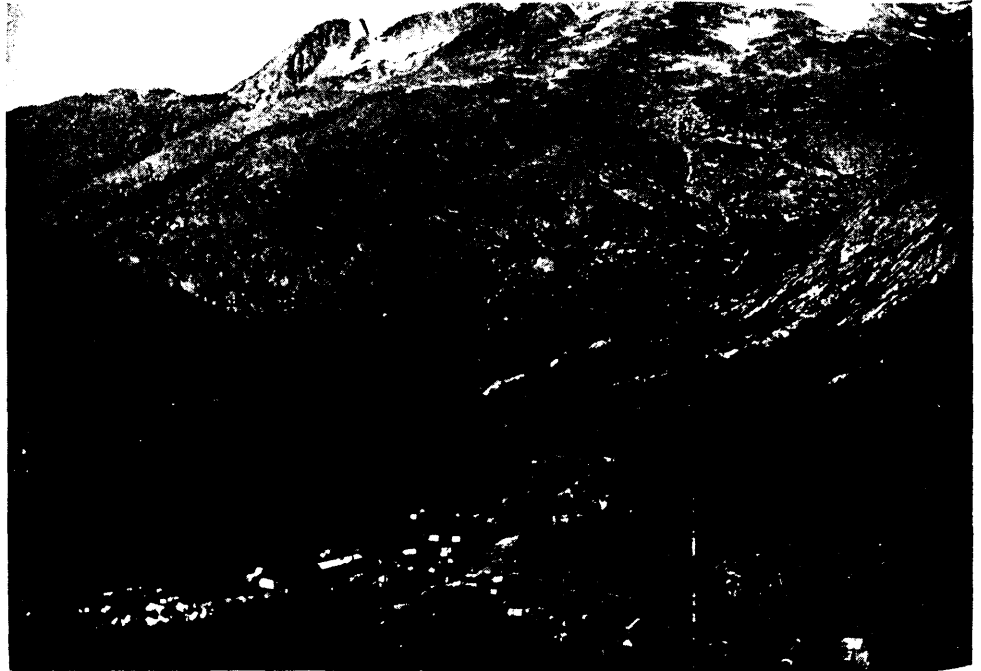
From—	Miles
Skagway to White Pass City	15½
Skagway to Summit of Pass	20
Summit to Log Cabin	15
Skagway to Lake Bennett	41
Skagway to Cariboo Crossing	74½

The road-bed from Skagway to the Summit of the White Pass has been described as a "veritable shelf in the mountains," and in order to secure a line, the maximum curvature of which is not more than 16 degrees, the maximum grade being 3.9 per cent., some very heavy work was undertaken before the Summit was reached.

In many places, so steep is the mountain side traversed by the road-bed, the workmen had to be slung with ropes to enable them to make the

where trains can pass, as also a number of short sidings and switches. The work since the commencement in June last has certainly been prosecuted in the face of most extraordinary drawbacks.

The survey of the line beyond the Summit, where British Columbia territory is entered, shows, however,



WHITE PASS CITY.



TURNING THE FIRST SOD ON BRITISH TERRITORY.

drilling preparatory for the blasts. It was, moreover, found that several tunnels would be required near White Pass City to get round what has been called Tunnel Mountain, and between Skagway and the Summit three long level sidings have been put in

can be completed with great rapidity, in favourable weather, for the line passes through grass and small timber land, which will present no difficulties in the way of railway building.

When work was begun on this railway in June

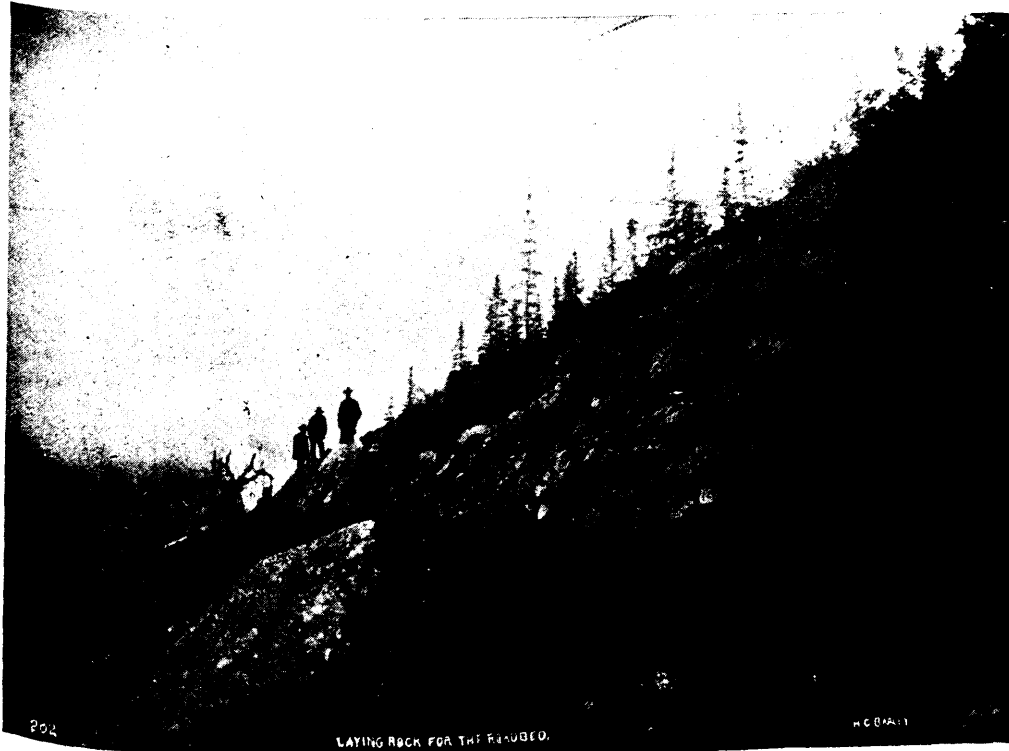
fewer natural difficulties to contend with and here will be comparatively plain sailing, though it seems improbable that the line will get beyond Lake Bennett this year. From Log Cabin to Cariboo Crossing two routes were surveyed, one of which, running along the shores of Lake Bennett, will necessitate some heavy work in crossing the mountains. The second survey to the east of Lake Bennett, by way of Windy Arm, will be comparatively easy. From Cariboo Crossing (shown on the map at the head of Lake Bennett) to Fort Selkirk, there is simply "plough and scraper" work to be undertaken, and the grade

last, the promoters of the enterprise reckoned solely on the Yukon trade to recoup them for their outlay. but the construction was scarcely well under way before the Atlin placers were discovered. Doubtless this railway will prove an important factor in opening

fresh lot of men had to be brought in. Even these were in a state of excitement, until the severe weather of the fall and winter put an end to the gold excitement for the time being. But high latitudes bring some compensations to the anxious and hard-worked

railway contractor. During the summer months there is only a very short time out of the twenty-four hours when the sun is not in the sky, so that the contractors on the White Pass road last summer were at least enabled to work two shifts a day of eleven hours each and make up for lost time.

The travel into the Atlin country this year is very certain to assume big proportions. The provision against aliens taking up placer claims will doubtless turn away many American and other miners, but perhaps it will also have the effect of inducing many British subjects to try their luck here who otherwise would have gone elsewhere.



LAYING ROCK FOR THE ROAD BED.

LAYING ROCK FOR THE ROAD BED.



A ROCK CUTTING.

up the gold fields of the Yukon proper by facilitating travel in that direction; but, meanwhile, there can be no doubt that its chief business this year will be in connection with the Atlin diggings. The Atlin discoveries were reported on August 8th last, by some miners who stopped at White Pass City on their way to Skagway, and had there exhibited some 14 lbs. of gold dust and nuggets, which they stated they had taken from the streams flowing into Atlin Lake. This story at once was noised abroad among the railway workmen, and before noon that day 800 of them "lined up" in front of the paymaster's office, demanding their wages, and purchasing supplies and outfits, stampeded helter-skelter to the new gold fields. It was a rather rough experience for the contractors, for within a few days the festive navy was remarkable for his scarcity on the railway, and a

As the chances of securing good ground will thus necessarily be so much better.

The White Pass Railway Company has already obtained a charter for a railway from Log Cabin into



THE EXPRESS LEAVING SKAGWAY.

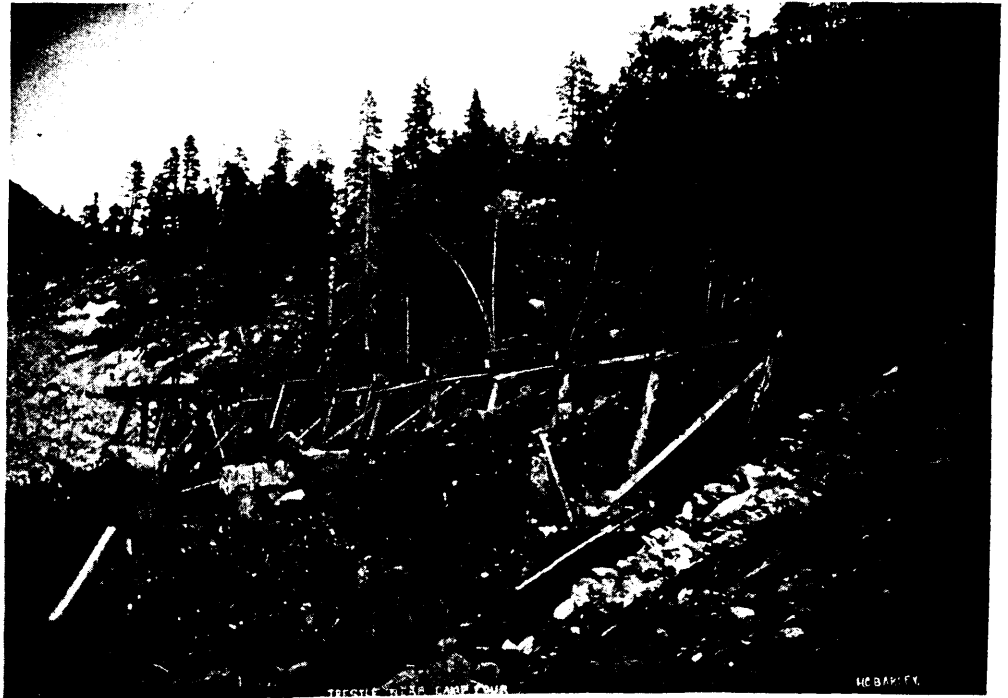
the Atlin district, and it is given out as being the intention of the company, should the developments of the coming spring in Atlin seem to justify the outlay, to proceed at once with the construction of



THE EAST FORK BRIDGE.

the road in that direction. The line would be a comparatively easy one to build, passing as it would through a fairly open and level country.

As regards the Atlin District itself, I am able to give herewith the first technical description of the country that has yet been published, my informant being a well-known geologist, who has spent several months in this locality: The valleys of all the principal rivers run from a mile to three miles wide, filled with immense deposits of gravel, comparatively coarse in kind, well worn, and carrying a fair amount of boulders. The present streams have worn their way through these beds of gravel, leaving the benches level and well timbered. The underlying rock formation, wherever it can be seen, seems to have been identified as the typical Cariboo schists, varying from a black or bluish shale to a more or less foliated grey or greenish chloritic or talcose schist. The detrital matter is said to be characteristically a "blue gravel." Quartz veins carrying gold have been discovered in various parts of the district, and while some of them have been reported to be extremely rich,



TRESTLE NEAR CAMP FOUR.

TRESTLE NEAR CAMP FOUR.



CROSSING THE SKAGWAY RIVER.



ROCKY POINT.



A DIFFICULT CUTTING—THE TRAIN ON A DOWN GRADE.

enough is not yet known of them to speak with any degree of definiteness as to extent and values. However, the general geological character of the country gives the very highest expectations that a rich quartz country will be developed.

The placer gold is a fine coarse gold, some nuggets as high as \$100 having been taken out. The gold is not uniform in colour or value, varying in some of the creeks from \$16 to \$19 per ounce. The bedrock on the creek bottoms is from three to ten feet. The benches range from 50 to 70 feet above bedrock. The whole district is simply covered with a great wash, which renders prospecting for quartz a difficult operation except on the high hill sides, and very little of such prospecting was done last year.

The placer gold seems to be pretty evenly distributed—not “spotty.” The pay last year was singularly even on the claims worked on Pine, Spruce, Wright, Otter and Boulder Creeks, averaging \$20 a day to the man, with occasional strikes of pay giving an ounce an hour on bedrock.

The divide between Atlin and Teslin Lakes is an extension of the granite axis that runs at intervals northwest through the Province from Wild Horse Creek through Cariboo, Omineca, Cassiar, and onward to the Klondike. The richest gold-bearing gravels in the Province have been found in the beds of streams flanking these granite hills or outbursts, such as occur in the Cariboo, Cassiar and Klondike districts, giving an added assurance of the great richness of the Atlin country.

THE MINES OF BOUNDARY CREEK.

NO. 2—THE GOLDEN CROWN.

(By Concentrate).

AMONG the many properties in the Boundary Creek district which are now becoming well known, at least by name, to the investing public, few, if any, have been more pluckily and systematically developed, or have a greater chance in the near future of proving steady dividend earning mines than the Golden Crown. This property adjoins the well-known “Winnipeg” on the north and is a full-sized claim, owned and operated by the Brandon and Golden Crown Mining Company, Limited, the head office of which is at Rossland. Through the courtesy of Mr. G. H. Collins, the company’s managing director at Greenwood, I was kindly granted permission to visit the mine and examine the various workings thereon—an undertaking which, by the way, proved both interesting and instructive. Since April, 1897, the date Mr. Collins commenced the work of actively prospecting and developing the Golden Crown mine, the property has been opened up by tunnels, drifts, shafts and cross-cuts, in all, nearly 800 feet of driving and sinking having been accomplished, and thus at the present time the Golden Crown ranks away the best developed mine of the district. Apart from a great deal of surface cross-cutting—carried out in order to trace the principal leads—and the prospect shaft sunk by the original owner, Mr. W. J. Porter, active development has been confined to one tunnel and a main shaft and to cross-cutting and drifting on the ore body encountered in the latter.

The tunnel (4 x 6½ feet) was originally driven with the idea of cross-cutting and prospecting the ground to the north of the old working. It was run a distance of 322 feet and cross-cut seven leads, varying in width from eighteen inches to seven feet. The ore in these veins is a pyrrhotite in a silicious gangue and careful sampling places its value from \$18 to \$22 in gold per ton. These leads are parallel and have a northwest and northeast strike, dipping to the south, and appear to run diagonally to the main lead, which is being opened up by a shaft. The tunnel was driven at an average cost of \$17.47 per foot. This is considered a comparatively low cost in view of the fact that the rock through which the drivings were made was diorite. The cost, moreover, includes not only the labor but the powder and fuse used, and the laying of the tramway.

