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THE MONTH.

It is the custom of the Provincial Mineralogist to each year prepare for the Annual Report of the Minister of Mines for British Columbia a table showing the comparative mineral production of this and other Provinces of the Dominion. The form in which this table is published exhibits in a striking manner the proportion of the total production of the principal metals, and of coal and coke, respectively, of the Yukon, of British Columbia, and of all the remaining parts of the Dominion combined. In this table it is made clear that the production of gold, silver, copper and lead in this Province is larger year by year than that of all parts of the Dominion east of the Rocky Mountains. In iron and in nickel the advantage is very decidedly against this Province, but, though coal and coke are also still much in favour of the Eastern Provinces, British Columbia is gradually lessening the disproportion in output of these latter products. We are not yet in possession of the necessary particulars to admit of our making a comparison in detail—these will in due course be published by the Provincial Department of Mines—but we are sufficiently well informed as to last year's mineral production in this Province to allow of our presenting the approximate percentages that appear below. The Summary of the Mineral Production of Canada in 1903, prepared (subject to revision) by the Section of Mines of the Geological Survey Department, places the total

value of the metallic minerals at \$33,707,403, of non-metallic minerals (including coal and coke, \$17,621,671) at \$29,219,107, and the estimated value of mineral products not returned at \$300,000, making a grand total of \$63,226,510. The item of \$300,000 is left out of account in making the calculations that give the following results: British Columbia produced in metallic minerals 36 per cent. of the Dominion total; in coal and coke 27 per cent., and in all non-metallic minerals (including coal and coke) 18 per cent. Further, if the mineral yield of the Yukon and British Columbia be taken as together representing the production of what may be designated the Pacific slope portion of the Dominion and be compared with that of the Canadian territory east of the Rocky Mountains, it will be found that the former produced 75 per cent. of the year's total metallic product or 47 per cent. of the gross mineral product—metallic and non-metallic combined. We commend these figures to the attention and careful consideration of British Columbia members of the Dominion parliament in the hope that they will find them of service when urging the Right Honourable the Prime Minister to accede to the request preferred by the Provincial Mining Association of British Columbia that a Minister of Mines be appointed to the Cabinet and that such minister be a representative from the Pacific Coast.

The Annual Report for 1902 of the Section of Mines of the Geological Survey of Canada came to hand last month. There is much interesting information in this report, which deals fully with the mineral industries of the Dominion. It is unfortunate, though, that so long a delay has taken place before this revised and detailed review has been made available to the public, which now has before it the summary statement for the following year (1903). The report appears to have been completed by the end of October last, yet although the information it contained was then ten months old, a further delay of four months took place before the volume was printed and mailed. At the recent Convention of the Provincial Mining Association the Provincial Bureau of Mines was much blamed for delay in getting out its report for 1902, which was printed and submitted to the Legislature before the end of May last. That was late enough in all conscience, but it was nine months ahead of the Dominion revised report. We are not suggesting that the Provincial Bureau of Mines deserves especial praise for having been in point of time so far ahead of the Dominion Section of Mines, but are doing the former the bare justice of directing attention to the fact that other official publications of a like nature are much longer in being placed at the

disposal of the public. We note that the Mining Engineer to the Geological Survey suggests that a more prompt response on the part of all applied to for the requisite information would help towards an earlier publication of the report. In a similar connection it may be mentioned that the Provincial Bureau of Mines also has much difficulty in getting prompt replies to its circulars asking for particulars relative to the mining industry, and, strange to say, among the worst delinquents in this respect are some who are most severe in their criticism of the department for a delay to which they themselves contribute by their neglect to promptly make returns. It seems as if some of those whom the law requires to supply certain information relative to their mining operations take advantage of the known reluctance of the Government to prosecute for such neglect, which is to be deplored.

During a recent public discussion on the Provincial Bureau of Mines and the official reports it issues, several speakers expressed themselves as strongly of the opinion that all references to values of ores and commercial prospects of mineral claims should be omitted from such official reports. Seemingly there is at least one instance on record where their views in this direction had already been officially anticipated, but whether in the best interests of this Province, which happens to be the one directly concerned, or not, may be left to individual judgment for decision. On pp. 72s and 73s of the Dominion Section of Mines Report for 1902 some information is given relative to "a new discovery of coal in the West Kootenay District." The locality is not in what in this Province is known as West Kootenay, but is in the north-east part of the Boundary District. It is not this inaccuracy in location, though, to which we desire to call attention, but to the misleading character of the information given. Mr. R. W. Brock's report on this alleged coal-field was not quoted in full. We do not take exception to that, though, so much as the omission to take careful note of Col. Linsley's report on this coal discovery as published in the Report for 1901 of the Minister of Mines for British Columbia, pp. 1071-2. In the Section of Mines Report Mr. Linsley is quoted as having reported the discovery of four seams of coal, of which "the upper (seven inches wide) was the largest," but he was *not* quoted as having given the thickness of the three other seams as 1½ inches, 1 inch and ½ inch, respectively. That gentleman regarded the coal-field (!) from a commercial standpoint, and his report to his principals did not encourage them to proceed to develop the property. Last spring, however, months before the date of the Report of the Section of Mines, the property was prospected, with results that led to its abandonment, to all intents and purposes no work having been since done on it. In this case a proper regard to the commercial prospects would have prevented the Geological Survey from officially calling attention to "a new discovery of coal" months after it had been shown to be of no practical value.

On March 6th the Rossland *Miner* published the following:—

"The *Miner* is reliably informed that an attempt was made last year to wantonly abuse the public-spiritedness of the Provincial Mining Association. It appears that thousands of copies of the British Columbia MINING RECORD have been sold to the Association for which the Association had no particular use. The parties responsible for this piece of business are open to censure if the facts are as stated. The Association has had a hard time steering itself clear of the shoals of politics, but to attempt to saddle it with any feature of 'yellow-legism,' and jobbery is nothing short of intolerable."

This is not the first time the *Miner*, under its present direction, has either plainly or, as above, by innuendo, done the MINING RECORD injustice. Heretofore we have not replied to its aspersions, secure in the knowledge that this journal has a reputation for honesty and straightforwardness that cannot be injured by attacks from such a quarter. But since the managing editor of the RECORD is also treasurer of the Provincial Mining Association, it may be in the interests of the Association to show that there is no justification at all for the above-quoted attempt to imply that either he or the RECORD has wantonly abused the public-spiritedness of the Association. The facts are that last year's printing committee, of which no one connected with the RECORD was a member, invited tenders for printing 15,000 copies of the report of the proceedings of the 1903 Convention. For a legitimate reason approved by the committee the tender of Mr. T. R. Cusack, printer, of Victoria, was made through and in the name of Mr. H. Mortimer Lamb. It was the lowest tender received and Mr. Lamb was notified on March 6 that this tender, which was for printing and did not provide for any illustrations, had been accepted. The printing committee had the right to seek advertising and it availed itself of this right to advantage, obtaining advertisements to the total value of two hundred dollars, less thirty dollars commission paid to the canvasser. Mr. Lamb turned over the printing order to Mr. Cusack at the amount of the tender. The RECORD obtained some additional advertising in accordance with an agreement with the committee, but it supplied two full-page cuts and eighteen smaller ones and had a special ornamental cover prepared all at its own expense. It should be particularly noted that this number was published in April, or about a month after the printing committee, to whom the Executive had delegated full power to deal with the matter, had, after careful consideration, accepted the lowest tender. The details of receipts and expenditure in connection with that report of the Convention proceedings were printed in the Victoria newspapers a week before the *Miner* published its innuendo against the RECORD. The statement of accounts showed that the charge for printing was Mr. Cusack's and his name appeared in the statement of liabilities as a creditor for \$358.02 for balance due on Convention proceedings. It was therefore plain to any fair-minded critic that the Association recognized its liability to Mr. Cusack and not to the MINING RECORD.

Further, the Provincial Government paid \$1,250 for 5,000 copies of the proceedings, and this amount was handed to Mr. Cusack by Mr. Lamb without any deduction whatsoever. The unpaid amount shown in the balance sheet was the amount actually owing to Mr. Cusack when the year's accounts were made up, but he has since received, direct from the Association, \$200 in reduction of this liability.

The *Miner* is too prone to measure other people's wheat in its own bushel. That we are not alone in this conclusion can be seen by the following editorial comments published last summer by the *Boundary Creek Times*, Greenwood, in reply to some aspersions made by the *Miner*: "We find a newspaper whose 'graft' was so notorious that it was recently the subject of stinging condemnation from a Supreme Court judge, who characterized this sheet as a disgrace to Rossland and the Province—this same *Rossland Miner* is found deprecating the fact that a large portion of the Provincial press is willing to advocate anything or anybody for money. The *Rossland Miner* is a gross libeller as well as a 'grafter.' Outside the *Rossland Miner* and its editor, there are few newspapers or newspaper men in this Province who are not innocent of such a serious charge. The Press of British Columbia, outside of a few newspapers like the *Rossland Miner* which have fallen into the hands of corporations and who are always thanking God that they are not like other newspapers, is as honest and as straightforward and as independent as the Press of any country in the world. The *Rossland Miner* cannot bring the Press of British Columbia down to its own level by hurling wild charges of venality."

We repeat then that we believe the reputation of the *MINING RECORD* for honesty and straightforwardness cannot be injured by attacks from such a quarter.

Mr. A. F. Rosenberger, of the Mines Exchange, Ltd., has for some time past been successfully endeavoring to interest residents in several Michigan towns in mining properties situate in the vicinity of Camborne, Fish River camp, in the northern part of the Lardeau district. The Calumet & British Columbia Gold Mines, Ltd., owning and operating the Eva group, and the Northwestern Development Syndicate are two companies organized as an outcome of his efforts. The former is reported to be doing well, the gold recoveries at its stamp mill at Camborne being sufficient to leave a margin of profit above all cost of working. The latter got into financial difficulties, mainly through gross mismanagement on the property, which was in the charge of a manager who was either utterly incompetent or recklessly extravagant, or both. The Gold Finch Mining Company has been formed, and this is to a large extent a reconstruction of the Northwestern. In order to give those interested a better idea of the situation than could be conveyed in either written or spoken descriptions, Mr. Rosenberger has been exhibiting in five or six towns in Michigan a series of stereopticon views of the mining property the new company is taking over from the discredited Northwestern Syn-

dicate, the scenes thrown on a 15-foot square canvas illustrating both surface and underground conditions at the mining claims, the aerial tramway, water power and plant for generating the electric current for operating the stamp mill, general views on the claims, maps of the locality, etc. His exhibitions have been accompanied by interesting talks, and as he is very familiar with the district and conditions he describes he has done much to restore confidence among those who temporarily felt that they had "had enough" of mining in British Columbia. He has supplemented these efforts by making good use of opportunities afforded by interviews with representatives of Michigan newspapers. It is not unlikely he has done good work for the Lardeau particularly, but he has not restricted himself to that district alone, for he has also contended that the possibilities of British Columbia as a whole are constantly brightening. Such persistent work must do eventually great benefit to the province.

We publish this month some notes on mining and smelting in the Boundary district prepared by Mr. Frederic Keffer, M.E., general manager of the B. C. Copper Co., for the information of members of the Canadian Mining Institute assembled recently in annual meeting. These are supplementary to Mr. Keffer's description (published in the *MINING RECORD* for April, 1902) of the methods employed in mining the big bodies of low-grade ore occurring in the Mother Lode mine, the development of which from the merest prospect it was in 1896 to the important promual meeting. These are supplementary to Mr. Keffer during his nearly eight years' continuous close connection with it as manager. The Mother Lode mine commenced shipping ore towards the end of 1900, and its output has now reached an aggregate of about 420,000 tons. It is evident, therefore, that the conclusions arrived at possess a thoroughly practical value, since they are based upon results obtained over a period of several years' duration, and not upon those of a few intermittent experimental tests. Among the facts brought into prominence in Mr. Keffer's notes are (1) that under the conditions of mining—mainly ore-quarrying—at the Mother Lode it would not pay to sort the ore now that the pits are so large as to permit of immense bodies of ore being blasted down at a time; (2) that further economies are being effected in handling, crushing and shipping the large output of the mine, and (3) that the ore mined on the 300-ft. level has been found to be of generally better grade than that taken from the workings nearer the surface. This last is most important, since it will, if this favourable experience continue, serve to more than offset the small increase in cost of handling the ore that must accompany mining at the deeper levels. Further, attention is again directed to the importance of having a sufficiently large percentage of iron in the ores of the district, so that the local smelters may be able to maintain their excellent record for smelting, both as regards expeditious treatment and low costs.

The annual meeting of the Canadian Mining Institute has again drawn public attention to the importance of such gatherings, especially to parts of the Dominion favoured with large mineral resources. The deliberations of a number of specialists on subjects connected with the development and utilization of the great natural wealth contained in large areas of mineral lands of the Dominion should be of far more general public interest than they are at present, and it is gratifying to find that to an increasing degree this is being recognized. The members of the Institute certainly cannot complain of indifference or lack of courtesy on the part of those prominently connected with the Department of Mines of Ontario. The Commissioner of Crown Lands for the Province accepted an invitation to be present and address the convention. In the course of his remarks he expressed the pleasure it gave him to meet such a representative body of members of a profession with which a branch of his department was so nearly concerned. He acknowledged the value of many of the suggestions and recommendations of the Institute, pointed out wherein he had endeavoured to meet their views, and assured them of his willingness to give all possible assistance to the mining interests of the Province. It was evident that his was more than a passive interest, for had he been simply giving those he addressed "the glad hand," with no sincerity behind his professions, it is unlikely that officials of the Mines Department would have been taking the active part they were in promoting the objects of the convention. The Director of the Ontario Bureau of Mines gave the convention much practical information, showing the progress of mining and the manufacture of the products of mining in the province during 1903, and the Provincial Geologist dealt at considerable length with the undeveloped mineral resources of Ontario. It may be that this good example will yet be followed in British Columbia, even at gatherings where those taking part are not all professional men. Let us hope that next year will see in this province a similar display of tactful courtesy and cordial co-operation, prompted by real recognition of the value of the service that is being rendered to the mining industry by the Provincial Mining Association.

The address of the managing director of the Le Roi Mining Company (Mr. Anthony J. McMillan, of Rossland,) to the shareholders assembled in general meeting in London a few weeks ago should assist in restoring confidence in the Le Roi. At considerable length he dealt with the affairs of the company's mine and smelter, and at the close of his address, which was listened to with close attention, he reiterated his belief, first expressed to the shareholders in general meeting nearly two years since, that the Le Roi is a great mine. Further, after showing that profits on ore extracted had freed the property from debt, he gave it as his judgment that the mine is in a better position to-day in every respect than it has been for years past. True, there are the three great

problems he called attention to, viz., how to get more ore, how to get cheaper coke, and how best to deal with the low grade ores of the Le Roi mine, awaiting solution, but the first and last seem now to be in the way of being solved ere long, whilst the remaining one will in all probability appear less formidable as competing collieries and railways become established and do away with existing practical monopolies. With a thoroughly business-like directorate, an able and conservative general manager, the smelter under a skilled modern metallurgist, the office under fully competent supervision, and the mine as good as, or even better than Mr. McMillan indicated, the Le Roi Company should yet prove a success in very deed.

At the same meeting Mr. Geo. S. Waterlow said: "I believe it has been stated by those who know very little about British Columbia that very little real values are turned out in that country; but the contents of the matte shipments of your mine alone for the year under review, as per refinery returns, have been absolutely 91,037 oz. gold, 122,447 oz. silver, and 4,816,155 lb. copper. I think that these figures alone will show that there is something in the Le Roi mine, and, I have hopes, a great deal more yet." This kind of testimony must eventually benefit British Columbia, especially when attention is directed to such facts by one who has expended money freely in mining properties in the Province, and has made repeated visits to the mines in which he is consequently deeply interested. Had the figures been available to him at the time, Mr. Waterlow might have gone farther and told his hearers that the total production of metals by the Kootenay and Boundary smelters in 1903 added to that of the Le Roi mine as above was as follows: Gold, 216,614 oz.; silver, 2,866,816 oz.; copper, 24,541,535 lb., and lead, 16,779,182 lb. Even these figures, convincing as they should be, do not do the Kootenay and Boundary districts full justice, for there were besides the metal contents of a lot of Rossland ore, not included in the foregoing statement, smelted at Northport, Washington, and silver-lead ores from the Slocan also shipped to United States smelters. Then there was the production of other parts of the Province, including a considerable tonnage of ore smelted at Vancouver Island smelters, so that, comparatively speaking, there was quite a large aggregate production to disprove any such statement as that so opportunely corrected by Mr. Waterlow.

Had it been suggested two or three years ago that Boundary district smelters, established at points distant 100 to 120 miles by rail from Rossland, would compete with the near-by smelters at Trail and Northport for ores produced by Rossland mines, the suggestion would probably have been ridiculed. Yet today we find the managing director of the company owning the Northport smelter admitting that this competition has to be met, and that consequently his company is face to face with new conditions. The

reason the Boundary smelters can successfully compete for the treatment of Rossland custom ores, notwithstanding that they are handicapped by the higher freight charges of the much longer railway haul, is that these ores contain certain constituents that the Boundary ores do not possess in sufficient quantity, so that the loss in transportation charges is offset by the more effective and economical smelting of the much larger tonnage of local ores, made practicable by the admixture of a small proportion of Rossland ores. It is probable that ere long the tables will in some measure be turned; in fact it has already been announced that when the Great Northern Company's railway system shall be extended to Boundary mines the Northport smelter will obtain Boundary ores, the large percentage of lime and silica in which would assist in the more economical smelting of Rossland ores. The Le Roi Company has been notified that the Great Northern Railway Company, which already has a railway running through Grand Forks, expects to commence the construction of a branch thence to Phoenix as soon as the snow goes off the ground this Spring, so that we may expect to see after this year, in both the Rossland and Boundary mining camps, competition between railway and smelting companies that should tend towards a further reduction in transportation and smelting charges, to the advantage of companies mining the immense bodies of low-grade ore characteristic of the Boundary district, and, in smaller degree, to the smelting companies as well.

The annual report of Mr. A. H. Gracey, manager of The Athabasca-Venus, Ltd., operating the Athabasca and Venus gold mines, stamp mill and cyanide plant, situate on Morning Mountain, near Nelson, is published elsewhere in this issue. This report shows the good results that have followed careful and economical management by a competent mine manager. Mr. Gracey's policy has been a progressive one. His experiments have enabled him to considerably raise the percentage of extraction of values from the ore, so that during the last seven months of the period under review the recovery averaged 93.3 per cent. of the total values. Milling costs were reduced from \$1.32 per ton to 81 cents, and cyaniding costs from 85 cents to 80 cents per ton of ore milled. With certain development work kept well ahead of stoping it is estimated that mining costs could be reduced to \$3.85 per ton and that after adding the costs of tramming, milling and cyaniding, management and general expenses, the total cost would be \$5.80 per ton of ore from the Venus mine. The average returns obtained during the last six months of the year showed a recovered value of \$9.55 per ton, so that with ore of similar general grade an average profit of \$3.75 could be looked for. From the ore of the Athabasca mine, which is of a generally higher average grade, more than twice as much profit per ton should be made. It is therefore to be hoped that the directors will see their way clear to authorize the doing of the additional development work requisite to the attainment of these indicated

better results. In any case it has been demonstrated that these mines can be worked at a profit, which is important to the shareholders directly concerned, and to the Nelson district indirectly.

At the annual meeting of the Canadian Mining Institute, held last month in Toronto, the president read a paper on "Some Suggested Improvements in the Mining Laws in Canada." He pointed out that there is an enormous area of Crown-granted mineral lands in Canada lying idle, thereby retarding the development of the mineral resources of the country. He favoured the imposition of assessment work to the value of \$5 per acre per annum, with immediate forfeiture to the Crown in case of non-compliance. He pointed out that only about one-half of one per cent. of the mineral lands Crown-granted in Ontario during the past six years were being worked. He did not give the figures relative to British Columbia, in which province about 4,600 Crown-grants for mineral claims have been issued during eight years, 1896-1903. The percentage of Crown-granted claims being worked in this province whilst so insignificant as to be a serious detriment to the development of its mineral resources, is certainly not so small as that stated to be the case in Ontario. Whilst the tying-up of mineral lands by Crown-granting without adequate provisions for work or heavy taxation, is a growing evil, and one calling for effective measures to remedy it, what a howl there would have been made had the president at the recent Convention of the Provincial Mining Association, or for that matter the Provincial Government, at a session of the local Legislature, advocated an assessment of \$5 an acre, whilst to suggest immediate forfeiture as a penalty for non-compliance, would have called down condemnation on all hands. Yet there are British countries where such requirements in connection with gold mining lands are met without a murmur and as a matter of course.

In a report of the annual meeting of the Rossland Board of Trade published in a local newspaper, it is stated that the report of the retiring president "concluded with a statement of the ore production of the Rossland camp since 1893, and for 1903. His deduction from the figures submitted in this statement and by the Associated Boards' leaflet on the subject of mineral production was that in 1903 the Rossland camp produced about 46 per cent. of the entire mineral wealth mined in British Columbia." If Mr. A. H. McNeill, the retiring president, was correctly reported, either his source of information or his deduction was unreliable. Assuming that the percentage claimed was intended to be in value, not in tonnage (for in tonnage the Trail Creek Mining Division did not contribute more than one-third of the total output of metallic minerals, leaving out consideration the much larger tonnage of non-metallic minerals), we think that when the official figures shall appear it will be found that the Trail Creek Mining Division, which includes the Rossland camp, did not contribute more

than 25 per cent. in value "of the entire mineral wealth mined in British Columbia" in 1903, nor not more than 33 per cent. of the metallic mineral output. In 1902 that division contributed about 28 per cent. of the former, or about 39 per cent. of the latter, but it will be found that it did not maintain so high a proportion in 1903. As it is especially necessary that the statements of Boards of Trade shall be as nearly correct as possible, we have no doubt that the Rossland Board of Trade will accept this correction of the local newspaper report in the spirit in which it is made, our mutual purpose being to state facts and facts only. Its annual output of between \$4,000,000 and \$5,000,000 is so creditable that the Rossland camp can well afford to keep well within the mark rather than go beyond it, which latter in the case in point was done, but no doubt quite inadvertently.

In addition to having contributed much to the enjoyment of those of the up-country delegates to the Provincial Mining Association Convention who availed themselves of his kindness in placing a train at their disposal to enable them to visit the working mines in Mt. Sicker camp, Mr. James Dunsmuir did good service in the interests of metalliferous mining on Vancouver Island. There is an old saying that "seeing is believing," and there is much truth in it. No matter how many times mining men from the interior may read descriptions of **Island mines, they are** unlikely to adequately realise the importance of such properties, as several of those now being developed at Mt. Sicker without seeing for themselves the fine showings of mineral of payable grade, and the extent and generally good class of mining work that is being carried on in the mines there. Probably one of the greatest advantages that can result from the visit to the Island of a number of men from other parts of the Province will be found in the fact that men familiar with the working of producing mines have been shown that there are good metalliferous mines on Vancouver Island, and that they are being operated under the direction of fully qualified mine managers. It is but the merest courtesy to Mr. Dunsmuir to express appreciation in this way of the benefit derived from his generous public-spiritedness on the occasion alluded to, and it is also due to those connected with the several mines visited, to the management of the smelter at Crofton, and to the several Victoria organizations that assisted, to acknowledge the part they all took in contributing to the success and enjoyment of the excursion to Mt. Sicker and Crofton.

