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E. JACOBS,.....Managing Editor

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NOTES AND COMMENTS.

The *Mining Journal*, London, of July 22 said: "Le Roi shares have advanced sharply to £1. Whether the amalgamation has fallen through or not is unknown, but the position of the company has been improving for some time past."

It is understood that smelting operations are to be commenced in October at the smelter of the Alaska Smelting & Refining Co., erected for that company by Mr. Paul Johnson, the well known smelter man, at Hadley Prince of Wales Island, S. E. Alaska. Mr. B. D. Brown, of New York, president of the company, was in Victoria this month, and confirmed the report that preparations are being made for blowing in the furnace shortly.

The strong tone of the base metal market speaks well for the mining industry in America generally, observes the *San Francisco Mining and Scientific Press*. Copper, lead and spelter are each showing an upward tendency, and this in the face of increased production. The great industrial activity in this country and abroad absorbs the metal output as fast as it reaches the markets, and prices are not only maintained, but advance under the stimulus of strong demand.

Our special correspondent at Princeton, Similkameen, informs us that beside the fireclay met with, as described in his letter published this month, the Vermilion Forks Mining & Development Co. has struck several other seams of clay while drilling on the Princeton townsite. The clay is described as one of the best yet discovered in America, and should prove of value, since it can be got out cheaply in connection with the coal, with which it occurs.

The editor of the *MINING RECORD* is in receipt of a letter from Dr. R. W. Raymond, secretary of the American Institute of Mining Engineers, in which the following occurs: "I have the pleasure of expressing to you the thanks of the Council of the Institute and its visiting members and guests for the important assistance given by the British Columbia *MINING RECORD*, and by you personally, in promoting the professional interests of the late Institute meeting and ex-

cursions in British Columbia, and the entertainment of the visiting party."

The announcement that Mr. F. W. Rolt, long associated with mining enterprises in and about Rossland, has been appointed to a vacancy on the board of directors of the Le Roi Mining Co. has been favourably received at Rossland, where Mr. Rolt was for years prominent in local matters. It is not yet known whether Mr. Rolt will return to Rossland from England, whence he went last year on business, but whether or no, the appointment to the Le Roi directorate of another man well informed as to conditions prevailing at Rossland is gratifying.

During July there were 3,088 tons of lead-bearing ores received at the Hall Mining & Smelting Co's smelter, from which was recovered about 1,324 tons of metallic lead. The average lead content of the ore was nearly 43 per cent. Ore from the St. Eugene mine ran about 63 per cent lead. The lead ore receipts at the Canadian Smelting Works, Trail, in July totalled 1,259 tons containing about 660 tons of lead, or an average of about 52 per cent. The lead values of the ore ranged from 4.1 per cent, in the case of a rich gold-silver ore, to 71.7 per cent in a shipment from the St. Eugene, which mine contributed about 60 per cent. of the ore received at the two smelters and about 80 per cent of the lead.

The Nelson *Daily News* reports Dr. Hendryx to have expressed himself, with regard to the working of his process at the mill of the Reliance Gold Mining & Milling Company owning the May and Jennie mine, near Nelson, as follows: "I could not afford to let the first test in Canada result in a failure on account of lack of ore, or lack of values, or bad management. Here I am perfectly satisfied. The ore is here in unlimited quantities, the values are here, and the management is efficient. Therefore, I consider the perfect and continued success of the process is assured." The Hendryx electro-cyanide process had not previously been operated on a commercial basis in British Columbia.

One of the subjects on the programme for discussion at the sixteenth annual session of the Trans-Mississippi Commercial Congress which was opened at Portland, Oregon on 10th inst., was the question of demanding the establishment of a United States Department of Mines and Mining, with its head a member of the President's cabinet. Nearly 3,000 delegates were in attendance. Press reports are to the effect that powerful speeches were made in favour of this movement. The president of the California Mining Association expressed the opinion that the only way to secure such a department is to keep on introducing in Congress resolutions recommending a Department of Mines and Mining "until every pigeon-hole is filled, and hammer on the doors of Congress until it grants the demand in order to get rid of the noise."

The Ladysmith *Ledger* remarks: "A Vancouver

story about dredging on the Fraser is decidedly yellow. It is a boom for a Fraser river company, and claims that between \$60,000 and \$70,000 has been saved by its dredge since March, all of which, if true, would be very good news. Unfortunately, there is very little foundation for this fairy story. The above-mentioned company has made very little, if any, headway. They are said to be in debt for labour and it is said the Hamilton Manufacturing Co. are holding the plant for their pay. There is gold in the river, but so far only careful management makes money in dredging the Fraser river bed. Within the past ten years \$2,000,000 has been spent in building and equipping such plants. Members of the Fraser river company claimed a year ago, when they started, to be taking out \$2,500 per day. That story, like the present one, was a fake."

We take the following from a published report of the meeting of the Great Northern Mines, Ltd., held at Nelson on August 8: "All the principal shareholders were present, and it was fully realised that a crisis in the affairs of the company had been reached. The two elements which have hitherto controlled it had reached the parting of the ways, so far as dual control was concerned, and gracefully accepting the inevitable, the presidential section, headed by W. B. Pool, stepped down, and allowed those who had been in nominal control for nearly a year to reign in their stead. In retiring from the presidency Mr. Pool . . . practically admitted that his *forte* lay rather in promoting than in operating mining properties." As this is the man who tried to deceive the provincial mineralogist, when that official visited Poplar creek, by showing rich gold specimens he falsely alleged were taken from a claim he was largely interested in, seemingly with the object of favourably influencing the expected official report, we cannot but regret that he has not also retired from "promoting" mining properties in British Columbia, since it is by such trickery that the public is sometimes deceived and legitimate mining brought into undeserved disrepute.

The *Mining Reporter*, of Denver, Colorado, in its issue of 10th inst., made mistakes common to all publications that entrust to those who have no knowledge of facts and local conditions the work of compiling a review of the mining situation. For instance, it stated that "At Rossland the West Kootenay Power & Light Co. has been organised and will erect a hydro-electric power station at Bonnington Falls," etc. This of a company which commenced its construction work at Bonnington in July, 1897, and before the close of 1898 was supplying power to Rossland mines, and has since supplied to Rossland Trail and Nelson, electric power generated by its three generators of a total capacity of 3,500 k.w., is a statement far wide of the mark. This is of little importance, though, in comparison with the following gross mis-statement: "The Consolidated Cariboo Hydraulic Co., which has been resting under a cloud of mismanagement for some time." We cannot think this unwarranted and entirely untrue reflection on Mr. John B. Hobson, the general

manager of that company, was deliberately made—rather must it have been the result of ignorance. Mr. Hobson has for many years been in charge of the most important hydraulic mining enterprise in British Columbia, and has to date recovered from its gravels more than \$1,000,000. His main difficulties have always been the result of a shortage of water, and when these shall have been overcome, as they will be if present negotiations for the introduction of sufficient capital be carried to a successful issue, the "mismanagement" will immediately disappear. Meanwhile, it will be in order for the *Mining Reporter* to ascertain the facts and acknowledge that its error arose through ignorance of the actual position.

The *Nelson Tribune* says that the MINING RECORD, "usually fair-minded and open to conviction, sticks to its error as to the value of Nickel Plate ore, and repeats that statement that it ranges from \$12 to \$15 a ton." One difference between the *Tribune* and ourselves is that the former quotes the stated assay values obtained from the sampling of an "expert," and from the alleged statements of a subordinate official when interviewed by the reporter of a newspaper, while we prefer to take the statements of the provincial mineralogist, who has access to sworn returns showing the values recovered in 1904 from 9,000 to 10,000 tons of ore milled, and the positive assurances of men in whom we have full confidence that Mr. M. K. Rodgers, general manager for the company owning the Nickel Plate group, informed them that \$12 to \$15 per ton is the general average value of the ore treated. Further, the *Tribune* asserts that we disagree as widely with our Similkameen special correspondent as with the *Tribune*. As to this, we do not pretend to reflect editorially the statements appearing in our news columns, although we have confidence in the general reliability of our correspondent, or his communications would not be given space in our columns. Our readers, though, will quickly recognize one reason why the *Tribune* is unlikely to convince us we are wrong if they will make a little calculation for themselves after reading the following quotation from its comments: "The same special correspondent says \$1,000 a day is being saved on the plates. Now with 40 stamps dropping, the tonnage crushed is about 160 daily, and this saving in gold alone would mean \$25. to say nothing of the other values in the tailings." We are dense enough to think that the *Tribune's* calculation gives a result four times what, in our ignorance, we arrive at.

ZINC RESOURCES OF BRITISH COLUMBIA.

RECENT press despatches from Ottawa indicate that the Dominion government is at length arranging to comply with the request for an expert examination into the zinc resources of British Columbia, and matters relating thereto, made by the Associated Silver Lead Mines of British Columbia, the Associated Boards of Trade of Eastern British Columbia, the Provincial Mining Association, and others, who at the beginning of last year urged this ques-

tion upon the consideration of the government. The necessary investigations will be made by Mr. Walter Renton Ingalls, M.E., editor of the *Engineering and Mining Journal*, New York, and author of "The Production and Properties of Zinc," assisted by Mr. Philip Argall, M.E., of Denver, Colorado, and Mr. A. C. Garde, formerly resident manager for the Payne Consolidated Mining Co., at Sandon, B.C. Mr. Garde has for years taken an active interest in the local zinc question.

Among the despatches published in the press relative to this matter is the following:

Acting under recommendation of Dr. Eugene Haanel, superintendent of mines, the minister of the interior, has decided to have an investigation made into the character and extent of the zinc deposits of British Columbia. The points to be determined by the expert are briefly as follows:

1. Examination of present development of mines and approximate determination of tonnage of ores immediately available; occurrence and character of the ore and future access, together with cost of mining.
2. Examination of present methods of milling.
3. Investigation of adaptability of the ores of the new methods of concentrating—magnetic, electrostatic, and so forth.
4. Study of conditions affecting marketing of concentrates, including the question of smelting in British Columbia or elsewhere in Canada.
5. Investigation of the desirability of utilization of zinc ore with silver content.

SUBSTANTIAL APPRECIATION OF SMELTER MANAGER'S ABILITY.

WE heartily congratulate Mr. Thos. Kiddie, who designed and erected the Tye Copper Co's smelter, at Ladysmith, Vancouver Island, upon the substantial recognition of his ability and success as a metallurgist and manager of the smelting business he has had charge of for several years, shown in the offer lately made to him of the position of manager for the Britannia Smelting Co., which a few weeks ago acquired the smelting works situated at Crofton, Vancouver Island. We have on several occasions drawn attention to Mr. Kiddie's skilled and successful smelter practice, under conditions that, owing to the unusual nature of the Tye ore, presented many difficulties. In addition, he has gradually built up for the Tye Copper Co. an enviable reputation among shippers of custom ores, his absolutely fair and honest methods having inspired general confidence. It is a matter of regret that this company is shortly to lose the valuable services of one whose name has been intimately associated with its smelting department from its inception, but it is satisfactory to know that Vancouver Island and the Pacific Coast portions of the province will continue to derive the benefit Mr. Kiddie's connection with the local smelting industry assures.

It is no secret that the keen—and heretofore successful—competition of the Tacoma smelter has seriously retarded, if not prevented, the enlargement of

the smelting industry of Vancouver Island. With larger works, abundant capital, and lower labour and other costs, the management of the Tacoma establishment has generally been able to underbid the local smelters, with the result that for more than a year the Crofton works have been idle, and those at Ladysmith never had a sufficiently large ore supply to admit of their being kept running without monthly interruptions of from a week to three weeks. With the opening up of the enormous ore bodies occurring at the Britannia mines, Howe Sound, now in active progress, and the extensive equipment of that property with mine and concentrating plant, and adequate transportation to tide water and shipping facilities, the situation has improved to a marked degree. It has been further strengthened by the acquisition of the Crofton smelter by the capitalists controlling the Britannia mine, and now it is intended to add to the equipment of those reduction works and so extend their treatment facilities as to place them in a position to successfully compete for the smelting business of the coast north of Puget Sound. With ample capital available for this purpose, there remained but one other essential to provide for, viz., the securing for the position of manager of just such a man as Mr. Kiddie has during his seven years' active connection with local mining and smelting industries unmistakably proved himself to be. We may, then, look forward with confidence to the future of the smelting industry on Vancouver Island, the more so since available ore supplies from northern British Columbia, Yukon Territory and S. E. Alaska are gradually increasing in quantity.