The main working shaft, which has so far been sunk vertically to a depth of 154 feet, is 4 x 8 feet in the clear with a double compartment and timbered throughout. At the fifty-foot level the main (or Winnipeg) lead was encountered and passed through, it being at this point a little over five feet wide between walls. A short drift was run at this level. At a depth of one hundred feet an eighteen-foot cross-cut was made and the vein again met with and drifted on for sixty-six feet. At the 150-foot level thirty-two feet of cross-cutting again disclosed the lead and a fifty-two-foot drift disclosed a fine body of ore. In this drift a diagonal upraise was further made, entirely in ore, to the 100-foot level. This work has resulted in the exposure of a very fine body of shipping ore, maintaining a good average assay value throughout from wall to wall. At the present time a winze is being sunk on the vein in the drift at the 150-foot level with a view to further determining its dip. This is now down twenty feet and is to be continued for a short distance, when the work of sinking the shaft to the 300 or 400-foot level will be taken in hand, and cross-cuts made to tap the various leads.

The total cost per foot of the various workings has been as follows :

Shaft 154 feet (including timbering throughout)	\$40 51
Cross-cuts and drifts, 220 feet	14 52
Upraise, 60 feet	15 67
Winze, 17 feet	23 49

The formation in the shaft shows the vein to have a diorite hanging wall, the foot wall being an altered gabbro. The ore filling of this vein is similar to that of the leads cut in the tunnel, samples at the 100-foot level returning from \$18 to \$22 in gold and 3 per cent. copper, and at the 150-foot level \$32.80 in gold and 3 per cent. copper.

So far from twelve to seventeen men have been steadily employed since the property was acquired by the present company, the only suspension of operations being last summer, when work in the shaft was delayed for two months owing to inflow of water. Recent development, however, will render it possible to drain the water into a sump. Hence there will be no cessation of operations this season from the same cause.

The hoisting and pumping plant which has been in operation since last February was supplied by the Ingersoll-Sergeant Drill Company. This is sufficiently powerful to fill all requirements until the 400-foot level is reached, when a larger compressor plant will, in all probability, be installed.

Active and careful development work appears to be the motto of the company, and every effort will be made to have ore blocked out, so that steady shipments can be made to the nearest smelter by the time that the branch line of the C. & W. Railway is completed, which the C. P. R. have surveyed and intend building at once to tap the camps. A spur of this line has been surveyed to a pass within 100 feet of the shaft-house on the Golden Crown, and thus when the management is in a position to ship ore, the very best facilities will be produced for that purpose.

Mining men in the Boundary Creek district have unbounded faith in the future of the Golden Crown, and it is generally conceded that the management has been both painstaking and practical.

MINING MEN OF THE PROVINCE.

MR. ALFRED HAMMOND BROMLY was born in Bristol, England, and commenced his professional career by being articled to Messrs. John Warner & Sons, of London, the well-known hydraulic engineers, passing through their shops, drawing and commercial offices. Whilst with this firm he was engaged upon numerous important pumping and hydraulic installations both at home and abroad. He next accepted the post of assistant to Prof. Louis, then general manager of a Transvaal gold mine, and in this capacity made the plans for the company's sixty-stamp mill, supervised its construction in England and subsequent erection in South Africa. This mill was considered to be one of the finest, at that date, turned out by English makers. Mr. Bromly remained as engineer to this company until re-construction becoming necessary he resigned and returned to England, after nearly three years' service.

He then took a course of practical metallurgy at King's College, London, and was appointed engineer to the Clarkson-Stanfield Ore Reduction Company, Limited, of London, being engaged in the treatment of difficult and refractory ores from all parts of the world, and more especially in researches upon the Broken Hill (N. S. W.) sulphide ores. This position he resigned to take the managership of Carnochan mine, North Wales, which having been worked for gold some twenty years previously it was now proposed to re-start. These mines having been opened up and equipped with modern plant, the result was payable returns, which still continue, due largely to the recovery of lead and other mineral constituents previously lost by the older methods of treatment.

In 1894 he accepted the post of engineer to the Choukpazat gold mine, a pioneer syndicate, proposing to operate mines in Upper Burma. Mr. Bromly selected his plant, and in company with the promoter of the scheme, left for Rangoon. The difficulties here were very considerable. The jungle dense, feverish and unexplored. Labor mainly consisted of local jungle-dwellers, unacquainted with any form of skilled work, and who, a few months before, had been engaged in the (to them) more congenial task of

waging a bush war against British sepoys. Twelve miles of road had to be cut and made, including bridges; a mile of tramway laid to connect mine and mill; the mine opened up and the mill erected. The white staff only numbered three, all told, and yet, in the short space of five months after reaching Rangoon, the stamps were dropping at the mine, 600 miles up country. As instancing what may be done by intelligent enterprise, unhampered by directorial charges and interference, this property was opened up, equipped with ten-stamp 800-lbs. mill, engine, boiler, tramway, laboratory, buildings, etc., and put into working order for about \$30,000; and operations have been successfully continued since without a day's interruption. Considering the circumstances of bad

climate, isolation and untrained native labour, this, the first gold mine operated by Europeans in that country, may rank as a record.

Having successfully carried out this work, Mr. Bromly returned to London in 1896, and was appointed general manager to the Almarath Tin Mining and Smelting Company, Limited, operating some twelve mines in Spain, two in Portugal and smelting works at Carril. A large concentrating mill had been established, but upon further acquaintance with the mines, Mr. Bromly considered the prospects insufficient to justify the large works erected and in operation. This opinion, although subsequently absolutely confirmed by the cessation of operations, caused friction with the London Board, and at the expiration of his engagement Mr. Bromly severed his connection with the company.

Having reported upon the San Finx Tin mines in Spain, he then

opened an office in London as consulting and mining engineer, and was immediately commissioned to report upon mines in New Zealand, and accordingly examined and reported upon properties in every leading district in the North Island.

In August last year he was appointed consulting engineer to the London and Vancouver Finance and Development Company, Limited, of London and Vancouver, having charge of the development of various properties held by that corporation, including the Blue Bells, Frederick Arm.

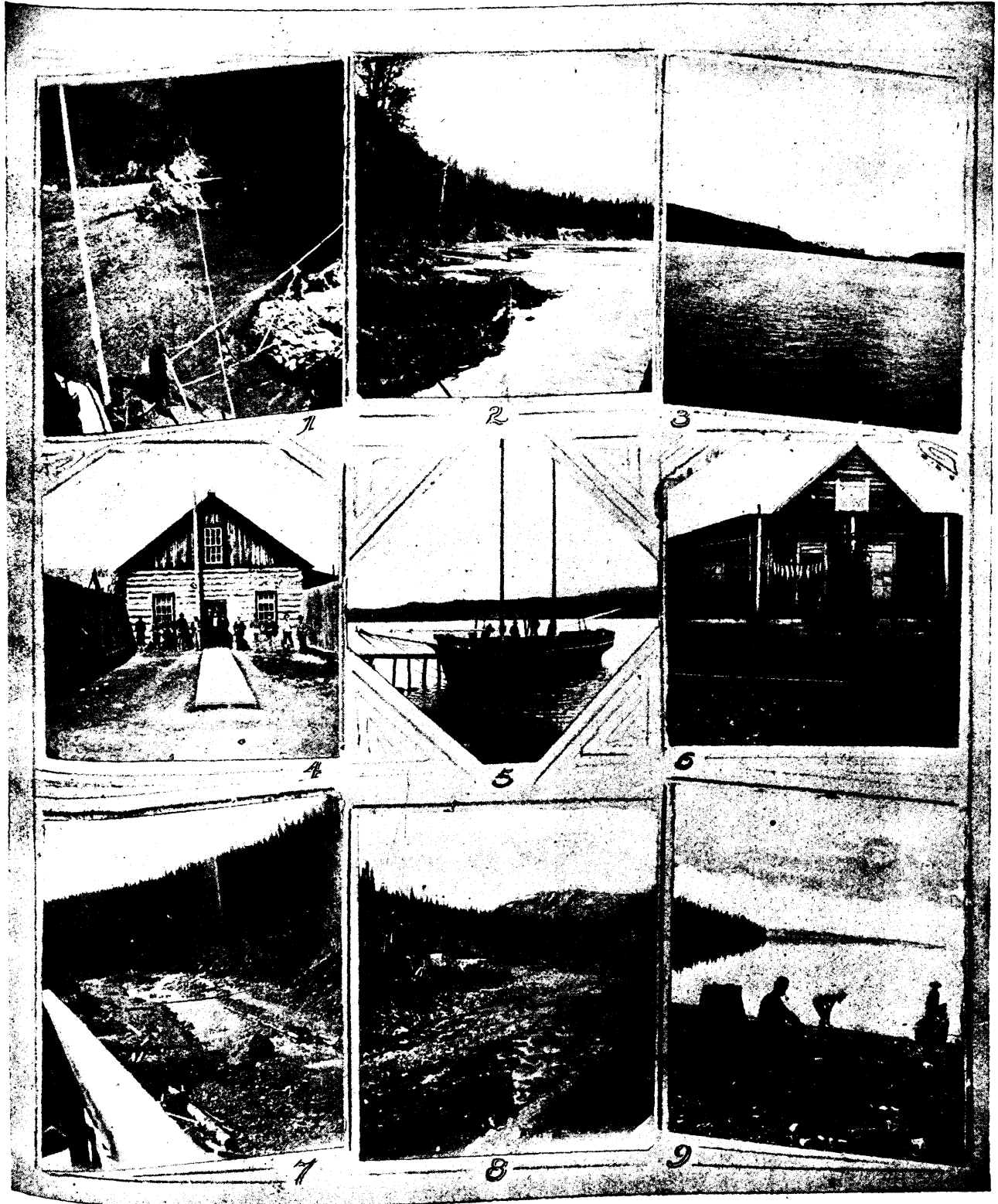
Mr. Bromly is the author of "Gold Mining Machinery," a paper read before the Junior Engineering Society in 1893; "Notes Upon Gold Mining in Burma,"



MR. A. H. BROMLY, ENGINEER OF THE BLUE BELLS MINE.

read before the Institution of Mining Engineers, in 1896; an article in *Mineral Industry*, 1896, entitled the "Mineral Industry of Burma," and amongst various contributors to technical journals may be mentioned a recent one upon "Treatment of Gold Ores in the Hauraki Peninsula, New Zealand," appearing in the *Engineering and Mining Journal*, of November 12 last.

He is a member of the Institution of Mechanical Engineers, the Institution of Mining Engineers, and the American Institute of Mining Engineers. He also holds the King's College certificate for practical metallurgy, and the New Zealand Government's certificate as first-class mine manager.



1. Steamer ascending the Skeena River against the current. 2. Passengers helping to tow steamer on the Skeena. 3. A view on the Skeena River. 4. Hudson Bay Post at Babine. 5. The Hudson Bay Co.'s schooner on Babine Lake. 6. Hudson Bay Post at Hazelton. 7. Looking up Germansen Creek. 8. Another view of Germansen Creek. 9. Babine Lake.

OMENICA DISTRICT—PAST AND PRESENT.

(By an Omenica Pioneer).

THE Omenica District as it is known to-day comprises that portion of British Columbia bounded as follows: On the north by the 56th degree of lati-

Creeks were found and worked. The news of these rich finds reached old Cariboo, and in a couple of years three thousand miners were at work along these different streams, or prospecting the country around about endeavouring to find other streams equally rich.



Views at Cariboo Hydraulic Mine, Quesnelle Forks, B.C.—Taken during the "clean up" of \$62,000, August last.

tude; on the west by the 127th parallel; on the south by the 54th degree of latitude; and on the east by the 124th parallel. It was first worked by white men in the early seventies, when Vital Creek was discovered, and after Vital, Germansen Manson and Lost

Miniature towns sprung up both on Germansen and Manson, dance houses, saloons, boarding-houses, stores and gambling houses being very much in evidence. These were busy times while they lasted, but that was not for very long, for news reached the

men here that wonderful gold discoveries had been made in Cassiar; and as distance lends enchantment to the view, claims, tools and buildings were abandoned, and although it was almost mid-winter, hundreds of men a few hours after receiving the news were pushing their way out to the coast by way of Hazelton, the most of them to regret in after years they had ever deserted the Omenica.

About two years after this rush the Omenica was virtually a deserted camp, only a few old-timers who had faith in their claims remaining, and even this small number gradually dwindled down until in 1895 there were only some 15 or 20 men known to be in



HYDRAULIC FLUME—OMENICA DISTRICT.

Klondike or Atlin, but as one of the best and most permanent hydraulic mining districts in the whole of North America.

The country has not been in any sense thoroughly prospected; in fact there still remain hundreds of square miles still untrampled by white men which, when prospected and opened up, should surely prove as rich in gold as the developed sections of the district. The climate during the summer months, from the beginning of May until the middle of October, is delightful; the snowfall in winter is not heavy, two feet, or three at the most, and the cold not more intense than Montreal or Ottawa. Fuel is plentiful, vegetables grow wherever planted, fish abound in every stream and lake, so that living is not nearly so hard as one might be led to believe.

To reach the Omenica probably the best trail is now *via* Hazelton, on the Skeena River, across Babine Mountains and Babine and Tatlah Lakes, (by ferries) thence to head of Vital Creek, whither a trail leads down to the Omenica River and on to Manson; while another, north of Germansen Lake, runs to Manson near which two companies are now at work (1897). Old trail from Quesnelle, part of it being the Telegraph trail, is also open, and much of the supplies for the hydraulic mine has been sent in this way. If the telegraph line is constructed to Dawson City, this old Telegraph trail, in all probability, will be greatly improved.

Referring to the geological formations represented in this section, Mr. R. G. McConnell, of the Canadian Geological survey, has said "that the west slope of the Rocky Mountains consists largely of gneisses and schists, with some crystalline limestone, diorite and



HYDRAULIC FLUME—OMENICA DISTRICT.

the whole district. The trails which had been cut out and kept in repair during the early days had by now become almost obliterated by fire, windfalls, and the natural decay of the forests; but a small party of men pushed their way in from Quesnelle to the district and made some locations on Slate, Kildare and Manson Creeks, which are being worked at present by the Forty-Third Mining and Milling Company of Cariboo, an Ottawa syndicate, and backed almost entirely by Ottawa capital. This company have completed their development work, and this coming spring will be ready to begin actual mining.