In the last issue of the *B. C. Mining Exchange*, a rather fierce onslaught is made against Mr. E.

Jacobs, now secretary of the Provincial Mining Association, who is charged with having taken advantage of his opportunities as a delegate to the recent Mining Convention to make "a savage attack upon the Lardeau district in general, and upon Mr. W. B. Pool and the Great Northern Mines, Ltd., in particular," in order to air "his private and personal animosities." But had Mr. Jacobs been guilty of the offence with which he is accused, it is somewhat strange that, notwithstanding the "indignation and disgust" of the delegates, as alleged by the *Mining Exchange*, a most representative executive committee should have subsequently appointed him secretary of the association. But the facts as reported in the *B. C. Mining Exchange* are certainly not fairly or correctly stated. Mr. Jacobs made no attack on the Lardeau district, though in speaking to a resolution which charged the Bureau of Mines with inefficiency, he pointed out that the principal traducers lately of the Provincial Mineralogist were Mr. Pool, who thus showed his annoyance that Mr. Robertson had not "boomed" the district in which he (Mr. Pool) was interested, and the representative of a Chicago newspaper, who some time since had served three months in jail in Nelson. Whether Mr. Jacobs' points were wisely taken or not may be a matter of opinion, but at least he was honest and certainly courageous in the stand he took in this matter.

It is a matter of some regret that the proposed scheme for amalgamating the B. C. Copper Company and the Snowshoe Gold & Copper Mines, Ltd., in the Boundary district, has failed to materialize, probably on account of the present depression in financial circles, accentuated by the Russo-Japanese war. Although the Snowshoe is a most promising mine in itself, the arrangement as contemplated would undoubtedly have strengthened its position, while we should also have liked to have seen the consolidation added to the list of British Columbia companies whose shares are listed on the London Stock Exchange. However, since the scheme misfired, comfort may be extracted from the thought that instead of, as would have been the case, one big undertaking paying proportionate profits almost immediately, the Boundary may ere long depend on having the two disassociated, but still distinctly important enterprises, in the same fortunate position. Meanwhile another Boundary mine amalgamation is reported the newly organized Montreal & Boston Consolidated Mining & Smelting Company having arranged to purchase either for cash or in exchange for its own treasury shares, the assets of the Morrison Mines,

Ltd., at a valuation which affords shareholders in the latter undertaking two cents per share. The price is, of course, exceedingly low, but in view of the fact that the Morrison Company is hampered by lack of working capital, the arrangement is perhaps as satisfactory as could be expected under the circumstances.

From the annual report of the Dominion Superintendent of Mines we learn that during the fiscal year ended June 30, 1903, 36,295.69 oz. of bullion, valued at \$568,888.19, representing 509 deposits, were received and assayed. As the receipts during the corresponding period of the fiscal year 1901-2 were 69,925.67 oz., valued at \$1,153,014.50, representing 671 deposits, it is evident that there was during the first-mentioned year a falling off in business done of about one-half. Dr. Haanel narrates several causes to which he attributes this very considerable decrease of business, and adds the following significant comment: "Under these circumstances, the amount of business coming to the Dominion of Canada assay office will continue to be small, and not until a market has been created in Canada for Canadian gold, by the establishment of a mint, will its business be commensurate with the gold output of Canada." Will the British Columbia senators and members of the House of Commons, to whom were sent last month copies of the resolution urging upon the Government the desirability of hastening the establishment of the national mint, for which Parliament has already made an appropriation, please take note of what Dr. Haanel has reported to the Government as his opinion on the subject above referred to.

In the report of the directors of the Le Roi No. 2, Ltd., which we published last month, it was confidently stated, regarding the operation of the Elmore oil concentration plant at that company's mine at Rossland, that the ratio of concentration had there been found entirely satisfactory, but that it was yet too early to speak with any certainty as to the cost per ton of the treatment of the ore. We have since received a report of the second ordinary meeting of the Canadian Ore Concentration, Ltd., at which the chairman is stated to have said that, even at such an expensive place as Rossland and with so small a plant, \$2 per ton should be the very outside cost of working the experimental plant erected for the Le Roi No. 2. It was contended by one of the inventors, who was present at the meeting, that with a 6 or 8-unit plant, oil, royalty, and all charges should not greatly exceed

three shillings (.75 cents) per ton. It would therefore appear that, if a high ratio of concentration, with very small loss of values in the tailings, can be maintained at so low a cost per ton of ore treated as that last above mentioned, the Elmore process certainly should contribute very materially to a much enlarged output from the mines of Rossland and vicinity.

We have much pleasure in calling the attention of our readers to the generally favourable Press comment, which we print in another part of this month's MINING RECORD, on the Second Annual Convention and the good work and prospects of the Provincial Mining Association. From widely separated sections of the Province have come words of appreciation and encouragement. Especially gratifying, in view of the temporary misunderstanding that led to the Association receiving a set-back there for a brief period, are the reports that have appeared in Vancouver newspapers relative to the branch in that city—the largest in the Province. The *News-Advertiser* recently concluded a report of a meeting of the local executive as follows: "It was very gratifying to the Executive to have it reported that the Association is meeting with enthusiastic support from all classes in the City, and that the branch in Vancouver will shortly be the banner one of the Province, both in membership and financially." If it beat the Rossland branch with its nearly 500 members, it certainly will be a strong branch, which it should be since anything that contributes to the prosperity of the mining industry will also in some measure add to that of the commercial capital of the Province.

The President of the Canadian Mining Institute, speaking at the annual meeting held last month in Toronto, said that the membership now tended more and more towards the West. In making that statement he included Ontario's membership as well as what we in this Province know as "the West." A little attention to the numbers of full members in the Dominion, that is excluding student members, will disclose the fact that of the 286 Dominion members 68, or 24 per cent., are from British Columbia. If the Yukon members be added to those of this Province the figures will be 79 out of 286, or nearly 28 per cent. British Columbia's proportion of the total full membership of 357 members is 19 per cent., and that of British Columbia and the Yukon together, 22 per cent. These figures will probably interest some of our readers as showing the considerable share our Western mining men take in the leading professional organiza-

tion connected with mining and metallurgy in the Dominion. Another significant fact may be mentioned, viz., that at the recent annual Convention 25 per cent. of the papers contributed dealt with British Columbia subjects.

The outlook for the Nelson Mining Division for the current year is distinctly encouraging. The Athabasca-Venus is making profits, announcement has been made that active development is to be continued at the Juno through the season, a local company has been organized to operate the May and Jennie group on which much work has already been done by Messrs. A. H. Kelly and R. S. Lennie with excellent results, the Alice group in the vicinity of Creston is being opened up with good prospects ahead, the Hunter V. has settled down to making regular shipments of payable ore, the Ymir and several other gold mines in the same camp are at work under competent management, and several properties at Salmo and Erie are also being operated. Then there is the Silver King still a producer, and the Nelson smelter continuing to treat ores from various parts of the Kootenay. Certainly it appears as if the Nelson Mining Division will make a good showing in 1904.

Included in the voluminous Annual Report of the Department of the Interior for 1902-3, which was received recently, are the annual official reports of the Commissioner of the Yukon Territory (Hon. F. T. Congdon) and the Dominion Superintendent of Mines (Dr. Eugene Haanel). Summaries of these reports are printed elsewhere in this issue of the MINING RECORD. To the former is appended reports from the Assistant Gold Commissioner (Mr. F. X. Gosselin) and the Crown Timber and Land Agent (Mr. H. M. Martin), and to the latter a report by the Government Mining Engineer (Mr. A. J. Beaudette) on the stamp mill and assay office, Dawson, and one by Messrs. R. G. McConnell and R. W. Brock, of the Geological Survey of Canada, on the great landslide which occurred at Frank, Alberta, on April 29 last. The reports are all for the fiscal year ended June 30, 1903, so are somewhat out of date, yet there is probably much in them still of interest to some of our readers.

Appropos of the application of the Provincial Mining Association to the Dominion Government to permit the free importation of all machinery not obtainable of equal quality in Canada, and imported exclusively for the mining, smelting and reduction of ores, coals and other mineral products, the following from the annual report for 1902-3 of the Commissioner of the Yukon Territory will be of interest: "The temporary removal of duties on certain classes of mining machinery has, in my opinion, been amply justified by the importation of several large plants,

which, I believe, will next season prove large producers, and more than return to the Government the loss of duties, and will, if successful, create a still larger demand for similar machinery after the remission of duty has ceased to operate."

In all the placer mining districts preparations are in progress for a very active season's work, the late heavy snow and rainfalls insuring in most cases an ample water supply this year. Recently arrangements were made to send it a consignment of heavy machinery for a mine in Cassiar, which is to be worked for the first time this year. Parties have already left to prepare for the summer's hydraulic mining in Omineca, and it is expected that conditions will permit of the commencement of active work at the big Cariboo hydraulic mines early next month. In East Kootenay placer mining is again becoming an important industry, and recently a number of new applications have been made for leases.

The Mining Department of the Canadian Pacific Railway Company is opening up at Banff what promises to be a very large anthracite coal mine. Tenders have been invited for driving a tunnel about 1,200 feet long, and other preliminary work is either under way or is being arranged for. It is proposed to install compressed air haulage and to include in the colliery equipment a modern anthracite breaker. It is expected that by next winter this mine will be in a position to supply the country from Vancouver to Winnipeg with a superior class of anthracite coal for domestic purposes.

The Nelson *Daily News* is to be commended for its exposure of one Otto M. Rosendale, of Portland, Oregon, who advertised in its columns that he wanted mining property. The advertisement was replied to by a Rossland mining broker, who offered for sale a group of claims, and thereupon Rosendale made a proposition to him which he describes as a "rascally production." Immediately upon being apprised of the facts the *Daily News* obtained and published Rosendale's letter in full and expressed the opinion that it stamped him as "a fakir." Public exposures of this class of men who similarly fraudulently use the mining business for "revenue only," help to rid it of such hurtful parasites.

Among the amounts included in the Dominion estimates for the ensuing year are several that will in some measure benefit several of the mining districts of the province. These provide for improvements to waterways, including Columbia River (above Revelstoke, above Golden, below Golden and between Upper and Lower Arrow lakes, respectively), North Thompson River, Duncan River, Skeena River and Anderson and Kennedy Lakes.

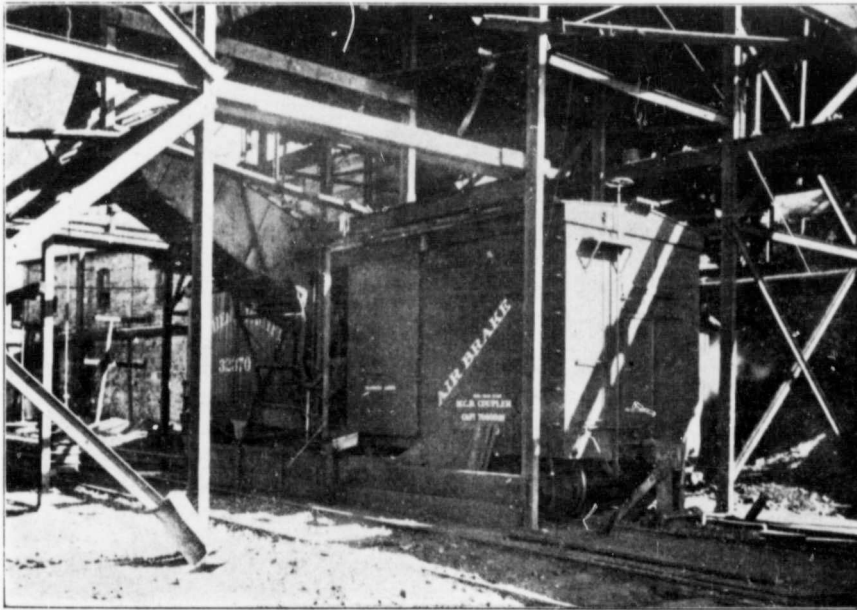
THE SMITH GRAVITY HYDRAULIC BOX CAR LOADER.

(By E. Jacobs.)

ONE of the most interesting features of the equipment of the Crow's Nest Pass Co.'s collieries, East Kootenay, is the Smith Gravity Hydraulic Box Car Loader, illustrations of which, showing a car in three different positions, accompany this description. It would be a decided advantage to many consumers of coal if there were no necessity for the use of any such contrivance, that is to say, if the companies owning the railways provided sufficient dump cars in which to ship coal instead of using by far the larger proportion of box and gondola cars for this purpose in British Columbia. It will be evident to any one giving

this connection have already been made to the railway company carrying most of the coke used in the interior of the Province, but for the time there are only box cars in use for carrying coke. Similar objections to the use of either gondola or box cars for the shipment of coal hold good, but since the quantity of coal used by mines and smelters is not nearly so large as that of coke the additional cost in unloading does not in the aggregate amount to anything like so high a sum of money. So long, however, as existing conditions shall be continued there will remain the necessity for the use of an expeditious and economical mechanical car loader, and this being so, the colliery owners will continue to seek the most efficient machine for this purpose.

The Smith Box Car Loader is the invention of the



No. 1.—Smith Gravity Hydraulic Box Car Loader.

the matter a little consideration that if it were practicable to use dump cars instead for the shipment of coal and coke from the collieries to the mines and smelters, a considerable saving would thereby be effected in the cost of unloading the fuel at the places to which it is delivered for consumption. In fact one of the serious difficulties the larger smelters are now facing, as they extend their operations and considerably increase their treatment capacity, is the excessive cost, in time as well as in money, of unloading coke from the box cars in which it is shipped, by the present very slow and expensive means of shovelling by hand, whereas if it were carried in dump cars the whole carload of 20 tons or thereabouts could be dumped in two or three minutes. Strong representations in

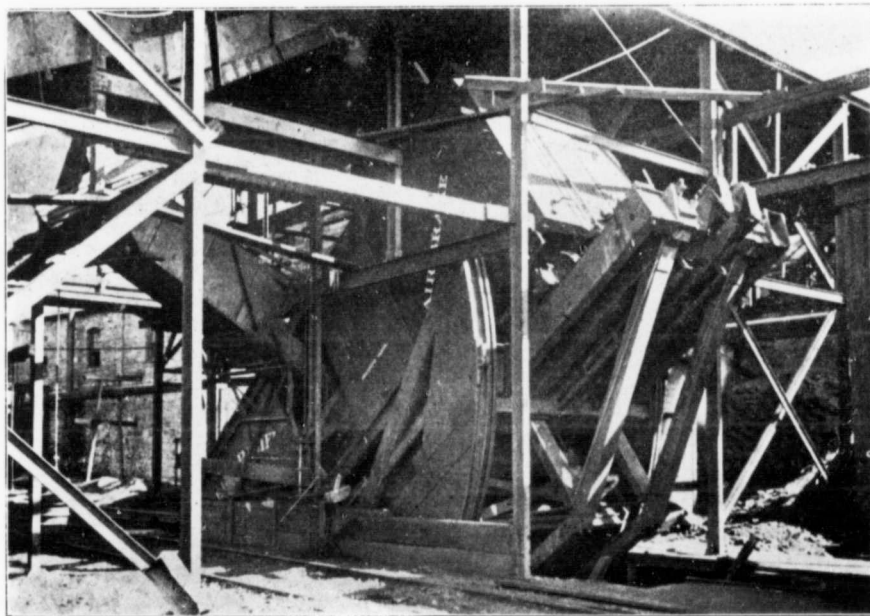
patentee, Mr. S. Kedzie Smith, C.E., well known at some of the larger collieries in the State of Washington, and now of Billings, Montana. Mr. Smith's device for loading box cars is both ingenious and thoroughly effective. It does its work quickly and can be operated by one man. It is singular in comparison with other mechanical loaders in that it provides for placing the car in the machine instead of the machine in the car as other contrivances previously invented do. In the operation of this loader the box car is run on to a tilting platform and securely locked thereon. The first of the illustrations shows a car on the platform before being tilted. As will be seen, the rails on the platform constitute a part of the railway track, and the empty cars are pushed on one at a time and

passed on, after being loaded, to the continuation of the track beyond.

The operation of loading is very simple. After the car is locked on, one end of the platform is tilted down (as illustration No. 2) and the coal is run into the car, by means of a chute from the bunkers above, until the lower half is loaded. The car is then brought back to a horizontal position and, whilst the coal is still running in, it is slowly tilted in the opposite direction. The tilting is continued up to the maximum of about 35 degrees, at which the car is held (as illustration No. 3) until fully loaded. The exercise of care in tilting the second end will prevent much of the coal from running down from the end first loaded when the other end of the car is lowered for filling.

the semi-circular rim at the bottom is a horizontal hydraulic cylinder, which is movable longitudinally and has each end attached to the opposite side of the rim by a wire rope which circumscribes the rim from the bottom to near the top, where it is attached. By means of a moderately high pressure pump and a four-way cock water is forced into corresponding ends of the cylinders and allowed to escape from the other ends. The cylinders thus travel longitudinally and, by means of the wire rope, cause the sides of the cradle to roll upon the supporting rollers and the platform to tilt. To handle box cars of 80,000 lbs. capacity requires a water pressure of 250 lbs. per square inch, the cylinders being 13 inches in diameter.

The car loader described above is in use at the



No. 2.—Smith Gravity Hydraulic Box Car Loader.

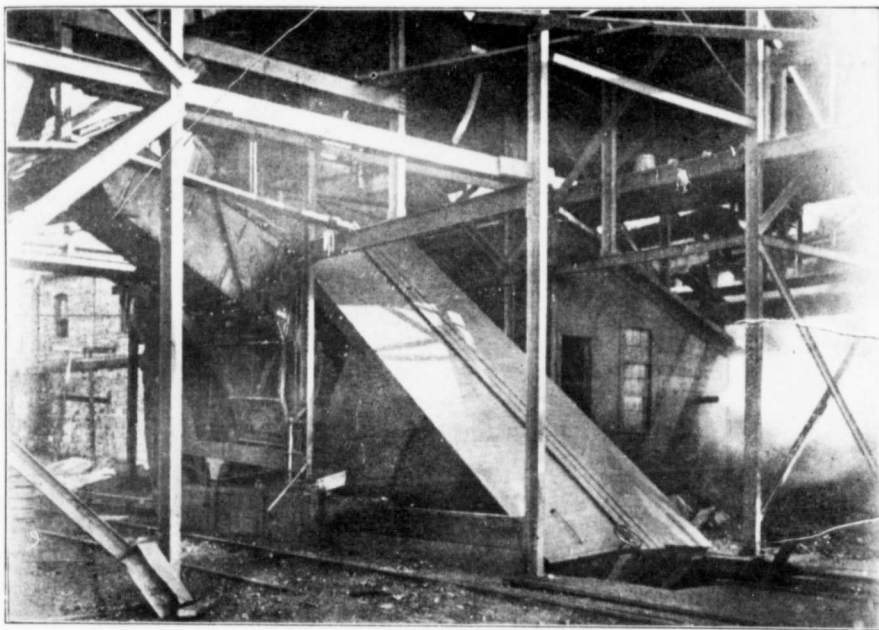
When the car is loaded it is brought back to the horizontal and moved off the platform, which is then ready to receive another empty car.

The loader is substantially constructed, necessarily so since it has to carry up to 60 or 70 tons weight at a time. The platform is supported by vertical sides, each of which is a sector of a circle, the centres being eight feet above the track and the arc 150 degrees long. The combination of platform and sides is called the cradle. These semi-circular sides have tires or rims of railway T rail and they are supported by cast rollers. The rollers, two on each side of the cradle, are spaced 60 degrees apart, 30 degrees each side of the vertical. On each side of the cradle and tangent to

Crow's Nest Pass Coal Company's Morrissey colliery, where all the equipment of plant and machinery is modern and has been provided in the expectation that the development here during the next year or two will admit of a comparatively large output of coal being regularly maintained. At present the producing capacity of the five mines, all situate on the north side of Morrissey Creek, now in operation is from 800 to 1,000 tons per diem. These mines are about five miles up the creek from Morrissey Junction, a station on the Canadian Pacific Railway Company's Crow's Nest branch nine miles lower down the Elk River from Fernie, at which latter town are the Crow's Nest Pass Coal Company's headquarters in British Colum-

bia. The Morrissey colliery is the latest to be made productive of the three collieries owned by this company in the Crow's Nest district. Between 400 and 500 men are employed at this colliery, including those engaged at the coke ovens, of which 240 have been recently built here. The larger part of the output of coal and coke from this colliery is sold in the United States, with which direct railway connection is given by the Crow's Nest Southern Railway to Gateway, on the international boundary, and thence to Jennings, on the Great Northern Railway Company's transcontinental road, by a branch line operated by the latter company.

ren or very poor rock by loading it into cars and tramping to waste dumps, but as the funnel system developed it became quite inadvisable to remove any except large bodies of waste, for the cost of removal had become greater than the cost of smelting. Experience has shown, however, that the detrimental effects of these smaller bodies of waste have been more than offset by the improvement in the general run of the ore body, due to lesser quantities of partially leached surface rock being included; so that the average copper contents of the 137,800 tons mined in 1903 were appreciably higher per ton than those of the 135,500 tons mined in 1902. In places, however, large



No. 3.—Smith Gravity Hydraulic Box Car Loader.

MINING IN THE BOUNDARY DISTRICT.

(By Frederic Keffer, M.E.)

TWO years ago the writer contributed a description of methods employed in mining low-grade ores at the Mother Lode mine, in the Boundary district. It is the purpose of the present paper to briefly note developments of the system, particularly as regards the quarrying and economical handling of ores, and also to touch upon certain features connected with smelting operations.

At the Mother Lode the series of quarries has been extended and there are at present four raises to the quarries from the main tunnel, with a fifth in course of driving. As far as is possible, the tops of these raises are maintained funnel-shape so as to reduce to a minimum the handling of the ore. While the pits remained shallow it was an easy matter to remove bar-

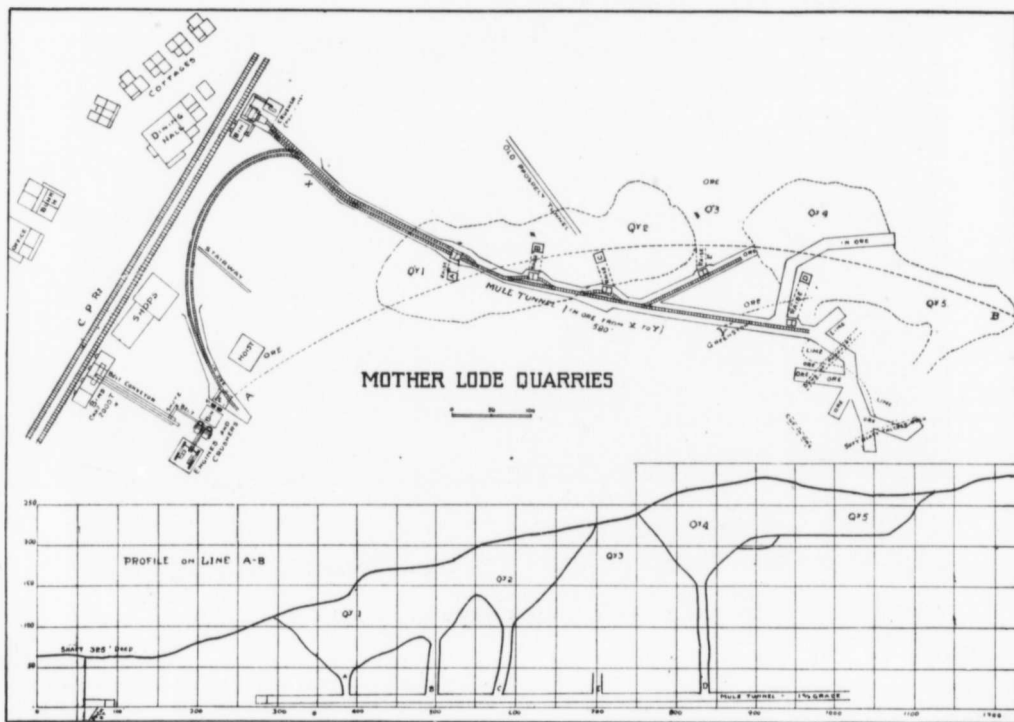
dykes of epidote and alkali porphyry, and occasionally isolated bodies of limestone, occur, which are removed by blasting into the raises, all the ore having been previously withdrawn.