Mr. Kiddie's chemical and metallurgical experience has extended over many years. From 1872 to 1882 he was with first the Bede Metal and Chemical Co., of Hebburn-on-Tyne, England, and then with the Tharsis Sulphur & Copper Co., of Glasgow, Scotland, owning mines in Spain, situated west of the Rio Tinto. In 1882 he entered the service of the Orford Copper Co., of New York, and remained with that company until 1888. Then he had two years at Mr. Clarke's, at copper smelting in New Mexico, and after that three years at the London mine, Park City, Colorado. From 1894 to 1898 he was with the Orford Co. which, in addition to treating copper ores and mattes, refines nickel ores and mattes from New Caledonia and Canada. In 1898 he came to British Columbia, to the Van Anda property on Texada Island, where, in 1899, he built a smelter. Later, he was manager there for the bondholders, and afterwards remained with the company that took over the property under option of purchase. In 1902 he was engaged by Mr. Clermont Livingston, general manager for the Tye Copper Co., to design and erect a smelter for that company, since which time he has been at Ladysmith, with results already mentioned. His resignation has been sent to London, and it is expected that the directors of the Tye Copper Co. will at once appoint a successor, so that he may, without unnecessary delay enter upon his new duties at Crofton.

HASTINGS (BRITISH COLUMBIA) EXPLORATION SYNDICATE, LTD.

THE declaration of a dividend by the Hastings (British Columbia) Exploration Syndicate.

Ltd., an English mining company operating in the Ymir district of this province, with Mr. Leslie Hill, M.E., of Nelson, as consulting engineer and manager, is a matter for congratulation, not so much on account of the amount of profits available for distribution among stockholders, for this was not large, though even a small dividend is an encouragement to further enterprise, but from the fact that Mr. Hill has transformed a company operating at a loss into one that from the time he took charge of its affairs first steadily overtook accumulated arrears until they were entirely wiped out, and next gradually increased its cash surplus until a sufficient sum was in hand to admit of a division with prudence of about half the amount among the stockholders in the company. Further, Mr. Hill, whose conservatism is well known, was able in his annual report, extracts from which are printed elsewhere in this issue, to state that "there is more ore now exposed than at any previous time during my management, and there is a large block of ground in which it would be reasonable to expect development to find fresh ore shoots."

Mr. Hill took charge of the company's Arlington mine and mill, at Erie, Ymir district, in the spring of 1902. His predecessor had reported the mine worked out and, as it had been gutted, it certainly appeared as if there was nothing to do but abandon it. Previous to March, 1901, a large amount of development work had been done and the ore body opened up and its limits apparently determined. All the ore, which constituted a much larger body than any found for some time subsequently, had been stoped: everything that appeared rich enough to put through the mill had been gouged out, until it was not practicable to longer keep the mill running. Mr. Hill quickly decided that the ore was not of a character suitable for profitable milling and concentration, so he closed the mill down, and afterwards sent to the Hall Mines Co's smelter the comparatively small quantity of ore he found in the course of further development. The wisdom of this course and the widely different results Mr. Hill obtained can be briefly summed up as follows: During fifteen months ended May 31, 1902, the net smelter value of returns from 2,322.7 tons of ore and concentrates treated and shipped, was \$93,804.22, and boarding house profits, \$1,979.50: total, \$95,783.72. Against this there were mining and shipping costs, \$83,589.55, and expenditure on other account, \$33,199.97: total, \$116,789.52. The operations for this period, therefore, showed a deficit of \$21,005.80. During the following twelve months with Mr. Hill in charge, there was made a net profit over mine cost of \$16,082.58. The total costs of mining, milling and shipping in the former case were at the rate of \$35.80 per ton produced, while Mr. Hill's costs, with smelting substituted for milling, were \$23.55 per ton—a difference of \$12.25 per ton in favour

of the latter. Results during the two succeeding years (to May, 1905) changed the position so materially that there was at the close of that period a cash surplus of nearly \$33,000 as compared with a deficit of \$21,000 three years earlier. We have, therefore, pleasure in calling attention to this changed position, which is the direct result of a clear realisation of local conditions and requirements, together with management fully competent in other respects. While operations in this instance have not been extensive, their later results have been of such a nature as to in some measure encourage those directly interested to continue to give attention to mining in this province, which is a step in a direction distinctly desirable, especially from a local point of view.

NEW RAILWAYS IN MINING DISTRICTS.

RAILWAY construction which when completed, will benefit several mining divisions in the province, is in progress. In N. E. Kootenay grading has been commenced on a line known as the Kootenay Central, and which is understood to be an enterprise under the control of the Canadian Pacific Railway Co., between which company's main line, at Golden, and its Crow's Nest line at south of Fort Steele it is intended to give direct connection, following the valleys of the upper Columbia and upper Kootenay rivers *en route*. In the mountains bordering these valleys are mineral deposits that, with the provision of suitable transportation facilities, can be profitably worked, notably several silver-lead mines in the Windermere mining division that have during recent years shipped to Kootenay smelters sorted ore in quantity.

In South-east Kootenay a line is being built between the Canadian Pacific Railway Co's Crow's Nest road, at Yakh, and Spokane, Washington. This branch will be in competition with the Great Northern Railway Co's line between Spokane and the coal-fields of the Crow's Nest Pass.

A commencement has been made, on a small scale, to grade a line from Grand Forks, Boundary district, where is situated the Granby Co's big smelter, northwards up the north fork of Kettle river. This work, though, is understood to be but preliminary, pending an application to the provincial legislature for a subsidy. The line is designed to eventually provide an outlet for the ores of Franklin camp, in which occur, on the McKinley, Glouster, and other properties, ore bodies known to be of considerable size and value.

The construction of the road known as the V. V. & E. (Victoria, Vancouver & Eastern), the charter of which has been acquired by the Great Northern Railway Co., is at last being proceeded with in earnest. This is an extension of the Great Northern Co's branch line from Marcus, Washington, on that company's Spokane Falls & Northern railway (between Spokane and the British Columbian towns of Nelson and Rossland, respectively), to Republic, Washington, and Grand Forks, B.C. Grading from Curlew, Washing-

ton, to Midway, B.C., was completed some time ago, and the rails are being laid on this section. Contracts have been let for grading and rock-work between Midway and Oroville, Washington, and thence to Keremeos, B.C. Engineers are making final location of the route from Keremeos up the Similkameen river to Hedley, where the Daly Reduction Co's 40-stamp mill is reducing gold ore from the Nickel Plate mine, on Twenty-mile creek, also owned by the Marcus Daly estate. The Great Northern Co's announced plans include the continuation of this railroad up the Similkameen river to Princeton, in the neighbourhood of which town are seams of coal of commercial value, and, on Copper mountain, bornite and other copper ores of much promise. One group of mineral claims on this mountain is under bond to the British Columbia Copper Co., of New York, which, after having established a profitable copper mining and smelting enterprise at Greenwood, Boundary district, is seeking to extend its operations to the Similkameen country.

From the northward the Canadian Pacific Railway Co. is building a branch from its main line at Spence's Bridge to Nicola, in which extensive district are coal measures and occurrences of copper and other metaliferous minerals, in addition to a comparatively large area of agricultural and pastoral lands. An extension of this branch southwards to Princeton and Hedley, and, later, connection with the company's Columbia & Western system in the Boundary, are understood to be included in its plans for securing its share of the big traffic it is believed will develop in the Similkameen as transportation facilities shall be provided.

Still another mining section in which a beginning has been made towards railway building, is that part of the Boundary district through which the west fork of Kettle river flows. The absence of transportation —of even a good wagon road until recently—has prevented in this locality development adequate to demonstrate on a fairly large scale the production capabilities of the west fork mining camps. In 1901 one mine, the Carni, shipped 885 tons of silver-gold ore, half the distance over a snow-road, 50 miles to Midway, whence it was taken by rail to the British Columbia Copper Co's smelter at Greenwood. Returns from this ore gave an average value of between \$40 and \$50 per ton, but the cost of hauling to the railway was so high that the mine was closed down until transportation conditions should be less unfavourable. Last year a small stamp mill and a concentrating table were put in and experimental work was done for guidance as to future operations. Other properties in this neighbourhood that have shipped sorted high-grade ore are the Sally, Rambler and Butcher Boy. Prospecting work has indicated the occurrence of shoots of ore of payable grade on other mineral claims in this district, which will probably prove a good mining camp when means for shipping ore at moderate cost shall have been provided. It is stated that the banking firm of Kuhn, Loeb & Co., of New York, are arranging to finance this undertaking, which is known as the Midway-Vernon railway project.

UNWARRANTED CRITICISM AT THE GENERAL MEETING OF THE TYEE COPPER CO.

ELSEWHERE in this issue we publish a report of the general meeting of the Tyee Copper Co., held last month in London. As the statement of accounts for the financial year ended April, 1905, has not been published, we are unable to make an comment on the results of the year's operations from a financial point of view, but since in the course of the discussion that, according to press reports, took place regarding the advisability or otherwise of distributing among the shareholders more of the accumulated profits, one shareholder asked "why, with £32,000 (\$160,000) on deposit, and in view of the statement that 2,000 tons (the present reduced monthly ore output of the mine) would pay all expenses and give them 10 per cent on the nominal capital, the directors wished to hold back the money in hand?" while another stated that "at present the company had about £73,000" (\$365,000), it is evident the company's financial position has become still stronger as the result of the last year's mining and smelting operations.

There are, though, three matters that came before the meeting to which we desire to direct attention. To two of these, viz., the questions (1) of the strategem alleged to have been employed by Mr. Ludwig Loeffler and his nominees to prevent the re-election as directors of Messrs. E. B. Livingston and F. W. Hodges, and (2) the advisability of paying to the shareholders more dividends under existing conditions, we make only this passing reference, knowing that if, in the former case, a wrong has been done the retired directors, or, in the latter, a policy is being followed that the holders of a majority of the stock do not approve, a special meeting can be called and the will of the majority be thereafter carried out.

The third matter is the aspersions cast upon Mr. Clermont Livingston, local director and general manager of the company, in regard to his connection with the Vancouver Island Mining & Development Co., Ltd. Mr. Hancke, one of Mr. Loeffler's representatives on the board, after quoting from a newspaper a statement concerning this company and its operations, is reported in the *Financial Times* to have said: "I cannot agree that it is fair and proper for Mr. E. B. Livingston and Mr. Hodges, while acting as directors for the interest of the shareholders of the Tyee Co.—and the same remark I wish to apply to our local director, Mr. Clermont Livingston—to be largely interested in the Vancouver Island Mining & Development Co. when that company extends its work of exploration to ground adjacent to the boundaries of the Tyee Co. In my opinion, directors of the Tyee should in such cases act in the interest of the Tyee alone, and it should not happen, as it has, that when the company competing with the Tyee has some success in its exploration work close to our claim, we, the co-directors of these gentlemen on the board of the Tyee, should hear it first, and only, through the newspapers. The duty of the gentlemen connected so closely with

the Tyee Co., and more especially so in the case of our local director on the spot, should be to act in the interest and for the benefit of the Tyee Co. when there is a chance of ore finds in close proximity to our own mine, and the knowledge and experience gained at the expense of the Tyee should not be utilized for the benefit of another concern in which these gentlemen are interested." Mr. Ludwig Loeffler said "He considered it wrong on the part of the directors to whom they entrusted their affairs to act in the interest of another company, and take advantage of all the money they had spent and all the work they had done. Such an act might not be legally wrong, but certainly it was morally wrong."