The year following, a Victoria Company sent in a representative who took up large areas of ground on Germansen and Manson Creeks. This Germansen property has since been sold to a very strong American syndicate from California, who have already this season sent their engineer with a force of men into the district to commence operations upon newly-acquired property. The Victoria Company still hold their Manson property, and will continue development work this season. Vital Creek, which has been in the hands of a Chinese syndicate for some years past, has also changed hands, and is now about to be operated by an English Company represented by Dr. Powell, of Victoria. Other companies are working on Tom, Lost, Evans, Manson and Skeleton Creeks. Trails have been opened and improved, a waggon road is in contemplation, a line of telegraph may be built north from Quesnelle, stores are already established, and it would seem that in the near future Omenica will again come to the front, not as a second

quartzites, the eastern ranges exhibiting bedded limestones. The area of Archaean rock gneisses, schists and crystalline limestone occupies the western side of the Finlay also as far up as the Ingenica, where it bends a little more to the west, and the river flows through shales, and sandstones and conglomerates which occupy the valley, but are not found on the higher levels. The same formation appears to be present in the Tacla Lake valley, and also along the Omenica for a few miles above Black Canyon."

The mountains pierced by the Finlay, where it

enters the main valley above the Tochieca, are composed of green volcanic schists, in which some stringers of quartz alternating with bands of yellowish weathering dolomite, are reported by Mr. McConnell. Similar green schists, associated with dry grey argillites and some diabasic tuff, occur along Germansen Creek, and the Omenica from Germansen Landing to New Hogem, and again in the range between Tacla Lake and the Omenica. A small area of conglomerates and sandstones forms the Finlay valley to the west of the schistose range, and is followed by a belt of limestones, with schists and argillites about five miles wide, which apparently extends southward to a distance of sixty miles. A narrow strip of conglomerate, interbedded with some quartzites and schists, and succeeded by the Archaean schists, which confined the valley at its mouth. These are here about six to ten miles wide, and give way to eruptive rocks, consisting of diorite on the border, but passing into granite. The limestone areas occur on Omenica River, the first part above the Tchutetzeca and the other below Germansen Creek separated by an area of Archaean schists overlain on the west side by fine-grained conglomerate, quartzites and slates.

"Granite is found on Manson Creek and on Omenica River between the two areas of volcanic schists before referred to, and following the river upwards from above New Hogem to the Omenica, Sitelka Pass and beyond as far as explored, a distance of twenty-five miles or more.

"Gold was first found in this neighbourhood in 1861 on the Parsnip, about twenty miles from the mouth, and was successively found on Toy's Bar, on Finlay River, below the Omenica, on Silver Creek, Vital Creek, Germansen. Slate, Manson and Lost Creeks, and on Tom's Creek in 1889.

"The gold in the Omenica region has been obtained principally from the gravels overlying the older rocks in the beds of the present streams. The gravels as a rule have little depth, and the productive portions of the different streams seldom exceed three miles in length. The auriferous gravels underlying the boulder clay on Germansen, Manson and other creeks in the district have a wide distribution, and promise favourable results if worked on a sufficiently large scale. Water can be obtained almost anywhere from lakes and mountain streams within a reasonable distance, and the only drawback to successful hydraulic mining is the great expense attendant on the carriage of material and supplies from the coast. At the present time the greater part of the supplies are brought in by pack animals from Hazelton, at the Forks of the Skeena, the rate to Manson Creek amounting to seventeen cents per pound.

"Some prospecting has been done in the Omenica region every season since its auriferous character became known, but the district has by no means been thoroughly explored. The discovery of pay gravels on Tom's Creek, close to Vital Creek, twenty years after the latter was found, shows how loose the examination has been. That further discoveries of auriferous creeks will be made admits of little doubt.

"The same remarks apply with perhaps greater force to the Finlay system. Fine gold has been found in small quantities all along the river and at the mouths of its chief branches, the Ingenica, Quadacha and Tochieca; but on Paul's branch, or the neighbouring streams from the Rockies, none of these creeks have been thoroughly prospected."

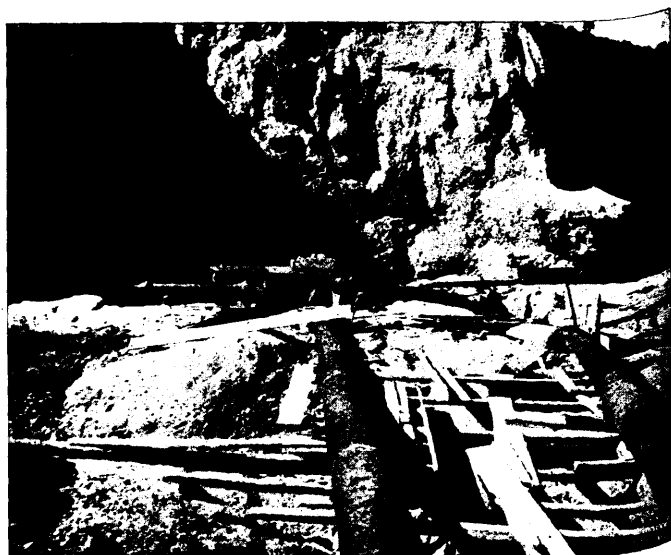
USEFULNESS OF THE DIAMOND DRILL.

(By J. N. S. Williams, Victoria, B.C.)

THE idea of making a machine that can penetrate the hardest rocks and produce a perfect section of those rocks in a portable form must be credited to a Frenchman, but the perfecting of the machine in all its details so as to fit it for an extended sphere of usefulness is due to American genius, and it is in American hands that the drill's best work has been, and is to-day, done.

When the saving of money and time is considered it is remarkable that the Diamond Drill is not more used outside of the United States; beyond drilling for coal it may be said that little other work of the kind has been attempted in British Columbia, yet there exists to-day no means so practical and so economic for proving the existence of mineral deposits at various depths below an outcropping.

The Diamond Drill is used in American mines very largely to prospect ahead of tunnels, and the



CEMENTED GRAVEL—OMENICA DISTRICT.

value of ore bodies of various kinds, such as gold, copper, silver, lead and iron, not including coal, discovered by the use of the drill, runs into scores of millions of dollars. On the other hand, the use of the Diamond Drill has saved the expenditure of vast sums of money by proving that a suspected deposit of ore in reality did not exist at the point supposed.

In locating faulted veins the machine has proved its value many times, and it is asserted that there are few mining companies operating in the big mining camps of the United States who do not open a special Diamond Drill account, for the purpose of prospecting ahead of the regular development work.

But the use of the Diamond Drill is not confined to mining works; in the construction of the great Croton Waterworks, supplying New York, the whole of the substrata were explored to determine the character of foundations required; perfect sections of the underlying formations were produced which rendered the foundation work simply a matter of figures, there being no such thing as guess work, or waiting until the excavations were made to determine the class of work.

Testing for the foundations of the East River Bridge, New York, was carried out with the Diamond Drill, with the result that the supposed bed-rock was found to be merely a boulder deposit and that the actual bed-rock lay at a further depth of some twenty feet; one can easily see how much the drill save those who paid for that great bridge by proving this fact.

In the improvement of the James River, Virginia, the drills were used in submarine work in the removal of obstructions to navigation, boring four-inch holes in groups which were ultimately charged with explosives and fired, the debris being cleared away afterwards with a dredge.

It is also used very extensively in shaft sinking, by what is known as the long-hole process; this system, while being no cheaper, is much quicker and has very decided advantages in this respect.

The chief use of this machine in British Columbia is to enable owners of mineral claims to determine with accuracy and despatch the value of their prospects; an outcropping can be sunk on, or cross-cut at several points to a considerable depth, and the value shown for a fraction of what the work would cost gained by hand work, and in a very short space of time.

In these days it is not hard to sell a good mineral property, but no mining man who understands his business buys a prospect, except at a nominal sum, taking the risk of development himself; the mineral claim that has several hundred feet of tunneling and sinking, showing up ore in such a way that it can be seen and measured and assayed, has no difficulty in finding a buyer; but to put in such an amount of work costs from eight to twelve thousand dollars and a couple of years of time, whereas by the use of the Diamond Drill the same work could be done for two or three thousand dollars, and in three months' time, with practically the same results as to determine the value of the property.

It does not follow that the drill holes put down are entirely wasted, especially as regards the vertical holes, which can be filled up with sand, and then be used as a centre hole in sinking, scooping the sand out to depth required for charge and then dressing out the shaft corners by hand or machine work. This is what is known as sinking by the long-hole process and is largely used.

The advantage of having a perfect representation of the under-lying strata before making contracts for shaft sinking is very apparent, as it can be determined at once whether the shaft requires timbering, whether it will be dry or wet, and what class of rock is to be excavated, enabling the mine owner or manager to calculate very closely the cost of the proposed shaft before any serious work is undertaken.

The Diamond Drill, producing as it does, a perfect section of formation through which it operates, is thus a factor in cheap and effective work that should not be neglected. There are many people who cheerfully pay a good round sum for a large and extensive hole in the ground that proves in the end to be nothing but an expression of vain hopes and fleeting fancies, who would hesitate to entertain a proposition to put down a bore hole to the same depth (or an eighth part of the sum the big hole cost, and who would grumble dreadfully if the said bore-hole showed up nothing, while they look philosophically at the bill for the big shaft and call it "paying for ex-

perience," and hope for "better luck next time," forgetting that they could for the cost of one shaft put down eight bore-holes, cover eight times the hidden area they wish to explore, and get eight chances to one of making a valuable discovery.

CRYSTAL FORMS AS AN AID TO THE DETERMINATION OF MINERALS.

(By Charles H. Walker, Rossland.)

LITTLE or any attention, is as a rule, paid by most explorers and prospectors to the crystallised forms of the minerals with which they may come in contact, such forms being usually regarded as merely curiosities of more or less interest, and of little use as an aid in the identification of a mineral; but although the practical utility of crystallography in mineral determination may be somewhat limited, yet exceptions to this rule are numerous, and some slight acquaintance with this science will often enable an unknown mineral crystal to be named without any resort to chemical analysis. It is well known that when minerals pass from a state of fusion, solution, or sublimation into a solid form, that, in the course of such changes, should the conditions be favorable to the unstrained deposition of their molecules, that these molecules obeying certain unknown forces inherent in themselves, will arrange themselves in mysterious yet definite forms, such forms being homogeneous, i.e., of a certain fixed chemical composition. It is obvious then that having once ascertained the crystallographic form of a mineral, some slight attention to other of its marked, physical or optical properties, such as cleavage, hardness, color, streak, etc., will often result in its easy classification without the aid of the chemist or assayer. It is seldom, however, that the crystals of minerals are sufficiently large for study by aid of the naked eye alone, most metallic ores being made up of masses of small and imperfectly formed crystals. Much time and patience is required in the study of micro-crystallography, and the results though interesting, and of great value to the scientist, do not justify in a practical sense the time and perseverance devoted to their attainment.

Nevertheless, in spite of the generally minute or microscopic size of crystallised substances, there are still many minerals which occur in sufficiently large crystals to be easily handled and identified by a study of their form and physical characters. No stupendous amount of study is requisite in order to successfully "read" such crystals with a view to determining the "system" to which they belong. As an illustration, let us take a piece of crystallised lime carbonate, such as occurs so frequently in the vicinity of many mineral veins. It will be observed that the substance in question usually presents to view a number of smooth shining surfaces, and it will be found that it will split or "cleave" quite easily in directions which are parallel to these surfaces or "cleavage planes," leaving an equally smooth surface to the one which has been split off. Now let us with a sharp knife, cut out of a piece of thin cardboard or thick note-paper, an angle, containing as near as possible $105^{\circ}5'$. Upon applying this angle to certain of these surfaces over a "polar edge" of the crystal, it will be found that the contact is perfect, hence from the perfect cleavage, and the angular measurement, it is safe to deduce that the mineral is calcite. Although the "rhomb" is the commonly occurring form of this

mineral, and the eye can detect no sign of "hexagonal symmetry," yet did space permit, the close relationship of the rhomb to the hexagonal pyramid could be easily demonstrated, in fact, one form is included in the other, and calcite may be said to belong to either the "hexagonal" or "rhombohedral" system, these terms being synonymous.

Some months ago in Rossland, B.C., there was on view in the window of a well-known druggist of that city, a rather handsome specimen from one of the neighboring mines. A label beneath this specimen informed those that were interested that the substance in question was "yellow calcite." A momentary glance at its crystallised form, and the lines and faces of a very distinct "octahedral" cleavage, was quite sufficient, however, to name it at once, and with certainty, as fluor-spar, or calcium fluoride, the chemical composition of which is Ca F_2 , and of course an entirely different substance to calcite (Ca C O_3). Fluor-spar is sometimes used as a flux in metallurgical operations, and is the substance used in the manufacture of hydro-fluoric acid. Apart from these uses it is of little economic value. It often occurs in the most beautiful and perfect of crystal forms and belongs to the "cubical system." Sometimes this mineral occurs as cubes, and sometimes as octahedrons, and frequently as a combination of the two forms, in the latter case the angles between the cube and octahedral faces may be measured in a similar manner to those of calcite, and the angle will be found to be $125^\circ 16'$. Sometimes all traces of the fundamental form of a crystal are lost in its combination of faces, but by some practice it will be found possible to "refer" such faces to the original form or "system" to which it belongs. Angular measurements, which are always fixed and constant for similar substances over certain planes often make it by no means difficult to assign the crystal to its place amongst the "six systems," and hence frequently to discover its name and composition.

Among some of the crystals of minerals, which sometimes occur in fairly large and well developed forms, may be mentioned. Calcite, fluor-spar, quartz (rock crystal), garnet, beryl (emerald), corundum (sapphire and ruby), tourmaline, antimonite, celestite, strontianite, blende, galena, tetratredrite, iron-pyrites, and numerous others. It would extend too far beyond the limits of this article to attempt to explain the meaning of the few technical and scientific terms which have been unavoidably used. A brief study of almost any text-book of mineralogy will soon illustrate their meaning. Full of interest and importance as is the science of crystallography, it yet remains, strange to say, a much neglected study. In the schools of a mining country, it should at least take even rank with the sister science of botany. Apart from its practical use as an aid in the determination of many minerals and their salts, there is no science better calculated to stimulate the faculties of reasoning and of observation.

PHARAOH.*

AN INCIDENT OF THE YUKON RUSH.

(By Wanderer).

HIS owner we never knew; and he came to us without divulging his name. That is how he came to be called as per title of this article, and for reasons

which will hereafter appear. It was in Skagway last winter during the thick rush. Our party formed the advance guard of a larger party, whose members were expected on an early boat. We had many goods and a large tent, which latter we erected and strove to be comfortable.