The crusher plant located at the entrance to the quarry tunnel has dealt with the quarry ore alone, that from the stopes having been crushed by a Gates machine installed at head of shaft. Work is now being carried forward to consolidate the crushing plants and to do away with the Gates machine, which, although a No. 5 size, is entirely inadequate to the demands now made upon it. To this end a tunnel is being driven to intersect the main shaft on the same level as the quarry tunnel. At the shaft will be placed a very large pocket, and this will discharge the ore into 5-ton skips which will replace the cages now used. The skips will empty into a bin at the head of the shaft, ore passing thence to either one or two Jenckes-Farrel crush-

ers, each crusher having a jaw opening 2 ft. x 3 ft. These crushers will be driven by a pair of 100-h.p. engines so arranged that either engine can drive either crusher, this arrangement to eliminate all chance of stoppages through breakdowns in either engines or crushers—stoppages which past experience has shown to be inevitable as well as costly. The crushed ore will be conveyed by a Robins belt to the main ore bins. All car dumping and opening of bin and pocket gates will be done by means of compressed air. The same skips and crushers will, of course, serve all levels in the mine.

Although the ore will have to be hauled further under the new arrangement, crushing costs will be lowered, for the reason that, aside from stoppages for

In the matter of power, the cost of this item at the mine has been greatly reduced through the consolidation of power plant, and the driving of all machinery by compressed air. The 100-h.p. crusher engine, formerly steam driven from boilers located near by, now uses compressed air, which is heated to a considerable degree just before entering engine. This expedient has effected a direct saving in labour and fuel to the amount of from 5 to 7 cents per ton of ore crushed. Air is furnished by a cross compound condensing Corliss compressor, capacity 3,200 ft. free air per minute. Two boilers situate near the crushers and hoist will be available to furnish steam on short notice should the compressor machinery break down, thus guarding against stoppages from this cause.



Plan and Section of Mother Lode Mine Ore Quarries.

repairs to machinery, the provision of capacious pockets and shaft bins insures steady operation of crusher, which machine, if constantly supplied with ore, can crush a furnace day's run in a single shift, instead of this work taking a shift and a half as at present. Jamming of elevator buckets, constant repairs to them, and their clogging with frozen fine ore in winter, all serious drawbacks to rapid work, will be avoided. The short tunnel to shaft will become the general entrance to mine, both for men (whose houses are all on this level) and for materials from shops and store houses. The main features of this work are shown in the reproduced photograph of map of the mine.

From a smelting standpoint, the ores of the larger Boundary properties have, as a rule, grown less basic as the workings have been extended and deepened. That is to say, the proportion of iron oxide ores to the whole ore body has sensibly diminished, there being no great change in the amount of other base. Whether or not this reduced proportion of base to acid ore is to be permanent, it is (at any rate in the case of the Mother Lode mine) impossible to predict. Long experience in mining these deposits has shown that it is not possible to make safe predictions as to occurrence of zones of mineralization, new ore bodies frequently having been found in unexpected places. On the 200-

ft. level of this mine there has been found considerably less oxide of iron ore than in either the quarries or the 300-ft. level. The iron oxides of this latter level are uniformly of higher grade than those of the quarries, carrying more copper and gold, and they do not appear to be directly connected with the upper deposits, although this is not absolutely proven. No exploratory work has yet been done beneath the 300-ft. level, (which is about 500 ft. under the highest outcropping of the ore). A large body of iron oxide ore occurs at the mouth of the main tunnel, but no work has yet been done on it owing to close proximity of the crusher plant, which would be damaged by flying rocks were the requisite blasting to be done.

The change in the basic character of the ore is illustrated by the following average slag analyses, taken over corresponding periods of 1901, 1902 and 1903. The small tonnage of foreign ores treated affect the assays somewhat, but not materially:

Year	Silica	Iron	Lime	Total
1901.....	33.2%	28.5%	20.6%	82.3%
1902.....	40.5	22.2	20.2	82.9
1903.....	42.7	20.4	20.2	83.3

With slags running in silica from 40 to 43 per cent. and with matte at 40 to 45 per cent. copper, it is found that the furnaces can be maintained in good running condition, and slag losses kept within proper limits. To guard against possible scarcity of iron fluxes it has, therefore, become the general practice to conserve the iron ores of the mines, using only sufficient to keep slags within bounds above indicated.

A PROMISING MINING CAMP IN THE SIMILKAMEEN.

(By David Black.)

IN the interior of British Columbia it is the frequent complaint of mining men that Coast people know so little of the resources of new districts, not at least until some unusual excitement is aroused, and that as a natural result possible investors at the Coast find that when any such section is opened up, every property of particular value has fallen into the hands of more enterprising and practical mining operators from across the international boundary. Under these circumstances, and as there is little doubt that the past history of the opening up and development of Southern British Columbia to a great extent justifies such statements, it may interest Coast readers of the MINING RECORD to have placed before them information relative to the resources of a camp in the Similkameen district of which little has been heard outside, but which is well known to the prospector and mining man of that region, and will undoubtedly come into prominence as soon as transportation facilities of any kind shall be assured. For all practical purposes it will be best known in the future as

CENTROMINO CAMP.

This camp is situated at the headwaters of Keremeos Creek, on the Nickel-Plate-Penticton wagon road, twenty miles south of Penticton and eight miles north of the Nickel Plate mine. The region consists of a

cluster of mountains, five in number, namely, Green, Dividend, Independence, Riordan and Northey Mountains, on all of which immense ore bodies have been discovered and opened up, these carrying good values in gold-copper, copper, and gold ores. Most of these claims were located in 1899, and the camp is being developed so far as the limited resources of prospectors will allow. It is remarkable for the unusually large size of the lodes already exposed and the generally good values they contain; also for their apparent great extent, for in every direction for a distance of at least three miles a network of lodes and lenses of ore has been exposed, running from small veins of arsenical ore to huge deposits of chalcopryrite and pyrrhotite varying from thirty to three hundred feet in width, and practically all of commercial value. As regards mining facilities, they could scarcely be improved, there being an abundance of timber and good water power and tunnel sites, besides which the climate is exceptionally mild, the Keremeos district being noted as the garden spot of the interior.

On Green Mountain more than seventy claims have been located. One of the principal properties, the Green Mountain group, comprising nine claims, three of which have been crown-granted, owned by Black Bros. and the J. B. McArthur estate, has been developed by about four hundred feet of tunnelling, and considerable surface work in the way of stripping the lead and tracing it by open cuts to a distance of seven hundred feet, showing it to have an average width of seventy-five feet of solid pyrrhotite and chalcopryrite, sampling from one to ten per cent. copper and from \$3.00 to \$7.50 in gold. In addition to this, other leads have been exposed, these running in a parallel direction and having the appearance of being similar in character.

The Golden Crown group lies north of and immediately adjoining the Green Mountain group. It is owned by J. A. Schubert, of Penticton, and J. Brent, of Okanagan Falls, and has been opened up by shafts, open cuts, and stripping exposing a solid body of pyrrhotite and chalcopryrite more than one hundred feet in width and traceable for about a thousand feet. Average assays from this large lode run from one to six per cent. copper and from \$2.00 to \$6.00 gold per ton. East and north of this lies the Dunvegan group, which is owned by N. McLean and McKinnon Bros., of Okanagan Falls. A thirty-foot shaft is in solid ore similar to that of the properties already mentioned, besides which open cuts and stripping have exposed the lead about twelve hundred feet. Assays of this ore approximate \$14.00 in gold, copper and silver values.

Another promising group known as the Gold Crown lies north and east of the Dunvegan. The ore so far worked, being free-milling quartz, is of a distinctly different character to that above described. Two shafts, 12 and 16 feet deep, have been sunk on the vein which is three and one-half feet wide on the surface and increases with depth. Assays run from \$35 to \$75 per ton in gold. The group is owned by J. W. Wirth, of Hedley, and others.

On Dividend Mountain in the neighbourhood of one hundred and fifty claims have been located. The

Dividend group consists of eight claims, several of which have been opened up by tunnels, surface cross-cuts and small shafts, showing up a big body of pyritic ore. This has been traced fully fifteen hundred feet and it is about three hundred feet in width, in fact in some places it is much wider. Average sample assays give \$12 in gold and copper. This property is held by the Olalla Copper Mining and Smelting Co., of New York.

Another group on this hill is known as the Maple Leaf group. It adjoins the Dividend on the north and consists of four claims, lately purchased by a syndicate of Sandon miners. It is being continuously developed by shafts and tunnels. So far the ore body appears to be about forty feet in width. It is exposed for more than six hundred feet. Values taken clear across the ledge matter average \$12 in gold and copper.

The Mountain Rose group which adjoins on the east has also a fine showing of ore which is about fifty feet in width. Assay values are \$10 per ton in gold and copper. This group is owned by Messrs. Clark and Eastwood and the Stump estate.

The Nellie adjoining also has an exceptionally good outcrop, which has been traced by open cuts and surface work the full length of the claim. The ore is pyrrhotite and arsenical iron. The latter mineral contains good gold values, assays as high as \$400 having been obtained. Both ores also carry a small percentage of copper. This claim is owned by J. Black, of Keremeos.

Still another group on this mountain is the Scotia, which adjoins the Nellie on the northeast. It has been opened up by tunnelling and shafting. The lead is about sixty feet in width and it has been stripped on two claims. The ore is chalcopyrite and pyrrhotite, and it samples about \$5 in gold and five per cent. copper. This property is owned by McDonald and Wieden and is being continuously opened up.

On Independence Mountain more than one hundred and fifty claims have been staked. The principal property is the Independence group, owned by H. W. Conkling and Frank Richter, of Keremeos. It consists of four claims and so far two distinct lodes on them have been partially exploited. The larger, containing solid pyrrhotite, is nearly one hundred feet wide where exposed, and it carries the usual gold and copper values of the camp in that class of ore; the smaller, which strikes in a parallel direction, has an average width of four feet and runs high in gold.

Another group, adjoining, on the same hill, is called the Dominion. A large body of pyritic iron ore has been exposed here. This fine showing is owned by Lind Bros., of Sandon.

East of the Independence is the Teviot group, owned by K. P. Matheson, of Phoenix. Considerable development has been done here showing up a fine body of pyrrhotite and arsenical iron. Assays of the latter run high, \$60 having been obtained in some instances.

Another series of locations, known as the Standard group, adjoins the Teviot on the north. The owners are the Keremeos-Pontiac Mining Co., of Rossland.

On this property a lead of arsenical iron is being opened up, averaging eight feet in width and carrying steady values of \$30 per ton in gold.

Two other groups on Independence Mountain well worthy of mention are the Beaconsfield and the Gem. The former consists of eight locations, owned by the Keremeos Mining Co., of Rossland. It is being extensively developed by shafts and adits, and four strong leads are being opened up under the capable management of R. W. Northey. They carry pyrrhotite and chalcopyrite and the ore averages well. The latter claim adjoins the Beaconsfield on the north, and on it a body of pyrrhotite, evidently of great extent, has been exposed. The owner is Jas. McNulty, of Phoenix.

The principal property on Riordan Mountain is the Shamrock group, owned by James Riordan, *et al.* It has been continuously developed for four years by adits and shafts, and an enormous body of high-grade gold-copper ore exposed. This mine will be capable of shipping hundreds of tons daily as soon as transportation facilities shall be available.

The Knob Hill group lies southwest of and adjoining the Shamrock. It has a large body of pyritic ore carrying good values. The owners are McKinnon Bros., of Colorado.

Another group known as the Summit adjoins on the northeast, where a similarly large deposit has been shown up. The owners are Gladden Bros., of Greenwood.

Northey Mountain is the fifth mountain surrounding Centromino. On it there are three principal groups of claims—the Lorna Doone, the Cinnabar, and the Golden Zone.

The Lorna Doone group contains six claims owned by R. W. Northey, of Rossland, and others. Large lenses of pyrrhotite have been exposed on it. Assay values range from one to eight per cent. copper, and from \$2 to \$14 gold per ton.

The Cinnabar group adjoins the Lorna Doone and has a large lead carrying pyrrhotite and arsenical iron. High values are contained in the arsenical ore. This group is the property of R. B. Venner, of Camp McKinney, and associates.

The Golden Zone group is considered one of the best undeveloped gold properties in the camp and it appears to be a free-milling proposition. The ledge is more than fifty feet wide on the surface, and an average sample gave \$10 in gold. The lead has been traced over two claims. The owners are Murphy, Brodaghian and Marks, of the Nickle Plate. Little development has been done, but the surface showing where the lead has been exposed is a remarkable one.

The foregoing is a brief description of the class of property in this section of the Similkameen, to which practical mining men have been devoting their attention for several years, and which will undoubtedly some day bring it to the front rank as a mining camp. Railway facilities are, however, badly needed, and it is incomprehensible to the ordinary mining man up country why so little attention is being paid by the people of the Coast cities to the opportunities afforded by this the nearest large mining region to them in the interior of British Columbia.

GOLD AND SILVER MINES NEAR GREENWOOD.

(By E. Jacobs.)

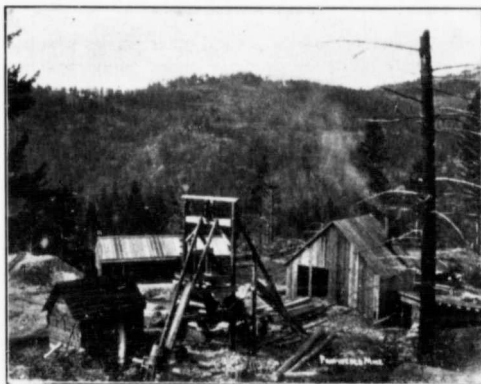
ON the side-hills above Boundary Creek near Greenwood are a number of mineral claims on which occur gold and silver-bearing quartz veins. Several of these properties have come into prominence during the past eighteen months, notably the Providence, Elkhorn, and the E. P. U. group. Their aggregate output since the Providence commenced shipping late in 1902 is between 1,500 and 1,600 tons of a gross value of between \$150,000 and \$200,000. Their combined tonnage when compared with that of, say, the Mother Lode mine, also tributary to Greenwood, appears small, for it is not as much as that copper mine sends down to the smelter in three days. There is, though, a marked difference in the value of the ores of these two classes of mining property, that from the small mines being worth nearly twenty times as much per ton as that from the big mine. The Mother Lode mine and the still larger Granby mines, with their enormous bodies of low-grade ore, are the mainstay of the Boundary district, but the much smaller and richer silver-gold mines supplement in no inconsiderable degree the benefit the district derives from the larger properties. And the latter have this distinct advantage over the former, that they do not require the outlay of a large amount of capital to make them reproductive, for they can turn single carloads of their ores into money and have this available for use in further development and production, and so do without the necessity of an initial provision of capital to the extent of hundreds of thousands of dollars before any return may reasonably be looked for, as is the case with the big low-grade mines.

Ten years ago a few score tons of rich ore were sent out from Boundary Creek, the Providence, Elkhorn, Defiance, Skylark and American Boy all contributing to these pioneer shipments from the district. Later the D. A. also shipped a few tons to a Puget Sound smelter, and five or six years ago the Gold Bug received nearly \$4,000 from the Trail smelter as the net returns from a couple of cars of quartz ore. But it was the Providence that in recent years led the way as a continuous producer, and then followed the Elkhorn and the E. P. U.

PROVIDENCE.—This mine has shipped in all about 50 cars of ore, including some 20 cars of sorted ore to Trail, 9 cars of second class ore to Boundary Falls, and the remainder unsorted to the Greenwood smelter, sorting having been discontinued latterly and the ore sent to the local smelter just as it came from the mine. The property lies northeast of Greenwood, within half a mile of the northern boundary of the city. When the mine was acquired from Mr. Wm. Fowler by the Providence Mining Company, a local organization, in September, 1902, there were two shafts, one down 50 feet and the other 84 feet. The former was afterwards deepened to 180 feet, levels were run at 50, 120 and 175 feet, respectively, and a raise was made from the 120-ft. to the 50-ft. to give better ventilation. More recently the work of deepening the shaft to the 300-ft.

level was taken in hand and other development work below the 175-ft. level proceeded with. This showed the vein to maintain its general characteristics, ranging in width up to about 30 inches and retaining high values in silver and a good average in gold.

Some of the returns from carload lots of sorted ore shipped to Trail were high. One car of rather less than 22 tons contained 5.40 ozs. gold, 288.50 ozs. silver and 5.45 per cent. lead per ton, with a gross value of \$5,323.20 for the lot. Another car of nearly 19 tons returned \$4,675.24; another of 20½ tons, \$4,085.80, and still another, of 20 tons, \$4,644.51, this last containing gold per ton, 2.44 ozs., silver 327.80



Providence Mine, Greenwood, Boundary District.

ozs., and lead 7.60 per cent. The company's statement of accounts for the year ended September 30th, 1903, showed that 543.3 tons of ore had been mined and that the net value of this—that is, after deduction of freight and treatment charges—was \$54,314.24, or just about \$100 per ton. Now that the ore is shipped without sorting the average value is lower, yet it is still high enough to pay well, the gross values contained in four carloads shipped in December and January last having been successively \$78.07, \$78.55, \$84.03 and \$75.71 per ton.

The Providence has paid two dividends during recent months, each of ten cents per share on the 27,600 issued shares, or a total of \$5,520. Its low capitalization is in its favour as a remunerative enterprise. The property has been paid for, substantial improvements have been and are being made out of current earnings, and the stockholders are obtaining a return on the money they have put into the company. The mine is under the management of Mr. Duncan McIntosh, and Mr. W. M. Law is secretary to the company. Greenwood people are proud of both the company and the mine and they maintain that there are other properties in the vicinity of the town that offer similar opportunities under like conditions of competent management and low capitalization.

ELKHORN.—The Elkhorn mineral claim adjoins the town of Greenwood on the north. To be literally correct it must be stated that its south-western corner is within the city limits. The claim was staked and the location recorded about ten years ago—two or three years before the enterprise of Mr. Robert Wood led him to start the town. Mr. Wm. Fowler located the Elkhorn, and later sold it to Mr. C. L. Thomet. The latter prospected the claim intermittently, but he was not fortunate enough to do his development work where it afterwards transpired there occurred the lead of high-grade silver-gold ore that has yielded the present owners of the property very profitable returns. Lanches of rich ore had previously been found occasionally in the course of prospecting, but no continuous lead that it would pay to work was discovered until after Messrs. Jas. Sutherland and Philip McDonald had secured the claim under a bond and had sunk deeper than had the several other parties who had successively taken the property under option and had



Elkhorn Mine, Greenwood, Boundary District.

given up work discouraged at the poor results they obtained.

The photograph of the Elkhorn reproduced herewith shows the dump at the mouth of the shaft well up the hill. The large building in the foreground is not a mine building, at least not in the sense that it is a part of the property yielding crude ore. It may be a mine, in another sense, to its owners, for there are thirsty people in a mining camp, and this establishment is the Elkhorn brewery. The Elkhorn shaft is down just 150 feet on the incline of the vein, the strike of which is about east and west and the dip to the south. Levels have been run at 82 feet and 150 feet depth, respectively.

When the mine was visited about the middle of February the east drift at the 82-ft. level was in 204 feet from the centre of the shaft and the west drift 80 feet to where a raise had been made to the surface to improve the ventilation. Owing to the rapid slope of the hill this raise had reached the surface at 35 feet from the level. Since it was made all the ore blocked out above this level between the shaft and raise has been stoped out and shipped to the smelter. As an offset

to the loss of depth going west a considerable gain has been made in the opposite direction, the face of the east drift being about 300 feet on the incline below the surface. As only about a third of the ore has been taken out east of the shaft and above this level there remains a comparatively large tonnage yet to be stoped.

At the 150-ft. level the east drift was in about 70 feet and that to the west about 75 feet. The latter was being extended by two shifts of men, with the object of coming out at the surface low down the hill side, so as to provide ventilation for this lower level and at the same time obviate the necessity of hoisting all the ore and waste from this level to the mouth of the shaft. The distance from the shaft to where the drift will emerge into daylight is about 270 feet. The bottom of the level will be eight to ten feet above the wagon road passing through the claim near the foot of the hill. After this connection shall have been made the ore sheds will be removed from their present position at the mouth of the shaft and be placed alongside the wagon road, and the man, horse and whim now required for hoisting purposes will no longer be needed. Conditionally that the vein lives through to the boundary line between the Elkhorn and Providence claims there is about 700 feet of drifting ground east of the shaft. With a similar number to the present force—14 men—employed and the monthly output of ore remaining at about 60 tons, there will be three years' work ahead to stope out this ground. About half the ore between the 150-ft. and 82-ft. levels has been stoped for the distance driven east of the shaft at the deeper level. It is not proposed to open up the mine below the 150-ft. level for the present, but it is planned to cut a station on this level, so that whenever the owners shall be prepared to resume sinking they may install here a steam hoist to facilitate the work of development at a lower level.

The Elkhorn ore is quartz mineralized with galena, zinc blende, iron and a little copper, values being principally in silver, of which there is an average of about 160 ozs. to the ton, and \$18 to \$20 in gold. Lead values are low and now that the ore is being treated at the Greenwood smelter these are not saved. At first the ore was sorted, the higher grade going to the Trail smelter and the second to Boundary Falls, but now all the ore taken out is sent to the local works without being sorted at all. The vein is variable in size, ranging from four inches to eighteen inches. A fault was met with early this year, the ore cutting out quite unexpectedly where the vein was at its widest. It was picked up again about 20 feet away from where thrown out of its course and its width was found to be maintained. Within a few feet of where this fault occurred some of the richest ore yet obtained from the mine was encountered. Some fine specimens of this rich ore, one of them between 100 and 200 lbs. in weight, were to be seen in Greenwood, this showing much native silver and gold.

Messrs. Sutherland and McDonald commenced work on this property in December, 1902. Up to March 1st, 1904, they had shipped about 460 tons of ore averaging in all values about \$100 per ton. They paid

\$7,500 for the claim, and at the time they bonded it this price appeared a good one for the seller. As it happened, though, it proved to be a low one for so rich a property, but the buyers took the chances, so they deserve the success they have achieved, for it is the outcome of their enterprising outlay and energetic development of a claim that several other parties had in turn failed to prove of particular merit.