It may be here explained that there are 50,000 £1 shares in the Vancouver Island Mining & Development Co. Of these, Mr. Hodges holds 150 shares and Mr. E. B. Livingston 300. Neither of these gentlemen has at any time been on the board of directors of this company. The facts in connection with this company are that about three years ago it was formed, but not with the object of operating on Mt. Sicker, where is situated the Tyee Co's mine. It first worked under option claims on Mt. Malahat, distance some 20 miles from Mt. Sicker, but, developments not being considered sufficiently encouraging, this option was not taken up. Later, opportunity arose for obtaining under bond claims situated at Mt. Sicker. There was no secrecy observed in this connection, for not only did the *MINING RECORD* publish, in January, 1904, information regarding what the company was doing in preparation for developing this property, but the following particulars appeared in the Annual Report for 1903 of the Minister of Mines for British Columbia: "The Vancouver Island Mining & Development Co., the offices of which are in London, England, has secured the option for two years on a large group of claims on Mt. Sicker to the east of the Tyee, and work has been commenced on the Westholme claim. Suitable machinery has been purchased, including air compressor and drills, hoisting engine, etc., so that the development of the property will be pushed forward with expedition and economy. It is the intention to sink a shaft to a depth of at least 500 ft., and to thoroughly explore the ground. The necessary buildings, etc., are now being erected, and the coming spring should see the work in full swing." In the Annual Report for 1904 brief mention was made of the work done on this property, in that year, by the company, while last June the *MINING RECORD* published particulars of the company, its property, and its mining operations up to that time. Further, the company's office in London was the same as that of the Tyee Co., and its secretary was as well on the staff of the latter company, which facts were public property even if not known to Mr. Loeffler and his nominees on the Tyee directorate.

Coming now to the reflections on Mr. Clermont Livingston—we take this opportunity to express the opinion that the Tyee Co. has been especially fortunate in having as its general manager a man of such sterling integrity and such conspicuous zeal in the

advancement of its interests as that gentleman is generally known, and has amply proved himself, to be. In connection with the acquirement of necessary mining property, of which it has about 400 acres, it is entirely due to the persistent representations of Mr. Livingston that the directors added, somewhat reluctantly it may be observed, to the company's earlier holdings claims covering all possible deviations or faultings of the lode it is working. Next, the buildings, plant, and machinery, at mine and smelter, and an aerial tramway $3\frac{1}{2}$ miles from the mine down to the Esquimalt & Nanaimo railway, cost the company less than any other surface works of similar character, size and capacity in the province, so absolutely honest were Mr. Livingston (whose salary, by the way, has been very low for one filling so well the responsible position he has held throughout) and the mine and smelter officials under him. Then, there was never any understanding, neither expressed nor implied, that Mr. Livingston should not be free to take any interest he should think proper in other mining property, his written agreement with the company only stipulating that he "shall attend with due diligence to the business of the company, and shall devote sufficient time to such business to enable him to efficiently discharge his duties." Finally, the Vancouver Island Mining & Development Co. in no sense competes, as alleged by Mr. Hancke, with the Tye Co., nor has it derived benefit, as charged by that gentleman and Mr. Loefler, from knowledge and experience gained at the expense of the Tye Co. As to the latter, the development work so far done by the former company consists of a shaft and cross-cuts on its Westholme claim (between which and the Tye boundary line lie the Richard III. claim and a fraction) which shaft is situated 1,700 ft. east of the known occurrence of ore on the Tye, and in which workings no ore body of sufficient size to be of commercial value has yet been discovered, in contrast to which the Tye has shipped, 130,000 tons of ore of good grade.

We think it manifest from the foregoing that Mr. Clermont Livingston's actions and position, morally as well as legally, have throughout been, and still are, above reproach. We protest most emphatically against the undeserved aspersions cast upon him, and think it the duty of the shareholders of the Tye Copper Co. as a whole to do him the simple justice of making public their dissent from the reflections unworthily cast upon him by those who do not appear capable of recognising the strict honesty and unremitting zeal in the Tye company's interests characterising one who merits only the unqualified confidence of those he has so well served.

IMPORTANT DEVELOPMENT WORK AT SLOCAN MINE.

THE *Sandon Standard* lately published the following account of important development work being done by the Rambler-Cariboo Mines, Ltd., at its mine in the Slocan district:

The Rambler-Cariboo Co. entered on this piece of development work for the purpose of proving the

mine at depth, and also to allow of more economical working of the property. The saving in the expense of fuel, pumping, wages and haul hitherto incurred on the old basis of operation that will be cut out will be sufficient to pay the cost of the new work in three years or less. The savings can be applied to more extended development or to dividends.

The new workings are about 4,500 ft. from the Kaslo & Slocan railway in an air line, and will tap the lead from 1,500 to 2,000 ft. depth below the apex. Abundance of water for power, and timber for mining purposes, exist. If the lead pans out at depth, a tram line will be constructed to the track, and the mill will be located at the foot of the tram. The Rambler will then be about the best developed and equipped mine in the Slocan. The new tunnel is 7 by 9 ft., but the rock has been allowed to break to the solid wall. Beyond the first seven sets at the portal, not a stick of timber has been found necessary. Hauling out the waste is done by mules, three cars at a trip, the cars being of 25 cu. ft. capacity each. Six more cars will be put on as soon as constructed. The grade is half of one per cent. Its length is now 2,500 ft., and if one stops at the face, the mouth can be seen. A water-box is located under the track, built of 2-in. plank, 2 ft. wide by 1 ft. in height, and the drainage water can be flumed off to the main water supply of the compressor. In fact all the water from the motors used at the tunnel portal is re-used for the compressor plant. The rails used are 16-lb. Sidings are arranged for moving ahead every 200 ft. The siding rails are laid on plates and can be moved toward the face with a minimum of trouble. A 12-in. galvanized exhaust pipe, connected to a Connersville blower with a capacity of $12\frac{3}{4}$ cu. ft. each revolution, driven 150 r.p.m., by a Pelton water wheel keeps the air in circulation. The air at the face is excellent; the large blower capacity allows entry after shooting very quickly, the draft being so strong that there is little perceptible odour 5 ft. back from the end of the exhaust pipe, which is kept up to about 100 ft. of the working face. The blacksmith's and tool shops are located at the portal, and are supplied with ample equipment. The work throughout is conducted with a regard for system that looks to results. Twenty men are employed, the extra delay wages paid allowing the pick of the best men. No delay has been experienced in the conduct of operations, and not a man has been injured on the work. The men at the face are first-class rock drill hands, thoroughly used to hard drilling. The character and speed of the work performed, together with the average rate of progress of more than 200 ft. per month, shows the wisdom and good judgment of the policy pursued. A Canadian Rand Drill Co's air compressor, with a capacity of 700 cu. ft. of free air per minute, is installed some distance below the tunnel. It is driven by a 36-in. Pelton wheel working under a head of 750 ft. It supplies air to two Sullivan $3\frac{1}{4}$ -in. drills, which work under a pressure of 100 to 110 lb. The rock is hard throughout but breaks well. For the first 1,200 ft. the regular Slocan slate was encountered, then granite, and now the drills are working in a species of black porphyry. The heavy pressure used

makes for fast work—16-ft. cuts are made, 16 holes to the face, and fired every 18 hours. The drilling is figured to secure the best leverage possible with the powder used; 40 and 60 per cent powder is used and the cut holes are blasted first. Bennett green tape or submarine fuse is employed, a costly brand, but absolutely certain. The methods of drilling and shot-firing are carefully studied to secure the best results. The walls all through show the most careful work, as there is no shattering or weak places visible. Steel plates are laid down a sufficient distance back from the face to muck from, which makes for expeditious work, and the allowance of the working time of the drills to the limit. A Sheffield velocipede is furnished for greater ease in going in and out and for use in shot firing.

It is expected that the work will be completed about May, 1906. Mining is more or less of a lottery, but with regard to the class and permanent character of the work performed around this enterprise, there is not a suggestion of guess work. If success is achieved in striking the ore body, the investment will be a highly profitable one. It will prove that the Slocan ore bodies do go down, and this work will be but the forerunner of development in other properties. The management have done everything possible to prove that the veins do extend to depth, and are backing their judgment by the new tunnel. It is no stock scheme, but mining from a businesslike and practical basis, work of that class which we hope to see lots of in the future of the Slocan.

A NEW JIG.

IN the Arizona Copper Company's report for the year ended September 30, 1904, the directors state:—

"After giving the new jig a fair trial, we purchased the right to use it free of royalty. It is an Australian invention, and it is remarkable for its wonderful capacity as well as for the excellency of its work. The ordinary jig treats 50 tons of ore per day; the new jig treats 650 tons in the same time, and we have yet to find the limit of its capacity. We have erected two of the jigs, one for taking the place of the ordinary jigs and the other to perform the work done by the first rows of Frue vanners. The results have been so favourable that we have decided to adopt this jig in all of our mills, and we are making the arrangements necessary to that end. The great advantage of this jig lies in its capacity. On account of that, it will not be difficult nor very expensive to double the capacity of certain of our concentrating plants."

No further particulars concerning this new jig have yet been made public, the company named stating that they are not yet in a position that will admit of their giving fuller information.

NEW EXPLOSIVE.

GERMAN papers state that acetylene gas, generated from calcium carbide by the simple addition of water, has not met expectations, which, however, were very great. On account of the ease with which a gas for lighting purposes could be obtained,

it was believed that it would be used very extensively, but the boom in the acetylene industry did not last long. New uses for the gas have been looked for for some time. The latest invention is its use as an explosive.

By means of an air mixture, explosive force is obtained which can compete with that of powder and dynamite. The explosion takes place in an air chamber and is caused by an electric spark. For this purpose carbide of calcium is reduced to small particles and put into a cartridge, consisting of a tin box. In this the carbide lies at the bottom and above it is a partition filled with water. Above this is a vacant space with the electric percussion device. On the side of the cartridge is an iron pin by means of which the partition between the carbide and the water can be perforated. After the drill hole has been completed the cartridge is placed into it and the hole is closed with a wooden stopper. Then the protruding iron pin is dealt a blow, by which the partition is perforated and the water is caused to come in contact with the carbide, whereby acetylene gas is generated. This mixes with the air of the drill-hole. After five minutes the gas is ignited by an electric spark.

By this method of blasting the rock is said to be not thrown out, but rent with innumerable cracks, so that it can be easily removed afterwards. About 1.7 oz. of carbide, which produce about 16 qt. of acetylene gas, are used for each cartridge.—*Mines and Minerals.*

TIN IN ALASKA.

A correspondent of the *London Mining Journal* has written the following from Tin City, Alaska:

It may be of interest to you to hear something of tin in Alaska. Our company, the Bartels' Tin Mining Co., owns and operates several tin mines at Cape Prince of Wales, Alaska, and struck tin ore in one of our tunnels on the Lucky Queen claim last summer, but only in small stringers, the largest being 10 in. wide. The ore was very high grade, running 60 per cent and above in tin. The Lucky Queen tunnel runs nearly on top of the claim, and though we are in 283 ft. we have but 40 ft. of roof above us.

We started a tunnel below the Lucky Queen, on the North Star claim, and struck tin ore within 15 ft., but only in stringers as before. We struck tin ore almost every round we blasted, till we got in a distance of 115 ft., when we struck a vein with very rich ore in the vein filling—very heavy brown crystals of cassiterite. The vein filling is of heavy brown or reddish material, mostly oxides of iron, with bunches of large crystals of cassiterite. The footwall is of hard, blue crystallised limestone; then comes the vein filling, which, so far, is from 18 in. to nearly 4 ft. wide; then without any other distinct wall it passes into syenite rock, with dark blue zwitter in it. Some assays run over 60 per cent in tin. Tin ore which was taken out last summer may be seen at our office, No. 1 Madison Avenue, New York City. We have two electric drills running with power transmitted two miles.

LEAD MINING IN THE LINARES DISTRICT,
SPAIN.

(By Norman Carmichael, M.E.)

AS the lead production of British Columbia is sold on the basis of the price of Spanish pig lead on the London market, and therefore to a certain extent in competition with the product of the Spanish mines, a few notes descriptive of the conditions obtaining at Linares, which is one of the important producing districts of Spain, may be of interest to British Columbian lead miners and other readers of the *MINING RECORD*.

houses and that of the surrounding hills that even at a short distance away there is little to attract the eye, and, as nothing but charcoal is used for fuel, there is no cloud of smoke hanging over it. Its very eastern appearance impresses the stranger at every turn: the open fields cultivated close up to the walls of the town, the absence of straggling suburbs, the close narrow streets paved with cobble stones, the common washing places with their large stone wash tubs, the wells or fountains in the streets where the women fill their jars and then carry them home on their heads, the low-roofed market place where the various products of field and orchard are exposed for sale and the day's bargaining is done, the donkeys toiling under their



Fig 1.—Linares.—Arrayanes Mine (p. 293).