The condition of Skagway last winter is a matter of too recent history to need any amplification at the hands of the writer. Let it be sufficient to say that, in the words of Charles Kingsley, writing of a different country and a far earlier day, it was "nought but chaos and the dance of all devils." We never dared leave the tent unguarded, by night or day, for sneak-thieves, highway robbers, burglars, *et hoc genus omne*, appeared to constitute the bulk of the inhabitants.

It was a bitterly cold night, and we were just finishing supper, when the flap of the tent was suddenly parted, and a Thing inserted its head and looked wistfully at the remains of our meal, and imploringly at us. The shock the Thing gave us was considerable. This, because of its face. The rest of it was plain dog and full two and a half feet high. But that face! The lower jaw was heavy, under-shot like that of a bulldog, while the upper part of the head was a cross between Scotch collie and huskie-dog, with two pointed ears that stood up prominently like good deeds in a naughty world. Add to this that one of his eyes was brown and the other a bright blue, such as I have seen in Chinese pug-dogs, and you will admit that the Thing's appearance was rather out of the common. That one of our party who performed the duties of cook was just heaving up the iron ladle to demolish the intruder, when Timothy Thompson, C.E., the head of our advance guard, interfered. "Let the poor devil be," says he, "perhaps its hungry." Timothy, I may remark, though a first-class fellow at heart, is about as ugly as home-made sin, and we know that "a fellow-feeling makes us wondrous kind."

There was no doubt about the Thing being hungry. It devoured all the scraps we gave it, waving its great tail, but would not come further than just inside the tent. Having eaten all we could give it, it went outside. We smoked our pipes, played a rubber of whist—our table an inverted boxful of dried apples—drank a night-cap, and prepared to roll into our blankets. Just before turning in, I took a look outside. Lying there, about a yard from the flap, was the Thing. It wagged its tail when I appeared, but did not move. Across what did duty for a street was a nondescript shanty of boards, tarpaper and canvas, belonging to certain adventurous members of the half-world, wherefrom came loud and unmistakable sounds of that hilarity which is engendered by tenth-rate liquor. The place was musical with the sound of feminine voices, but everyone appeared to be under cover.

Well, we turned in and slept, perhaps for three or four hours. Then we were aroused by a hideous turmoil just outside the tent. Rushing out, an interesting sight met our gaze. In that side of the tent which covered our piled-up goods was a long knife-gash. Several cases had been hauled out already and lay on the snow. Another object lay there, too, a man whose foot had evidently caught in one of the guy-ropes, and whose head had equally evidently come in violent contact as he fell with one of the iron

*All rights reserved.

tent-pins, judging from the dark patch by his face slowly widening on the snow. He was quiet enough, but not so his coadjutor in crime, a big fellow in one of those ridiculous sulphur-colored mackinaw coats which Klondike society affected last year. He was still standing, but one leg was in the wolf-trap jaws of the Thing, one of whose paws rested on the throat of the fallen man, while a worrying sound of canine blasphemy issued from his deep chest. The upright person, for his part, was using language which no self-respecting man could even think of, and beating the dog on the head with a ponderous club.

Apparently the Thing had played sentinel in return for the meal we had given it. But obviously it was no good to hand over the two to that lamentable farce known as American justice. We disentangled the Thing from its prey, deprived said prey of its club, resuscitated the person who was stunned, and after a few hearty kicks and a dozen blows from the buckle end of a heavy strap, sent them on their way sadder and sorer men.

Further sleep that night was out of the question. When we had repaired damages, we gave the Thing some more grub, and Timothy Thompson brought out the demi-john. Then we all solemnly drank the Thing's health.

"But what's his blessed name?" asked the Doctor, a wandering medical out of a practice.

"How the hereafter should I know?" said Timothy.

"But a dog with a mug like that ought to have a pretty striking title. What shall we call him, boys?"

Then the cook spoke up. "When I was a shaver I used to go to Sunday school," he observed. In the silence of astonishment that followed this admission, he continued. "I mind we used to read about a chap called Pharaoh. The Book said he would not let the people go. I disremember what people they was, but they was ornary and no account anyhow; I reckon we might call this feller Pharaoh. He won't let the people go, you bet, judgin' from the way he froze to them two brothers of his outside." ("Brothers of his" was not exactly the expression used by the cook, but the intelligent reader will have no difficulty in understanding what he did say.)

"Bully for you, Jim," said Thompson, C.E., when the laughter and applause had ceased. "Pharaoh he shall be. I have something myself."

Pharaoh stayed with us for ten days. On the evening of the tenth day a gentleman slightly under the influence of alcohol meandered down the so-called street; barely was he opposite our tent, when the door of the abode above alluded to, across the way, flew open and a lightly clad female appeared.

"You brute," she observed, "take that." Followed by two sharp reports from her revolver, and a general tumbling out of the residents of all the tents and shacks in the vicinity. The luckless object of the aim of the fair fury (who, it appeared afterwards, was not the party she had taken him for) ran like a hunted deer. The neighbors took after him. Every man had his "shooting-iron," and, as the war correspondents say, "firing became general all along the line." In the half-light every citizen who saw a running object had a shot at it. I suppose about fifty or sixty shots were fired. Yet, for a wonder, no one was hit.

But Pharaoh, who had joined the chase with enthusiasm, did not appear. In the morning we organized a search party of three, Thompson, myself and the Doctor, and found him about two hundred

yards down the trail. A Winchester bullet had gone clean through him. He was still alive, licked our hands, growled and died, the poor victim of the bad aim of some sixty of the worst men in Skagway. Thompson kodaked him before we buried him, and when Thompson gets back, I'll ask the editor to publish Pharaoh's picture.

A B. C. MANAGING DIRECTOR ON B.C. AND THE B.C. MARKET.

(From Our London Correspondent.)

Of course we all know that B.C. has been a long while in securing recognition at the hands of the English, and indeed the European investor. Mr. W. H. Corbould, the Managing Director of the Canadian Pacific Exploration, Limited, who has recently returned from a prolonged visit to Rossland, referred to this apathy on the part of the public somewhat fully in his speech to the shareholders at the annual general meeting. Mr. Corbould, who had had extensive experience in connection with West Australian mining matters before associating himself with B.C., has complete faith in the future before the Pacific Province, but as you will see from his remarks he has been much disappointed at the slowness with which the Province has created confidence in the minds of those who control the European stock market.

"I think I have said enough to show that there is a great future in store for British Columbia, and will therefore turn my attention to matters more closely connected with this company.

"You all know what an Exploration Company is, and you understand that to go into a new country with the object of exploring the earth for wealth, there must be a certain amount of risk in the undertaking. Not only that, an exploration company is not a mining company—the object of such a company is to open up the lodes and prove if they will warrant further capital being expended on the undertaking, and if so, to bring in fresh capital to further develop and equip the property.

"Unfortunately there has not been much interest taken by people in properties that were not in a position to pay their way. We were not strong enough financially to continue the development of several properties that might have turned out well, and in consequence, they had to be abandoned. I must say I would have liked to have seen a better feeling shown last year towards British Columbian mines, but it is no use lamenting over the apathy shown towards the Province. We, under the circumstances, decided to throw up several of our options and settled down to place the Porto Rico mine on a paying basis. As you will have seen by the report the Porto-Rico mine is well equipped, with rock drills, compressor, 10-head mill and tramway from mine to mill, and the mine opened up in a satisfactory manner.

"At the commencement of the company," said Mr. Corbould, "I predicted that British Columbia was one of the coming mining districts, and I think you will agree with me, that the returns which our chairman has just given us, bear out the fact that I was not mistaken in my opinion regarding the mineral resources of that part of the empire, and from what I have seen during my recent trip there, I am confident that the mineral output will steadily increase for many years to come. Those of you who have seen a copy of 'Rossland in 1898,' issued by the Rossland Board of Trade, will doubtless have observed from the illustrations, the rapid progress that has taken place in the Kootenay district, which only a few years ago supported a small number of trappers and hunters. Large works have been erected in different localities for the treatment of ores and mine have been developed to a considerable depth and equipped with all the latest machinery. The power from some of the rivers, which for ages past, has been of no value, has now been harnessed and the electricity generated by this means, transmitted to the mines. I may mention that on the Kootenay River, the power plant there develops about 20,000 horse power, which is transmitted thirty miles to Rossland, and the owners contemplate utilizing two other falls, which will give them 60,000 available horse power. On another river a company is going to utilize the power, and transmit same through pipes in the form of compressed air to the mines. All over the country there is an abundance of fuel and water, but the erection by various companies of large power works will tend to considerably cheapen the cost of working the mines."

THE SEDERHOLM BOILER.

WE illustrate on this page the new Sederholm boiler of 2,0-horse power capacity, manufactured by Messrs. Fraser and Chalmers, of Chicago. These boilers are intended of these boilers may be summed up under the following to work under 125-lbs. pressure. The principal advantages heads:

First.—The main shell is protected by the furnace drums from the direct action of the fire. The furnace drums are made of thin metal and are therefore best adapted for taking up the direct heat from the furnace. Their seams are all away from the fire. Second.—Special facilities are afforded for collecting mud and blowing it out. The blow-offs are arranged at each end of drum. Third.—The circulation is perfection itself. It starts from the centre of each furnace drum outward towards each end, carrying all sediment to the point where it is out of harm's way. It also runs upward through the bent side tubes down on the photograph, and downward in the middle of the main boiler. This rapid circulation insures that the steaming surfaces are continuously kept free from steam bubbles. It therefore minimizes the danger from burning, and above all increases the economy of the boiler by the effectiveness of the heating surface. Fourth.—The boiler takes up unusually small floor space. Fifth.—The boiler can be built in very large units, which means simplification in piping, flue arrangements, etc. Sixth.—The boiler requires a very small amount of brick work, roughly speaking, one-half that required for any horizontal tubular or water tube boiler. In addition to the small amount, the brick work is so disposed of that it is free from strains, and since the main walls of the boiler setting are only from 5 to 6 feet high, the walls become more durable than they are with ordinary boilers. Seventh.—The boiler can be thoroughly cleaned at every part and the parts most in need of cleaning are most easily cleaned. Each furnace drum contains a man-hole of standard size, and since the drums are of sufficient diameter for a man to conveniently work in them, they can be kept perfectly free from scale, adding not only to the safety of the plant but equally as much to the economy. The main boiler has a large man-hole underneath the tubes and one above them, so that it can be kept free from scale and mud. Eighth.—Last, but not least, there is an exceptionally free sweep for the flame. This feature is important because it is only by allowing the flame freedom to develop before it is burned out that perfect combustion can be secured. This is a matter very often lost sight of, especially in the different water tube systems, where the flame is always without exception forced in amongst the narrow space between the tubes long before combustion is complete, and this naturally results in great loss of economy. This is much more apparent wherever soft coal is used for fuel. The anthracite burned the loss does not amount to so much, nor with such high-grade coals.

THE MONTH'S MINING.

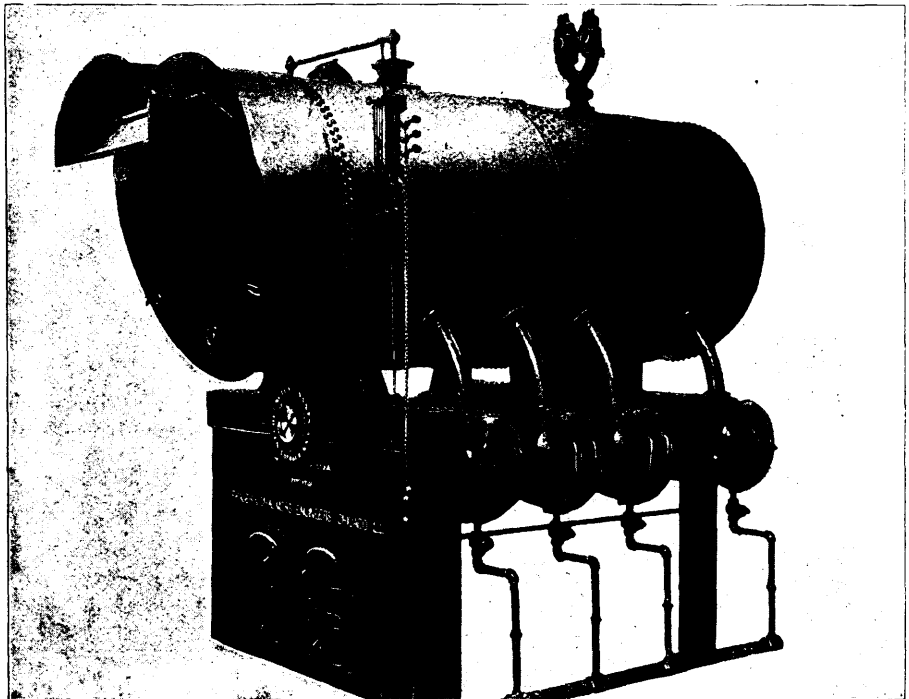
CAMP M'KINNEY.

(From a Correspondent.)

The outlook is growing very bright for an active season this year.

Work has been started on the Fontenoy, lately acquired by the Dunsmuir Syndicate of Victoria. The property carries two ledges, one being an extension of the Cariboo (free milling ore), and the other a ledge of base ore crossing the

Cariboo at right angles. As the company is a strong one, and the intention is to spare no means in developing the property vigorously, the Fontenoy will in all likelihood soon take its place among the working mines of the district. A shaft has been sunk 85 feet on the base ore vein, and when a dip of 100 feet has been reached a drift will be run to the Cariboo ledge and the latter will be worked both ways. The



necessary pumping and hoisting machinery will be in operation in a few days.

The Lemon Gold Mining Company have just received a steam hoist for the Gold Standard, which they are now developing.

A compressor plant is daily expected for the Minnehaha, meanwhile the work of cross-cutting is being pushed with a Burleigh drill. Major McGaw, the manager, intends to thoroughly develop this mine before asking for the erection of a stamp mill.

In the Granite mine, the property of the Camp McKinney Mines, Limited, a shaft is being sunk on the ledge and foundations are being laid for the prospecting stamp mill which the company intends to install at once. The ore body is very large and well defined and shows well in galena and free gold.

A little work has been done on the Radja by Messrs. Bogle and Reddin, of Rosslund, who bonded the property from the owners, Messrs. Frank and Bennett. The Radja has also been surveyed.

Considerable work is to be done on the Ecuador, which lies east of the Fontenoy, and has been acquired by a strong syndicate.