E. P. U. MINES.—The group of mineral claims known as the E. P. U. Mines is situate on a high hill immediately southeast of the town of Greenwood, the western base of the hill being within the city limits. In 1902, shortly after public attention had been recalled, by the profitable opening up of the Providence mine, to the prospective value of the quartz veins known to occur on several claims in the vicinity of Greenwood, Mr. D. W. McVicar, of Nelson, obtain-



E. P. U. Mines Gravity Tramway, near Greenwood.

ed for himself and associates an option on the E Pluribus Unum and Lancashire fraction, then owned by Mr. Chas. R. Pittock and others. Some good-looking quartz had been found in a 20-ft. prospecting shaft sunk on the Lancashire fraction by Mr. Pittock and co-owners. Mr. McVicar deepened this shaft and ran drifts at the 25-ft. and 60-ft. levels. Later he started a tunnel where the vein outcrops lower down the hill. This tunnel is a drift on the vein and six weeks ago it was in 85 feet, with 150 feet more to be driven to reach the bottom of the shaft. More than half the ore between the shaft and the surface to the north of the shaft and above the tunnel has been taken out and stoping south of the shaft has also resulted in a lot of ore being produced. Alto-

gether about 225 tons have been shipped to the smelter, the greater part of it from the Lancashire fraction.

There are several known veins on the E. P. U. group, but only one has as yet been developed to any extent. The quartz occurring where the 85-ft. shaft has been sunk carries free gold and tellurides, the estimated average value of the ore in the bottom of the shaft being about \$125 per ton. The drift at the 60-ft. level has been run south into the hill and the quartz is solid in the face of the drive. On the surface the vein has been stripped along a distance of about 300 feet north from the shaft. Ore of good quality shows for this distance, assaying up to 7 ozs. in gold to the ton. The work done thus far indicates that the shoot of pay ore is at least 350 feet in length without having run out at either end.

The Marjorie and Goldfinch were later included in the E. P. U. group. The Goldfinch is not so high up the hill as the Lancashire fraction. The workings here include a tunnel, in 75 feet, with a shaft sunk about 100 feet from the tunnel level. A fine vein of quartz of good grade is also being opened up on this claim, and the ore is of similar character and value to that of the Lancashire fraction. Several carloads of ore have been shipped and the returns have left a good margin of profit.

A double-track gravity tramway has been constructed to facilitate shipment of the ore from the E. P. U. group. It is 937 feet in length and the difference in elevation between its upper terminal at the Lancashire fraction workings and its lower terminal on Twin Creek is about 700 feet. The wagon road haul from the foot of the tramway to the railway is about a mile, so the cost of shipping the ore is not great. The property is a promising one and its development is in capable hands, so it may be expected to give an excellent account of itself in the future.

ON MINING ENGINEERING FROM AN OUTSIDER'S POINT OF VIEW.

(A. R. Barrow, N.M.E.)

MINING engineering embraces the practice of so many branches of the profession of engineering, that the non-mining engineer, no matter how employed, cannot visit a mine without finding something to interest him. If we qualify the old saying that outsiders see most of the game, by supposing that they see some of it, it is possible that these notes of some impressions may furnish food for thought, even to specialists.

In prospects which are being developed, it is not unusual to see a tunnel being made in the side of a hill which, the foreman guesses, will eventually meet a ledge which he sees outcropping on the surface. Having suffered from missing trains and steamboats, owing to the guesses of local experts as to their times of departure, the outsider mildly wonders where the tunnel will arrive at, and goes on his way. In some cases inquiry will elicit the fact that the tunnel has been lined out in some fashion. One was surveyed with a pair of steel spectacles and a compass, the

needle of which followed its owner like his faithful dog. Although the owners of such prospects are often pressed for money, it would seem to be money well spent, if in properly laying out the workings.

Ascending to prospects which are called mines, with all the dignity of a manager and staff, the plans will sometimes be found to be on several different scales, undated and unsigned, with no comprehensive view of the entire workings. The surveys, in which they originated, have been made by many different men, usually by anyone who could be spared at the time from more pressing duties. This leads the non-mining pilgrim to speculate as to where the responsibility is placed if reliance on the plans at any time causes the waste of a few thousand dollars. It seems to be by no means a universal practice to show the boundaries of the claims with reference to the underground workings.

Our traveller, if from the older countries of Europe, will not be long in a mining district of British Columbia, before he notices the important part which timber plays in the surface constructions. If, however, he expects to get any information as to working strengths of our native timbers in definite figures, he will be woefully disappointed. He will probably not have heard of the collapse of any trestles or buildings, even if long resident, and will conclude that the factor of safety or the factor of ignorance, as a recent writer puts it, is very high. In many cases he will be in error, for the constructions have not been designed at all, but the dimensions of a timber have been settled when the last one has been put in place, or have been made to conform to those of a timber which is handy. It is true that this method answers the purpose, but will it continue to do so? The wealth of timber is not inexhaustible; we have no system of forestry or replanting. Would it not be as well to have some reliable data as to the safe working stresses on our native timbers, while there is sufficient timber left to provide the test pieces?

Another thing which sometimes strikes the unprejudiced observer, on reaching the surface, is that the surface itself seems to be arranged in the interests of the man with the wheelbarrow. Of course gravity is usefully employed even in those mines which appear the most eccentric from an engineering point of view, but as the mines are usually situated on the sides of hills, on which it is difficult to retain a footing, the most modest gravity could not entirely escape notice.

The non-mining engineer, if of the mechanical variety, will find much to interest him. The abundant sources of water power, the scope of which has been so much increased by electric transmission, have rendered the steam engine, as a prime mover, to some extent, unnecessary in this Province, so that the water-wheel or turbine will attract attention.

The miner's inch is then unearthed by the engineer, perhaps for the first time. He will learn, possibly from an article in a back number of this journal, that the miner's inch is, by law, the flow of water under a certain head, through an orifice of certain dimensions, or a certain number of gallons per minute. He thinks that this will repay investigation and finds that the

alternative legal quantities of water are by no means the same. After puzzling the matter out for some time he very likely concludes that the alternative legal flow of water bear somewhat the same relation to each other that the astronomical full moon bears to the Paschal full moon of the English Prayer Book. If there is any one thing on which the engineer, who is not a miner, may congratulate himself, it is that he can claim no part in the possession and use of such an inch as the miner's inch.

The flow of water through various orifices and under different heads has been the subject of many careful and costly experiments so that there is no occasion to undertake new ones locally; but it seems to be time to amend the legislation on the subject so that it shall no longer be ridiculous.

On arriving at another mine our traveller perhaps finds that it is using steam power. He may have seen on the road an engine being freighted to its destination, destitute of white lead, grease or other preservative for the working parts. His morbid curiosity shifts to the source of this steam power and he finds it is to be cordwood. Being accustomed to think in pounds of coal per horsepower per hour, after inquiring as to the consumption of cordwood, he will ask the weight of a cord of wood. Failing anyone who can solve such a riddle, he is driven to seek information as to the evaporative efficiency of the cordwood of the neighbourhood or indeed of any cordwood. If coal is being used, he may in a few cases, get definite figures as to the efficiency of Island or Crow's Nest coal. In some cases, the mine is so situated that both coal and cordwood are available. It is stated that one or the other is cheaper. How, then, is this knowledge evolved? How useful the process of reasoning would be in other fields of engineering!

The sizes and types of the boilers and engines employed are determined in some cases by an accurate knowledge of the work to be done and the good judgment of the superintendent; in some cases by what the manufacturer thinks suitable to the case. There are honest manufacturers, and if the data supplied to them are accurate and sufficient, satisfaction will result, but occasionally the machinery certainly looks as if it were made to sell to mines—to sell only. The most curious cases are where the size and type are determined by what the old mining man "guesses" will fill the bill. The curious visitor will do well not to probe these too deeply.

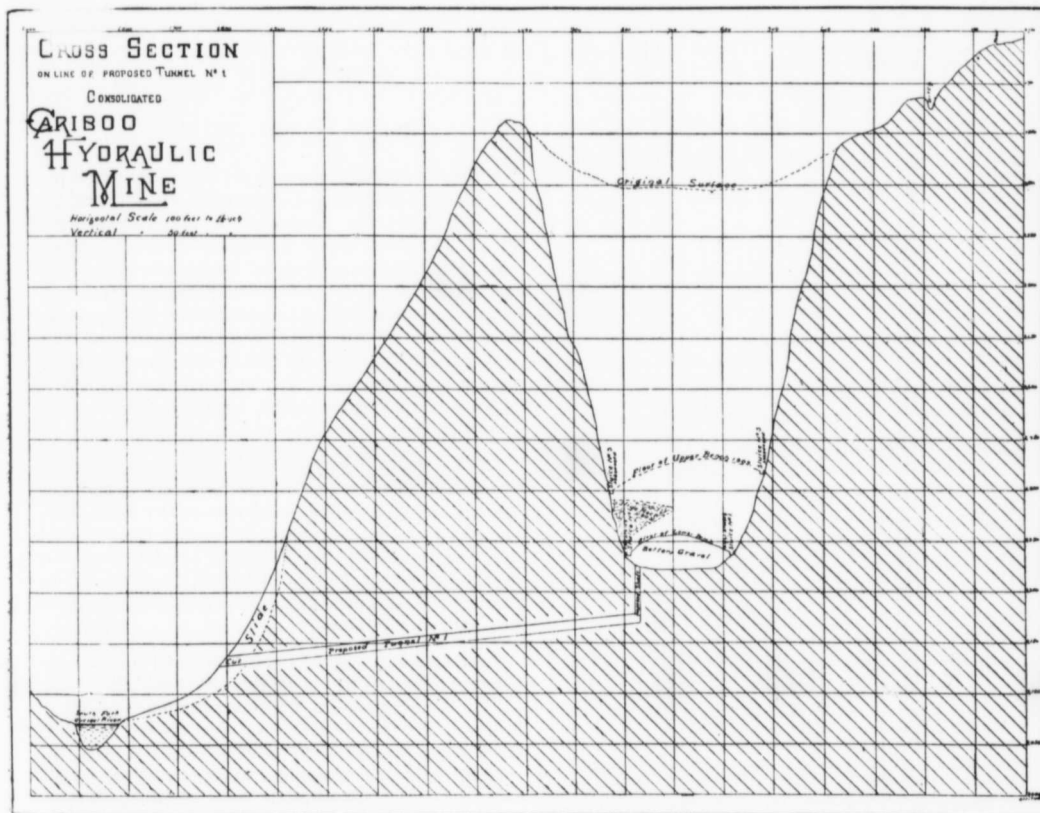
Washing out boilers does not seem to be popular and generally speaking, the stitch in time which saves nine, is left too much to the engine driver or fireman. If you can get his private ear you will learn that, in former times he has minded boilers for fabulous periods which were never washed out, had stays renewed or blew up. Regular periodical inspections appear to have commenced with the passage of a recent Steam Boiler Act. The boilers are sometimes grouped to save the wages of a second fireman. These wages are said to be more than the loss by condensation in long stretches of poorly protected steam pipes; but in view of the vague answers to particular inquiries how is this solution of a matter of hard cash arrived at.

The steam-driven air compressor is an object of interest, as being the machine in which, excepting those driven by electric motors, it is easiest and cheapest to measure the power consumed and going out. Its efficiency, if stated at all, is on the word of the maker when the compressor was new, but it is hardly ever determined from a diagram taken with a good indicator. Yet how much steam and air are going undetected through those leaky valves?

The non-mining man, following the source of the air, asks how much is lost in transmission and what power a certain drill at the face may be supposed to

have been greatly improved thereby. It is to them a fascinating subject, but the boiler has been left behind in comparison.

In much the same way, in the mining districts one hears much learned talk of geological formations by mining experts in the sleeping cars and by men in the streets who all have samples with them of the finest thing on the Pacific Slope or off it. This is, no doubt, an interesting subject, but in its acquirement and pursuit is there not a danger of neglecting the more vulgar subjects which mining has in common with the broad profession of civil engineering?



require under existing conditions, but his guide, beginning to be alarmed, sidetracks him into the dining room. The outsider finds here hospitality which could not be exceeded by any branch of the profession and stifles his desire to ask the cost of apple pie per ton of ore raised.

The foregoing reflections lead to the conclusion either that mining engineering is not hampered by the natural laws which restrict engineers generally or else that some mining engineers overspecialize.

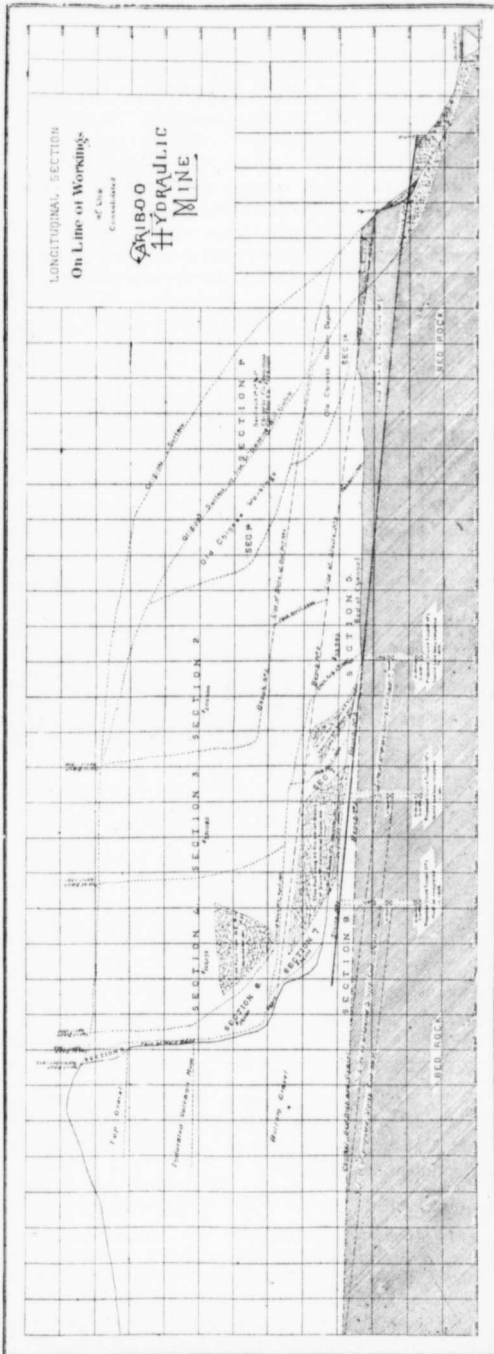
In the field of steam engineering, the engine, as apart from the boiler, has received disproportionate attention at the hands of engineers and its economy

Finally, might it not be within the scope of the Mining Association to collect reliable data of the nature indicated above, and possibly to use some of its funds in experimental research?

HYDRAULIC MINING IN CARIBOO.

IN consequence of the pressure on our space last month, the diagrams accompanying the report of the manager of the Consolidated Cariboo Hydraulic mine were unavoidably crowded out. They are now reproduced. Number one represents a cross section on the line of the proposed sluice tunnel and Number

two a longitudinal section on the line of the workings. The longitudinal section shows that all the



ground in the third bench, including sections Nos. 5

and 7, has been worked out up to the face of the main bank, leaving a shallow bench of ground between sluice No. 1 and bed-rock, as bench No. 4, extending from the point where sluice No. 1 goes above bed-rock at "A" about 1,110 feet to the face of the main bank. The manager has also pointed out that the bed-rock cut "B," and sluice tunnel No. 1, at site No. 1, should have been completed during the season of 1900, when all the ground included in sections 4, 5, 6, 7 and 8, and the fourth bench, included in section No. 9, might have been washed through the cut and sluice at a reduced cost of mining and sluice maintenance. During the present season it is proposed to drive a sluice tunnel from either site No. 2 or site No. 3, to afford an outlet to the dumps for the ground worked in 1905.

HINTS TO PROSPECTORS.

IN his preliminary report on the Boundary Creek district, published in the recently-issued Summary Report of the Geological Survey Department, Mr. R. W. Brock gives some useful hints to prospectors. Mr. Brock was occupied the greater part of two seasons in field work in the Boundary and these hints are the outcome of his conclusions after close personal observations extending over several months, and numerous enquiries made by him from mine managers, miners and prospectors, more or less familiarized by practical experience with local conditions. He remarks:

"Since there is a great deal of similarity between the geological conditions in the Boundary district and those of other parts of South-eastern British Columbia, so far as they are known, it is quite likely that the experience gained in the Boundary Creek district may be applied in the districts west of it. Some of the results of observations in the Boundary district may be summarized as follows:

"Ore may be found in any of the Pre-Tertiary rocks where conditions for mineralization were favourable.

"The chief condition for mineralization appears to be heavy Tertiary volcanism. Ore occurs (1) near vents through which the volcanic rocks reached the surface; and (2) where the country rock is extensively dyked by the pink or grey alkali-syenite porphyry. Limestone contacts in such areas should be prospected with particular care.

"On account of the irregular form which the ore bodies may possess and the complex nature of the rock formations, a careful and detailed study of the surface of the ground in the neighbourhood of the mines would be of practical assistance in the exploitation of the ore bodies. For the same reason development work must always be kept well ahead of the actual mining. Cross-cutting must frequently be resorted to, to determine the actual limits of the deposits, and to prove the existence or non-existence of parallel ore shoots. The limits of mineralization must be actually proved, and similarly, only that ore can be certainly

reckoned on which has been actually blocked out. In this connection diamond drilling can be resorted to with advantage.

"Prospecting by means of magnetic surveys might sometimes be successful, so far as the magnetitic and pyrrhotitic ore bodies are concerned. Since much of the surface is drift-covered, and the ore bodies do not as a rule have any oxydizing effect on the soil above, this is often the only way in which any indication of the spot where a test pit should be sunk can be obtained. It might also be applied in searching for ore bodies in the mines themselves. It has not yet been attempted in this district.

"Where the ore occurs at a limestone contact, the limestone wall may often be used for following the ore, it being kept in mind that the ore does not always follow strictly along the contact, and that the limestone may pinch out without causing the ore to likewise disappear. The dykes in some cases may be used in the same way.

"The pyrrhotite and magnetite should always be assayed, as barren-looking material may contain good values. The minerals in the ore and the conditions where pay values occur should be carefully studied with a view to ascertaining which minerals carry the values, and what were the causes which produced the concentration of values. The porphyry dykes themselves, while not mineralized in the same way as the country rock, may in places prove auriferous. In a specimen from a similar alkali-porphry dyke, from the Valkyr mountains, east of Lower Arrow Lake, examined last winter, free gold as a primary constituent was plainly visible even with the naked eye.

"Since, with the exception of certain deposits in Copper Camp, there is no zone of oxydation and secondary enrichment in the large deposits, while the general conditions remain unchanged, no loss of values is to be expected in depth.

"Platinum should be tested for in the copper ores and in the quartz ores. Gravels of streams draining areas of serpentine should be panned for platinum. In places the nuggets are some times brown or lead-coloured, but become silvery-white when treated with nitric acid. The serpentines themselves, especially where containing chromite (a magnetite-like material), might be assayed for this metal.

"In the oxydized type of copper deposit a zone of enriched sulphides occurs between the oxydized minerals and the pyrites. Below this zone of enrichment the deposit may or may not have sufficient values to pay for working. Sufficient work has not been done to determine the lower limit of the zone of enrichment.

"The quartz veins merit more attention than has been given them.

"In prospecting it is to be remembered that float may have been carried a considerable distance, even across valleys, by former glaciers. The general course of the latter was about S. 30 degrees E., but it was influenced by the local topography."

THE MINERAL PRODUCTION OF CANADA IN 1903.

THE recently issued preliminary statement of the mineral production of Canada for the year 1903, prepared by the Section of Mines of the Geological Survey, under charge of Mr. Elfric Drew In-gall, is as follows:

SUMMARY OF THE MINERAL PRODUCTION OF CANADA.

<i>Metallic</i>	Quantity.	Value.
Copper..... Lb.	43,281,158	\$ 5,728,261
Gold.....		18,834,490
Iron ore (exports)..... Tons	368,233	922,571
Pig iron from Canadian ore..... "	42,052	797,838
Lead..... Lb.	18,000,000	767,660
Nickel.....	12,505,510	5,002,204
Silver..... Oz.	3,182,000	1,700,779
Zinc..... Lb.	900,000	48,600
Total Metallic.....		\$ 33,707,403
<i>Non-metallic.</i>		
Actinolite..... Tons	550	3,108
Arsenic..... "	257	15,420
Asbestos..... "	31,780	891,033
Asbestic..... "	10,548	13,819
Chromite..... "	3,383	33,830
Coal..... "	7,996,634	15,957,946
Coke..... "	544,132	1,663,725
Corundum..... "	no returns	
Feldspar..... "	13,228	18,066
Fire clay..... "	2,317	2,505
Graphite..... "	738	23,745
Grindstones..... "	5,538	48,302
Gypsum..... "	307,489	384,259
Limestone for flux..... "	277,452	259,244
Manganese ore (exports)..... "	135	1,889
Mica..... "		159,473
<i>Mineral pigments—</i>		
Barvta..... Tons	1,163	3,931
Ochres..... "	6,226	32,440
Mineral water..... "		100,000
Moulding sand..... Tons	3,568	7,256
Natural gas..... "		168,900
Peat..... Tons	1,100	3,300
Petroleum..... Bbl	461,336	922,672
Phosphate..... Tons	1,329	8,214
Pyrites..... "	33,530	126,133
Salt..... "	53,537	334,088
Talc..... "	688	2,064
Tripolite..... "	835	16,700
Total non-metallic.....		\$ 21,202,062
<i>Structural Materials and Clay Products.</i>		
Cement, natural rock..... Bbl	92,252	\$ 75,665
Cement, Portland..... "	627,741	1,090,842
Granite.....		150,000
Pottery.....		200,000
Sands and gravels (exports)..... Tons	355,792	124,006
Sewer pipe.....		317,970
Slate.....		22,040
Terra Cotta, pressed brick, etc.....		386,532
Building material, includi'g bricks, building stone, lime, tiles, etc.....		5,650,000
Total structural materials and clay products.....		\$ 8,017,045
Estimated value of mineral products not returned.....		300,000
Total, 1903.....		\$63,226,510

The tons used in this statement are short tons, of 2,000 lbs. The average prices used in computing values of metals are: Silver, 53.45c.; copper, 13.235c.; nickel, 40c.; lead, 4.237c. The coke reported is all oven coke; gas coke is not included.

It is to be borne in mind that the only general and

definite standard for valuing the varying and various products of the metal mining industries of the country is that herein adopted, viz., the final value of their metallic contents at the average market price for the year.

This reduces them to a common datum line for the purposes of this general table, and results in such uniformity of statement that the figures are reasonably comparable from year to year, in illustration of the fluctuation and growth of the different industries.

The non-metallic minerals having a tangible use or value as individual minerals are put down at the average spot value for cash.

While this plan, of course, results in some discrepancies, it is adopted as the best attainable method for the purposes of this general statement, which is practically an advance presentation of the mineral industry as a whole.

The detailed presentation of the particulars of the various subordinate industries from other standpoints is reserved for the annual reports of the Mines Section.

The total production of pig iron in Canada in 1903, from Canadian and imported ores amounted to 297,885 tons, valued at \$3,742,710, of which it is estimated 42,052 tons, valued at \$707,838 should be attributed to Canadian ore and 255,833 tons, valued at \$3,034,872 to the ore imported.

The value of the total production reported for 18 years past has been as follows:

1886	\$10,221,255	1895	\$20,648,964
1887	11,321,331	1896	22,584,513
1888	12,518,894	1897	28,661,430
1889	14,013,913	1898	38,697,021
1890	16,763,353	1899	49,584,027
1891	18,976,616	1900	64,618,268
1892	16,628,417	1901	66,339,158
1893	20,035,082	1902	63,885,999
1894	19,931,158	1903	63,226,510

The remarkable increase in the period from 1898 to 1900, inclusive, was due to the gold discoveries in the Yukon.