The Linares district is situated about 200 miles south of Madrid. It occupies a comparatively level plateau of a few square miles in extent and gradually changing to rolling hills, which stretch away to the Sierra Morena mountains, on the north-east, and less important mountains on the south. It is drained by the Guadalén river, which winds its sluggish course through a channel cut deep into the soft clay beds, and its waters, like those of many other Spanish rivers, are red and muddy.

The city of Linares, one of the principal towns of the Province of Jean (pronunciation corrupted into Hine), is located in the centre of a mining and agricultural district, and, as approached, presents a peculiar appearance common to most of the old Spanish towns which one almost unexpectedly runs across in driving through the country, looking more like a solid mass of clay and stone than a city of houses and streets. I use the word 'unexpectedly' because there is but little to indicate that one is approaching a city: so slight a contrast exists between the colour of the

heavy loads, the flocks of goats driven in to be milked or out to be pastured along the margins of the dusty roads, the unmelodious calls of the street pedlars and the appeals of the blind or crippled beggars at the street corners—all contrast strangely with the scenes we are accustomed to in our mining camps out West.

Linares has a population of about 40,000. The houses are built of adobe, brick, or stone, and roofed with the heavy clay tiles of a dirty straw colour common throughout Spain. The ground-floor windows of all the houses are heavily gaol-barred so that the sashes may be removed or kept wide open in hot weather. The town can boast of one fine wide street, with shade trees (a rare boon) on each side, a band-stand in the centre, and a neat shrubbery at one end, while near the other is one of the oldest and largest stone bull rings in Spain. There are also several good public buildings, and a fine big stone hospital is being built. Manufactures include a 250-barrel roller flour mill, run on modern lines and driven by electric power derived from water-falls seven miles away, the quan-

tity of power available, however, being limited; and a lately completed foundry. The latter is one of five plants owned and operated in Spain by a French company with \$2,080,000 capital, but in charge of an English engineer. It is completely equipped with tools of the most improved description, electric travelling cranes, etc., and is prepared to build engines, boilers, and other machinery, and to execute all kinds of light and heavy repair work, the power being supplied by Mond gas, manufactured on the premises.

The miners and other labourers live mostly in several-storied tenement houses, which are usually rather more closely packed than we should consider sanitary. Most of these men are accustomed to walk perhaps three or four miles to their work, though an electric

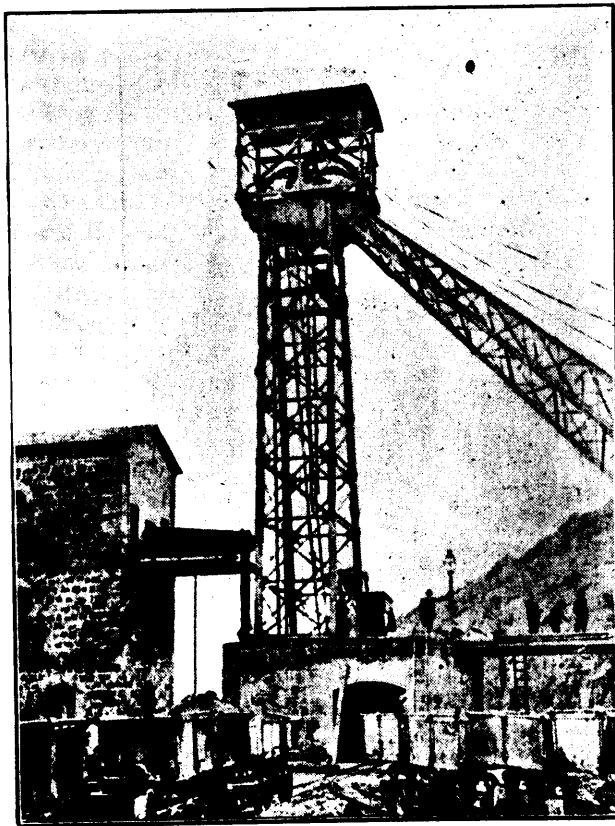


Fig. 2. Linares.—Headworks at Arrayanes Mine (p. 293).

tram system which an English syndicate operates between the mines and the town is largely patronized by the workmen.

Near the town the land is closely cultivated, and no fences of any kind divide the crops of barley, oats, beans, etc., which cover the low round-topped hills, upon the highest points of which watchmen are stationed day and night to warn away with their noisy tin horns any marauding droves of goats or donkeys.

The mines occupy a more or less level tract 3 to 5 miles north of the town, and are embraced within a strip perhaps 3 miles long and 2 miles wide.

The country rock in which the veins occur is granite, a common coarse-grained variety with no unusual characteristics, and appears as an immense mass

shoved up among the slates and schists which surround it, and which form the Sierra Morena mountains to the north-east. These slates are said to belong to the Silurian age and the important lead mines of the Carolina district are being developed in the spurs of the range within 50 or 60 miles of Linares.

The granite rarely shows on the surface, for it is covered with a capping of soft red sandstone varying from a few feet to 50 ft. or more in thickness. The contact is very distinct, the sandstone of fresh appearance, and no contact metamorphism is noticeable. The veins cut both formations, but their outcrops are long since entirely obliterated. Limestone measures are found some miles off, and in places marble quarries are worked on a small scale.

The veins are true fissure, and cut the formation in a nearly east and west direction and with a dip about vertical. Sometimes the same vein is found to dip north at one level and south at another. There are many such veins running nearly parallel to, and within a few hundred feet of, each other, sometimes overlapping and sometimes appearing as extensions of other veins, although underground development may show no connection; while in a few cases the veins fork or have spurs large enough to be worked for the ore they contain. They may usually be followed for 4,000 to 5,000 ft. along their course and at their extremities are found to split up into numerous small stringers which, going off in various directions into the country, gradually disappear.

The ore is a low-grade galena carrying from 4 to 15 oz. silver to the ton, different veins and different portions of the same vein yielding slightly varying values, no doubt due to the presence of secondary minerals. There are also minor quantities of carbonates met with in the more oxidized portions of the veins. Usually the ore occurs in shoots which may be from a few hundred to as many as 1,500 ft. in length, with barren areas of sometimes hundreds of feet between. These veins, when found, may be depended upon to continue down to a depth of about 2,000 ft., near which level all the veins in this area are found to become impoverished, though as yet very little exploration at greater depth has been carried out.

The ore shoots vary in width, but rarely open out to more than 5 or 6 ft. and the ore is found in the form of small bunches and kidneys in a filling consisting mostly of calcite and kaolinized matter, from the decomposition of the wall rock, and masses of less altered granite and some, though very little, quartz. Associated minerals are copper and iron pyrites, lead sulphate and phosphate, and zinc blende, but these occur only in insignificant quantities. The walls are free but show very little slickensides or evidence of movement, and the veins are rarely faulted, nor are they cut by dykes. The mine water is extremely hard, and incrustations of carbonate of lime are to be seen wherever it drips over exposed surfaces.

Owing to the similarity of the veins the manner of working them is much the same throughout, the differences being chiefly in the extent of the workings. They are all operated through shafts varying in depth

down to 2,000 ft. There are scores of these, and from the top of any building the surrounding district will be seen to be thickly studded with gallows-frames, engine-houses and other mine buildings; everywhere great waste dumps spread out over the landscape, interspersed with sickly olive orchards which they have ruthlessly over-run, and here and there a smelter rears its lofty smokestack; all giving evidence of great mining activity. And such there was some years ago, when the district produced about four times what it does to-day, but now a large number of the mines are closed, having exhausted their known ore bodies.

Many of the mines have been working for nearly 50 years, but 20 years ago were the palmy days of the Linares mines and the era of maximum production,

Most of these mines have produced ore for more than 40 years, while one or two that have been closed down for some years are again being opened up and equipped with machinery capable of developing them to greater depth. One of these latter is the Pozo Ancho, over the shaft of which a new steel head-frame was being erected at the time of my visit and has since been completed (See Fig. 3). A larger hoisting engine was being installed to replace one which has served the mine continuously for nearly half a century, a photograph of which latter appeared in the *Engineering and Mining Journal* some months ago.

Of the above-mentioned mines the Quinientes is at present the most important producer. About 100 men are employed underground and a similar number of

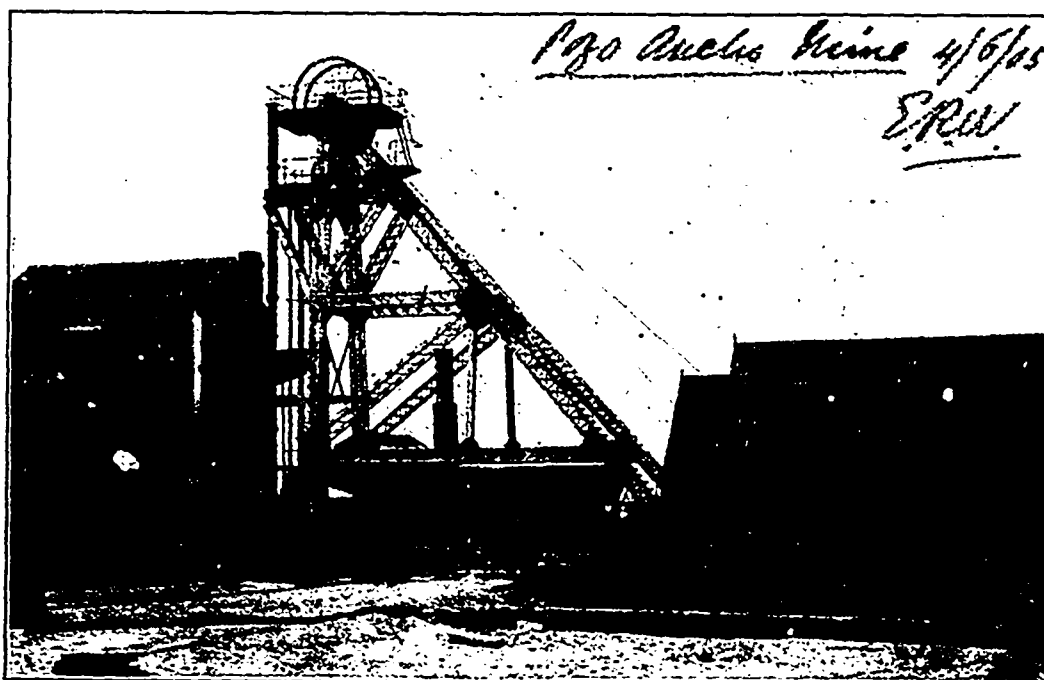


Fig. 3. Linares.—Pozo Ancho Mine (p. 293).

since when it has been steadily declining. The mines are held under lease from the Crown, to which they pay various royalties and taxes. Some are worked by individuals, some by tributers, but the largest number by English mining companies. One mine, the Arrayanes, (the head works of which are shown in Figs. 1 and 2 herewith) is operated directly by the Spanish government, which, as well runs a smelter in connection with this mine.

Mr. Ernest R. Woakes, formerly of Nelson, B.C., who has many friends in this province, is resident managing engineer for John Taylor & Sons for three English companies, viz., the Linares Lead Mining Co., owning the Quinientes and Pozo Ancho mines; the Alamillos Co., owning the Alamillos, Aventura and San Filipe mines; and the Fortuna Co., owning the Salidos, Canada-Incosa, and San Pedro mines. Through his courtesy I was recently shown over some of these mines, and am indebted to him for much of the information contained in these notes.

men, women, and boys on the surface. The vein is opened up for 3,000 ft. along its strike and to a depth of 1,470 ft. There are 15 levels; the upper or earlier ones are 65 to 80 ft. apart, and the lower, 120 ft. The mine has three shafts, but is worked principally through one triple-compartment engine-shaft equipped with a fine steel head-frame, double skip and cage, the last-mentioned for lowering and raising men. The skips are one-ton capacity, and the hoisting speed is 500 ft. per minute. The mine, like all others in this section, is comparatively dry, and the Cornish pump going 4 or 5 strokes per minute can easily dispose of all the water the mine makes. This is the only form of pump used here, though in some of the more recently-developed districts various forms of mechanical pumps, and some of the most modern type of electrically-driven compound centrifugal pumps working against tremendous heads, and which have been described in the leading technical journals, are used.