Lumber has been delivered in large quantities on the Sailor Townsite, which lies to the west of the Camp, and it is understood that a large hotel, which, by the way, is very badly needed, will be erected at once.

A townsite is also to be laid off about half a mile east of the Sailor, and altogether the indications are such as point to a summer of unprecedented activity in Camp McKinney.

BOUNDARY CREEK.

(From Our Own Correspondent.)

The past month's record is one of steady progress in several directions. Development work has been continuous on most of the better-known claims, with generally satisfactory results. In Deadwood camp work has been in progress at the 200-foot level, so that information respecting the size of the ore body at that depth and its value may shortly be looked for. A good strike, quite unexpected where made, has lately been reported from the Morrison and stock in the company has consequently advanced in price. It has been stated that a mining plant will shortly be placed on the Sunset, which is another Deadwood camp property giving promise of yet yielding ore in bulk. There is nothing new

to chronicle regarding the development—suspended for the time—of the several groups of claims in the northern end of Deadwood camp, but in passing it may be mentioned that confidence in one of them (that owned by the Boundary Creek Mining and Milling Company, of Greenwood,) has steadily increased since the London and Canada Syndicate obtained a controlling interest. This fact was evidenced lately when Mr. D. H. Holbrook succeeded in so impressing Mr. Ross Thompson and several associates with the company's good prospects that they purchased from him 100,000 shares at 10 cents per share.

The Ruby, now under bond to Mr. Alex. Dick, mining engineer, of Rossland, is the only claim in Smith's camp upon which development work is at present being done. Some nice looking iron-copper ore has lately been obtained in the prospect shaft, now down 45 feet, and it is hoped that a permanent lead will yet be encountered. It is generally believed, by those most familiar with the locality, that a body of pay ore will yet be found on the Ruby, but it may take a comparatively large expenditure of money to find it. As far back as 1894 ore was shipped from a neighbouring claim, the American Boy, and notwithstanding that the haulage charges to Marcus, Wash., were \$30 per ton, a margin of profit over mining and shipping expenses was returned to the enterprising men who at that early stage in the opening up of the Boundary Creek district had the pluck and the confidence to mine and ship ore under very great disadvantages.

Newspaper reports have lately been published to the effect that the King Solomon and other claims in Copper camp are showing up well, but the writer has not had opportunity of ascertaining for himself whether or not these are borne out by facts. There is, however, a returning confidence in Copper camp, which has hitherto seen such vicissitudes as usually attend a set-back, following an unsuccessful expenditure of money in prospecting a claim from which great things were expected. For pretty specimens of copper ore no camp in the district has yet approached the native copper and azurite and malachite of this camp. Its surface showings, too, are among the most remarkable in the district. It is to be most earnestly desired that the increasing demand for good copper properties will lead to Copper camp being given an exhaustive trial, which it has not yet had. Graham's camp, near Midway, is another instance where attractive surface showings induced great expectations which were rudely dispelled after one or two unsuccessful attempts to locate the big body of ore believed to occur in Ingraham Mountain. Fortunately, though, there are some claim-owners who retain a belief in ultimate success here, and two or three of these are pegging away on a small scale, meeting occasionally with bunches of nice ore, and persevering in the hope that their persistence will eventually meet with an adequate reward.

No information is just now available to the writer as to the state of affairs in the City of Paris group, Central camp. Last advices, several weeks' old, were to the effect that the tunnel, then in 600 feet, was being continued with the expectation that it would intersect the Lincoln and City of Paris leads. Probably success will have resulted before the time comes for next month's letter to be written, in which event the fact will be duly chronicled.

The Oro, Makel and Coruncopia, three valuable claims situate six or seven miles east of Midway, were bonded last month by Mr. Edward C. Finch, whose name is known as associated with a recent successful deal in connection with a Slocan property, the Silver Queen. The amount to be paid for the three claims is stated to be about \$40,000. They are Crown granted claims, upon which Mr. John Douglas, of Midway, and his associates, have done a lot of effective prospecting, so more will likely be heard of the group when Mr. Finch shall have carried out his plans for their extensive development.

Wellington and Greenwood camps still attract much notice. But the Winnipeg and the Golden Crown, in the former camp, have made steady progress in the direction of underground development. The annual meeting of shareholders in the company owning the latter property, was held a few days since at Greenwood, and the report of the managing-director was received with much gratification. The Snowshoe, in Greenwood camp, has again been bonded, this time for \$70,000, by Mr. J. W. Astley, of Rossland. The Brooklyn, Stenwinder, Old Ironsides and Knob Hill, also in Greenwood camp, are all actively employed in opening up underground, and the two last named especially are well maintaining the good showing made at earlier stages of their development.

In Summit camp, the Oro Denero and the B.C. are still in the lead in this camp. Both are at work, with results that are encouraging, and in the case of the B.C. very satisfactory. The ore body now being explored in the B.C. is reported to be fully sixteen feet in width where opened in one of the drifts, and its values continue good. The Jewel, in Long Lake camp, is also reported to be looking well, both in the shaft at 235 feet and in the drifts. Little, however, can just now be learned of this property.

Of course there are numerous other claims upon which more or less work is being done, but the foregoing are among the best-known properties now having attention. Before closing, an earlier omission must be rectified—the British Columbia Copper Co., Limited, of New York, last month purchased the Tenbrock fraction, which adjoins the Mother Lode claim. The sum paid was \$8,000. The company now owns the following adjoining claims, which constitute the Mother Lode group: Mother Lode, Primrose, Offspring and Tenbrock. One or two other items of interest may be added. Grading along the line of the Columbia and Western Railway is well forward between Boundary Falls and Midway, the graders being at work within half a mile of the latter place. Mr. C. A. Stoess, C.E., has been taking levels at Midway and other places, it is assumed in connection with the smelter project, he having accompanied Messrs. Dean and Moore, of the Trail smelter, when those gentlemen were in the district last month. Telephone extension is probable, the latest scheme being the establishment of communication between Trail and Camp McKinney, via Grand Forks, Greenwood and Midway. It is announced that the Greenwood Waterworks Company has disposed of its water interests in Boundary Falls for power purposes, and that the purchasers will provide electric light and power ere long. Building improvements are numerous and extensive at Greenwood, and there is a prospect of much activity shortly at Midway in a similar direction, the two local saw mills being nearly ready to start cutting and so relieve the lumber famine which through the winter has prevented progress.

PERCY VEREUS.

ROSSLAND.

(From Our Own Correspondent.)

The closing down of the smelters, reported in our last month's letter, at Northport and Trail, has been lightened by the starting up of the Northport smelter, consequent on the shipments from the Le Roi. The Trail smelter is at present still shut down as the unfortunate delay in the completion of the hoisting arrangements at the War Eagle, prevents the shipment of any ore from that mine to the smelter on the Columbia river. The Iron Mask is shipping a little ore, but it is that which is chiefly found in the ordinary development work. The management of the War Eagle state, however, that the cause of delay will be but transient.

It is understood that the starting machinery was found to be inadequate, and consequently orders had to be sent to the East for a replacement of the same by a more effective motor. Spring is setting in early and by the time this news appears, we Rosslanders sincerely hope that the snow will have vanished from the neighbourhood of the camp, though, of course, it will still be found on the hills for many weeks to come. It is expected that with the disappearance of the "beautiful" work will be begun on many properties which are at present lying idle. With the completion of another on the Le Roi property, and the shipments from both mines will be very greatly enhanced. The decrease in the shipments of ore during the months of February and March will thus be more than compensated by the increased output of the following months of the year.

Abe Lincoln.—Work is still progressing in the cross-cut to the south from the 200-foot level. It is now in about 60 feet and the ledge ought to be run into during the month of April.

Big Three.—Work is going on in the Southern Belle and Snowshoe, and also in the Mascot, the three properties of this company. On the Southern Belle the tunnel is being extended and is in a distance of 350 feet. There is also a winze being sunk which is down about 90 feet. No great strike is to be reported, but a good percentage of copper ore is found in the winze. On the Mascot, No. 2 tunnel is being worked. It is now in 350 feet and the winze in that tunnel is now working, as the hoist is ready for operation. In No. 3 tunnel three shifts are extending it forward to a distance of 750 feet. At the present point it is 540 feet. Some small stringers of ore have been encountered. There has been quite a furore in the shares of this company,

which has excited some comment. The management hopes to thoroughly justify the confidence displayed in the mine by the public, by the favourable nature of the ore ledges which are expected to be struck.

Centre Star.—The main shaft of this property is being extended; a number of extra hands have been taken on and before the beginning of June the mine will probably be a shipper.

Columbia and Kootenay.—Tunnels Nos. 5 and 6 are being driven and the upraise from No. 4 to No. 3 has been completed. It was in this upraise that the great strike was made.

Commander.—Drifting is going on in both directions from the 240-foot level. There has been no further development of the strike that was made in the middle of February.

Deer Park.—An examination of this property is being made and it is hoped—the report being favourable—that the mine will on re-opening justify the hopes entertained of it by its shareholders.

Evening Star.—A chute of ore was discovered last month, from which a quantity of pay ore was removed; enough, indeed, to justify us in saying that the mine will shortly be a shipper. The ore body, as at present known, is about 50 feet in length, and 160 feet in depth and about four feet in width, nearly all of it being of a shipping grade.

Fourteen Consolidated.—Work has been started on the Philadelphia, which is thought to be the best claim of the company's holdings.

Giant.—A deal is said to be in progress with regard to the future of this mine, the particulars of which we hope to be able to give next month.

Great Western.—Machines are to be put in at the station at the 300-foot level and the shaft continued to the 400-foot.

Green Mountain.—Work is still progressing, though nothing of importance is to be reported.

Homestake.—A drift has been started from the cross-cut at the 200-foot level. This drift will be carried in under the hill along the ledge.

Iron Colt.—This mine is still retaining its position in the public confidence, but there is nothing of moment to be recorded.

Iron Horse.—A small ledge three feet in width has been met in the north drift, carrying much copper. A large ledge—that uncovered at the Butte Fraction in the cut made for the big trestle over the Centre Star gulch, is expected to be run into at any moment.

Iron Mask.—The machinery lately placed in position, is working well. A good deal of prospecting is being done and much other work in connection with the Iron Mask-Centre Star suit, which will be commenced in the beginning of April.

Jo-Jo.—Work has been suspended upon this owing to the influx of water and the completion of the first contract for the sinking of a shaft which is now down 70 feet. As soon as the snow is gone, it is proposed to enter in upon a further contract for the extension of the shaft.

Jumbo.—The feature of the month has been a strike of iron ore at a depth of 130 feet in No. 3 tunnel. It is similar in character to the strike made on the upper levels.

Le Roi.—Shipments from the Le Roi will hereafter average 350 tons per diem. The ore bodies of the 800-foot level are being drifted upon and the work on the Black Bear shaft and tunnel is making rapid progress.

Lily May.—Some small stringers of ore have been met in the west drift, which is in about 35 feet. The east drift has been penetrated to 60 feet.

Nickle Plate.—No new developments have been recorded. The drifting at the 200-foot level is still in progress.

No. 1.—The shaft is down 250 feet and is to be continued to the 400-foot level. In the adjoining properties—the Josie and Annie—development work is in progress, especially on the raise from the 300-foot to the 100-foot level.

Silver Bell.—Nothing new is to be reported; work is still progressing.

Spitzee.—Work has been started upon this new property with the intention of sinking a perpendicular shaft 200 feet and then cross-cutting to find the ledge.

Sunset.—A strike has been reported upon this property at the point thought likely under the old discovery shaft. No verification of this has been made.

Umatilla.—The shaft is being sunk and is down about 90 feet.

Velvet.—Great reports are in from this mine. The vein, which was reported as being six feet wide, was found on further prospecting to run as much as twenty feet, which is as large a showing as any in the camp. It is thought that

the entrance of this mine into the shipping list cannot be long delayed, as the ore body is said to be nearly all of a commercial value and to run as high as \$40 per ton.

Victory-Triumph.—A vein seven feet in width has been met upon the cross-cut at the 100-foot level. This contains a pay-streak three feet wide, consisting of copper pyrites carrying good values in gold.

Virginia.—A long-delayed strike at the 500-foot level is said to be encountered. (This by mouth of rumour, the management themselves being extremely reserved.) It will be remembered that the strike at the 300-foot level was of a dubious nature, and with the permanence of the ore body at the 500-foot, the future of this mine will greatly depend.

Wallingford.—A waggon-road connecting this property with Rossland and Sophie Mountain, and opening up the many properties on that line, is being advocated. Mr. Archer, the managing-director, has, during this winter, suffered many inconveniences and the work on the mine was much delayed by the non-existence of this thoroughfare. In the meantime the brest of the tunnel in the Wallingford is looking very well.

War Eagle.—There are 275 men at work in this mine. Ore is being stoped out in all directions, and when the hoist is ready for work, the War Eagle will easily be able to fulfil its contract with the Trail smelter. The big trestle over the Centre Star gulch, which is to carry the broad-gauge line connecting this mine with Trail, is nearly completed. Before the end of March the rails should be in place.

YMIK.

(From Our Own Correspondent.)

With the mineral resources which this camp possess, it is a source of wonder why the town has not grown faster. Mining men from all parts, and particularly Americans, have all remarked upon this fact. A short time ago a newspaper writer from Spokane who visited our camp in the interest of his paper, and after one week's sojourn amongst us, during which time he visited all of the principal mines, remarked: "Why, what is the matter with the people of Ymir; I had no idea that your camp was such a rich one. Why, take Republic, where there is only one mine, they have a population of over 2,000, and Ymir only has 600, and has been longer in existence. If we had Ymir on our side of the line with the extraordinary showings which you have, we would have all the capital that we needed. Advertise," he said, "and let the people know what you have." He struck the keynote. The people of Ymir must let the outside world know what they have, then, and not till then, will the outside come with capital. Another necessary factor which we lack is the absence of public enterprises. Among our people they seem to be asleep. Outsiders will come in and gobble up all the good things. When too late Ymirites will bemoan their ill-fortune. The Ymir Miner has done more to advertise this camp on the outside, especially in England, than any other medium, but I candidly believe that its efforts are appreciated by but a very few.

Mr. Eugene Coteau, part owner in the Dumas group, who has been wintering in Vancouver, returned on the 13th inst. He, in company with his partner, Mr. Gilbert Pellant, intends to do a considerable amount of work on the above property this summer. Already it is a fair stage of development, and I predict only a short time ere it will be added to our list of shippers. Indeed, there is no doubt that Ymir will present a busy appearance this summer and already we have had a number of mining men here bonding properties. The Big Horn group lately stocked and owned by the Simcoe G. M. Co. is to be shortly opened up. The company's stock is being eagerly taken up, while there are ample funds in the treasury to carry on development operations.