The main feature presented by the mineral industry of Canada as a whole consists in the decrease in the grand total of production of a little over 1 per cent. in comparison with the figures for 1902. A comparison of the items for the two years shows the reason for this falling off. The shrinkage in the production of the Yukon placer gold-fields accounts for \$2,250,000 of the total diminution of over \$2,500,000 in the gold output of the country. This is augmented by over \$1,000,000 decrease in the values of the output credited to others of the metallic class, pig iron, silver, lead and nickel. To offset this the copper, iron-ore and zinc industries exhibit increases, aggregating nearly \$1,500,000, leaving a minus amount of a little over \$2,000,000, against the metallic class as a whole, equivalent to nearly 6 per cent.

Advances were shown in several of the non-metallic class, notably in coal and coke, limestone, mica, salt, cement, and in some of the clay products. The total growth in all the non-metallics showing increases amounted to nearly \$2,000,000, the advance in the coal and coke output accounting for over \$1,600,000 of this. As against these non-metallic industries showing in-

creases, decreases are exhibited in the values of the production in asbestos, natural gas, petroleum and a number of others, aggregating about \$500,000, leaving a net gain in this class of somewhat under \$1,500,000, or a little over 5 per cent. to offset the above mentioned falling off in the metallic class, the final difference in the grand totals for the two years amounting to nearly \$660,000, or a proportional decrease of close on 1 per cent.

Decreases, both in quantities and values, have been the chief characteristic of the leading metallic industries, with the notable exceptions of copper and nickel. In the latter case, however, the considerable increase in the output has been more than offset by the lower valuation which has been given to the metal following the drop in the average market price for the year. The increase in the copper output was, on the other hand, considerably enhanced by the higher average market price of the metal. It is interesting to note also that with regard to pig iron, lead and silver, higher market prices modified the heavy falling-away in these items. The whole of the group classed as metallic, shows a decrease of 5.8 per cent.

In the non-metallic class the more important contributors exhibit substantial increases in quantities, but lower prices reversed the effect in the case of asbestos and lessened the advantage gained in the case of coal and cement, coke only showing a slight gain. In the grand totals of the non-metallic class the figures for structural materials and clay products show a slight increase of 1.5 per cent., all other non-metallics being credited with an advance of over 6.6 per cent.

The relative importance of the different mineral industries contributing to the grand total will be apparent from an inspection of the above table, in which the figures account for all but about five per cent. of the aggregate. As usual, gold, together with coal and coke, constitute Canada's most valuable mineral assets, gold forming 29.8 and coal 27.9 per cent. of the value of the whole mineral output of the country. To the metallic class as a whole must be credited 53.31 per cent. of the mineral output, the structural material division contributing 13.15 per cent., and the other non-metallic products a little over one-third, or 33.53 per cent.

The per capita value of the total mineral products for 1903 was \$11.29, as compared with \$2.23 in 1886, the first year for which figures are available.

Gold.—A decrease of \$2,500,000 is shown, of which \$2,250,000 is to be ascribed to the decreased output from the Yukon district. The Yukon output for the year, \$12,500,000, is based on the receipts of Canadian Yukon gold at the United States Mint at San Francisco and other receiving offices. The total from other districts was \$6,584,490.

The contributors to the total, as formerly, were Nova Scotia, Quebec, Ontario, Saskatchewan, the Yukon Territory and British Columbia.

Silver.—Silver production, according to present indications, shows a considerable decrease, over a million ounces, compared with last year's output. Over

90 per cent. of the production is obtained from British Columbia.

Lead.—The production of lead in 1903 has been estimated at about 9,000 tons. The exports, according to customs returns, were 9,314 tons, valued at \$426,466. The production is practically all the output of British Columbia mines, no return having been received from Eastern Canada.

Copper.—The copper contained in ore, matte, etc., shipped from Canadian mines in 1903, was about 21,640 tons, an increase of 2,238 tons, or over 11.5 per cent., over the previous year's output. In Ontario and Quebec there was little change, perhaps a slight falling off, the increase being practically all in British Columbia. From the Sudbury district, Ontario, about 13,832 tons of high-grade matte were shipped, containing 3,576 tons of copper. In British Columbia shipments of ore from the Boundary district were approximately 625,000 tons in 1903, and from Rossland about 377,000 tons. For statistical purposes the copper is valued at the average price for the year of electrolytic copper in New York, viz., 13.235 c. per lb. This is an increase on the average price for 1902 of nearly 14 per cent.

Nickel.—The following were the results of operations on the nickel-copper deposits in 1903:

	Tons.
Ore mined	136,033
Ore smelted	207,030
Matte shipped	13,832
Matte in stock at end of year	1,246
Copper contents of matte shipped	3,576
Nickel contents of matte shipped	6,258
Value of matte shipped	\$2,686,469

According to customs returns exports of nickel were as follows: To Great Britain, 1,335,677; United States, 11,363,470; other countries, 80; total, 12,699,227 pounds.

Zinc.—About 1,000 tons of zinc ore, worth \$10,500 were shipped to Swansea, Wales, from the Long Lake zinc mines in the county of Frontenac, Ont. No returns have been received of zinc production in British Columbia.

Iron.—Exports of iron ore were 368,233 tons, valued at \$922,521. About 81,035 tons of iron ore from Canadian mines were charged to blast furnaces in Canada and valued at the furnace at about \$247,229. In addition to the above Canadian ore, 485,911 tons of imported ore, valued at \$823,147, were used in Canadian furnaces. The total quantity of pig iron manufactured from both Canadian and imported ores was 297,885 tons, of which 19,614 tons were made with charcoal as fuel and 178,271 tons with coke.

Arsenic.—The arsenic plant at Deloro, Ont., was worked for three months only, producing 257 tons of white arsenic, valued at \$15,420. Exports of arsenic were 198 tons, valued at \$10,583.

Coal and Coke.—An increased production is reported from all the provinces in which coal mining is being carried on. The Dominion Coal Company, the largest producing company in Nova Scotia, increased

its output, notwithstanding the serious check caused by the fire in Dominion No. 1 colliery in March. The Nova Scotia Steel & Coal Company also shows very largely increased output from the Sydney mines. Considerable activity has been displayed in the operation of the mines in the Northwest Territories, especially on the eastern slope of the Rocky Mountains, in the district about Blairmore.

In British Columbia, the output of the Crow's Nest Pass Coal Company exceeded that of 1902 by 49.8 per cent., and the company has made substantial progress in the development of its properties. On the coast the Western Fuel Company is actively operating and developing the properties formerly worked by the New Vancouver Coal Mining & Land Company. The Wellington Colliery Company has been opening up a seam of anthracite coal, from which it is expected shipments will soon be made.

Corundum.—Returns have not yet been received of production of corundum, but railway shipments at Barry's Bay are reported at 1,000 tons, which may, however, include corundum ore as well as grain corundum.

Asbestos.—The production of asbestos, divided into crude and mill stock, was as follows: Crude, 3,134 tons, valued at \$361,867; mill stock, 27,995 tons, valued at \$554,021; total, 31,129 tons. Exports of asbestos, according to Customs returns, were 31,780 tons, valued at \$891,033. The product was all obtained from the Eastern Townships, Quebec.

Cement.—The production of natural rock cement is at present small in comparison with the output of Portland, and the sales in 1903 were less by 35,679 bbl. than in 1902. Detailed statistics for 1903 were as follows, in barrels:

	Natural.	Portland.
Cement sold	29,252	627,741
Cement manufactured	96,152	714,136
Stock Jan. 1, 1903	23,000	41,991
Stock Dec. 31, 1903	26,000	128,386
Wages paid	\$29,550	\$400,000

The imports of Portland cement in 1903 were 135,394 tons, valued at \$1,060,696. This is equivalent to about 773,678 bbl. of 350 lb. each.

Exports.—The following table shows the chief items of minerals exported during the year:

Product	Quantity	Value
Arsenic, lb.	395,573	\$10,583
Asbestos, tons	31,780	891,033
Coal, tons	1,954,629	5,219,860
Gold in all forms		17,566,540
Copper, fine, in ore, etc, lb.	37,039,175	3,702,368
Copper, black or coarse, etc; lb.	203,701	25,226
Lead in ore, etc, lb.	18,624,303	426,466
Nickel in ore, matte, etc., lb.	12,699,227	1,116,099
Platinum in ore, con., etc, oz.	283	304
Silver in ore, etc, oz.	3,360,192	1,989,474
Mica, lb.	956,244	196,020
Iron ore, tons	368,233	922,571
Graphite, crude, cwt.	8,235	26,230
Pyrites, tons	21,067	59,604

The gold exported was chiefly in the form of gold dust, nuggets and the like, or contained in ores.

THE REMINISCENCES OF A PIONEER
PROSPECTOR.

A PROSPECTOR of fifty years standing. How much is expressed in that brief description!

The man who has lived such a life, has lived. To follow the career of a prospector for any lengthy period, one must necessarily be a man. Endurance, perseverance, pluck, self-control, these are the qualities that went to make up that fifty years' record of which Mr. James Moore, the holder, has every reason to be proud—and British Columbia is proud of it, too. As the sole survivors of the party of miner which located the first mine in what was then New Caledonia, and now known as the mainland of British Columbia, in March, 1858. Mr.

Moore figures as the pioneer of the pioneers of the country; but to meet our old friend in ordinary every day life, much less after hearing him at the recent Mining Convention, "spout" most effectively for upwards of an hour, it is difficult to realize that he is over seventy years of age, and that the major part of this long life has been spent at one of the roughest and hardest of callings. But here is his history from his own lips:

"Tell you my story," he repeated. "Well, all right. I'll try, but I'll just begin at the interesting part and cut out the first chapter or so. In '51 I came out to the Pacific Coast from Ireland, this by-the-way. In San Francisco in those early days, if you wanted any excitement, the proper thing to do was to join the Fire Department. Practically every man in the town was a member of the brigade, and it was at one of our meetings, in February, 1858, to be exact, that I first heard of British Columbia. The news that gold of good quality had been found in the Thompson River was announced to us at that meeting by the purser of the *Otter*, and I well remember his exclaiming with conviction as he concluded his remarks, 'Boys, you may take my word for it, the next big rush will be to the Fraser River.' Well, a few days later a company or syndicate was formed in San Francisco, to equip a party to proceed to the new goldfields and ascertain whether they were as rich as report stated. I was a member of that party, and after arriving at Whatcom we took a small boat and rowed from Point Roberts up the Fraser, prospecting *en route*. We struck nothing

worth while, however, until we reached Hill's Bar, but the prospects here repaid us well for the hard work we had gone through in bucking the swift current of the river, for at the upper end of the bar we made \$100 a day per man with rockers, the lower end yielding about an ounce a day and the middle of the bar, \$50. Meanwhile we ran out of provisions and some of us therefore went back to Fort Langley to replenish our stock and report our find. But all the grub we could get for love or money was some black flour, and I remember how I missed the sugar. Just about this time a sloop came up the river and anchored off our bar. At first we hoped she was laden with provisions, but instead of good food, her hold was full of bad whiskey, which the captain proceeded to sell to

the Indians at the rate of five dollars a bottle, receiving pay in gold dust. This was all very well, but it meant danger to us, and so wishing to be quite fair we proposed to buy the liquor at a fair price, but as our offer was refused, we proceeded to confiscate the spirits, and promised the trader a hempen neck-tie if he did not make himself scarce within ten minutes. He left in less than ten minutes. The Indians, however, were not at all pleased, and we very nearly had some trouble with them, especially after one of our party had broken a shovel handle over the head of a particularly obstreperous buck. But just then the barge of H. M. S. *Satellite* with Governor Douglas on board hove in sight, and the natives were speedily pacified with a 'blow out' of molasses and hard-tack. Oh, yes, the Governor was a great man.

I remember he appointed George Perrier first J. P. at Yale. Perrier said he felt he was well qualified to act as a magistrate as he 'had read Blackstone.' 'Tut, tut, man,' Douglas replied, 'exercise a little common sense and never mind Blackstone.'

"In April, we gave Billie Ballow, a Californian expressman, a letter to our friends in San Francisco, acquainting them with the news of our discoveries, and then in the fall of '58 a number of us started from Yale with a boat-load of provisions up the Fraser, and the river being at the time at its lowest stage, we had a very hard time indeed in making the ice portages. We ate our first Christmas dinner in British Columbia on *Chatman's Bar* in company with McArthur, formerly a Hudson's Bay Company's



Mr. James Moore, a pioneer Cariboo prospector.

factor, who was taking his boats up the river.

"Was the dinner a good one?"

"You bet it was, particularly the plum duff. Well, two days later McArthur started ahead of us, and we followed on the third day. We had not gone very far when we saw a boat bottom up and a man clinging to her keel. We rescued the man, who belonged to McArthur's party, but it was a close call for the rest of us, as we very nearly got into a strong riffle; if we had, that would have been the end of my adventures instead of the beginning. At last we reached Lytton, and found that a number of other prospectors had arrived at this point by the overland route! Capt. Frevalaux had been appointed Gold Commissioner, and he was a very strict man. For example he confiscated all the liquor brought to the town by different parties. In the long winter evenings, however, we would go to the Commissioner and give him the hint that he had been made a fool of, so far as those liquors were concerned. They weren't spirituous at all, we would tell him, but just kegs filled with plain water. Then the Gold Commissioner would be quite sure we were misinformed, but to prove it, he'd tap a keg or two and when we'd taken a number of samples, the evening would close by our putting the Commissioner to bed.

In the winter of '58 and the spring of '59, I did some prospecting round Lytton, locating a bench above Van Winkle Bar on the Fraser. This paid about \$25 a day, and I worked the claim for two months or so, but abandoned it as in those days we were looking only for big values. When the spring of '59 had well set in, several prospecting parties arrived at Lytton from the Coast and a lot of us, myself included, started inland. We found nothing of particular value *en route*, but we eventually reached Horsetly, and here we discovered the richest claim ever worked in Cariboo, the Blue Lead, now known as the Ward claim, which yielded us (there were twelve men in our party) \$100 a day per man working with rockers. Forty years after I re-visited this, our first location in old Cariboo, and Tim Deasy, the foreman, showed me a pan of gravel taken not 200 feet away from where he had worked, and it seemed to me that half the gravel was gold. But what impressed me most was the contrast, the difference of methods employed—between the old days and modern times. There is a wide difference between winning gold by rockers and by hydraulic elevators, and where we had no other illuminant besides that afforded by our camp fires, now these big companies are not content with less than electric light.

In the fall of '59, Hans Helgesen, Duncan McMartin, Neil Campbell and James Kennedy, members of our party, proceeded to Quesnel River, but I and others returned for a short time to Victoria. That winter Kennedy, hunting with a party of Indians, shot the first cariboo killed by a white man in the country, and that is how the district came to receive its name. In the meantime Keithley Creek was discovered, George Weaver landing the first prospects on this stream, and his partners, 'Cap.' Bowen, Fred Black, John Rose and a few others, staked some rich ground at the mouth of the creek. In the fall of '60 'Cap.'

Bowen, Weaver and 'Black' Martin went on a prospecting trip and presently camped on Antler Creek. Bowen and Weaver here found some big prospects, but they had left Martin in camp and decided not to let him in on the discovery. I had meanwhile got back to Lytton and met Bowen when he came down. He took me aside and with a great air of mystery said that he would want to see me particularly in the spring. Then he went off to Victoria to try and obtain a special concession from the Governor of half-a-mile of ground on Antler. But somehow in the winter the news leaked out and then followed a regular stampede, over Bald Mountain to stake claims on this latest El Dorado. It was a rich creek, too. I remember one case. Helgesen and his partner Hendryx had but a hundred feet of ground between them. In six weeks they rucked out over \$9,000. From a crevice they got out as high as \$400 to half a pan of gravel, and frequently a bucket of dirt would run six ounces. After they believed the mine to have become exhausted they declared a dividend of \$80,000, having recovered altogether \$130,000 worth of gold. They subsequently sold the claim to some Italians who got enough money out of the property to take them back to Italy and set them up as rich men in their own country. In the summer of '61 I went into Antler myself, with a pack train of provisions, chiefly flour and bacon. The former I sold at the rate of a dollar a pound and bacon at \$2.50. With my profits I bought a large train of mules, but coming out in the fall, I lost them all in a snow-storm. In the meantime some of my old partners were making from six to nine ounces a day shovelling dirt into sluice boxes. They staked a claim for me on Antler, which was jumped, however. At the time I was sorry to lose it, but after all it didn't make much difference, for this particular claim happened to be a blank and quite valueless.

"Williams Creek was discovered in '61 by a party of Germans—Dutch Bill and others. Bill's claim, by-the-way, turned out the poorest on the creek. I was packing at the time, but still I got an interest on Williams and worked it that year, but the results were not satisfactory and so I abandoned my claim. In '62 I tried to re-locate, but the men owning the adjoining ground, which proved very rich, had forestalled me. Well, I didn't stake any more ground until '66 when I located on Cedar Creek, and for some time worked a claim that paid about an ounce a day and in '68 I discovered a mine on the North Fork of Quesnel, which I worked for about five years, taking out from two to six ounces to the sett of timbers. After that I went to the Cassiar country. It seemed now that my luck had abandoned me, for I got ill and had to remain at Glenora Landing all summer. My partner told me at the end of the season that our claim had not paid and sooner than pay the assessment I relinquished my interest, on the understanding that the adjoining claim was to be staked for me, but this was never done. I afterwards found out my partner had taken out \$6,000 that season and subsequently the claim yielded \$20,000. The adjoining claim, which

was to have been mine, on McDame's Creek, paid its owners over \$40,000. It was three years before I began to recover my health, and after a long spell of idleness in Victoria, I returned to Cariboo in '78 and located a claim on Snowshoe, which yielded me \$40 a day for a short time, but the devil was still in the luck, for didn't I just then while working at a claim on Four-Mile, a branch of Keithley, meet with the accident that near put an end to me altogether, and left me blind of one eye ever since. We were driving a tunnel, and the only fuse obtainable was defective. We were anxious to get through with the tunnel and so took chances with the fuse. But that's where I got left. It was some time before I was much good for mining after that, so I kept store at Keithley for Veith & Borland for a spell. As soon as I was able, however, out I went prospecting again, and located the ground on Spanish Creek, known as the Moore claim—a large channel, but requiring to be opened up. The upper part of the gravel averaged about a dollar to the square yard. What I wanted to do was to prospect the deep ground, but my partners over-ruled me, on obtaining a small prospect alongside the rim, which gave from one to nine ounces to the sett of timbers. They have never crossed the channel nor prospected the deep ground, although they have run over 2,000 feet. However, I threw up my interest and located some claims on Bear Creek in 1894, working them until my money gave out. I also located some ground at the mouth of Morehead Creek which I sold to the Consolidated Cariboo Hydraulic Company, and this is supposed to be the best ground now owned by that company. And that brings us up to modern times. I am still mining and expect to make a big stake yet."

MINING IN THE YUKON.

THE following information relating to mining in the Yukon Territory has been taken from the annual report for the year ended June 30, 1903, of the Commissioner:

"In regard to the gold mining industry in the Yukon, the returns for the last year are satisfactory, and the promises for the future are more so. Preparations have been made for an unusual amount of work during the coming season. Whether the gold output for the present summer shall equal, exceed or fall below last year now depends wholly upon the rainfall. If the season is as wet as last year, or more so, the output will exceed last year's. If there is anything in the nature of a drought the output will decline proportionately with the severity of such drought.

"The gold output of the Yukon depends as completely upon the rainfall as do the agricultural crops in other parts of Canada. It depends more now upon the rainfall than it did formerly, when water was used chiefly for supplying the sluice-boxes and enabling the separation of the gold from the pay-dirt therein. This will be apparent from knowledge of the fact that now much dirt is removed from place by hydraulic methods, and for this purpose more water is required than when the dirt was handled entirely by means other than hydraulic up to the time it was placed in the

sluice-boxes. I do not, however, anticipate as large an output this year as last, for the reason that last year was an unusually rainy season, and still more because many properties which yielded largely last year, and are still capable of yielding largely, will produce very little, owing to the fact that enormous plants are being installed for working them, and these plants cannot be expected to be more than finished and ready for work before fall. From these operations I expect much in the season of 1904.

"The new discoveries have not been worked as largely as expected, although there is little doubt of the great value of some of them.

"The Duncan Creek country is certainly good. The shallow diggings on that creek and vicinity show great promise, but the depth to bed-rock on the creek has prevented any large development until machinery was available, and this could not be until a road was constructed. Such road will be constructed this year; some machinery will then go in, and the next season will, I believe, justify the great faith of many excellent miners in the richness of Duncan Creek.

"A recent strike has been made in the Alsek country, in the vicinity of Lake Dezadeash, and about 100 miles south of Whitehorse, from which the citizens of Whitehorse expect much. It is too soon to speak in regard to this.

"That fortunes are still made in the Yukon is shown by an incident of the year's mining operations. The North American Transportation & Trading Company let a 50 per cent. lay to three men on claim No. 28, Upper Bonanza, from which little was expected. They took out during the winter, and washed up in the spring, ground from which was obtained \$204,000 net. This sum was the return from 22,000 buckets of dirt, each bucket, therefore averaging over \$9. A bucket contains 6 pans, and there are 150 pans in a cubic yard of dirt. The company obtained \$102,000 as their share, and the fortunate laymen divided the same amount among themselves.

"Some progress is being made in quartz development, and it is hoped that diamond drills will be provided, which will aid such development, and also enable the copper properties at Whitehorse to be proved.

"Quartz in place has been located on what is known as the Violet Hill group off Eldorado Creek. Some territorial assistance has been voted to aid the development of quartz and other mining, and I propose to devote this to proving the Violet Hill group, as this is the most promising presentation of quartz, and proof of its value will stimulate the prospecting and development of quartz mines. I trust, before another year expires, to be able to report at least one well-established quartz mining venture.

"The temporary removal of duties on certain classes of mining machinery has, in my opinion, been amply justified by the importation of several large plants, which I believe, will next season prove large producers, and more than return to the Government the loss of duties, and will, if successful, create a still larger demand for similar machinery after the remission of duty has ceased to operate."

The report of the Assistant Gold Commissioner.

after dealing with financial matters, continues as follows:

"Duncan Creek district has come to the front considerably, and although it has not produced much gold, still everything tends to indicate that the district will be in the near future a large producer. At present there are about 800 claims recorded.

"The Clear Creek district has not proved yet to be a large producer, but I understand from claim owners interested in that part of the country, that the placer claims on Clear Creek and tributaries may yet become fair producers.

"During the last fiscal year the mining district of Forty-mile was divided into two separate districts, namely: one district to be known as the Forty-mile district and the other as the Sixty-mile district. This division was made in order to accommodate the miners on Miller Creek, Glacier, Bedrock and other creeks tributary to Sixty-mile River, near the international boundary line. From information received from the Mining Recorder for Sixty-mile district, everything tends to indicate that the claims which were the first producers of gold in this country in 1894, 1895 and 1896, will be good producers in the future; and a lot of gold has been taken during the last twelve months from claims in that locality which were abandoned at the time of the discovery of gold on Bonanza, Eldorado and Hunker.

"Stewart River district has not developed to the extent of the indications of a year ago, still I understand from a number of miners on Henderson Creek that a large number of claims in the locality can pay good wages.