Machine drills have only recently been introduced

at Linares, and at the Quinientes mine a Daw compressor, with cross-compound steam-jet condensing engine and compound air compressor with intercooler, of 1,200 cu. ft. capacity, supplies air at 80 lb. to four Holman 2½-in. machines, which are used in development work. The number of machine drills will be gradually increased. There are two Galloway two-flue Lancashire boilers of 150-h.p., each working at 110 lb. pressure, one in use and the other in reserve.

Development work is always kept well ahead of mining, and the ore is blocked out by levels and raises, the latter being 200 ft. apart. Timbers lagging, and ore chutes are then put in ready for ore extraction. In this mine all stoping is done by contract, usually two contractors to the block, who work one from one

When stoping is finished the ore is drawn as required, and when exhausted the stope is filled with waste from development, if available; otherwise stulls are put in to support the walls where necessary, but the ground is good and stands well and little of this is needed, which is a great advantage in a country where timber is so scarce. Some timber, good enough for stulls, is procurable in the mountain districts and is floated down the rivers, but timber for construction, pump rods, etc., has to be imported from America or Australia at a cost of from \$30 to \$60 per thousand according to dimensions. Under-hand stoping is sometimes resorted to where the ground is particularly good and when greater tonnage is needed.

In the case of tributers who are allowed to work



Fig 4. Linares.—Sheet Lead Works at T. Sopworth & Co's Tortilla Smelter (p. 297).

side and the other from the other towards the centre. These men over-hand stope the ore on to the timbers, and only as much is drawn through the chutes as leaves the men room to work until the block is finished.

Contracts for this work can usually be let for about 15 pesetas per square meter. The peseta, at present rate of exchange (33 pesetas to £1), is equivalent to about 15 cents, so that this will amount to about 20 cents per sq. ft. The miners are required to take out all the vein between walls, so if the vein be 5 ft. wide the cost will be, roughly, 40 cents per ton of ore. Partial payment for the work is made weekly, and the balance settled after measurement at the end of each month. Contractors purchase all supplies from the company, including steel (which is weighed and loss charged) and the 60 per cent powder used, which costs 25 cents per lb., the high price being due to government monopoly. Machine drills are not yet generally used in stoping. With these costs it is found profitable to mine the vein even when it contains an average of only 1 in. of low-grade galena.

out old portions of the mine, the arrangement usually is that they dress their own ore, the company buying it from them at one-third to two-thirds of its value, according to the nature and richness of the ground.

All mucking for the mine is done under one contract at so much a skip load hoisted (about 15 cents), and the company pays the hoistman. The muckers do not use shovels, but scrape the muck towards themselves with a short-handled triangular-shaped iron hoe into a straw basket, holding 40 to 50 lb., which, when full, they pick up and dump into a car standing in the level behind them. This, while apparently a very crude method, has some advantages, for even in a narrow drift two muckers can work side by side without getting in each other's way, and it also affords the men greater variety in their work, so is probably less fatiguing. In sinking, a larger basket is used, holding about 200 lb.

Shaft sinking is done by hand. In the case of an engine shaft, say 2½ by 4 meters (8 ft. 3 in. by 13 ft.

3 in.), the men work in two shifts of 8 hours per day, six men at a time, two strikers with 7-lb. hammers and one twister to each drill. This work is done by contract at a cost of about 300 pesetas per meter or \$13 to \$14 per foot. This is in wet ground, but the timbers are supplied by the company. Winzes are two meters by the width of the vein, and cost 70 to 90 pesetas per meter, or \$3 to \$4 per ft. This work is done by three men on two shifts, and the rate of sinking is about ten meters per month.

Previous to the introduction of machine drills, driving the levels cost about 90 pesetas per meter, or \$4 per ft., with a rate of advance of about 10 meters per month working two shifts per day, while with machines the cost per ft. remains about the same but the rate of advance is 30 meters or say 100 ft. Having

for hanging to the sides of the drift, and attached to each is a steel pin for prodding the wick. Altogether, they feel very heavy and clumsy as compared with our miners' candlesticks.

The temperature of the mines, especially where the ventilation is bad, is very warm, and the miners wear nothing but a pair of overalls and sandals. A mere walk through the mine is about as good as a Turkish bath.

The miners are all Spanish and, as will be seen from the foregoing, in point of efficiency compare fairly well with our miners working in similar ground.

The foremen are usually Cornish men.

Contract work has been found to be the most satisfactory method of working, where everything is cut and

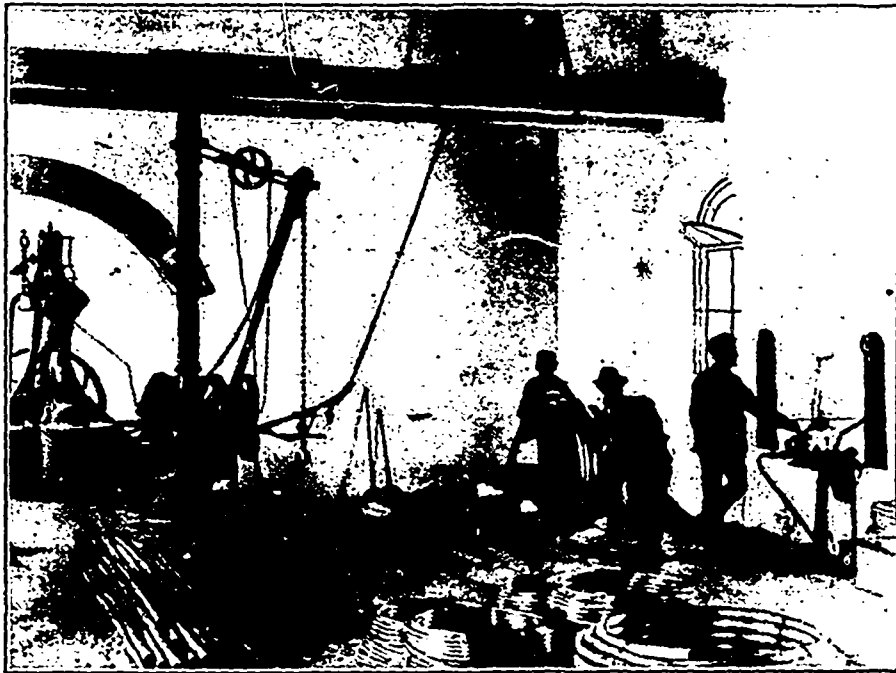


Fig. 5. Linares.—Lead Pipe Works at T. Sopworth & Co's Tortilla Smelter (p. 297).

good air, machine work can be kept going three shifts per day. It takes two men and a boy to the machine, the boy (pinche) being a cheap convenience for packing steel and water and doing such errand work. The practice is to put in 22 holes to the round. Only single or chisel bits are used, and the holes are drilled 4 ft. deep. No cut holes, as ordinarily meant, are used; the bottom holes are blasted first, then the centre, and last the back holes, and about a meter per round is broken. Contractors pay for all supplies, including machine parts, which makes them very careful of their machines. Mucking is not included in the contract for driving.

There are no candles used in the mines, but instead, iron lamps with cotton wicks, which burn olive oil. This oil, while cheap and giving a fairly good light, makes an amount of smoke that in a confined place becomes almost intolerable and covers everything with soot. The lamps have various hooks and chains about them,

dried, but when work is done by the day the standard rate of wages is as follows:—

	Pesetas per day.	Dollars per day.
Machine men...	5	.75
Hand miners...	3½	.52
Hand miners in shafts...	4	.60
Muckers...	3	.45
Timbermen...	4	.60
Timbermen's helpers...	3½	.52
Hoistmen...	3½ to 4	.52 to .60
Blacksmiths and carpenters...	4	.60
Labourers...	2½	.37
Women and boys (surface)...	¾ to 1¼	.11 to .19

The men board themselves, and live principally on a very close-grained, white bread into which, it would seem, they knead about as much flour as they possibly can, and which they eat without butter. This, with

dried fish, fruit, rice, beans, pork and goats' milk, forms the staple diet. Very little meat is used, for cattle are not kept. Even goats' meat is scarce and dear; though plentiful, goats are only kept for milk. They are worth from \$15 upwards, so are not killed until after they have outlived their period of profitable production. Cooking is done with olive oil over charcoal fires. The women make their own stoves, which consist of a bowl about 1 ft. in diameter kneaded out of clay, with holes in the bottom, and over these holes they fit in a little iron grate. Rows of newly-made charcoal burners, set out along the side of the street to dry in the sun, are a common sight.

Coming to the process of ore-dressing—as may be imagined, it is very simple, the galena being contained

heap, and once or twice a month the accumulation is crushed with a pair of heavy Cornish rolls belted to a pulley on the end of the hoisting-engine shaft, the work of hoisting being stopped for the time being. Owing to the nature of the vein-filling the ore as it comes from the mine is mostly quite fine; the waste is easily separated by hand and there is but a trifling proportion that needs crushing. The ore is reduced to as fine a degree as the usually corrugated condition of the shells will permit. It drops into a revolving trommel with 8-mesh cover, the oversize going to a raff wheel which returns it to the rolls, while the product goes to a propeller where the blades, acting on the ore under a gentle cross stream of water, separate out clean concentrates, the middlings being further made to pass

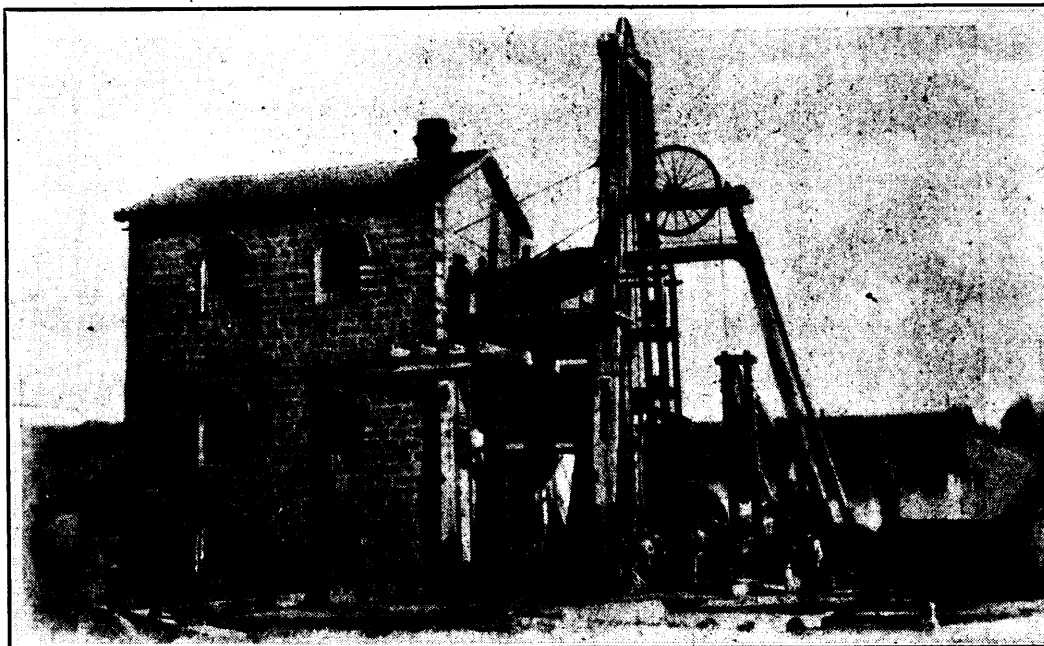


Fig. 6. Linares.—San Miguel Mine.

in bunches of various sizes, practically unassociated with other heavy minerals, and not intimately mixed with the gangue matter or disseminated through it in fine crystals. The dressing floor consists of an open space graded off or with a natural slight slope, and a sky roof, and usually located close to the mouth of the shaft. The ore, as it comes from the mine, is dumped into a stone ore-bin, from which it is raked through a flat chute having a cast iron grating in the bottom with 1-in. square holes in it, over which a stream of water falls on the ore and washes the fines through. The coarse, or oversize, falls on a stone bench, where it is cobbled by women, the clean ore being thrown on a heap, and the waste in straw baskets; these are packed away by boys and emptied into a car which, when full, is pushed out to the dump by two boys. Very little hand breaking is done by the women, the second grade rough stuff being carried across the yard to another raised bench, where an old man with a stone hammer cracks it up and further separates clean galena; his discards are thrown on a

over a series of riffles in a launder, the contents of which are shovelled out and hand-jigged. The tailings from these jigs are re-crushed in fine Cornish rolls, driven by a little over-shot water wheel, and the product buddled. The launder tailings go to the dump and the fines and wash-water to settling tanks.