With regard to other properties, I subjoin the following summary for the month: The Rio Grande group, on Porcupine Creek, is showing up well, some high-grade ore being now met with. There has been a big demand of late for Tamarac stock, as a result of the striking of the true ledge. Concentrates are now being shipped regularly from the Porto Reco and Dundee mines to the Northport smelter. Through the carelessness of leaving waste and oil around the boiler at the Dundee mine the shaft house and contents were destroyed by fire on the 13th inst. Fortunately the night shift had left the mine only half an hour previous to the fire, otherwise they would have inevitably perished. The total loss to the company is estimated at \$3,000. The new buildings, however, are being erected, so that it will not be necessary for the mill to close down, as there is sufficient ore in the bins to last till the new shaft-house is built. The temporary closing down of the Porto Reco became neces-

sary in consequence of the difficulty of getting wood cut for fuel. Seven cords of wood per day is required at the mill, and owing to the depth of the snow wood-cutters demanded \$8 per cord for cutting and delivering the wood. The management, therefore, very wisely decided to close down the mill and mine for a month. There are, however, over 1,800 tons of ore broken in the stopes that will average over \$30.00.

Mr. H. Nole has purchased the Spotted Horse mining claim adjoining the Flossie R, on which property over \$2,500 was expended by the former owners.

At the Monarch group a good strike of copper ore is reported.

The Summit claim has been purchased by Mr. W. A. Galliner, Nelson, from John Linbeade. This property has an extraordinary fine showing.

NELSON.

(From Our Own Correspondent.)

Very great quietness in mining matters is the rule all round Nelson, as the snow is still far too deep to allow of any serious work being accomplished, excepting on those few properties that are well into the ground, but it is very pleasant to chronicle the wonderful activity prevailing in both the South and East. In the latter district especially the Crow's Nest line has wonderfully stimulated claim owners, and ground that might but for that railway have lain idle for some time to come owing to the cost of transportation, has in many cases been vigorously examined and opened, with most gratifying results. Indeed there seems little room to doubt that East Kootenay will be a formidable rival to the celebrated Slocan, in the very near future.

As most mining men are aware, snow is no hindrance at all to the shipment of ore when the mine is sufficiently far developed to ship, as transportation over snow is much cheaper than by hauling in waggons but with undeveloped properties the case is of course very different, and delays work or stops it altogether.

As regards Nelson itself, there is not any work of consequence being done, excepting at the Silver King, the Athabasca, and in a less degree, at the Exchequer, but the last two are so very promising, and what is better, performing, that their permanent future value seems to be assured.

The Silver King is doing a very large amount of development work at present, and not sending every ton of ore in sight to the smelter as was done rather too freely at first; and this is a wise policy, because a smelter cannot be blown in and out as easily and economically as a cook-stove, and it is better to make one long campaign than three short ones. However, from last accounts, the mine is looking very well, and there is every hope that the smelter will soon be in full blast again. A good deal of development work is being done on the granite and adjoining claims on the river west of Nelson, but so far no shipping has been done to the best of my knowledge.

The value of the February clean up from the Athabasca, by the way, is reported at over \$8,000, which is very satisfactory. From all round the Ymir district, which is so near to Nelson as to render a few remarks upon it not out of place, very favorable reports are to hand. It is true that here and there a mill may be idle for want of water, but that is simply a temporary inconvenience which a little more of the milder weather we are now enjoying will easily remedy. The Porto Rico, Tamarac, and Dundee are all doing well, and reports of new and wonderful discoveries in the neighbourhood are by no means wanting; hence, there is no doubt of a busy spring and summer for this camp and the surrounding district.

The Boundary district is attracting great attention in Nelson, several firms having decided to sell out here and take their chances in that rapidly rising country. All accounts seem to agree that there are wonderful bodies of copper ore there, and that a large smelter will almost certainly be built. Now, while the smelter is not at all an unmixed blessing to its vicinity, yet it enables mine owners to deal with their material at a profit and in other ways greatly improves the trade. Where the smelter will be built is not yet definitely announced, but many people think Cascade City would be a very convenient point, as there is ample water and consequently possible power available.

A large sampling works has been assured for Nelson, to be situated near the water front and close to both the existing railways; and this of itself seems to indicate that the owners consider Nelson a desirable place to put up expensive machinery, as it certainly is a conveniently central point to deal with ores from a very extensive neighbourhood.

If only we can get a well organized science class established, so that mining men and others can get at least the rudiments of a sound scientific education, Nelson will certainly not be behind any other town in Kootenay, but there remains the old, old difficulty, the expense. Surely the Government will be able to help in this matter when they get settled, and so assist in building up a mineral training in this country which will prove of the utmost value, increasing every year.

SLOCAN.

(From Our Own Correspondent.)

Notwithstanding the unprecedented depression in this section of the Province, it can be said with the utmost truthfulness—having recourse to the vernacular of the regular newspaper correspondent—that the mines, one and all, never looked so well, and the prospects were never so bright and encouraging for the Slocan district as they are to-day. This is not one of the results of the attention which is now being bestowed upon us in the financial centres of Canada and the Old Country; but rather the latter is directly traceable to the former. It is common knowledge that the Slocan has been side-tracked by the representatives of capital for years, solely on account of the unwarranted prejudice which existed against silver properties; our mines receiving but scant consideration until the district had risen by sheer pluck and merit to an eminence whence recognition could not longer be withheld. The Payne, that monument of wealth to which we can always refer with justifiable pride, continues to beat even its own mammoth record in the way of shipments. Thus early in the year it has a grand total of two thousand five hundred tons to its credit and last week alone its output amounted to two hundred and seventy tons. The re-modelling of this company into a strictly Canadian concern and placing of the stock on the open market should do a great deal to stimulate investment in these parts, more especially when the prodigious profits already earned and still in process are thoroughly comprehended.

The Last Chance has not belied the anticipation which were formed of its capabilities last year. Although allowing the Payne undisputed right to the title of supremacy, it is far in advance of any other property in the silver belt and manages to ship an average of a car every day over its new aerial tramway, which latter, by the way, works to perfection in the smallest detail.

Owing to the scarcity of water and consequent stoppage of the concentrator, the Slocan Star has not figured so far this year in the list of shippers, but this must not be construed into an indication of weakness, because in actual fact the very reverse happens to be the case. Development has disclosed such large bodies of ore that those in authority do not hesitate to express the opinion that there is more in sight now than at any time during the past three years. It would be good policy therefore to watch and see these predictions verified in future shipments.

Lack of water appears to be responsible for inactivity at more mines than the Star; the Whitewater mill has had to suspend operation for a like reason and seventy men have thus been thrown temporarily out of employment. The concentrator will be thoroughly overhauled during the stoppage and a couple of new jigs added. This property, it will be observed, is making a most excellent showing, which of course is what we expect from one employing 125 men, having shipped nearly seven hundred tons since Christmas.

Probably the most important strike of the month, however has been made in the lower tunnel of the Queen Bess. This mine has long been recognized as a considerable factor in the Slocan production, but from all accounts it is in a position to very largely increase its output whenever it is deemed advisable, news which must be very gratifying to Mr. Milbourne, the managing-director, who has only just returned from a somewhat extended stay in London. The strike referred to consists of several feet of solid galena in No. 5, or lowest tunnel, which has been extended sufficiently to tap the main ore-chute. Some apprehension was felt at one time that the ore might not continue as favourable lower down as it did near the surface, but all doubts on that point are now fortunately set at rest. When we remember that the tunnel was driven some five hundred feet on the ledge without encountering anything of value, there is seen to be the more reason for congratulation now that the chute has finally been reached. It is safe to say that the reserves of the mine have been fully doubled at one bound and the management will lose no time in pushing the No. 6 to exploit it at still greater depth.

The Idaho has perforce suspended operations until the snow-slide season is over. Attempts to keep the road clear have not met with the success necessary to ensure continuous shipping and production has consequently to be curtailed in keeping with the facilities for removing the ore.

The North West Mining Syndicate are commencing to branch out a little, as was to be expected after the enviable showing made by their properties thus far, and intend evidently to embrace in their group those claims situated most advantageously for the purpose. They succeeded in acquiring the Fidelity Fraction, as previously recorded, and now the Lakeview group, consisting of two whole claims and two fractions, extending nearly to Silverton, has also been included in the company's holdings. In addition they have bought a half interest in the Broken Lock, situated east of the Bosun. Operations at the latter are continuing as formerly, the regular monthly output of a hundred tons being well maintained.

The breaking up of the roads has put an end to the season's work on Four Mile, as far as shipments are concerned. The Wakefield and Vancouver, the two principal mines, have both fallen back on development. It will be some months before the roads will permit of hauling in waggons; although it is doubtful whether either of these properties wish to avail themselves of such means of transport, raw-hiding and sleighing in the winter months being much more economical. A car of concentrates from the Comstock, the first ever produced around Slocan Lake, found its way to Trail during the month, but owing to the condition of the roads and other causes, the mine and mill have both since been closed.

HOWARD WEST, A.R.S.M.

TROUT LAKE DISTRICT.

Considerable development work is being carried on in this very promising district, particularly on the St. Elmo group of claims, where a valuable body of ore exists. A smelter test of five tons of this ore gave 113 ozs. silver, \$2.80 gold and \$17.09 lead, or a total value per ton of \$85.18. Up to the present not much development work has been done on this property, but the management are making arrangements for regular shipments of ore over the Great Northern trail.

The Beatrice is another Trout Lake property which, as d. cent trails are obtainable, will apparently become a regular shipper of ore, though at present only about 125 tons are ready for shipment.

The Silver Queen has been bonded to Mr. J. Dixon of Vancouver for \$25,000.

There seems to be a good thing on Galner Creek, assays of what were said to be average samples giving the very pleasing return of \$900 per ton.

FORT STEELE.

(From a Correspondent.)

The approach of spring is accompanied by preparations for the resumption of work on many mining properties which have lain idle during the winter, and the railway now being completed and rapid and cheap transportation being assured from this time forward, many new claims will be vigorously opened up this summer.

Manager Smith, of the Sullivan group, where development work is going on briskly with a large force of men, has returned. Shares in this company, which were quoted only recently at 15 cents, have taken a sudden rise consequent on the rich strikes in the mine already reported, and are now quoted in Spokane at a fraction over 25 cents. Mr. Smith expects to ship a large tonnage of ore this year.

At the North Star, Superintendent Curran has a force of men drifting from the 200-foot level, which is at the bottom of a large compartment shaft 215 feet from the surface. Mr. Curran reports that the appearance at the bottom and in the drift could not be better. From this property (which is claimed by some to be likely to prove the greatest silver-lead mine in the world), some thousands of tons of ore have already been shipped, and during this year as much as ten or twelve thousand tons are intended to be taken out, while at the same time the property will be steadily developed.

During last week seven carloads of ore left Moyie City for Trail smelter, six of them being from the St. Eugene and one from the Lake Shore. This will be followed by four or five additional carloads from these two properties next week, and thenceforward regular shipments in increasing quantities may be expected. Both mines are looking well.

A good deal of work is now being done on Tracy Creek. The Estella is working on an up-raise now seventy feet in, with every indication of an approaching ore body. The energy and determination with which work on this mine has

been carried on, often under discouraging circumstances, is admirable.

The Pyramid-Kootenay group of copper properties, of which great things have long been predicted, are undergoing a thorough system of prospecting. Before Captain Petty, the company's manager, left for England, contracts were let for several thousand feet of tunnelling, and during the winter this work has been carried forward with a large force of men. The Pyramid camp is situated in the heart of the Purcell Range of mountains at the head of Pyramid Creek, northward from the valley of St. Mary's River. There has been a large number of claims taken up, all showing copper and gold, but apparently not of very high grade.

The recent developments of large bodies of rich ore in the district surrounding Windermere, which lies seventy-five miles north of Fort Steele, are still attracting a great deal of attention here, and the prospect of the early construction of a railway up the Kootenay and Columbia Valley from this point, adds greatly to the interest being taken in the upper district. But these mines will not need to wait for a railway, for next month boats will be plying on the Columbia River from Windermere to Golden, where connection is made with the Canadian Pacific Railway. The fleet of river boats will be added to this year by a steamer and three ore barges, now being built by Mr. H. E. Foster, of Klondike, who is personally interested in several of the Windermere properties. Mr. R. F. Kimpton left last week for the Coast, to complete the sale under bond of two or three of the Foby Creek mines.

Preparations for resuming the operations of the several hydraulic companies working the gold-bearing gravels of Wild Horse Creek are going on, and in a few weeks the monitors will again be throwing water.

THE SILVER-LEAD QUESTION.

A TRULY ASTONISHING THEORY.

TO THE EDITOR:—The silver-lead question is again coming to the front and is being interestingly discussed from many standpoints. That we Canadians can expect relief from the voluntary action of our neighbours seems improbable in face of the upshot of the late commission. Retaliatory measures are mooted. This is but natural, as the average man in whatsoever position of life, be he legislator or miner, wants to even up circumstances betwixt himself and the aggressor. But the policy of the procedure is doubtful. Supposing that a duty is levied on the export of lead. Every manufacturer in Canada in whose products lead enters in ever so slight a degree will instantly advance the price of his manufactures. This might be very beneficial to him and possibly to his employees, but would the general public be benefited by the increased charge on goods of common consumption. It seems to be a policy of "cutting off one's nose to spite one's face." The question of lead ores is a question of treatment. If the ores can be transported cheaply half the battle is won.

As, of course, is well known, there is hardly sufficient market in Canada for our product of lead. An enquiry was to be made as to the market obtainable in the Orient. This does not seem to have been carried out very satisfactorily. But in the present condition of affairs Canada as an integral part of the empire should make her voice heard when it is upraised in the behalf of new markets. Doubtless the Imperial statesmen concerned will lend as willing an ear now to our wants as when Sir Wilfrid Laurier visited England during the Jubilee. And in the present conjuncture of affairs in China it seems that our wishes for a share of the trade could easily be consummated. Not only is there in China and Japan a large demand for silver. John Chinaman is a pronounced silverite. Looking at the subject from his point of view he sees that to-day, as twenty-five years ago, the same weight of silver, allowing for slight market fluctuations, will buy the same weight of rice. That is his staple. He knows that rice is produced in enormously large quantities to feed the 500,000,000 people in Japan, China, Siam, Burma and Hindustan, who make it their daily food. That quantity suffers little fluctuation. When it does there is a famine. Measuring silver by this standard, he thinks it as valuable as ever. Put that silver on his market in a proper shape and he will take it at a better price than the American market, which has shut down its mints and does not go in for pure silver manufactures can pay. A relatively small amount of bullion placed on the home market will bear silver, whereas in the marts of the Orient its presence would hardly be recognized. Not that Canada itself could not help considerably. Suppose we establish a mint and prevent the issuance of

notes under the value of \$5 the banks might squeal a little, but our Slocan mine-owners would be jubilant.