"As regards the Pelly, Hootalinqua and Dalton Trail districts, there has been no new development during the last fiscal year, and no new ground was relocated in those districts.

"As regards the Whitehorse district, there has been no development of any kind during the last fiscal year in placer mining, but there has been a large amount of development work in quartz and copper mining, and several Crown grants have been applied for in connection with mineral claims in that district."

The report of the Crown Timber and Land Agent has the following references to coal lands:

"Of coal lands 3,640 acres were applied for during the past year by 20 applicants. The status of these is as follows: 6 applications, or a total of 880 acres, approved and portion purchase price paid, 3 applications, or a total of 680 acres cancelled, 5 applications, or a total of 800 acres withdrawn, 6 applications, or a total of 1,280 acres in abeyance.

"A considerable amount has been expended by the companies in exploiting coal, and I think that before very long coal will be substituted for wood as fuel in this territory. The Five Fingers Coal Company, the North American Trading and Transportation Company and the Coal Creek Coal Company will ship coal to Dawson this year, the latter company being now at work constructing a railway from their coal lands to the Yukon River."

Summarized, the receipts for the year at the office of the Gold Commissioner were as under:

Free miner's certificates.....	\$80,134 50
PLACER.	
Grants.....	\$27,550 00
Renewals.....	78,135 00
Re-locations.....	28,765 00
Registered documents.....	18,460 25
Certificates of work.....	11,332 00
In lieu of assessment.....	14,200 00
Abstracts.....	633 00
Amended applications.....	60 00
Water grants.....	632 50
Inspection of work.....	217 00
Sundries.....	104 14
Advance deposit.....	2,362 08
	182,450 97
QUARTZ.	
Grants.....	5,220 00
Certificates of work.....	2,615 00
Certificates of partnership.....	225 00
Registered documents.....	1,553 85
In lieu of assessment.....	2,100 00
Crown grants.....	6,111 36
	17,825 21
HYDRAULICS.....	9,114 46
Total.....	\$289,525 14

DOMINION SUPERINTENDENT OF MINES' REPORT.

INCLUDED in the annual report of the Department of the Interior is the report of Dr. Eugene Haanel, Dominion Superintendent of Mines, for the fiscal year ended June 30, 1903. The following are excerpts therefrom:

"During the fiscal year ending June 30, 1903, 36,295.69 oz. of bullion, valued at \$568,888.19, representing 509 deposits, were received and assayed at the Dominion Assay Office, Vancouver. These deposits were derived from the following sources:—

Source.	Deposits.		Value.
	No.	Oz.	
Yukon.....	136	12,231.08	194,778 58
British Columbia.....	345	22,112.46	340,683 85
North-west Territories.....	13	340.65	5,679 67
Ontario.....	8	1,159.32	20,202 50
Alaska.....	7	452.18	7,543 59

"From this table it is seen that comparatively few deposits are obtained from the Yukon, and that most of the deposits come to us from British Columbia. In comparing the total amount of business done by the assay office during the past fiscal year with that done during the preceding fiscal year, as shown by the following table—

Fiscal Year.	Deposits.		Value.
	No.	Oz.	
1901-1902.....	671	69,925.67	1,153,014 50
1902-1903.....	509	36,295.69	568,888 19

it will be observed that the business done during the past fiscal year is only about one-half that of the previous year.

"This decrease of business is due to several causes: 1st. The inducement offered the Yukon miner to deposit his gold in the assay office at Vancouver by giving him a refund of 1 per cent. of the royalty paid by him at Dawson on his gold, has been withdrawn by

an Order in Council dated June 26, 1902, rescinding the Order in Council dated July 26, 1901, which provided for such refund. Although the Order in Council of June 26, 1902, provides for the free assay of the gold deposited by the Yukon miner in person in the assay office at Vancouver, and puts him, therefore, in the same position in which he would be if he deposited his gold in the United States assay office at Seattle, there is no reason for the Yukon miner on his way to the States to stop off in Vancouver to deposit his gold in the Dominion of Canada assay office, which offers him to special advantage over that at Seattle. 2nd. Most of the gold of Yukon origin is handled by the banks in Dawson, and therefore, only comparatively small amounts of bullion are taken out of the Yukon by individual miners to be personally deposited by them in assay offices, either in the United States or Canada. 3rd. On all deposits, of whatever source, representing gold on which no royalty has been paid to the federal government, the regular assay charge and commission for marketing the gold are exacted as provided by the Order in Council dated June 26, 1902. Under these circumstances, the amount of business coming to the Dominion of Canada assay office will continue to be small, and not until a market has been created in Canada for Canadian gold, by the establishment of a mint, will its business be commensurate with the gold output of Canada.

"The Canadian Bank of Commerce at Vancouver, which is authorized by the Government of Canada to market our deposits, received from the assay office gold bars to the value of \$570,444.13, and realized from the same of these bars and clippings \$572,034.28, showing a difference of \$1,590.15 in favour of the Government. In April, 1903, the express companies refused to ship bullion from Vancouver to Seattle at the cut rate of 50 cents per \$1,000, and charged the regular rate of \$1 per \$1,000 bullion. On account of this advance in expressage it became necessary to recoup the bank for the additional expense in marketing our gold bars, and increase the commission 12 cents per \$100 allowed them to 17 cents. This additional amount of 5 cents was directed to be added to the assay charges exacted on bullion deposits made in our assay office.

"The expenditures during the year amounted to \$14,992.53; the earnings, including extra assay charges, special assay charges, and value of sweeps, recovery of grains and residues amounted to \$2,504.75. The unexpended balance of the appropriation of \$21,000 amounts to \$6,017.15. The percentage of net expenses to the total deposits is 1,52962 per cent.

In accordance with your instructions to have a representative collection of gold dust and nuggets made from the Yukon, British Columbia and the Northwest Territories for exhibition at the World's Fair, to be held in St. Louis, in 1904, and afterward to be kept permanently in the museum, arrangements have been made with the Canadian Bank of Commerce to procure such collection for the Government, the collection to consist of gold dust of 1-16 oz. in weight and of nuggets of moderate size, the specimens to be num-

bered, their exact locality given and the whole to be sent to the Dominion of Canada Assay Office for assay. The manager of the Dominion of Canada Assay Office has been instructed on receipt of the collection to have the specimens assayed to ascertain the fineness and value per ounce of each specimen, and in the case of the nuggets, to have a cut made to remove just sufficient gold for assay, and to have the number corresponding to the specimen stamped neatly and in small figures on the upper side of the nugget when occupying a position of stable equilibrium upon a level surface.

"From the report on the quartz mill and assay office, Dawson, Y. T., of Mr. A. J. Beaudette, Government Mining Engineer, it appears that the agreement made between the Government and the contractor, Mr. Matheson, of the Dawson City Water and Power Company, Limited, to erect a two stamp mill, together with a concentrating plant, has not been carried out, but that Mr. Matheson re-modelled and put into operation a stamp mill situated on the Klondike River, formerly operated by Mr. Munger. This mill, Mr. Beaudette reports, is entirely unsatisfactory, and was on his advice to the Commissioner, on March 20, 1903, closed. Mr. Beaudette recommends, and I concur in the recommendation, that, unless a modern mill to correspond with the provisions of the original agreement be erected by Mr. Matheson, the contract be cancelled. The assay office established as an adjunct to the quartz mill is in charge of an officer paid by the Government and under the supervision of the Government Mining Engineer. The assay office is well patronized by the public, 384 assays having been made for fiscal year ended June 30, 1903. These assays were, in accordance with a resolution passed by the Yukon Council, made free to the public, the local government paying Mr. Matheson a set price of \$3 per assay. The cost per assay, according to Mr. Beaudette's calculation, is on the average \$1.74. In view of the failure of Mr. Matheson to meet the provisions of the contract, it would be in the interests of the Government to take over the assay office, charging for assays made a price just sufficient to cover expenses and remove the assay office from its present inconvenient location to one nearer the administration building.

"The separation of the gold from the black sands of the pay-gravel is, on account of the high specific gravity of the black sand, not completed in the sluice-box. Assays made of such black sands from the placer diggings of Bonanza and Dominion creeks show that these sands retain gold to the value of from \$62.01 to \$293.49 per ton of sand. Amalgamation has been resorted to in some cases to extract the gold from these sands, but this method of extraction has not been satisfactory, the treated sands still containing a notable percentage of gold, besides being costly on account of the loss of mercury connected with the process. A more promising method would be the employment of electro-magnetic separators which would separate the highly magnetic black sands from the gold. Such a separator might be set up near a source of electricity for custom work, or separators with per-

manent magnets of molybdenum steel might easily be rigged up by proprietors of claims which carry large quantities of black sands. Attention is directed to the occurrence of bornite at Selkirk and Indian River, carrying gold values to the amount of \$38.72 and \$36.52 per ton respectively. A specimen of iron pyrites from Eldorado Creek carried gold to the amount of \$938.26 per ton, another specimen from the same creek assayed \$37.20 per ton. The assays of auriferous quartz from Montana Creek, Quartz Creek and Chichaco Gulch, as reported, give the high values of \$283.79, \$268.76 and \$907.41 respectively per ton of ore. These values were obtained from five assays of doubtless picked specimens, and therefore, as Mr. Beaudette points out in his report, no conclusion can be drawn from such assay as to the average contents of the ores. Only a mill-run of sufficient quantities of the ore would furnish a basis for the calculation of the probable average contents. An inspection of the assay returns furnishes convincing proof of the abundance and wide distribution of auriferous quartz and gold bearing minerals, but so far as the occurrences of those giving high assay values have been examined, indications of their developing into mines are still wanting. Mr. Beaudette states in his report that 'the best prospect in the territory is situated on a ridge between Eldorado and Ophir creeks, known as the Violet group.'

"Specimens of minerals are constantly brought to Mr. Beaudette for determination by miners from outlying districts, and on his journeys of inspection he is often shown specimens, the names and contents of which he is asked to furnish. To enable him to do this expeditiously, Mr. Beaudette has been furnished with a complete set of blowpipe tools and determinative tables.

"The following mining districts were established by proclamation of the Honourable the Acting Commissioner: Forty-mile District.—All that portion of the Yukon Territory lying within the watershed of the Yukon River and its tributaries below a point ten miles above the junction of the Forty-Mile and Yukon Rivers. Sixty-mile District.—All that portion of the Yukon Territory lying between the watershed of the Sixty-mile River and its tributaries above and including Big Gold Creek, and extending westward to the international boundary line between the Yukon Territory and the Territory of Alaska. Clear Creek District.—All that portion of the Yukon Territory within the watershed of the Stewart River from and including Lake Creek, a tributary of said Stewart River, from its left limit to and including Mayo Creek, a tributary of said Stewart River, from its right limit, excepting thereout that portion of the Yukon Territory within the watershed of McQueen River above the forks of said creek. Duncan District.—All that portion of the Yukon Territory being within the watershed of the Stewart River above and including Mayo Creek, a tributary of said Stewart River, from its right limit, and also all that portion of the Yukon Territory being within the watershed of McQueen River above the forks of said river. Dawson District.

—All that part of the Yukon Territory tributary to the Yukon River, from a point ten miles above the junction of the Forty-mile and Yukon Rivers to a point one mile below the mouth of Henderson Creek, except therefrom that portion of the Yukon Territory tributary to the Sixty-mile River, above and including Gold Creek. Stewart District.—All that portion of the Yukon Territory tributary to the Yukon River, from a point one mile below the mouth of Henderson Creek to a point one mile above the mouth of Selwyn River, excepting thereout that portion of the Yukon Territory tributary to White River, above and including the Nisling River and further, excepting that portion of the Yukon Territory tributary to the Stewart River, above and including Lake Creek. Pelly District.—All that portion of the Yukon Territory tributary to the Yukon River, from a point one mile above the mouth of Selwyn River to a point one mile above the mouth of Little Salmon River; also all that portion of the Yukon Territory tributary to White River, above and including Nisling River. Hootalinga District.—All that portion of the Yukon Territory tributary to Yukon and Lewes rivers, from a point one mile above the mouth of Little Salmon River to the head of Lake Laberge. Whitehorse District.—All that portion of the Yukon Territory tributary to Lewes River above the head of Lake Laberge. Dalton Trail District.—All that portion of the Yukon Territory lying to the south and west of the Pelly and White Horse districts.

Statement of Bullion deposited at Dominion of Canada Assay Office, Vancouver, B. C., from July 1, 1902 to June 30, 1903.

Territory.	Deposits.	Weights.		Value.
		Before melt	After melt	
	No.	Oz.	Oz.	\$ ts.
Yukon.....	136	12,231.08	11,954.94	194,778 58
British Columbia.....	345	22,112.46	21,322.86	340,683 85
North-west Territories.....	13	340.65	310.62	5,679 67
Ontario.....	8	1,159.32	1,157.31	20,202 50
Alaska.....	7	452.18	415.05	7,543 59
Total.....	509	36,295.69	35,160.78	568,888 19
			Oz.	
Weight before melt.....			36,295.69	
Weight after melt.....			35,160.78	
				1,134.91
Loss percentage by melting.....				3.1268*

*This high percentage loss is due to the fact that many of the deposits were amalgam.

"Gold bullion to the amount of \$12,113,015.34 was exported from the Yukon Territory during the fiscal year ended June 30, 1903. The ports of export and value of bullion corresponding to them are as follows:

Dawson	\$12,081,594.84
Whitehorse	24,799.50
Forty-mile	6,621.00
	<u>\$12,113,015.34</u>

"Numerous requests for information relating to mining matters, the occurrence of economic minerals, the mining laws of Canada, and requests for annual reports on the mineral industries of Canada, of the

Bureau of Mines, and on the mines of Canada have been received during the year. No publications corresponding to the annual reports asked for are at present issued by the Federal Government.

The report of the Government Mining Engineer, Mr. A. J. Beaudette, gives much detail relative to the Munger 2-stamp mill and the assay office together with full particulars of the work done in the latter establishment. The following information concerning some of the mining localities is also included in it:

"The best prospect in the territory is situated on a ridge between Eldorado and Ophir creeks, known as the Violet group, which might develop into a mine. The development work started last year has been continued off and on ever since. It consisted of two shafts to a depth of 50 feet each, and cross-cutting in one shaft, and also an open cut on the outcrop of 40 to 50 feet long. The deposit appears to be between two and six feet wide, composed of iron stained quartz of a rose colour (a colour very characteristic of that of the quartz found in a deposit known as the White Channel), containing free gold and traces of galena. The galena occurs in spots irregularly distributed through the deposit. I sampled the open cut on the outcrop, which represents only a small amount of the ore in sight, and which gave an average of \$10.33 a ton. This proves that there is gold in the quartz not visible to the naked eye. I did not sample any place else, as the other parts were not accessible, being under water. I think instead of sinking shafts of 40 and 50 feet deep at different places upon the deposit, it would be better to sink one shaft only to ascertain if the ore has any depth and proof of continuity, to cross-cut it, and then to ascertain the length of the outcrop, and then to sample the ore in sight. Thus a decision can be arrived at as to the advisability of erecting a plant thereon. At present, I think there is enough prospect in sight to warrant development, but not enough ore in sight to erect a plant. According to my observation in connection with the gold-bearing quartz in the territory, I find that the gold occurs in the form of crystals, and leaf-like sheets, situated between the wall and vein matter, and very seldom in the vein matter itself. This vein matter being quartz is deposited in the form of large stringers meeting each other, forming a network. On the ridge between Bonanza and Eldorado creeks an outcrop occurs two feet above the surface of the ground, out of which I took small crystals of gold in perfect octahedrons and small nuggets adhering to the surface of the quartz, and only in exceptional cases could I find any gold on breaking the quartz. To confirm this, I had an assay made of a piece of quartz, which showed no gold adhering to the surface, and found it to contain but little more than traces of gold. This quartz is white, slightly iron stained. The quartz found in the Violet group appears rose in colour, although some has a grayish appearance, iron stained and spots of galena irregularly distributed through it. An assay of a specimen which showed no visible gold gave \$10.33 per ton. The occurrence of the two deposits above mentioned is, I think, in every respect the

same, but as to whether it is possible from the general appearance of the quartz to judge of its gold-bearing properties, I am not prepared to say definitely, although as far as my experience goes, all the pure white quartz so far examined contained very little or no gold, whereas quartz of a grayish appearance or of a rose tint, more or less iron stained, always contained upon assay fairly good values. In placers the gold occurs, as usual, associated with light quartz wash lying immediately on top of the solid rock, called bed-rock. If the gold is fine it is found as high as three feet above bed-rock. On Eldorado the gold has been found as far down as 55 feet below the present pay streak. I am not prepared to accept the supposition that there is a distinct pay streak at that level, but that this strange occurrence may be explained as follows: The bed-rock is fissured in many places to a considerable depth, the pay gravel lying on top of the bed-rock admits water, to percolate through it, and the gold finds its way down into these fissures."

A detailed and illustrated report, by Messrs. R. G. McConnell and R. W. Brock, of the Geological Survey of Canada, of the great landslide that occurred at Frank, Alberta, on April 29, 1903, also accompanies the general report of the Superintendent of Mines, but as a summary of their conclusions was widely published last year interest in that disaster has by now very considerably lessened.

PROVINCIAL MINING ASSOCIATION OF BRITISH COLUMBIA.

THE following is an excerpt from an editorial published early last month in the *Victoria Colonist*: "The Convention of the Provincial Mining Association has called public attention more particularly to the mining industry than is usually the case, and there is a general feeling that it is in a better position now than it has occupied at any previous time in the history of the Province."

Shortly after the close of the recent Annual Convention the *Ashcroft Journal* published the following news note: "Delegates to the Mining Convention from Ashcroft and Cariboo have for the most part returned to their homes. They speak in satisfactory terms of what has been accomplished and think the Association is now on a solid progressive footing. Messrs. R. Borland (150-Mile House) and W. Adams (Soda Creek) spent a day in Ashcroft this week before leaving for their homes."

The *Boundary Creek Times* (Greenwood) makes the following comment: "If the Provincial Mining Association does not flourish, it will not be from lack of ability on the part of its officers. John Keen has already demonstrated his fitness for the position, and the new secretary, E. Jacobs, is peculiarly fitted for that important office. Careful, painstaking and industrious, and with a wealth of information regarding the mineral resources of all parts of the Province, the Association is to be congratulated upon having secured his services."

The *Atlin Claim* says: "Despite the predictions of its detractors, the Provincial Mining Association accomplished a considerable amount of good work at the Convention lately held at Victoria, which closed its labours on the anniversary of its organization. As to the permanency and efficacy of this organization little doubt can reasonably exist, backed up as it is, by representatives of high standing from every in

terest, in any branch of industry, directly or indirectly connected with mining, in the Province."

The *Victoria Colonist* recently remarked editorially: "A very gratifying feature of the late Convention of mining delegates held in this city is found in the fact that a perfect understanding has been reached between the Government and the Mining Association. The impression that prevailed on one hand that the Association was run on political lines adverse to the Government, and on the other that the policy of the Government was inimical to the objects of the Association, has been dispelled. It has been shown that political issues do not come within the range of the Association's aims, and it has also been established to the satisfaction of all that the Government policy is in accord with the mainspring of the Association, viz.: the advancement of the mineral interests of the Province."

The day before the opening day of the Second Annual Convention the *Nelson Daily News* published some criticism of the Provincial Mining Association by "a well known mining man," whom it reported to have said, in part: "I think the forthcoming meeting of the Association will be of benefit to the mining interests. The Association has the faults of nearly all comparatively new organizations, but on the whole I believe it has a career of usefulness before it. . . . An effort will be made, however, at the Victoria meeting to prevent a repetition of the mistakes of the past and to run the affairs of the organization in a better manner than heretofore. When this is done I believe that the Provincial Mining Association will have a long career of usefulness to the mining industry before it."

An enlarged photograph of Mr. James Moore, of Black Bear Creek, Cariboo, one of the pioneer placer miners of Yale and Cariboo, has been placed in the office in Victoria of the Provincial Mining Association. The photograph is an excellent one, taken and enlarged by Mr. H. Mortimer Lamb. Mr. J. B. Hobson, First Vice-President of the Association, kindly had the picture framed. The Secretary will report to the Executive Committee at its next meeting the receipt of this memento of the early days of mining in British Columbia, and no doubt that body will at the earliest opportunity duly intimate to the donors its appreciation of the kindly thoughtfulness which has placed it in possession of so interesting a souvenir. Mr. Moore was a delegate from Quesnel Lake to both the 1903 and 1904 Conventions of the Association.

The *Rossland Miner* observes: "The Kamloops branch of the Provincial Mining Association has been disbanded. It is difficult to understand why the people of such a promising mineral district as that which surrounds Kamloops should allow such a thing to occur, except it is that they do not know enough to foster and protect their own best interests."

"It has been very pertinently remarked," says the *Rossland Miner*, "that the future of British Columbia depends on the growth and development of the mining industry. Mining is already conceded to be our premier industry, while agriculture takes and must continue to take a very secondary place. Yet year after year the Provincial Government appropriates a considerable sum in the aggregate in support of a fruit growers' association, a dairymen's association, a flockmasters' association, agricultural societies and the British Columbia Agricultural Association. The Provincial Mining Association has already proved its efficiency and usefulness. It is, however, handicapped and hampered for want of funds. It has therefore a strong claim on the Government for financial assistance and encouragement."

The following is from the news notes of the *Nelson Daily News* of Sunday, March 6: "H. E. Croasdaile and T. G. Proctor returned on Friday from the Coast, where they went as delegates to the Provincial Mining Association. In speaking yesterday about the Convention Mr. Croasdaile said the first effort of the Nelson delegation was directed to getting

in touch with the Government. This, he says, was accomplished in a diplomatic manner, as the Government at one time was hostile to the Provincial Mining Association because it thought that the Association was endeavouring to encroach upon its prerogatives. It was demonstrated to the satisfaction of the ministry by the Nelson delegation and the hearty co-operation of the other delegations that the only end that the Association had in view was the betterment of the mining industry and this resulted in a better feeling on the part of the ministers toward the Association, which it is thought, will lead to good results."

At the annual meeting of members of the Vancouver Board of Trade, held on March 1, the retiring president, Mr. H. T. Lockyer, manager of the Hudson's Bay Company's large establishment at Vancouver, in the course of his review of the year then just closed made the following reference to the Provincial Mining Association: "It is gratifying to note the good work being done by the Provincial Mining Association of British Columbia, a body comprising representatives of all sections of this industry. At the Annual Convention, recently held in Victoria, I was fortunately permitted to attend as a delegate from Vancouver and was struck with the earnestness of purpose on the part of all members of the Association, which appears to have but one object, and that is to place the general mining industry of our Province on a more equitable and workable basis, and it would seem to me, therefore, that the Association can rightly ask for the support and co-operation of everyone engaged in the mercantile business, as we know how much the latter owes to the development of the mining industry."

On March 22 the secretary of the Provincial Mining Association received a letter from the office of the Minister of Customs, as follows:—

"Dear Sir: I am directed by the Hon. The Minister of Customs to acknowledge receipt of your letter of the 4th instant, conveying to him a resolution adopted by your Association, urging the Dominion Government to allow the free importation of oils for use in the concentration of ores. The Minister desires me to say to you that the subject has received favourable consideration at the hands of the Government, and an Order-in-Council was recently passed in the following terms:—

"That oil (petroleum) be transferred to the list of goods which may be imported into Canada free of duty, when imported by miners or mining companies or concerns, to be used in the concentration of ores of metal in their own concentrating establishments, under such regulations as the Minister of Customs may prescribe."