Returning to the first separation, the fine material that passes through the grizzly in the bottom of the ore-bin chute is carried down a launder by the stream of water and is shovelled out by boys and hand-jigged, the boys getting very expert at this work, which looks a great deal more simple than it really is, for there is quite a knack in keeping up the relatively quicker down stroke and slower up stroke at the proper throw and speed that gives the best results. The product of these jigs is an 80 to 82 per cent lead concentrate. The tailings from the first jig are re-jigged on a second jig without further crushing, and then go to the dump. The hutchings are washed on flat buddles, all wash-water and fines are run into settling tanks and the settlings re-buddled. Women, boys and old men are

mostly used for all this work, with a few able-bodied men for the standing-about jobs.

This mine produces about 200 to 250 tons of ore per day, which will concentrate at a rate of from 10 to 15 into 1, and the total concentrates will run well up to 80 per cent lead. Judging by the appearance of the tailings, I should say that the saving is as close as the average work in this country.

There is practically no assaying done round the mines or concentration works; those employed being born and brought up in the business, the smallest boys soon learn to recognize the slightest difference in the grade of the ore and the standard required. Even dressed ore, bought from the tributers, is judged by appearance and so paid for.

The total output of this district is about 3,000 tons of sorted and dressed ore per month, or, considered in terms of lead, about equal to the normal production of our St. Eugene mine (East Kootenay), and is contributed by some 30 mines, which support a population at least ten times as numerous—about 300.

The ore from the Taylor group of mines is taken to their own smelter at Cordova, 80 miles south-east from Linares, the mines being all closely connected by rail with the main line from Linares. There it is treated in reverberatory furnaces, and the lead desilverized by the Pattinson process, and shipped to London, England. This refers to the galena ore; what carbonate ore is met with is kept separate in the mine. The latter contains about 55 per cent lead, and is sold to the custom smelters at Cartagena, where it is used to flux the various ores tributary to those plants, and where blast furnaces are operated, contrary to the general practice in Spain.

There are, however, several smelting works round Linares, the most important being the Tortilla smelter, owned by the English company of T. Sopworth & Co., whose managing director, Don Juan (Mr. John Powers), resides in Linares. This company owns several mines which in former days were large producers, but the smelter is now run principally on custom ores, which it purchases on the best terms it can make with the producers individually, according to circumstance and in competition with the other smelters, there being no uniform rates in vogue. Much of the ore is brought to the smelter by pack train from mines at a considerable distance. Often 50 or 60 donkeys are to be seen unloading in the smelter yard at one time. The ore is packed in bulk in two baskets, one on each side of the animal, about 250 lb. to the load. About 400 men are employed in these works, the smelting being by the old Scotch hearth method, with forced draught. There were 20 of these in operation at the time of my visit, these having a combined capacity of about 60 tons of bullion per day. It is rarely, though, that so many are in blast at one time. The very necessary flue dust chambers are of capacious dimensions and run for 3,000 ft. backwards and forwards along the side of the hill before entering the smoke-stack. Each hearth has two attendants at one time who work in shifts of four hours

per day, thus requiring 12 men to each hearth during the 24 hours. As they have a very smoky job, they are paid at a higher rate than usual for the hours worked, getting 4 pesetas a day. The ore, together with flue dust, lime and coal, is placed on the hearth. The slag as it forms is picked off and thrown on a heap at one side; the bullion is run into bars of a convenient size and is afterwards sent to the desilverizing plant, where there are 12 Pattinson kettles and the customary cupelling and melting furnaces. The silver values are raised from 12 oz., which is the tenor of the raw bullion, up to 500 oz. before being cupelled, while the resulting lead contains less than half an oz. of silver. The lead is run into 50-kilo pigs. The Luce-Rozan process is also used here, a two-unit plant served by one steam crane having been in active operation at the time of my visit. The slags from the hearths, containing about 55 per cent lead, are re-smelted in a blast furnace with iron and lime flux and coke fuel. This furnace is built of sandstone, the internal dimensions being 47 by 35 in., with three tuyeres at each side, and it lasts usually about 40 to 50 days.

The Sopwith company also operates a sheet lead and pipe works (See Figs. 4 and 5) and a very fine shot-making plant, where the lead produced from the blast furnace smelting of the slags, and which contains a considerable percentage of antimony, is manufactured into chilled shot of such excellent quality that this plant is the only one outside Great Britain successfully competing in the market of that country.

About \$340,000 was paid in bounties on coal oil produced in Canada during the last fiscal year. At the rate of 1½ cents per gallon, says the *Canadian Manufacturer*, this would represent a net output of some two and one-quarter millions of gallons of crude petroleum. This output of Canadian wells is far short of the total consumption. In addition to the home production there was imported during the year about twenty-two million gallons of coal oil, naphtha, gas oil and the like products of petroleum.

The New Zealand government have decided to hold an international exhibition at Christchurch from November, 1906, to April, 1907. A special section of the exhibition will be devoted to the colony's mineral industry. Though the output of gold has been continuous and increasing, it is probable that in this respect the mineral wealth of New Zealand has been little more than scratched; while it is well known that there are large deposits of iron ore, with excellent supplies of coal in proximity, awaiting development.

A new explosive, a British patent by Roberto Imperiali, is named "picrite," and consists of barium nitrate, 2 parts; potassium nitrate, 4 parts, and picric acid, 4 parts. It withstands heat up to 250 degrees C. (482 degrees F.), and does not explode by the action of heat alone under 360 degrees C. (680 degrees F.).

YUKON EXCURSION OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

(By J. C. Gwillim, M.E.)

AT 1.30 o'clock a.m. on July 7 the American Institute of Mining Engineers excursion party, 98 in number, left Vancouver, B.C., for the north by the C. P. R. Co's steamer Princess May. The voyage of about 1,000 miles by the inner channel was much appreciated for its scenery and calm water. Stoppages were made at Port Simpson and Ketchikan, on July 8, and at the Treadwell mine on the even-

Mr. Macdonald, superintendent of the mine, and writer of a paper on the subject in the transactions of the A. I. M. E., personally conducted us through the mine.

At Skagway, on July 10, three delegates from Whitehorse met the party—Messrs. Lowe, Whitney and Granger—and by their arrangements we were, on our arrival at Whitehorse, transferred from the train to conveyances which took us, in two parties,—one four miles out to the Copper King mine, and the other six miles to the Arctic Chief mine. The ladies and some others were taken to the head of Whitehorse canyon and there transferred to a lumber barge on



The Head of Skagway Bay.

ing of the following day. The management of this mine met us at this place and our party was divided into those who went through the mine, and those who chose instead to go through the mills. This mine, now taking its ore from below the level of the adjacent sea water, is distinguished by its great body of low-grade ore, which is mined and milled at a cost so low that it would not be high for such operations as the excavation of base metals or non-metallic minerals and coal, in some cases. Other features are the magnitude of the stopes in height and breadth, the dryness of the mine, and the system of milling the ore down chutes to the main and tail haulage, which transports it to the 4-compartment shaft, now about 1,000 ft. in depth.

which they experienced a passage through that famous waterway. The extent and high grade of the Whitehorse copper belt appeared to make a favourable impression upon those who visited the mines in it. A reasonable transportation rate of \$5 per ton for sacked ore and \$6 when in bulk has been given from Whitehorse to the Tye Copper Co's smelter at Ladysmith, Vancouver Island—a distance of 110 miles by rail over White Pass to Skagway and thence 900 miles by steamboat; yet the costs of labour and supplies make it difficult to at present carry on small operations.

Recently, some developments have been made in the vicinity of Windy arm and lake Bennett upon dry silver ores, and galena. There appears to be a belt

of schistose and slaty rocks immediately east of the granitic Coast range which is a mineral bearer, in some places of very high grade silver ores. The Conrad mine, on Windy arm, is said to be operating at the present time in some force. Leaving Whitehorse, after the pleasant excursion to its mines and a banquet, on the morning of July 11, we proceeded down the river in the companion steamers Selkirk and Dawson, taking with us Messrs. Stackpole and Black, delegates who came from Dawson to welcome and instruct us.

Our next stop, from a mining point of view, was made at the Tantalus coal mine, 14 miles above Five

On July 12 at 3.30 p.m. we arrived at Dawson, where we were met and welcomed by its generous citizens, who gave us an opportunity to ramble around this famous place for the rest of the afternoon at our own "chechaco" pleasure. At 9.30 that evening a reception was held at the Commissioner's residence, Mr. and Mrs. W. W. B. McInnes receiving.

At 9 o'clock next morning the whole party, attended by members of the reception committee and others familiar with the ground, left Dawson in a long procession of conveyances for a two-days' drive up Bonanza and Eldorado creeks, thence over the Dome and down Gold Bottom and Hunker creeks.



On the White Pass and Yukon Railway.

Finger rapids, on the evening of July 11. Coal has been mined at Five Fingers for some time, this giving satisfaction as a steam coal, but the present operations are at Tantalus, where Mr. Millar has opened up several workable seams by tunnels from the river bank. The situation is favourable, and the measures, without at first giving much of a lift on the seams, appear to pass regularly back across the valley. The coal is bituminous, probably a fair coking coal, and if so, and in large quantity as appears probable, will be a great asset to the country, especially in the reduction of such ores as the Whitehorse copper ores.

Other coal deposits on the Yukon are anthracite, reported in the vicinity of Whitehorse, and lignite, from below Dawson. The latter is at present most used in that camp.

The first day was spent in absorbing information on the many methods of alluvial mining—by open cut, steam shovel, scraper, travelling bucket, dredge and hydraulicing—all of which appear to be successfully operated on these creeks. Two clean-ups were made in our presence—one at 46 below Discovery, on the property of the Syndicat Lyonnais du Klondike, and one at 24 above Grand Forks, on the property of Stanley and Warden.

Next morning, July 14, with about two-thirds of the party, we continued our pilgrimage up the excellent government road along Bonanza creek to the summit and the Dome. From the last-mentioned we received a good impression of the extent of the gold-bearing creeks, radiating outwards for many miles northwards and southwards.

The return down Gold Bottom and Hunker creeks was made through the midst of active mining operations on the creek claims. A continuous pandemonium of steam whistles gave evidence of this activity until we reached a point near the mouth, where concessions have been given of considerable portions of the creek, and on which no great amount of work has yet been done. At Bear creek, on the flats of the Klondike river, 8 miles above Dawson, we were met and banquetted by the management of the Canadian Klondike Mining Co., Ltd. At this place a large dredge is being put in under the direction and management of Messrs. Brenner, Hargreaves and J. Moore Elmer. The ground to be worked is the old Slavin and Boyle concession.

Late the same evening we returned to Dawson. The next day, Saturday, 15th, was spent about the town, ending in a banquet in the A. B. hall, at which Commissioner McInnes presided. At 12 p.m. the party went on board the steamers Whitehorse and Dawson for the return trip up the Yukon river. This return was made during most pleasant weather, more enjoyable if anything than the trip in, as far as scenery is concerned. At 6 o'clock a.m. on July 23, according to the schedule, the party reached Vancouver, and thence proceeded eastwards over the main line of the Canadian Pacific railway.

MINERAL RESOURCES OF YUKON TERRITORY.

Concerning the mineral resources of this region—much information was given by Mr. W. M. Brewer, of Victoria, who accompanied us to Whitehorse. His wide acquaintance and knowledge of the mineral industry of these districts assisted our instruction. Also, at Dawson, Mr. J. B. Tyrrell, president of the reception committee, was eminently fitted to inform us upon the geology and local conditions of the Klondike region.

From a mining point of view the most impressive features seem to have been the great Treadwell mines; the discoveries of high-grade silver ores in the lake Bennett region; the Whitehorse copper deposits; the presence of large seams of bituminous coal at Tantalus; and the extent of the placer ground in Klondike, also its apparent adaptability to so many methods of working, which at one time were considered unlikely. With cheap water, and a demonstration of the success of dredging, there appears still to be a large field for hydraulic mining. Open-cut mining—in which the sun does the work of thawing, while scrapers remove the overburden, and buckets and cable lift the pay gravel—is the present method of working over the creek bottoms. Water, cheap and abundant, will bring into profitable operation an enormous amount of hillside and bench gravel, which at present is being worked, in the most favourable places only by costly pumping and an insufficient amount of water brought in by ditches and inverted siphons.