This should outline a better policy than that of spiting our neighbours. We are not defenders of Brother Jonathan through thick and through thin. We are not defending him at all. But even where he is wrong it does not prove us right by lacerating his tender commercial feelings and at the same time not improving our own. The spirit of retaliation is the spirit of revenge; it is certainly not that of amity. If one wants a quarrel he is a wise man if he seeks it at a distance. But we are all beautifully agreed that a quarrel is the thing that we don't want and the consummation devoutly to be wished is that the lion and the lamb, or rather, the lion and the eagle, should lie down in peace together.

But in this general millenium it is only right that the railways should assist. Now, of course, the C.P.R. ought to cut rates down to the very lowest point. The plea of a certainty is that the lines into the Kootenays were very expensive to build. At set-off is the fact that they had a royal bounty in assisting in their construction. If the high-muck-a-mucks of the only transcontinental line will do this, and they are under no compulsion, the Government should exercise their right and interfere. Should! But will they? The more practical conclusion is to allow of competitive lines being built. This will reduce rates to reason. There is the cry that this line of policy is not patriotic. But is this so? If our neighbours wish to benefit us by building lines into our country and thereby making profits themselves why should we endeavour to stop them? Besides it is done in the east and the Toronto or Montreal man is highly patriotic. Moreover, it is not even retaliatory to prevent these lines being constructed. As the people of Maine did not object to the C.P.R. building into their state or the inhabitants of the Sound cities cry out on the same company running into Seattle why should the British Columbian, against the spirit of fair-play, object to the presence of a foreign railway in their territories? But are the people of this Province really denunciatory or is it not rather the interested utterances of the railroad magnates of this country which are making the bother?

If the lead imposition is allowed and the railway stopped from entering British Columbian soil from the other side all ore will have to go to the smelters on this side at whatever charge the existing railways or those now under construction choose to fix for freight. If the smelters and the railways were separate concerns there would be some opportunity for the miner making a fair profit out of his mine. Even then a non-competitive railway can put on any rate they wish short of killing the traffic. If there are competitive smelters the rates for reduction will be within reason. But if the competitive smelters are on the other side of the line and the way is barred by an export duty ore will be compelled into the smelter provided by a beneficent railway monopoly. This monopoly owning the transportation with no rivals, owning the smelters with no competition, will soon own the mines. The people of the Kootenays will then resemble the deer on the Duke of Buccleuch's estates: they will be highly preserved.

Rossland.

A. W. D.

[We would be greatly obliged if our correspondent would explain the principle on which British Columbia is to get a higher price in the Orient for her silver than is paid to American producers? It would also be most interesting to learn why it is that if silver could be put "in proper shape" (whatever that may mean) on the Chinese market at an advanced price, shrewd Americans instead of shutting down their mines all over the country, have never discovered the fact and taken advantage of it.—ED.]

A VACATION VISIT TO THE ROYAL SCHOOL OF MINES, FREIBERG, GERMANY.

TO THE EDITOR:—Some years ago the writer spent a portion of his summer vacation at Freiberg and was allowed to carry on a series of investigations in the laboratory, as well as to visit some of the important mines and metallurgical works in the vicinity.

The special object of the Freiberg School of Mines is to educate young men in mining, as well as to prepare them for such positions as superintendent of mines and metallurgical works, and as mineralogists, assayers and the like. There are extensive cabinets of ores and minerals, as well as fossils and models of all kinds of mining machinery. There are also collections of all kinds of metallurgical products, and minerals in all stages from the rough ore as it leaves the mine to the finished product. There is also a cabinet of

instruments used in surveying mines and in carrying on the actual work of mining. There are also sections and models of all kinds of mineral deposits, and geological formations so constructed as to be of great value for teaching purposes. Besides the regular lectures and training in laboratory work, there is actual experience in mines and works. Excursions are made to mining centres, and a certain number of the students are sent with the miners to live for a certain number of days just as they do. They are allowed to do the actual mining, as well as sorting the ore and milling the same. At the school there are lectures on the following subjects, viz.: Plain and spherical trigonometry, geometry and surveying, the structure of mining machinery, instruction in mechanical drawing, metallurgical technology, inorganic and organic chemistry, analytical chemistry, mining processes, blow-pipe analysis, mineralogy, geology, crystallography and mining laws.

The Freiberg mines are sometimes spoken of as the silver mines of Saxony, but they are lead mines, the ore containing lead, silver, gold and arsenic. None of the ore contains more than one-quarter of one per cent. of silver, and yet it pays to work it. Silver to the amount of about two million dollars per annum is abstracted from the galena of that district.

R.

A MINING DEAL AT ALBERNI.

TO THE EDITOR:—About two years ago my associates located some properties in the Alberni district. I am convinced that this property, on which the surface showing is most promising, will pay from the grass roots without going to practically any outside expense. These properties were transferred to a company in Vancouver, known as the Ambrozone in exchange for non-assessable shares only. This company, furthermore, agreed to put no shares on the market until the dividend earning capabilities of the properties had been proved. I shall be very grateful to know whether this company have disposed of shares in the face of this agreement; for recently in glancing through a London mining paper I came across the company's shares quoted therein at par; and no work has been done on the properties, except by the original owners, who had exposed a fine body of ore previous to the transfer. But before the expiration of the time for performing last year's assessment work on these claims, Mr. F. S. Taggart wrote to the Government Surveyor to get the properties surveyed. The surveyor, I believe, replied asking this gentleman to deposit the money to cover his charges with a Gold Commissioner at Alberni. A few days afterwards the surveyor received a telegram stating that the amount would be remitted as soon as the work was completed and at the same time I was asked to draw on my private account. The money has not yet been paid into the Gold Commissioner's office and is now more than six months overdue. It is therefore needless to state that the assessment work has not been recorded by the company, and yet their shares are quoted in London. The question is, can they legally hold the claim as the work was done on the strength of the telegram. I shall be very grateful to anyone who can enlighten me on this subject, and also as to what steps it would be advisable to take under the circumstances.

T. H. KNIGHT PAYNE.

THE PELATAN-CLERICI PROCESS AT ROSSLAND.

TO THE EDITOR:—In reference to an article written by Mr. A. A. Watson, in your last issue, I have to say that Mr. Watson has written the same entirely without this company's sanction, and we are not responsible for any of the statements therein made. As this company is the sole owner of the patent rights of the Pelatan-Clerici system of gold extraction in British Columbia and in Ontario, it might be well to point out in answer to Mr. Watson's remarks as to "whether the copper gold ores of the Kootenay are adapted to the process, and whether ore containing copper causes loss of gold ore to destruction of cyanide," that copper present in the ore as a sulphide is not prejudicial to the process, as although a slight cyanide, the time of contact with the cyanide is so short that it exerts no material destructive influence on it as in the ordinary cyanide method by percolation, where the cyanide is in contact with the ore from seventy-two to ninety hours; but where copper is present as an oxide or soluble salt, it is objectionable as it is well cyanicidal, for when being dissolved it is then deposited by an electric current and so impoverishes the bullion.

LIONEL H. WEBBER.

Manager British Columbia Bullion Extracting Co., Ltd.

SHIPPING MINES.

THE COAST.

We are indebted to the general manager of the Fairfield Exploration Syndicate, Limited, for the following report of the company's operation at the Dorotha Morton mine during the month of February: The battery (5 stamps) ran 8 days 9 hours; the battery (109 stamps) ran 11 days 1 hour; crushed, 737 tons; treated, 898 tons by cyanide; assay value per ton, \$12.43 gold; assay value per ton \$1.02 silver; bullion received, 1,316 ozs.; value of bullion, \$7,936; cyanide consumed, 2.36 per ton treated.

NELSON.

We are indebted to the General Manager of the Hall Mines, Limited, for the following returns of this company's smelting operations for the four weeks ending 6th March, 1898: 2,458 tons of ore were smelted, containing (approximately): 54 tons copper; 36,890 ozs. silver.

ROSSLAND.

The ore shipments from the Rossland camp are increasing, but the War Eagle has not yet commenced shipping and may not do so for some weeks. The shipments for the four weeks ending March 18th were as follows:

Le Roi	5,016
Iron Mask	162
War Eagle	54
Total	5,232

SLOCAN.

The following ore shipments were made from Slocan mines during the four weeks ending March 24th:

	Tons.
Payne	1,160½
Last Chance	560
Ivanhoe	20
Reco	40
Treasure Vault	20
Total	1,800½

THREE FORKS.

	Tons.
Queen Bess	540
Monitor	42
Total	582

WHITEWATER.

	Tons.
Whitewater	168
Jackson	153
Total	321

SLOCAN LAKE.

January 1st to March 25th.	Tons.
From Bosun Landing—	
Bosun	260
From New Denver—	
Marion	20
From Silverton—	
Comstock	20
Comstock, concentrates	100
Emily Edith	40
Fidelity	3
Vancouver	300
Wakefield	580
Total	1,043

During the month of February the total clearances from Kaslo, exclusive of shipments made through Nakusp, which was then a sub-port of Nelson, were:

Gross lbs. ore	4,195,500
Pounds lead	1,729,400
Ounces silver	193,009
Value	\$143,968

THE METAL MARKET—MARCH.

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

A general activity and expansion of business has been noticeable during the month, and on this account money has been in unusually great demand. Wages are advancing and there is a general air of prosperity on the market.

SILVER.

In the beginning of the month the silver market was steady, the demands being normal. Later the prices weakened

owing to a limited demand from India, but was again strengthened by an order from Paris for 20,000 kgs. Prices during the month have ranged between 59¾ and 59½, our latest quotation by wire (March 27th) being 59½ and 59½.

COPPER.

The copper market was comparatively quiet during the first week of March, though a somewhat larger business was done. Both in America and abroad the consumption increases enormously and producers are ordered to their full capacity for some time to come. Brass manufacturers report the volume of business as unprecedented. The total production of fine copper in February was about 27,300 tons. Prices have ranged between 18 and 17½ cents for lake copper, our latest quotations being 17½ and 17 cents.

LEAD.

Prices were poor and business dull in the early part of the month, New York being quoted at \$4.25 and St. Louis lead at \$4.05. Buyers were few and seemed to want lower prices. The following week the market strengthened greatly owing to a belief that the supply was limited. An increase of activity was apparent throughout the month, the prices rising to \$4.45 for New York and \$4.27½ for St. Louis lead. Our latest reports give \$4.45 and \$4.40.

SPELTER.

Spelter has been very dull throughout the month owing to a decline on the foreign market. Consumers seem to have been liberally supplied and consequently sellers have been offering at lower figures than usual. During the month prices have fallen from 6.25c to 6.15c, New York, and from 6c to 5.90c, rising later to 6.35 and 6.45, our latest quotations.

PLATINUM.

The demand for platinum continues active and prices are high, \$15.50 per ounce being now quoted in New York. Quicksilver is steady at \$42 per flask.

COAL SHIPMENTS—FEBRUARY.

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

Date.	Vessel.	Destination.	Tons.
3—	SS. Titania	San Francisco	5,069
8—	Bk. Haydn Brown	Kahului	1,109
9—	SS. Siam	San Diego	4,312
19—	Str. Sea Lion	Port Townsend	50
11—	SS. San Mateo	Port Los Angeles	4,382
16—	SS. Titania	San Francisco	5,069
18—	SS. Wyfield	San Francisco	4,651
27—	SS. San Mateo	Port Los Angeles	4,407

Total	29,049
Shipments for January	33,185

Date.	Vessel.	Destination.	Tons.
1—	SS. Titania	Port Los Angeles	5,104
2—	SS. Siam	San Francisco	4,374
5—	SS. Amur	Alaska	220
11—	SS. Wyfield	San Francisco	4,684
14—	SS. San Mateo	Port Los Angeles	4,307
16—	SS. Siam	San Francisco	4,253
18—	SS. Mineola	San Francisco	3,285
19—	SS. Titania	San Francisco	5,150

Total	31,377
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Date.	Vessel.	Destination.	Tons.
2—	Str. New England	North	70
5—	SS. Pioneer	Port Townsend	50
8—	SS. Wellington	San Francisco	2,500
14—	Sh. Richard III	Mary Island	500
15—	SS. Willamette	San Francisco	2,850
17—	SS. Al-Ki	Seattle	300
18—	Str. New England	North	35
20—	Sh. Will Macey	San Francisco	3,400
20—	SS. Wellington	San Francisco	2,500
28—	Sh. America	San Francisco	2,975

Total	15,180
Shipments for January	11,420

Date.	Vessel.	Destination.	Tons.
4—	SS. Tartar	Tacoma	800
4—	SS. Dirigo	Victoria	440
4—	SS. Aorangi	Vancouver	1,600

4—Str. Czar.....	Mary Island	69
18—SS. Ragnald.....	Vladivostock	500
18—SS. Dirigo.....	Port Townsend	470
27—SS. Bristol.....	San Francisco	2,200
27—Sh. Glory of the Seas		3,318

Total..... 9,397
 Shipments for January..... 5,172

We are indebted to the Collector of Customs at Comox for the following returns of coal shipments from Union for the month ending March 20th :

Date.	Vessel.	Destination.	Tons.
21—	Sh. Glory of the Seas.....	San Francisco	3,318
25—	SS. Mananense.....	Manila	580
27—	Sh. Santa Clara.....	San Francisco	2,207
28—	SS. Sea Lion.....	Port Townsend	49
28—	Sh. Indiana.....	San Francisco	2,135
28—	SS. Miowera.....	Australia	1,224
4—	St. tug Czar.....	Mary Island	40
4—	Barge Shirley.....	Skagway	1,502
11—	Barge Colorado.....	Juncau	1,730
11—	St. tug Pilot.....	Mary Island	85

Total..... 12,885

STOCK MARKET—MARCH.

THE local stock market has been fairly active during this month and the demand for Boundary Creek securities has greatly increased. Old Ironsides have advanced from \$1.10 to \$1.15; Knob Hill from 90 cents to \$1; Brandon and Golden Crown, from 25 to 33 cents; Winnipeg, from 25 to 29 cents; Rathmillen, from 3 to 7 cents; Camp McKinney Development Company, from 16 to 22 cents. Several new Camp McKinney stocks have recently been put on the market and have sold well in Spokane, in Camp McKinney and in Greenwood. O'Shea is selling at 1½ to 2 cents; Mammoth, 1½ to 2 cents; Waterloo, No. 2, at 1½ to 2 cents; Beaconsfield, 1 cent; Shannon and Dolphin, 3 to 3½ cents; Fontenoy, 18 to 20 cents; Waterloo 12½ to 13 cents.