"Yours truly,

"JOHN BAIN,
"Assistant Commissioner."

The following comment is from the *Similkameen Star* of March 12: "The second Annual Convention of the Provincial Mining Association has gone on record as being most successful and interesting in every respect. No extraneous matters were introduced to mar the object of convening; not a jarring note was sounded nor friction felt throughout. Politics and social questions were strictly tabooed, notwithstanding the prediction of some morbid minds that the Association would develop into a political machine or become the tool of capitalists. If labour has not been as strongly represented numerically as it should have been it is labour's own fault. The Association may now be said to have crossed the Rubicon of its existence and to be fairly set out on the crusade that gave it birth. It is manned and equipped for offensive and defensive work and cannot fail to prove a power 'behind the throne' on all mining matters requiring legislative treatment. Freed from all taint of political animus the deliberations of such an influential body of men must be profitable to all and no man can afford to withhold his support of either membership or contribution. Princeton, by reason of its importance as a mining centre, must have a representative on the executive as well as have delegates to the

general meeting, and no doubt would have done so ere this but for the overtowering interest in railway construction into the Similkameen."

VANCOUVER BRANCH.

The Vancouver branch of the Provincial Mining Association was put upon a permanent footing at a largely attended meeting held in the Board of Trade rooms, Vancouver, on the evening of March 9. The branch was re-organized at a meeting held just previous to the Provincial Convention, with provisional officers, and on this occasion a permanent board was elected. The meeting was very representative.

Mr. Colin F. Jackson, provisional President, was in the chair, and in his introductory remarks briefly referred to the recent Convention held in Victoria as demonstrating that the Provincial Mining Association had come to stay and would do a great deal of good work. There were many reasons why the business men of Vancouver should rally round the local branch, and make it the important organization it should be in a city which was the commercial centre of the Province.

The following officers were then appointed:

President—Mr. C. F. Jackson.

First Vice-President—Mr. C. W. McMeeken.

Second Vice-President—Mr. James Findley.

Secretaries—Messrs. George Sheldon-Williams and T. J. Smith.

Treasurer—Mr. Campbell Sweeney.

Mr. Jackson said he had spoken to Mr. Sweeney, and that gentleman had said he would give the Association his hearty support. Mr. Sweeney had also stated that the Bankers' Association of Vancouver would probably elect a member to represent it in the Mining Association this year.

The Executive Committee, which by the amendment to the constitution will consist of 12 members instead of 25, and representing all classes of trade, will be as follows: Messrs. H. T. Lockyer, W. H. Malkin, E. P. Gilman, W. D. Hayward, Charles Law, George A. Walkem, R. P. McLennan, J. Y. McAdam, W. D. Ross, E. J. O'Sullivan, F. E. Woodside, and Frank Richards.

Mr. James Findley addressed the meeting relative to the mining industry on the Coast. He said that in Victoria much sympathy was shown with mines on the Coast. They had some mines directly tributary to the city, and appreciated the benefit they got from such properties as the Tyee and those on the West Coast of the Island. In Vancouver, the merchants made a bid for the trade of the whole Province, and yet showed comparatively little interest in these mines.

Mr. Lockyer, one of the delegates to the Convention, said that when Mr. Findley spoke of Vancouver people not taking interest in the Coast mines, he was right, and many of the business men of Vancouver were conspicuous by their absence that night. This should not be, as the commercial interests would develop as the mines progressed. Referring to the Convention, Mr. Lockyer said he was greatly impressed with the earnestness of those taking part. He had gone there with the idea that the Association was got up by some one with an axe to grind, but he soon saw that it was an earnest co-operation to put the mining industry on a sound basis. The delegates were men from all parts of the Province, who had left their work at their own expense to confer with others as to what was best for the mining industry. He had listened for political talk, but heard none. The officers were energetic and industrious men, and had the interests of the industry so at heart that they would work until conditions were improved. There should be a large membership in Vancouver, and all interested in the welfare of the Province should sign the roll. The commercial interests should, he thought, be the most largely represented.

Mr. J. H. Brownlee, who for five years has been operating in Atlin, said Vancouver had a wonderful heritage, and the people took more interest in mines than what was thought. When business men will drop everything and go down to the Convention, there's something doing here. Drop all talk of having stock and having been bitten. Mining is a legitimate business, and if rightfully followed is the best going. The

situation of Vancouver, he said, was admirable as a commercial centre for the mining industry. He thought the whole community, the Board of Trade, etc., should take a wholesome interest in the industry.

Mr. C. W. McMeeken said the work of the Association should be to so present the industry to the people that they may see why they should give it moral support. The real purpose should be to correct any faults which militated against successful operations. While the Association criticized, it should also take upon itself full responsibility of suggesting improvements.

Mr. Jackson said that to his mind the mining industry was the same as dealing with any article of trade. In all large operating centres, say of cotton, there were two classes those who buy and dabble in stocks, and those who knew what they were doing. The object of the Provincial Mining Association was firm, and if the members kept the sound principle before them, it would soon be seen that the mining industry was as worthy of support as any other in the Province.

There were several other speakers and among the suggestions made with the object of increasing interest in the mining industry were several advising the obtaining, for publication in the press, of information relative to the operation of mines and smelters, and the establishment of a mineral museum.

The proceedings closed with the adoption of a hearty vote of thanks to Mr. Jackson, Mr. Lockyer, Mr. T. J. Smith and others, who stood up for the city and were chiefly instrumental in having the largest commercial city represented at the recent Convention.

SOME NOTES FROM THE MINING CAMPS.

THE COAST.

STEADY progress is being made in mining developments on Vancouver Island. At Mount Sicker three mines are now producing regularly, the latest addition to the list of shipping mines from this locality being the Richard III, which while only making a relatively small output of twenty tons a day, is yet earning profits of over \$200 a day. The last monthly returns from the Tyee showed that \$60,000 was realized, after deducting definite charges and freight on the treatment of 5,392 tons of ore. This month a rich find of ore, assaying over \$85 per ton, the values being chiefly in copper, was reported to have been made near Ladysmith. On the west coast of the Island, American capitalists are again interesting themselves in the iron occurrence at Barkley Sound and at other localities.

Arrangements are being made for the establishment of a branch of the Owen Sound Cement Works, of Ontario, at Saanich Arm, Vancouver Island. It is said that cement can be manufactured locally and placed on the market at about half the cost of the imported article.

YUKON.

It is stated that the amount of gravel on the Klondike dumps at the present time far exceeds that taken out up to the corresponding date last year, and it is generally believed that the proceeds from the dumps on all the creeks will be much greater when spring opens than was the case when the snow went in 1903.

WHITE HORSE.

Dr. A. C. Robertson, mine inspector in the Yukon, recently visited Bullion and other creeks within the area of the new White Horse diggings. In the course of an interview he stated that in his opinion the district offered opportunities for summer rather than winter working, for the depth to which the gravel is frozen is limited to a few feet, and directly the miner sinks below the frozen ground he encounters running water. Drain ditches, which are quite feasible, must be employed, therefore to work the diggings successfully. Dr. Robertson furthermore stated that he prospected as thoroughly as possible along Bullion Creek and every pan he washed showed colors, some being coarse gold.

On the whole the opinion of this authority is favourable to the district, although it will be July before really definite information can be gathered to justify an unqualified expression as to future possibilities.

ATLIN.

In the Atlin district recently some important amalgamations of interests have taken place, and these will result in work of a larger extent, without the friction which has often militated against successful operations. The consolidation of the hydraulic interests on Spruce Creek has been consummated, and the Spruce Creek Power Company is the name under which the new concern will develop the valuable properties on this creek. The interests on McKee Creek have also been brought together, the Atlin Mining Company selling out to the Hamshaws and their Brooklyn associates. The claims on McKee Creek have been successfully worked for the past five years. The Deek and Stevendyke interests on Pine Creek have also been consolidated under one management. This is the creek on which placer gold was discovered in Atlin, and, strange enough, the first hole was sunk in gravel, than which there has been none richer taken out in the district.

CARIBOO.

It is reported that very promising indications of the occurrence of mineral oil have been found in the Beaver Lake Valley, on the road to Quesnel Forks in the Cariboo district, and specimens of shale smelling strongly of petroleum as well as samples of crude oil itself have been brought to the Coast for analyses. The inaccessibility of the district, however, considerably discounts any importance attaching to the discovery even if verified. Meanwhile at Steveston, on the Fraser River near Vancouver, boring operations for oil have been commenced under expert direction.

KAMLOOPS.

The Ashanti Lands, Ltd., an English company, has decided to exercise its option with the British Columbia Exploration Company, securing an interest in the Iron Mask and other claims at Kamloops and on the Coast. A new company has been successfully floated called the Kamloops Mines, Ltd., with a capital of \$750,000. The original syndicate expended \$215,000 in acquiring and developing the properties.

REVELSTOKE.

The New Imperial Mines, Limited, has just been formed with a capital of \$100,000 to acquire the Imperial group of claims on the Illecillewaet River, twenty miles north of Albert Canyon. The claims have been partially developed and the ore according to smelter tests is of good grade, averaging from \$100 to \$150 per ton in gold, silver and copper. The silver contents are especially high.

LARDEAU.

Another ten stamps is to be added to the Oyster-Criterion mill at Camborne. The Great Northern Mines also propose, it is stated, to install a 40-stamp mill at the Lucky Jack. The tunnel on the latter claim is now in 320 feet.

Several sales of mining property have been made recently in the Lardeau district, the latest being of a group at Poplar Creek—the Crown King and Golden West, adjoining the Swede group. It is said the purchase price was \$35,000.

At last month's run of the Oyster-Criterion mill at Camborne, 1,160 tons of ore were crushed yielding 300 ounces of gold. The cost of mining and milling was \$2.40 per ton.

The Silver Dollar group of four claims in this district has been sold to the Elwood Tinworkers' Gold Mining Company of Indiana. The property has been largely developed by surface stripping. It is announced also that operations will be resumed early in April at the Nettie L. and Silver Cup mines near Ferguson, the new combination silver mill being now practically completed. Development work is proceeding steadily at several claims in the Poplar Creek section, and last week pumping and other machinery was purchased for the Handy Company's mine.

SLOCAN.

Speaking of the situation in the Slocan, Mr. Buchanan, Government administrator of the lead bounty, recently expressed the opinion that the outlook was most encouraging, nearly every important mine being now in operation.

At a meeting in March of the Silver-Lead Miners' Association the following important resolution was unanimously agreed to: "That the Association do endorse the proposal of the low grade miners, whereby the Government is to be requested to extend the benefits of the Bounty Act to a limited amount of ore to be exported and smelted abroad; provided that such extension shall not prejudice the payment of the full bounty on ores smelted in Canada. Provided, further, that lead ores sold and smelted in Canada during the period of such proposed extension of bounty, the maximum freight and treatment rate shall not exceed \$15 per ton as per scale now in force; that the marketing charge shall not exceed \$20 per 2,000 lbs. of lead, as at present; and that the limit on zinc shall not decrease from ten per cent. and the penalty on the excess shall not exceed 50 cents per unit. And that the Executive Council shall be and are hereby authorized to confer with the smelters and aid the producers of low-grade ore in securing their co-operation, with full power to act for the Association as a whole." At this meeting Mr. Blackstock, of Toronto, representing the St. Eugene mine, pointed out that while he desired to protect and foster the Canadian smelting industry to the greatest extent possible, the best rate offered the St. Eugene by the Trail smelter was \$15.50 for freight and treatment and \$20 for marketing, and this was only assured for six months, which made the offer prohibitive. Certain European plants had offered to accept these ores at a much lower rate, and unless the bounty regulations were amended to permit of the exportation of these ores the St. Eugene and similar mines must remain closed down. The proposed extension of the bounty to exported ores should, he thought, be limited and only granted from time to time and it should not prevent the home treated ores from earning the bounty.

Evidently silver-lead mine owners in the Slocan and East Kootenay are not inclined to take too seriously the assurance made by Mr. Fernan, the Belgian metallurgist, that he is prepared to build a lead smelter in British Columbia and contract for ore on the basis of \$10 for freight and treatment charges—certainly a very low quotation. At any rate at the meeting of the Lead Mines' Association last week no reference was made to Mr. Fernan's proposals, and Mr. Fernan, in a statement published in a local newspaper resents rather strongly the manner in which he has been ignored, and expresses the opinion that lead ores sent out of the country to foreign smelters should not be entitled to the Government bounty. To quote Mr. Fernan: "The works I propose to establish should be in operation in about six to eight months' time. They will not be on as large a scale as would have been possible had an agreement been reached with the producers whom I approached, and if the lead ores are sent out of the country it would prevent the extension of these and other works and absolutely prohibit the local smelting industry ever becoming an important industry. I have not the slightest doubt that any amount of ore that may be produced in the Kootenays can be reduced on the ground, and feel very strongly that if it is allowed to go out of the country it will do immense harm to the district. So far as I am personally concerned, I cannot understand the silence that has been observed concerning my proposals on the part of those to whom they have been made."

SLOCAN CITY.

Reports from the Slocan City Division are most satisfactory. The necessary money has been secured by the Company owning the Howard Fraction claim to pay off all liabilities and afford a sufficient sum in addition to continue operations. The working force on the Fisher Maiden has been increased; the lessees of the Black Prince have encountered some exceptionally high-grade ore, while excellent returns have been obtained from the Ottawa shipments, the ore from the last carloads sent out averaging 250 ozs. silver per ton.

NELSON.

A company has been floated in Nelson to acquire and operate the May and Jennie mine on Forty-Nine Creek. It is proposed to install a stamp-mill at once, it being estimated that there are 60,000 tons of ore in sight at the mine.

At the recent annual meeting of the Juno Mines, Limited, it was decided to continue active development of the property.

The Queen mine on Sheep Creek, in the Ymir district, is to be worked at once, the owners having secured a lease of the Yellowstone mill. The Porto Rico mill is also again in operation.

ROSSLAND.

The latest reports from Rossland are of an eminently encouraging nature, the February profits of the Le Roi, after deducting costs of mining, smelting, realization and depreciation, being estimated at \$58,500. The manager furthermore expresses the belief that another fine body of ore has been opened up on the 700-foot level which may probably connect with the south vein on the 800-foot level. Construction work at the Rossland Power Company's new large concentrating mill is proceeding rapidly, and it is believed that the plant may be ready for operation within two months from this date. Preparations are also being made for the early erection of an Elmore concentrating mill at the White Bear. Meanwhile, in an interview, Mr. Claudet, manager of the Canadian Ore Concentration Company at Rossland, is reported to have predicted that the cost of concentration by oil in that camp should ere long not exceed \$1.25 per ton.

BOUNDARY.

An important strike is reported to have been made late last month at the Emma mine, in the Boundary district, a shoot of high-grade copper ore having been encountered in the new tunnel recently started near the old workings. Heretofore the Emma has been worked for the iron contained in the ore, which is shipped to the Nelson smelter and used for fluxing purposes. Ore from the Providence, one of the many high-grade mines near Greenwood, is now being sent to the Trail smelter without sorting. During the winter the main shaft has been deepened from the 183-foot level.

The Alameda, a claim adjoining the B. C. Copper Company's Mother Lode mine, was recently sold to Minneapolis purchasers.

Steps are being taken to incorporate a company to acquire the Athelstan and Jackpot claims in Wellington camp. A company has also been recently formed in Chicago with a capital of \$500,000 to acquire and work the Nellie Cotton group of claims in Phoenix camp. The B. C. Copper Co., last month bonded the Bruce group of five claims near Midway. Work is to be carried on continuously for eighteen months. Mr. J. P. Graves, general manager of the Granby Company, is reported to have stated the other day in an interview that the company was working on plans for increasing the capacity of its smelter plant at Grand Forks from 2,100 tons to 4,800 tons a day.

A circular has been issued to shareholders of the Morrison Mines, Limited (Boundary district), announcing the sale of the assets of that company to Mr. Andrew Laidlaw, for the sum of \$24,166.76, or at the rate of 2 cents per share, shareholders have the option of selling outright for this sum, or of exchanging stock for stock in the Montreal & Boston Co., in the proportion of thirty Morrison shares to one of Montreal & Boston.

CAMP MCKINNEY.

A good deal of disappointment is felt at the failure of the Waterloo Company operating at Camp McKinney to pay a dividend as promised so long ago as December last; but instead shareholders have received a notice calling upon them to pay an assessment of a mill a share, which seems almost like adding insult to injury. It is unofficially stated that the vein has faulted and that there is not sufficient high-grade ore in sight at present to keep the mill supplied.

THE NEW ALSEK DIGGINGS.

We extract the following information from a circular recently issued by the Traffic Department of the White Pass & Yukon Railway Company:

"The principal creeks on which important gold strikes have been made in the Alsek district are distant about 200 miles from White Horse in a north-westerly direction, and can best be reached *via* White Horse. A very good trail, which can be used both summer and winter, has been made from the latter point to the diggings.

"At the present time those who are engaged in hauling passengers from White Horse to the new district are quoting a rate of \$100 to Bullion Creek, the centre of the new strike, and \$75 to Ruby Creek. These rates do not include road-house expenses while *en route*. The time required to make the trip by stage from White Horse to Bullion is about seven days. Meals at the various roadhouses along the route are \$1.50 each, and beds \$1 per night.

"Freighters in White Horse are now asking from 25 to 30 cents per pound for the delivery of freight to Bullion and other creeks in the immediate vicinity, and it is fair to presume that the above will be about the average rate charged during the sledding season, which will probably close about April 10th.

"During the sledding season, upon reaching Marshall Creek, 125 miles from White Horse, it has been found necessary by freighters to abandon their heavy two and four-horse sleds and utilize a smaller, single horse sled known as the 'double ender' to complete the trip. About 800 pounds constitutes a load for a 'double ender.'

"After the opening of navigation, however, one can best reach the diggings by taking the steamer from White Horse to Mendenhall Landing and proceeding overland from that point, thereby saving some 75 miles of a journey by trail. The boat service to Mendenhall Landing will be established immediately upon the opening of navigation on the Tahkeena River, which will be about June 1st, and will be continued until approximately October 1st.

"The freight and passenger rate in summer time, it is believed, will be about the same as that prevailing in winter."

COMPANY NOTES AND CABLES.

LE ROI (Rossland).—The manager cabled the following report for the month of February: "Shipped from the mine to Northport during the past month 19,244 tons containing: Gold, 8,379 ounces; silver, 9,663 ounces; copper, 490,317 pounds. Estimated profits on this ore after deducting costs of mining, smelting, realization and depreciation, \$58,500. Expended on development work during the month \$11,000. I have reason to believe we have opened up a fine body of ore on the 700-foot level which may probably connect with the south vein on the 800-foot level. The present appearances are most encouraging on the 900-foot level. The vein matter assays very well indeed. The diamond drill hole between the 900-foot level and 1050-foot level looks most promising. On the 1350-foot level we are now hard at work making airways. Hope to be able to report more valuable discoveries during the present month."

TYEE COPPER (Mt. Sicker).—In February the smelter ran 25 days, and treated 5,302 tons of Tye ore, giving a return after deduction of refining charges and freight of \$60,007.00.

KING EDWARD (Fairview).—The latest addition to the list of incorporated mining companies in British Columbia is the King Edward Mines, Limited (non-personal liability), capital \$500,000; head office, Fairview, B.C. in the Boundary district. The company's shares are divided into 200,000 vendors' shares, which have been taken up entirely by the original owners of the property in acquiring the mines of the new company, and 300,000 treasury stock shares, part of which is now being offered for public subscription at 10 cents per share with the object of enabling the company to start work and build a concentrator at the mines and do some further development work on the property. When the proposed railway through the Similkameen Valley is an accomplished fact, this com-

pany will have unusually good transportation facilities and will be enabled to ship ore or concentrates to the nearest smelter at a very small cost. The company's mines are situated on the West Fork of Suesap Creek one mile above its fork, and about three miles above its confluence with the Similkameen River, in the Similkameen Valley, Osoyoos Mining Division, B.C. They consist of the King Edward, Night Hawk, Westmoreland, V. V. & E., Johnny Bull, Tip Top, Woodland, Bank of Fairview and Kendall mineral claims, and are distant about three miles from the route of the proposed railway through this district.

Mr. A. A. Watson, mining engineer, etc., of Vernon, has recently visited the mines and makes a very satisfactory report on the property, and the company hopes that, with the natural advantages they possess in the way of ample water power, a plentiful supply of good mining timber, and the lay of the ground being admirably suited for tunnelling purposes, these mines can be worked at a low rate of expense and with very remunerative results.

KOOTENAY CONSOLIDATED (Lardeau).—Judge Miller, the promoter of the Kootenay Consolidated Mining Company of British Columbia, writing from Minneapolis, says that extensive development work will be started as soon as trails are passable to the different properties now controlled by this undertaking.

LE ROI No 2 (Rossland).—From the mine manager's report on the operations of the mine for January: Output—Tonnage shipped, 1,790. From samples taken at the mine we estimate the ore will average \$14 per ton after smelting charges are paid for. The grade of ore for January should be better than for December. Development—On 600-foot level 93 feet were driven. The object of this was to undercut the downward continuation of stope 20. By placing this ore in sight we will be in a good position to start drifting westwards on the 500-foot level, but until this is done we do not wish to have too many machines on development work. Thirteen feet were cross-cut to undercut downward continuation of easterly bunch of ore in stope 20. This ore has not yet been reached. On the 10th floor of the old Annie stope 59 feet were driven. Diamond drill work—The following diamond drill work has been done during the month: 700-foot level—Hole No. 45 was driven 125 feet. Hole No. 46 was driven 167 feet. The object of both these holes was to undercut downward continuation of ore body No. 21. Nothing of importance was met with, however.

LIGHTNING CREEK GOLD GRAVELS.—The Lightning Creek Gold Gravels and Drainage Co. held its annual meeting in Ashcroft last month. The treasurer's report showed that \$90,000 had been expended on the property. Senator Reid was elected president, Mr. D. Murphy vice-president, and Mr. C. F. Unverzagt, secretary-treasurer. Mr. Unverzagt intends to have the ground thoroughly tested with a boring machine before more sinking.

B. C. COPPER (Boundary).—In reference to the proposed consolidation of the Snowshoe and B. C. Copper companies operating in the Boundary district, a circular issued by the latter company states that the Snowshoe directors have failed to meet the requirements deemed essential by the directors of the B. C. Copper Company to make the plan an advantageous one in the interests of shareholders but it is added that improved conditions at the property render the failure of the consolidation plan of no great consequence. The directors now state that the blast furnaces at the Greenwood smelter are now in full operation, with ample ore supplies; that the earnings are in excess of all expenses, and converting and electrical plants are rapidly approaching completion and will be at work, adding materially to the net earnings.

ARLINGTON (Erie).—During the month of February, 1904, ten carloads of ore were shipped from the Arlington mine, Erie, containing 229 tons, the net smelter returns from which amounted to \$10,453.69. The expenses in British Columbia for the month amounted to \$3,639.23, leaving a profit on the month's working of \$6,814.46.

GIANT (Rossland).—Mr. Charles V. Jenkins, of the accounting department of the War Eagle-Centre Star companies, has been appointed provisional liquidator of the Giant

Mining Company under the winding-up order granted upon the petition of Mr. Edwin Durant.