In the matter of quartz or lode mining, the whole district is at present handicapped by the costs of the country. The occurrence of large or important bodies of free-milling gold ores has not thus far been demon-

strated, and such alone could stand present costs. Probably the Whitehorse copper deposits, if opened up on a sufficiently large scale, could stand cost of operation, under existing conditions.

The country as a whole is not remote from seawater and its facilities—less so than is the Kootenay or the Cariboo country—and it will have its costs gradually reduced as business and tonnage become assured. After the interior is reached, the valleys and waterways make this region appear more accessible than the interior of southern British Columbia. The White Pass railway itself, with an elevation of 2,200 ft. above sea-level, is not as difficult of construction or maintenance as some of the mountain sections of the Canadian Pacific railway. More business and smaller margins will build the Yukon country up, as surely as has been the case in other places.

Exhibits of minerals, made at Whitehorse and Dawson, show a variety of metallic minerals—principally copper, with some galena, dry silver ores, and free-milling quartz,—and coal. The Violet claim, at the head of Eldorado creek, made a good display of its ores; also others from a wide area in the Yukon basin, but so far the placer gold quite dominates interest and leaves the lode showings undeveloped.

An interesting feature of the Dawson exhibit was the native copper ore from 150 miles up White river, above its junction with the Yukon. From appearances there promises to be an important field in that district. The matrix of this ore is a basic igneous rock, with disseminated patches of native metal.

The members of the Institute were well supplied with topographical maps, both by the Dominion Department of the Interior and the Provincial Bureau of Mines, but were regrettably wanting in geological maps, which, however, are obtainable and should have been supplied for the better understanding of the country.

AN EXPERT VIEW OF THE YUKON.

(By Dr. R. W. Raymond, Secretary of the American Institute of Mining Engineers, New York.)

IN responding to the toast of "The American Institute of Mining Engineers," at the farewell banquet at Dawson, Yukon Territory, on July 15, to the A. I. M. E. excursion party at the close of their recent visit to the Canadian Yukon, Dr. R. W. Raymond, secretary of the institute, gave an address of more than ordinary interest, not only to residents in that country but, as well, to large numbers of non-residents also concerned in the affairs and material progress of the "Golden North." The greater part of Dr. Raymond's observations on that important occasion, as reported in the *Yukon World*, which is published daily at Dawson, is contained in the following:

"I confess that I came here with the impression that this was a region in which man was fighting a hard battle with Nature, all of whose forces and passive resistance were arrayed against him at every point. That impression has been considerably chang-

ed. I have seen that Nature is not wholly hostile to you. Along with her bounty of gold, she has blessed you with an abundance of water—the agent which deposited that treasure, and upon which you must chiefly rely for its extraction.

"This water furnishes you also with a trunk highway for transportation, and with sources of mechanical power, to which may be added, in your beds of coal, another essential of your industry. Man has done much already to promote the industry of your territory. Good roads, good laws, good government, with a good governor, too, good, honest, earnest people—these things are more important, in the long run, than conditions of climate or distance.

"But I must confess to another impression with which I came here, namely, that this region was one in which a few deposits of gold of extraordinary richness were to be swiftly exploited and exhausted—probably at great expense and relatively reduced profit—after which it would be necessarily abandoned again to the Indians and the wild beasts, as no longer able to repay the labours of man.

"Is that true? It might be. There have been such regions, but I do not think this is one of them. Yukon Territory depends for its future upon the extent of the rich gold deposits now workable at a profit: the extent of the deposits available hereafter; and the resources which may be made to reinforce these and would be left if these were gone. The latter need not be considered now, for the former, in my judgment, ought to be sufficient for your children and your children's children.

"But rich clean-ups from placer and hydraulic mines, like rich yields in stamp mills and furnaces, are not proofs of permanent prosperity. When only rich returns are made, it is not because everything in the district is rich, but because what is not rich can not be worked without loss. There never was a mining district in the world that contained all rich and no poor ore, all coarse gold and no fine, any more than there ever was a cow that gave all cream and no milk. Where such concentrations of value as those which we have seen in this neighbourhood are shown, you may be sure that there are immeasurably larger quantities and values scattered through inferior material; and the mining industry becomes a really profitable business, giving steady and abundant employment to labour, dividends to capital, and a healthy atmosphere both of trade and of social life to the community in those regions, where it operates on low-grade material.

"We are all interested, of course, in seeing a skillful expert show a dollar's worth of nuggets and scales of gold to the pan; but those of us who have followed the business of mining for years are looking quietly away from that pretty exhibition, and trying to estimate the available ground which, yielding less, ought, under suitable conditions and proper handling, to pay more and last longer. It is not what this territory can do on a first spurt, but what it will do when it gets its second wind, that fixes its destiny for the present century.

"Forty years ago a certain silver mining district in

Nevada was famous for the extraordinary richness of its ores—ruby silver, silver glance, and the like, worth (in those days) over \$20,000 per ton, and when as United States Commissioner of Mining, I visited that district, they boasted to me that not one ton of ore had ever been milled in the district that did not yield at least \$125. But this proved only that they were unable to treat with profit at least nine-tenths of the ore they had to mine in order to obtain the one profitable tenth, and the yield of that rich tenth was in reality wholly wasted upon the expense of mining the rest: so that at that very time when the average yield of the ore milled was more than \$100 per ton, the total bullion produced of the district was only about equal to the cost of feeding its inhabitants.

"I have repeatedly made similar calculations with similar results concerning mining districts in which rich material only was treated for gold or silver, and though I have not reckoned with regard to the Yukon Territory, I feel quite sure that the same has been practically true here. What you need, first of all, is such a reduction of costs as will increase both the product and the profit of every man, whether labourer or prospector, or employer, in your community. The fundamental element—the auriferous area itself—you have in abundance. Even of the rich bonanzas you will, without doubt, discover many rivalling those which you are now exploiting. There is cream yet to be skimmed from the top, but if I am correct in my view, the cream will be chiefly valuable as showing you where milk is, whether in streams or in quartz. Of such milk, there is clearly a vast supply stored up for you, but to get it to market you must use what milkmen all over the world are reported to use, namely, water.

"The water question is the burning question of the Yukon Territory to-day. Nature has given you the means of solving that, also, and stands ready to assist you if you work with her. You can, if you choose, raise the water by main force to the level at which you need it. We have seen a magnificent sample of that bold defiance of Nature within the past two days. *'C'est magnifique, mais ce n'est pas la guerre.'* It is splendid, but as a general proposition, it is not 'biz.' For water can be brought down more easily than forced up, and the water you want is not in the Klondike or the Yukon, but in those mountain streams which feed them.

"In the great enterprise of utilizing that vitally essential element of a permanent industry, I feel sure that this territory will receive, as I think it fairly deserves, the encouragement and assistance of the government of the Dominion of Canada.

"It would be unbecoming for me to volunteer suggestions as to government policy, but I may be permitted to define my own view. I am not a friend of so-called paternalism or State socialism. I think that, outside of the maintenance of law and order and the enforcement of contracts, the less a government has to do, the better.

"Moreover, if I have read correctly the history of your country as well as my own, the attempt of the government to supplant private enterprise by directly

executing great works for the good of particular industries, has not resulted so advantageously as to make us long for its unnecessary repetition. It may have been sometimes necessary, but it has never been in itself desirable.

"On the other hand, your government, like ours, occupies a double position. It is not only a sovereign, but also an owner of land from which it derives, through sale or royalty, a revenue. So long as the Dominion collects, as land owner, a percentage of your product, it may fairly be called upon to manage its own property with at least ordinary wisdom, and to facilitate and assist the increase of that harvest of which it receives a part.

"I must frankly confess that my own government has thus far shown little of this wisdom in its administration of the Territory of Alaska, from which it has received much, and for which it has done less than it might wisely do. The Dominion government and the government of the Canadian provinces have been more liberal and far-sighted. Indeed, I am inclined to suspect that in some instances they have gone too far. But in spite of any such mistakes, if any there have been, the net results of Canadian policy are seen to-day in a solid advance which has surprised your warmest friends and surpassed your own prophecies.

"In conclusion, gentlemen, let me urge upon you the importance of unanimity in pressing the just claims and supporting the vital interests of your Territory. If you act together in warm—yes, white-hot,—yes, *fluid*—unanimity, obliterating all distinctions of personal ambition or party politics, there is nothing you can properly desire which you will not irresistibly achieve."

A REVIEW OF THE CANADIAN YUKON.

(From Pamphlets prepared for the A. I. M. E.)

IN connection with the recent visit to Yukon Territory of the American Institute of Mining Engineers' excursion party, at the close of the visit to British Columbia, of which latter a full account was published in the July number of the *MINING RECORD*, two comprehensive and interesting pamphlets were published at Dawson, these containing reliable and useful information relative to the Yukon. The greater part of that information is here re-printed, with the idea that it will in this way reach many readers to whom it would not otherwise be available. The order in which it is here presented is not that in which it originally appeared, nor has the selection of matter been restricted to only one of the publications, whatever seemed to be of public interest having been taken from the one or the other, without distinction as to the particular source from which it has been obtained.

BRIEF HISTORY OF THE YUKON.

In presenting, herewith, the features of the Yukon that will most appeal to the distinguished visitors whose coming makes occasion for this publication, it is in order to briefly give something of the history of this, one of the richest sections under the British flag.

That a complete and comprehensive history of the "Golden North" could not be given here is easily understood. The Yukon basin has been known for many years to contain rich deposits of placer gold, but the first gold was obtained by prospectors in 1878 from the bars of the Lewes and Stewart rivers. In 1886 coarse gold was found along the Forty-mile river, at a point about 60 miles from the site of the present city of Dawson, and a camp was then established at the confluence of the Yukon and Forty-mile rivers, that camp remaining to this day a prosperous one, and marking the northern boundary town of His Majesty's possessions along the mighty Yukon. The late Dr. Dawson placed the gold output of the Forty-mile country in those days at \$150,000 annually.

Gold was first discovered in the now world-famous Klondike (which bear in mind, is all in Yukon, Canada,) in 1896. The discovery which started the memorable rush to this section was that made by George Carmack on Discovery claim, Bonanza creek. The news of the discovery stampeded the Forty-mile country, and before the outside world learned of the discovery, the old timers in the north had a year at the diggings. In 1897 the rush from the outside commenced, and its incidents are fully known to all. By the spring of 1898 Dawson had reached a population of 30,000 hardy goldseekers, most of whom came here over the White Pass or Chilkoot trails from Skagway, enduring hardships they would have suffered in no other pilgrimage than one in search of gold. But the gold was here in abundance, and each season saw the facilities of access to and egress from Dawson made more easy and comfortable for the goldseekers until to-day the mining engineers who are honouring our camp can appreciate the ultimate improvement, as found in their travels o'er rail and on river in their pilgrimage to Yukon. And now, instead of the crude camp of tents and shacks that grew out of the early rush, our visitors find a well-built city, with all modern improvements, its own water and lighting systems, excellent transportation facilities, telephones, telegraphs, churches and everything that one could ask to make life in this remote region pleasant for the hardy races that people it and quicken into life all its dormant values.

GOLD PRODUCTION OF THE YUKON.

The output of the Yukon has been one of the many pleasing things to the inhabitants of the Yukon. It speaks for itself and that in no uncertain terms.

It increased from \$300,000 in 1896 to \$22,275,000 in 1900; and now after nine years' continual work, the last year shows the respectable production of \$10,350,000, making in all the formidable total of \$106,175,000.

The richest discovered pockets have been largely worked out, but in the known paystreak there is still far more gold than has yet been recovered.

The worked, gophered, and unworked auriferous gravels and deposits, with the experience gained in the past, and with improved appliances now coming into use, together with good roads and cheaper labour, can be worked to a good profit.

High rates of wages and heavy freight rates necessitated the handling of only the richest dirt, and many millions have therefore been left in the ground which more modern appliances will work at a handsome profit. The days of the bucket and the windlass are waning, and in future steam shovels, dredges, etc., will handle their thousands of yards a day where formerly the six-pan bucket and single windlass was content with 20 to 30 yards per diem.