In Rossland Deer Park shares have fallen since our last report from 12 to 8 cents; Monte Christo, from 16 to 12 cents; whilst St. Elmo has advanced from 6 to 9 cents; Evening Star has been active at 10½ to 11 cents. But speaking generally Rossland stocks have been quieter than usual.

Among Slocan stocks the greatest activity has been in Noble Five, at 34 cents; Dardanelles, at 11 cents; Rambler, at 36 cents; Wonderful, 5½ cents. Payne has been selling readily in Toronto and Montreal at \$3.30 and has advanced to \$4.

In Nelson stocks pooled, Tamarac advanced from 10 to 16 cents; Dundee has been selling from 33 to 35 cents; Athabasca, from 49 to 52 cents.

Of Coast mining shares Van Anda has been the best seller, at from ¼ to 4½ cents, in consequence of the announcement of the company's immediate intention to erect a smelter. A few sales of Victoria Texada shares are also reported, the

demand being due to rumours that negotiations are being made by the company to dispose of the property on a working bond.

THE ROSSLAND STOCK MARKET.

Special report and quotations by Messrs. Dickinson & Orde.

DURING the past month the stock market in Rossland has been exceedingly brisk and much money has been invested in mining ventures. The phenomenal rise of the month has been Rathmillen, which quoted at about 2c at the latter end of February has risen to 8c, at which figure it was fairly firm on the 20th March. A report of a rich strike on the property, together with the fact that the management had netted through the sale of Treasury stock a considerable sum for development work have caused the sudden rise. Novelty has also enjoyed a considerable share of the public favour. This was caused by the sale of the control of the property to the Montreal Gold Fields on a basis of 3c per share. Extremely favourable reports also received from the Velvet have contributed to the market value of the Victory-Triumph stock on the same mountain not very far distant. Deer Park has suffered a slump owing to the low smelter returns obtained from the trial shipment to the smelter. Manager Hastings of the War Eagle has, however, experted the property and it is thought likely that the result will be satisfactory. Winnipeg and Brandon and Golden Crown, in the Boundary country, are very well spoken of. The management on the latter mine intend installing a compressor. This will be at work within a few weeks. From the Slocan good news is heard of the Payne and the Noble Five, both of which mines will probably see a further advance in their stock.

Abe Lincoln.....	\$ 11	Athabasca.....	\$ 52
Commander.....	11	Brandon & G'n Cr'n.....	31
Deer Park.....	8	Cariboo (C. McKinn'ry).....	1 65
Eureka Con.....	10	Cariboo Hydraulic.....	1 20
Gertrude.....	11	Cayoosh Creek Mines.....	60
Giant.....	5	Dundee.....	36
Gopher.....	5	Dardanelles.....	13
Grand Prize.....	3	Goodenough.....	11
Iron Colt.....	20	Knob Hill.....	97
Iron Horse.....	18	London Hill.....	15
Jumbo.....	39	Nelson Poorman.....	27
Le Roi.....	8 00	Old Ironsides.....	1 15
Lily May.....	20	Reco.....	90
Monte Christo.....	14	Salmo Con.....	20
Mugwump.....	5	Smuggler.....	8
Novelty.....	5	Slocan Star.....	1 15
Poorman.....	13	Sable Creek.....	5
Rossland Homestake.....	6	Tamarac (pooled).....	16
Rathmillen.....	8	Tinhorn.....	9
Silver Bell.....	5	Two Friends.....	9
St. Elmo.....	8	Van Anda.....	5
Victory Triumph.....	11	Victoria Texada.....	10
Virginia.....	53	Waterloo.....	15
War Eagle.....	3 50	Winnipeg.....	28
White Bear.....	6		

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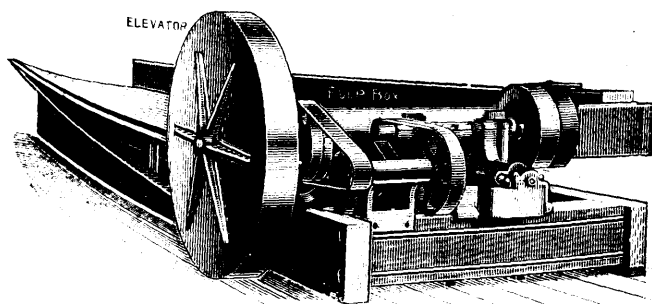
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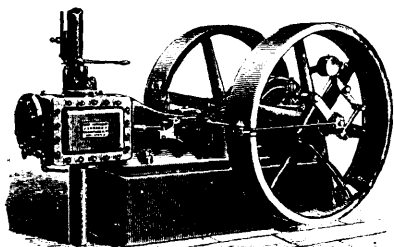
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Mining Stocks.

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

Company.	Capital.	Par Value.	Price.
TRAIL CREEK.			
Alberta.....	\$1,000,000	\$1	\$ 4½
Big Three.....	3,500,000	1	30
Bruce.....	1,000,000	1	10
Butte.....	1,000,000	1	02
Caledonia Con.....	1,000,000	1	5½
California.....	2,500,000	1	15
Camp Bird.....	1,000,000	1	05
Celtic Queen.....	750,000	1	03
Centre Star.....	3,800,000	1	7
Commander.....	500,000	1	12
Deer Park.....	1,000,000	1	8
Enterprise.....	1,000,000	1	20
Evening Star.....	1,000,000	1	11½
Georgia.....	1,000,000	1	02
Gertrude.....	500,000	1	11
Golden Drip.....	500,000	1	15
Gopher.....	1,000,000	1	04
Hattie Brown.....	1,000,000	1	03
High Ore.....	500,000	1	05
Homestake.....	1,000,000	1	6
Imperial.....	1,000,000	1	10
Iron Horse.....	1,000,000	1	18
Iron Mask.....	500,000	1	83
I.K.L.....	1,000,000	5	10
Iron Colt.....	1,000,000	1	20
Jumbo.....	500,000	1	40
Le Roi.....	£1,000,000	£5	£6
Lilly May.....	\$1,000,000	1	\$0 20
Mabel.....	1,000,000	1	15
Mayflower.....	1,000,000	1	10
Monita.....	750,000	1	19
Monte Cristo.....	2,500,000	1	12
Morning Star.....	1,000,000	1	08
Nest Egg-Firefly.....	1,000,000	1	05
Northern Belle.....	1,000,000	1	4½
Novelty.....	1,000,000	1	5½
Palo Alto.....	1,000,000	1	05
Phoenix.....	500,000	1	13
Poorman.....	500,000	1	14
R. E. Lee.....	2,000,000	1	5
Red Mountain View.....	1,000,000	1	3
Rosland, Red Mountain.....	1,000,000	1	13
St. Elmo.....	1,000,000	1	09
St. Paul.....	1,000,000	1	12½
Silverine.....	500,000	1	6
Silver Bell Con.....	500,000	1	6
Victory Triumph.....	1,000,000	1	25
Virginia.....	1,000,000	1	10
War Eagle Consolidated.....	2,000,000	1	53
West Le Roi.....	500,000	1	28
White Bear.....	2,000,000	1	4½
AINSWORTH, NELSON AND SLOCAN.			
American Boy.....	1,000,000	1	6
Arlington.....	1,000,000	1	6½
Argo.....	100,000	0 10	10
Athabasca.....	1,000,000	1	50
Black Hills.....	100,000	0 10	10
Buffalo of Slocan.....	150,000	0 25	—
Canadian M. M. and S. Co.....	2,000,000	1	07½
Channe.....	250,000	0 25	06
Cumberland.....	500,000	10	—
Dundee.....	1,000,000	1	35
Dardanelles.....	1,000,000	1	12
Dellie.....	700,000	1	12
Eldon.....	1,000,000	1	05
Ellen.....	1,000,000	1	07½
Elkhorn.....	1,000,000	1	10
Exchequer.....	1,000,000	1	13
Fern Gold.....	200,000	0 25	41
Goodenough.....	800,000	1	11
Gibson.....	650,000	1	17½
Grey Eagle.....	750,000	1	—
Hall Mines.....	£300,000	£1	—
Lerwick.....	\$1,500,000	\$1	10
London.....	150,000	0 25	25
Minnesota.....	1,000,000	1	—
Nelson-Poorman.....	250,000	0 25	25
Northern Light.....	250,000	1	16½
Noble Five Con.....	1,200,000	1	34
Ottawa and Ivanhoe.....	1,000,000	1	12½
Payne.....	2,500,000	2 50	4 00
Rambler Con.....	1,000,000	1	42
Reco.....	1,000,000	1	1 00
Slocan-Reciprocity.....	1,000,000	1	06
Slocan Star.....	500,000	1	50
Santa Marie.....	1,000,000	\$1	05
Silver Band.....	250,000	0 25	12½
Slocan Queen.....	1,000,000	1	10
Star.....	1,000,000	1	07
St. Keverne.....	1,000,000	1	03½
Sunshine.....	500,000	10	—
Tamarac.....	1,000,000	1	25
Two Friends.....	240,000	1	11
Washington.....	1,000,000	1	30
Wonderful.....	1,000,000	1	06
LARDEAU.			
Lardeau Goldsmith.....	200,000	1	04
Consolidated Sable Creek Mining Co.....	1,500,000	1	10
TEXADA ISLAND.			
Gold Bar.....	100,000	10	10
Raven.....	1,000,000	1	10
Texada Proprietary.....	250,000	0 25	25

Texada Kirk Lake.....	600,000	1	1 00
Treasury Mines.....	250,000	0 25	25
Van And.....	5,000,000	1	04½
Victoria-Texada.....	150,000	0 25	10
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
Quadra.....	500,000	1	05
CARIBOO.			
Cariboo Gold Fields Ld.....	£100,000	—	—
Cariboo Hydraulic Consolidated.....	\$5,000,000	1	85
Cariboo M. & D. Co.....	300,000	1	25
Golden River Quesnelle.....	£350,000	£1	1 40
Horsefly Hydraulic.....	\$200,000	—	—
Horsefly Gold Mining Co.....	1,000,000	\$10	1 50
Victoria Hydraulic.....	300,000	1	85
LILLOOET DISTRICT.			
Alpha Bell.....	500,000	1	—
Cayoosh Creek Mines.....	500,000	1	—
Excelsior.....	500,000	1	—
Golden Cache.....	500,000	1	04½
Lillooet Gold Reefs.....	200,000	25	—
FAIRVIEW CAMP.			
Smugler.....	1,000,000	1	5
Tin Horn.....	200,000	0 25	13
Winchester.....	250,000	0 25	13
BOUNDARY.			
Brandon and Golden Crown.....	1,500,000	1	83
Knob Hill.....	1,500,000	1	1 00
Old Ironsides.....	1,000,000	1	1 15
Winnipeg.....	1,000,000	1	25
CAMP MCKINNEY.			
Camp McKinney Development Co.....	1,000,000	1	21
Cariboo.....	1,250,000	1	1 70
Minnehaha.....	1,000,000	1	20
Waterloo.....	1,000,000	1	15
Pontenoy.....	1,000,000	1	02
O'Shea.....	1,000,000	10	02
Waterloo No. 2.....	1,000,000	10	02
Mammoth.....	1,000,000	10	04
Little Cariboo.....	1,000,000	1	03
Shannon.....	1,000,000	1	—
REVELSTOCK.			
Carnes Creek Consolidated.....	1,000,000	1	12
VERNON DIVISION.			
Hidden Treasure.....	100,000	10	10 00
CROW'S NEST PASS.			
Crow's Nest Pass Coal Co.....	1,500,000	25	52 00

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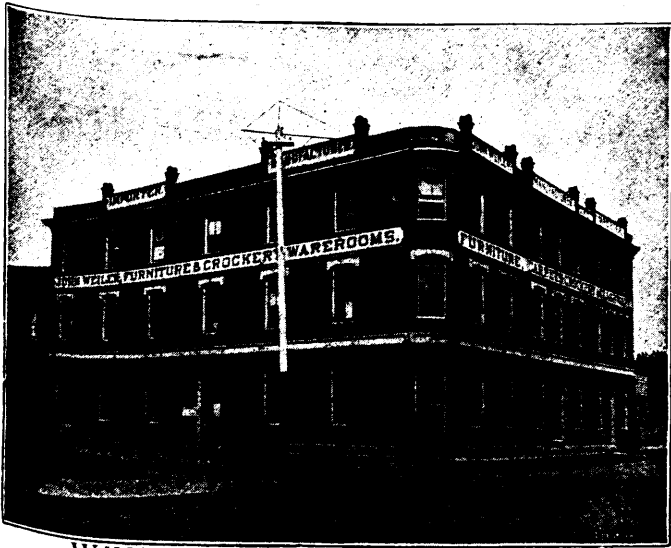
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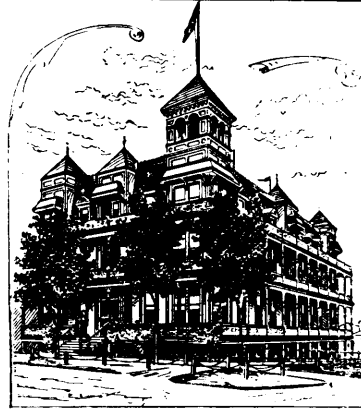
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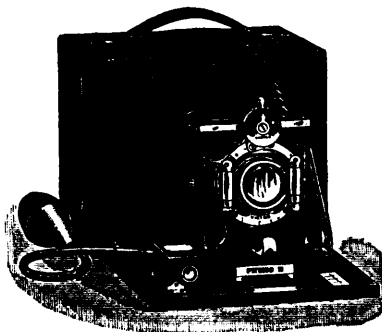
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FOR PLUMPER PASS—Wednesdays and Fridays at 7 o'clock.

FOR MORESBY AND PENDER ISLANDS—Fridays at 7 o'clock.

LEAVE NEW WESTMINSTER—For Victoria Monday at 13:15 o'clock. Thursday and Saturday at 7 o'clock.

FOR PLUMPER PASS—Saturday at 7 o'clock.

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

FRASER RIVER ROUTE.

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

NORTHERN ROUTE.

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

KLONDIKE ROUTE.

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

BARCLAY SOUND ROUTE.

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

G. A. CARLETON,
General Agent.

JOHN IRVING,
Manager.