CASCADE (Rossland).—A judicial order for the sale of the Norway Mountain mine has been granted to satisfy a judgment.

COMPANY MEETINGS. AND REPORTS.

ATHABASCA-VENUS, LIMITED.

The manager has submitted the following report covering a period from November, 1903, to December 31st, 1903: The work on the Venus has been confined to one vein which has been developed by a system of raises and tunnels having a total length of about 4,500 feet. Of this work about 2,100 feet have been driven in 1903 at a cost of \$6.50 per foot. When we began drilling in November, 1902, the Venus ore reserves were approximately 5,000 tons; since then 7,325 tons have been mined, producing \$62,000, but the years' development has maintained the reserves at about the same figure, that is to say, there is still as much ore in reserve as at the first of the year, but the probable reserves are much greater. About 1,200 feet of driving and 500 feet of up-raises, will add on 1, 3 and 4 tunnels from 20,000 to 25,000 tons of ore to the reserves. If No. 5 level was driven for 1,300 feet it would add 10,000 tons to the reserves.

It is stated that the ore extracted to date which has averaged in width 15 inches, has been from the outer blocks so near the surface as to result in the vein being disturbed mine in a position to produce 30 tons daily, would be: Min- and faulted, with blocky walls, necessitating a large amount of dead work and timbering. These conditions together with the fact that the development was not sufficiently advanced have made the mining costs much heavier than they would otherwise have been. It has averaged for the year \$5 per ton, included in which costs is a large amount of dead work. For a certain period during the year when the conditions were advantageous, the cost averaged as low as \$3.85 per ton and this condition he says he can maintain when the development is sufficiently advanced. In December the installation of an air-pipe line from the Athabasca to the Venus was completed. One small machine drill is being used in No. 4 tunnel and that another will soon be at work in tunnel No. 3.

The contract system for mining the outer stopes has recently been introduced. During the year steady improvement has been made, various costs have been reduced, and the grade of the ore has been increased.

The first work undertaken in the spring of 1903 on the Athabasca was the driving of an adit level to tap the No. 2E level, which had been driven east from the old No. 2 shaft. The vein, as exposed along this level for some 300 feet, is quite regular and of an average width of 12 inches. The value is not uniform, but in two shoots, each about 100 feet in length, they average fairly well. A mill run of about equal amounts from each shoot, totalling 145 tons, gave returns of \$18 net per ton, which would indicate that the gross value of the ore is about \$20 per ton. In regard to available tonnage there is about 1,000 tons in the two shoots mentioned between the tunnel level and the surface, in addition to what has been extracted, 640 tons. All of this except the 145 tons above referred to was milled with the Venus ore and gave returns of about \$12 per ton. The lower grade is accounted for by the fact that in starting to stope considerable waste was unavoidably intermixed.

As the showing of ore on No. 2E level is very promising the scheme of development is a shaft from that level. There is every reason to expect that this shaft continued for say 400 feet below the No. 2E level, with levels run each way at every 100 feet, will develop valuable ore bodies and place the mine on a better basis than at any time in its history. As the mine has been lying idle for two years a large amount of repair work was necessary which added materially to the year's expenditures.

The old works portion of the mine was let on the tribute basis, and during the season the tributors extracted from the old pillars, etc., throughout the old stopes, 295 tons of ore,

which yielded \$9,774, or \$33.19 per ton and of this the company received 40 per cent. and \$3 per ton for milling. The total tonnage produced by the Athabasca including tributes was 935, producing \$18,500.

The aerial tram, connecting the Venus with the mill, has worked satisfactorily during the year, and with the exception of one accident in June it has run continuously. Seven thousand five hundred tons were shipped over the tramway at a cost of 19 cents per ton. The three rail gravity tram from the Athabasca has given satisfaction, but it was found necessary to repair it considerably during the summer.

The mill has run since it was started in November, 1902, a total of 375½ days, and crushed 8,260 tons of ore. Of Venus ore alone, the mill could crush 30 tons a day. During the first four or five months in the year experiments were made in treatment both in the mill and cyanide plant in an endeavour to increase the extraction. Up to March 1st the average extraction from Venus ore was less than 80 per cent. In May it reached 88 per cent., while for the last seven months of 1903 it averaged from both mines 93.3 per cent.

In the cyanide plant there were treated 4,486 tons of sand, from which was recovered \$15,863.60, or \$3.50 per ton. From an average extraction of 62.5 per cent. it has been increased to an average of 92.8 per cent.

Milling for the first few months cost \$1.32 per ton while for the last half of the year it averaged 81 cents. Cyaniding costs were reduced in the same period from 85 cents per ton to 80 per ton of ore milled.

The manager estimates that costs at the Venus, were the following, \$3.85 per ton; tramming, 17 cents; milling and cyaniding, \$1.32; management and general expenses, 46 cents; total, \$5.80; leaving a profit, as shown by the last six months' average recovery, of \$3.75 per ton.

From the Athabasca with the \$20 grade of ore there could be made a profit of from \$8 to \$10 per ton, and by milling 600 tons from the Venus and 300 tons from the Athabasca per month, the property could make an approximate profit of \$5,000 per month. These estimates are based on actual results obtained during a certain period last year, when favourable conditions obtained. Both properties look better than at any period since work was started and development at present is proceeding with such satisfactory results that the company can look forward to a prosperous future.

CANADIAN ORE CONCENTRATION.

At the second ordinary general meeting of this company, Mr. Stanley Elmore stated that with the permission of Lord Ernest Hamilton, chairman of the Le Roi No. 2, he was able to give the result of the working of the oil concentration plant at that point. The oil loss was 1.03 gallons per ton of ore treated; there was a concentration of sixteen tons into one; the final tailings assay was three-fourths of a dwt. of gold, and less than one quarter of an ounce of silver per ton, and one-tenth of one per cent. of copper, which must be regarded as being extremely satisfactory.

Referring to this experimental mill the chairman said that \$2 per ton should be the very outside cost of working, even at such an expensive place as Rosslund, and with the present small plant. With regard to the oil consumption, although it was originally estimated at one and a half gallons per ton, since the works have started it has been reduced to very slightly over one gallon.

To show the advantages which are gained by increasing the plant the inventor stated that with a 6 or 8 unit plant oil, royalty, all charges should not greatly exceed 3s. per ton. The adoption on a large scale of an economical concentrator process such as this in the Rosslund mines will so greatly benefit the mining industry generally in that province that the satisfactory statements made at this meeting will be read with great interest in Canada.

MACHINERY NOTES.

Dr. W. A. HENDRYX in a recent interview stated that in treating the ore of the Mountain Lion by his new process he used only .094 of a pound of cyanide of potassium to the ton of ore. The average duration of the

treatment was only eight hours. It is claimed with the expense of mining and treatment not exceeding \$4 to \$6 per ton that Republic and vicinity can produce about 1,000 tons of ore per day.

Dr. Hendryx, the inventor of the new electro-cyanide process, is reported to have stated that he has succeeded in treating the ores of the Mountain Lion mine at Republic at a cost of \$1.50 per ton. The general values of the ores of the Republic camp are \$10, out of which the process saves \$8.33. The cost of milling, \$1.50, leaves the mine owner with \$6.83 to pay his extraction. The Republic mill and that of the Mountain Lion, erected at a large expense, both failed to settle the problem satisfactorily, and the mines could not smelt their ore profitably as smelting and transportation took up \$6.50, leaving the mine owner with \$3.50 to stope and develop his ore bodies. Out of this no profit was possible. Under the new conditions the mines are \$3.33 better off and this difference will pay handsomely. Within a year, it is declared, Republic will be altogether a different camp, and the new process will certainly be in use elsewhere.

Mr. S. S. Fowler, M.E., has finished the plans for the concentrator for the Alice mine at Creston. It will have a capacity of 100 tons in 24 hours. The work of constructing the concentrator will be commenced as soon as the snow is off the ground. Work on the tramway has already been commenced; that is, the iron is being made up for the various parts of the plant.

The Le Roi company, it is stated, is contemplating adding a converter plant to the Northport works, and thereby effect a considerable economy in freight rates on matte shipments.

It is reported that Mr. Hobson, manager of the Consolidated Cariboo Hydraulic, proposes installing an hydraulic elevator at the mine to avoid tunnelling the rim to make grade.

The lead refinery at Trail is now in regular operation, and shipments of pig-lead and refined silver therefrom to Eastern Canada have already commenced.

Messrs. Fernan & Lefevre, lead and zinc specialists representing European capital, have, it is announced, determined to establish a zinc smelter at either Fernie or Frank at either of which points an abundance of cheap fuel would of course be available. A zinc enriching works are also to be erected immediately at Roseberry on Slocan Lake, the plans and specifications for the plant having been already prepared.

It is reported that the Great Northern Mines, Ltd., propose erecting a forty-stamp mill on the Lucky Jack claim at Poplar Creek, and also doubling the capacity of the Oyster-Criterion mill.

The new machinery for the St. Eugene mine, at Moyie, East Kootenay, is being installed, and it is thought mining operations will shortly resume at this property.

The British American Mining Company, operating in Atlin, has ordered from a San Francisco firm a second dredge of 5,000 yards daily capacity to be operated by electricity.

A large hydraulic plant is to be installed at Bull River this spring.

COAL MINING NOTES.

THE output of the Nanaimo coal mines is steadily increasing, the monthly tonnage produced now being well over 30,000 tons. Machinery for the new pit-head at Departure Bay has been ordered and is now en route. The machinery is designed to enable coal to be taken direct from the mine and loaded in the holds of ships by a system of elevators, and thus provides for handling the mine product most economically. At the new mine Burleigh drills are now in use and rapid progress is being made, water no longer causing trouble.

It is reported that an important conditional sale has been made of coal areas in the Nicola, the purchasers being Tacoma people, who propose organizing a company to develop the field. It is possible that a railway connecting with the Canadian Pacific system will be built into this promising new section of country in the not distant future.

In the month of January 76,000 tons of coal were mined

at the three collieries of the C. N. P. Coal Co., constituting a record achievement in this regard. In February an output of 71,000 tons was made, heavy snowfalls having somewhat interfered with the work at the mines.

Application has been made for four coal claims on the left shore of Lake Lecharge, bituminous coal having been discovered in this neighbourhood. The producing coal mines at present in the Yukon are near Forty-Mile and Five Fingers.

At the annual general meeting of the shareholders of the International Coal and Coke Company held the other day, the following officers and directorate was elected: President, Mr. A. C. Flumerfelt, of Victoria; vice-president and treasurer, Mr. H. N. Galer, of Grand Forks, and secretary, Mr. Will G. Graves. The directors are: Mr. Flumerfelt, Mr. Galer, Mr. P. A. Paulson, Mr. Daniel Schultz, and Mr. C. S. Fowler, of New York. The company own coal areas 50 miles east of Fernie, which are now being satisfactorily developed. Shipments at present are made at the rate of but 150 tons a day, but it is expected that ere long a production of 2,000 tons a day will be maintained and electrical machinery and plant has been ordered on that basis. The dry walls and cribbing are completed and the brick work will be put in as soon as the weather permits. It is the intention of the company to erect 300 more ovens this summer. The ovens have a capacity of from a ton to a ton and a half of coke. The grading of the sidings at the mine and the track to the ovens is completed and the steel has arrived. The tracks will be laid as soon as possible.

DUNDEE GOLD MINING CO.

A CIRCULAR has been sent to shareholders of the Dundee Gold Mining Co., Ltd., whose mining property, situate near Ymir, in the Nelson Mining Division of West Kootenay, passed into the possession of the bank to which the company was indebted, and was last December reported to have been sold to Mr. A. E. Rand, of New Westminster, and others. In this circular shareholders in the Dundee G. M. Co. are informed that arrangements are being made to form a new company to purchase the property formerly held by the old company. It is proposed that the new company shall have an authorized capital of \$500,000, divided into 2,000 shares of the par value of 25 cents each. It is proposed to issue 500,000 shares in the new company at six cents per share, payable one-half a cent per share per month, shareholders in the old company to have the right to apply for shares in the proportion of three shares in the new company for every two they hold in the old company. Attention is called to reports of mining engineers, who examined the Dundee mine, in which it is stated that the limited amount of development already done on the property has exposed at least 6,000 tons of ore roughly estimated as likely to yield a net profit of \$20 per ton. In addition there are, it is stated, some 24,000 tons of concentrating ore, which, with proper machinery for treating it, would yield fully \$2 per ton net profit. It is further suggested that there are in the mine large bodies of concentrating ore from which profitable returns may be expected.

The circular further intimates that "about \$20,000 would probably install an air compressor and do the amount of development outlined by Mr. Bernard MacDonald (one of the mining experts above referred to) and another \$30,000 would be required for concentrating machinery. . . . There would be 500,000 shares in the treasury of the new company, which will be available for these purposes, and the shipping ore already exposed could be drawn upon to some extent."

It will be noted that it is not quite clear whether there are to be 500,000 shares in the treasury after the sale of the 500,000 first above mentioned, but perhaps it is proposed there shall be. At any rate there remain 1,000,000 shares to be accounted for. If these are to be appropriated by the promoters of the new company it would seem to be advisable for shareholders in the old company to satisfy themselves whether or not the new company is to obtain the property free of encumbrance in return for these shares, or if not, what value, if any, is to be received for them.

RECENT PUBLICATIONS.

The March issue of the *Engineering Magazine* (New York and London) is a notable production in several respects—in point of size, of workmanship, of the wealth of the information contained therein. The issue is entitled "First Labour-Saving Number," and contains the following articles: The World's Great Labour Savers and Labour Servers; the Effects of Labour-Saving Machinery, the Prime Mover and Its Influence on the World's Progress; What the inventor has done for the Railway Works; Hydraulic Power Appliances in the Engineering Industries; Labour-Saving Machinery in Foundry Operation; the Development of Power-Driven Machinery in the Mine; Mechanical Auxiliaries to the Economy of the Fire-Room; and the Relation of Electrical Inventions to Human Activity. The number is exceptionally well illustrated with very fine reproductions from paintings and photographs.

NEW ISSUES.

The following new companies have applied for certificates of incorporation during the month:—

	Capital.
Bentley Iron Mining Co., Ltd.	\$ 30,000
Cascade Copper Mining Co., Ltd.	250,000
Ferguson Mines, Ltd.	1,400,000
Golden Copper Mining Co., Ltd.	200,000
New Imperial Mines, Ltd.	100,000
Reliance Gold Mining & Milling Co., Ltd.	600,000
Yale Hydraulic Mining Co.	50,000
Spokane Falls Placer Mining Co., Ltd.	250,000
Camp Creek Hyd. Mining Co., Ltd.	125,000
Kamloops Coal Dev. Co., Ltd.	5,000
Queen-Dominion Mining Co., Ltd.	500,000
Richard H. Mining Co., Ltd.	650,000
Spy-Glass Mining & Dev. Co., Ltd.	500,000
Handy Gold Mines Dev. Co., Ltd.	1,500,000

B. C. ORES AT THE ST. LOUIS EXHIBITION.

THOSE visiting the forthcoming St. Louis Exhibition should have the opportunity of viewing a very representative collection of minerals and ores from Western Canada, mine-owners and others having given the Exhibition Branch of the Canadian Department of Agriculture their very hearty co-operation in the effort to secure a thoroughly comprehensive collection of specimens. In many cases the ores sent are in pieces weighing several hundred pounds, while some high-grade specimens of galena from the Sloean have an actual commercial value of perhaps three or four hundred dollars. Some fine specimens of gold-copper ores are also being sent from Rossland, Boundary and the Similkameen districts, and samples of British Columbian coal will too be shown in large cubes supplied by both the East Kootenay and Vancouver Island collieries. It is furthermore stated that a collection of ten thousand or more specimens of gold-bearing quartz, nuggets, minerals, crystals, agates and even precious stones from the Yukon is being prepared for the purposes of this exhibition, the whole weighing between ten and twenty tons, and having a value of at least ten thousand dollars.

IRIDIUM.

A well known firm of metal refiners writes to the *MINING RECORD* stating that a marked increase in the price of iridium, the second in commercial importance of the platinum group of metals, is reported to have taken effect during the past month. This fact is of interest to the electrical, chemical and dental industries, which are extensive consumers of the various alloys of iridium and platinum. Recent reports indicate a very marked shortage in the supply of iridium, while the demand for this metal is rapidly increasing.

Mr. N. A. Wallinger has been given charge of the assay office at the North Star mine, East Kootenay.

TRADE NOTES, CIRCULARS AND CATALOGUES.

THE business of the B. C. Assay & Chemical Supply Co., of Vancouver, has in the last year under the direction of Mr. Cave, increased very considerably. Recently the company supplied the large quantity of about seven tons of quicksilver, valued at between \$8,000 and \$9,000, to the Silver Cup Mines of Trout Lake, and last month another large order was secured for two and a half car-loads of chemicals for use in the new concentrating works now being erected at Trail for the Rossland Power Company.

The Westinghouse Companies' publishing department have just issued two circulars, Nos. 1,077 and 1,078. The former treats of their "Type L Motor," and the latter of "Westinghouse No. 91 Single-phase Railway Motor and Car Equipment." Both circulars are minutely descriptive, and contain many fine engravings and drawings illustrating the advantages in construction and operation claimed for these machines. These circulars may be obtained by writing to "The Westinghouse Companies' Publishing Department, Pittsburg, Pa., U.S.A."

The Chicago House Wrecking Company are sending out a new catalogue of machinery, supplies and miscellaneous merchandise, which should be in the hands of all mining and commercial men who are looking for bargains. The list comprises mining machinery, wrought iron pipe, light and heavy rails, tanks, pumps, wire rope, tools, builders' hardware, and an endless variety of other articles. Their advertisement will be found in another column and will repay a careful perusal. The following, quoted from their catalogue will give an idea of the extent and variety of their business operations: "We are purchasers and dismantlers of large institutions, including the World's Fair, Chicago; Pan American Exposition, Buffalo; Trans-Mississippi Exposition, Omaha; etc., etc. We purchase any manufactured article offered us at low enough prices."

The Canadian Westinghouse Co., Hamilton, Ont., proposes opening an office and warehouse in Vancouver under the general direction of Mr. Scribner, of the Seattle office.

Bulletin Nos. 4 and 5 from the Jeffrey Manufacturing Company are descriptive of "Storage Battery Industrial Locomotives," and "Electric Coal Mining Plant." These pamphlets are beautifully and profusely illustrated with large photographs, and the text is devoted to an explanation of the many points of superiority possessed by these machines. The locomotives both for mining and other industrial purposes are of various patterns and weights suitable for any purpose desired. These bulletins may be obtained from The Jeffrey Manufacturing Co., Columbus, Ohio.

The merits of the Lederholm Boiler are set forth in Catalogue No. 54 of the Allis-Chalmers Company. The book is handsomely bound and illustrated. That this boiler has been accepted as "the best" by a company of such magnitude is in itself a guarantee; but for the benefit of those who like to investigate for themselves, a careful perusal of the catalogue will be convincing. Write for Catalogue No. 54 to the Allis-Chalmers Company, Chicago, Ill.

MINING MEN AND MATTERS.

MR. RICHARD H. BATTEY, of Minneapolis, Minn., president of the Metropolitan Gold & Silver Mining Co., Ltd., owning the Triune mine situate about ten miles from Ferguson, Lardeau, is expected to shortly reach Ferguson to make arrangements for an early resumption of work at the Triune.

Mr. Dougald Cameron, well known in the Ymir district as mine manager for the Active Gold Mining Company, has been appointed to supervise the construction of a bridge across the Salmon River.

Mr. J. McLellan, of Camborne, who has been assayer for the Calumet & B. C. Gold Mines, Ltd., owning the Eva mine, is reported to have left the Fish River camp for Montana to there work a free milling gold property he has taken an interest in.

Mr. R. C. Campbell-Johnston recently left Slocan City on a

visit to Vancouver. It is stated that he will shortly remove from the Slocan to Kamloops.

Mr. Walter G. Perkins, who lately succeeded Mr. J. Cuthbert Welch as superintendent of the Le Roi smelter at Northport, Washington, under the manager, Mr. E. J. Wilson, has attained this position as a result of close application to his profession. After working for some time in the bucking room at the Trail smelter he was promoted to the post of assistant assayer. Later he went to the Granby Company's smelter at Grand Forks and, after six months' service in a similar capacity, was made chief assayer, which responsible position he held with much credit until his appointment to Northport. Mr. Perkins passed his examination for his certificate of competency and license to practise assaying in British Columbia at Victoria in March, 1901.

Mr. S. F. Parrish, general manager of the Le Roi Mining Company, Ltd., Rossland, was seriously ill in Spokane, Washington, last month. Latest advices were to the effect that a considerable improvement had taken place in his condition.

Mr. A. H. Kelly, who has long held a three-fourths interest in the May and Jennie group on Forty-Nine Creek, near Nelson, early last month visited Republic Camp, Washington, for the purpose of ascertaining what success was being met with by the Mountain Lion company in using the Hendryx electro-cyanide process for the treatment of the ores of the Mountain Lion mine. Last October Mr. Kelly had some May and Jennie ores treated by this process at Mr. C. M. Fassett's laboratory, Spokane, Wash., and though the experimental results obtained there were satisfactory he wished to see the process in use on a commercial scale, hence his visit to the Mountain Lion.

Mr. Bruce R. Warden, M.E., of Vancouver, has been appointed a member of the staff of the Mining and Metallurgical Department of the C. P. R., and expects after the 1st of April to make Banff his headquarters.

Mr. Mark F. Madden, of Chicago, Ill., president of the Providence Mining Company, Ltd., lately arrived in Greenwood on one of his periodical visits to the Providence mine.

Mr. H. F. Martin has resigned the position of superintendent of the Crow's Nest Pass Coal Company's Morrissey colliery. Mr. J. R. Roaf, of the company's engineering staff at Michel, has been appointed outside superintendent, having the coke ovens and the railway from Morrissey Junction to the mines under his supervision. Mr. Chas. Simister continues to be superintendent of the Morrissey mines in charge of all inside work.

Mr. R. Fernau, of Newcastle-on-Tyne, England, and Mr. Oscar Lefebvre, of Brussels, Belgium, recently paid a visit to the Crow's Nest Pass district, East Kootenay, with the object, so it is stated, of ascertaining what suitable locations there are in that section for a lead smelter and a zinc reducing plant. It is understood that the question of having reduction plants close to the source of the fuel supply rather than near the mines from which the ore supply will be obtained is engaging the close attention of these gentlemen.

A change has been made by the Department of Mines in connection with the inspection of the coal and metalliferous mines of the East Kootenay and Vancouver Island and Coast districts, respectively. Inspector Thomas Morgan has been transferred from the Coast to East Kootenay with headquarters at Cranbrook, and Inspector Archibald Dick from East Kootenay to Vancouver Island with headquarters at Nanaimo.

Sir Bevan Edwards, a director of the Cariboo Consolidated and Slough Creek Mining Companies, operating in the Cariboo, was reported two or three weeks since to be ill at his home in England with bronchial troubles. Sir Bevan takes a great interest in the development of the deep leads of the Cariboo, which district he has several times visited.

Mr. C. B. Gaddis, manager of the Spruce Creek Power Company, is returning to Atlin to prepare for the ensuing season's operations on ground held by his company.

Mr. Ernest Mills, Greenwood, has been elected president of the district association of the Western Federation of Miners. Mr. F. Phillips, of Nelson, is vice-president, and Mr. A. Shilland, of Sandon, is secretary-treasurer.