The following table shows the gold production of Yukon Territory, from January 1, 1896, to December 31, 1904. The figures relating to the yield from 1896 to 1901 are taken from the report of the Treasury Department of the United States, while those from

and colours can be found in almost any gravel bank in the valley of the Yukon and its tributaries. The chief deposits at present known are the hillsides and benches on Bonanza, Hunker, Dominion, Klondike, Eldorado, Stewart, Pelly and McMillan streams and their tributaries. The following is taken from a report of Mr. R. G. McCormell, of the Geological Survey Department of Canada, who is now in Dawson:

The "white channel" gravels have a total volume on Bonanza creek and its tributaries of approximately 250,000,000 cu. yd., and on Hunker creek and its tributaries of 200,000,000 cu. yd. They are everywhere more or less auriferous, and sufficient work has already been done to prove that a large proportion, at



Using Goats to Haul Supplies in Early Days of the Yukon

1901 to 1904 are from the records in the office of the Comptroller of Yukon Territory, Dawson:—

1896	\$ 300,000
1897	2,500,000
1898	10,000,000
1899	16,000,000
1900	22,275,000
1901	18,000,000
1902	14,500,000
1903	12,250,000
1904	10,350,000

Total \$106,175,000

GOLD BEARING GRAVELS.

The country in every direction is highly mineralized

least, of the whole deposit would pay to hydraulic, if water could be obtained at reasonable rates.

The present price of water delivered on the hills is \$7 per sluice-head per hour on Lovett gulch, and \$8 to \$9 further up the valley, and even at those rates some work is possible. These gravels are very favourably situated for hydraulic, as they rest on comparatively narrow benches, cut into the sides of the valley, at elevations from 150 to 300 ft. above the present valley bottom.

GOLD MINING IN THE YUKON.

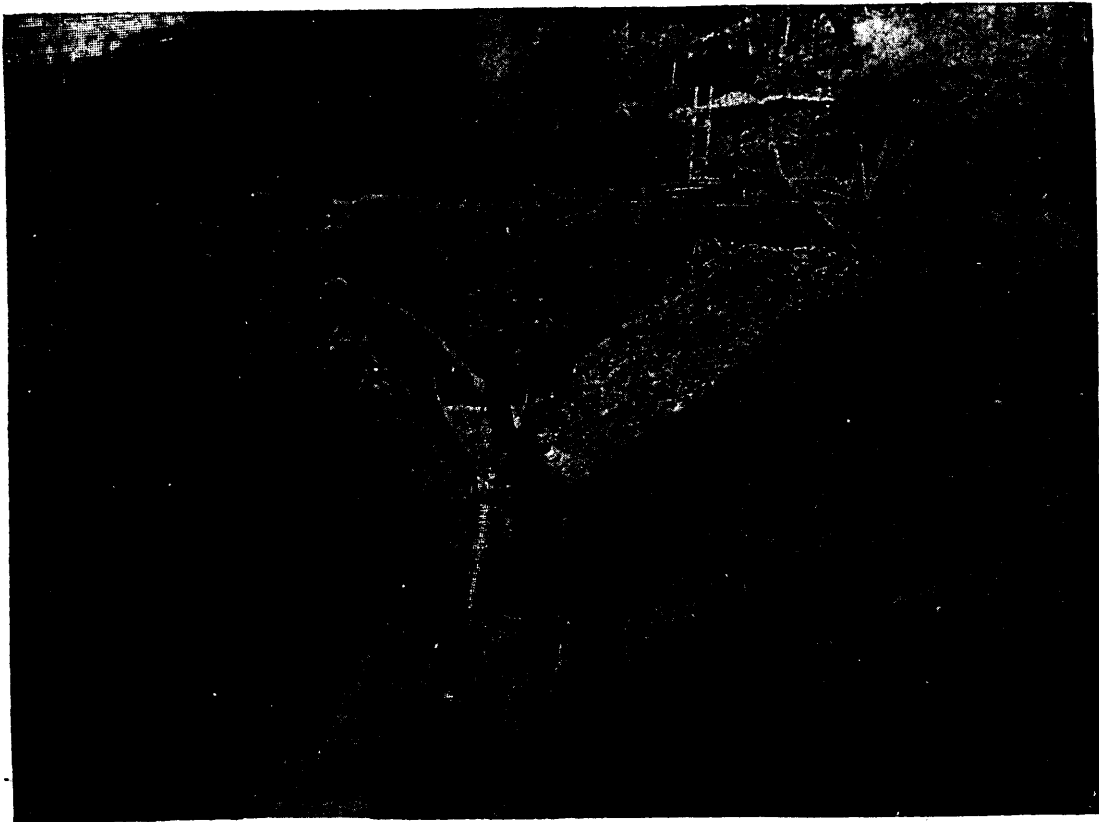
The pioneer miners of the Klondike mined under many and great disadvantages, but be it said to Dame Fortune's credit their returns were in many cases fully large enough to compensate them. The wood fires maintained in the shafts at night thawed the

frozen ground for removal next morning, and the same system of sluice-boxes and waterways now most in evidence here snatched from the long-hidden gravels their concealed golden grains. All over Yukon the expensive but effective old-time system of mining will still be noticed on the creeks, save that the wood fire has been replaced by steam thawers. It is, therefore, unnecessary to dilate upon the old system. What is newest to us, and that which we look to to revolutionize this camp and quicken its life into something like the frenzied movements of the rush days, is the bigger plants, together with the modern mining systems, of the larger companies.

Because of the cost of supplies landed in Dawson, the expense of mining is excessive. Vast deposits of

HYDRAULIC MINING.

As the self-dumper followed the windlass in the camp's progress towards economical developments, so have the water-ditch, the reservoir and the hydraulic nozzle followed the self-dumper. Where last seen the hydraulic system was here looked upon but as a "chechaco" experiment, this year there are found among those who are hydraulicizing: The Anglo-Klondike Co., Fox gulch; White Channel Gold Hill Hydraulics, Gold Hill; Fuller-Norwood Co., Bonanza; the Brenner Co., Eldorado; North American Trading and Transportation Company, Miller creek; Syndicat Lyonnais, Ten-mile creek; Breeze Mining Co., Bullion creek; Pacific Coast Mining Co., Last Chance; Treasure Hill pumping plant, Last



Old-Time Method of Working on Eldorado Creek.

gold-bearing gravel that would be considered an Eldorado of fabulous richness elsewhere cannot be handled here at a profit, except by the reduction of the cost of mining in comparison with what it has been in the past.

The individual miner has, in many cases, been compelled to release ground that was reasonably rich but that, with his limited facilities, he could not make pay a profit; and from the accumulation of such properties, and by purchasing the holdings of speculative concessionaries, who were the first terrible menace that confronted the camp, strong mining companies have obtained mining areas, to operate which they are spending fortunes on machinery preparatory to developing these holdings.

Chance; Elwell, Murray & Roselle, Temperance hill, Hunker; August Larsen, Temperance hill, Hunker; Delhi group, Hunker; Redmond Bros., Paradise hill, Hunker; Bonanza Creek Gold Mining Co., Bonanza. In additions to these large operators are many small ones throughout the country who use gravity water systems in place of the old pumping system, and succeed better thereby.

Ditches and Flumes.—The greatest drawback that the miners of the Yukon experience is lack of the water necessary to separate the gold from the gold-bearing sands. Water is the vexed question here, and each man is compelled to solve the problem for himself. The attempt to install a great public water system was prevented by the avarice of men who had the

right granted them by Parliament. They demanded, and were in a fair way to receive, too much for the service, when the protests of the people were met by the appointment of a Royal Commission, to investigate matters and things here—the Treadgold commission. Its finding approved the complaints against the concession, and the Treadgold Company's rights and emoluments were so curtailed that it abandoned its intention of supplying a water system, and the camp had nothing of the kind to look forward to. One result of the abandonment was to stimulate the big companies to build water systems of their own, and in the short space of time that has since elapsed 126½ miles of water ditches and flumes have been constructed to bring water to the various properties, besides the smaller lines built by individual owners of which there is no record. Twenty-eight companies have constructed ditches or flumes to convey water to

Indian river.—Croteau & McConnell, 3½ miles.

Boulder creek.—Cook, Mizner, Day & Elliot, 3½ miles; Anglo-Klondike Mining Co., 4 miles.

Quartz and Calder creeks.—Ole Tystead, 2½ miles; McGillivray, McDonald, *et al.*, 6 miles; Rosenberg, *et al.*, 4 miles.

Adams creek.—Fassbender, 4 miles; Pacific Coast Mining Co., 4 miles, one inverted siphon.

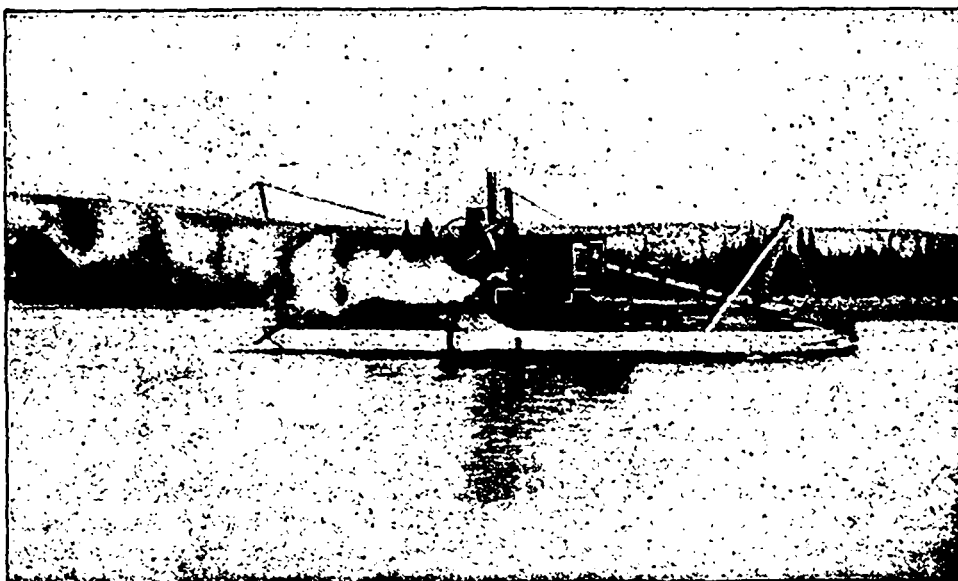
Ten-mile creek.—Syndicat Lyonnais du Klondike, 5 miles.

Quigley creek.—Parks, *et al.*, 4 miles.

Queen gulch.—Knox & Hamilton, 5 miles, one inverted siphon.

Pure Gold creek.—Bogden, *et al.*, 3 miles.

The available water supply is constantly being increased by the building of new waterways, and many dams are being built to catch and hold the water in



Ogilvie Co's Dredge, built in 1902. Operated for two seasons on Stewart River, and now at work on Klondike River.

their properties, and the average length of such ditch or flume is exactly four and a half miles. They are as follows:

Bonanza creek.—The Fuller-Norwood Co., 7 miles, with two inverted siphons; White Chamel Gold Hill Hydraulics, 6 miles, one inverted siphon.

Eldorado creek.—Otto Brenner, 7½ miles, one inverted siphon.

Hunker creek.—Redmond Bros., 7 miles; Elliot & Jensen, 3 miles; Larsen, Temperance hill, 3 miles; Delhi group, 4 miles; Anderson concession, 1½ miles; Ensel & Gandolfo, 3 miles; George Burke, 2 miles; Envoldson & Co., 2½ miles.

Last Chance creek.—Younkins, *et al.*, 4 miles.

Miller creek.—North American Trading & Transportation Co., 17½ miles.

Moosehide creek.—Acklen & Co., 9 miles.

Lower Dominion creek.—McLennan & Day, 2½ miles; Morrison, *et al.*, 3½ miles.

the rainy season, until it is needed later in the dry season.

DREDGES AND STEAM SHOVELS.

The dredge and steam shovel have entered upon their labours in Yukon, and much is expected from them. This is the third season in which the dredge has been used to move dirt on Bonanza creek, and that new dredges have been purchased for use on this creek indicates the suitability of the dredge for mining in the Yukon. No larger dredge is in use in the world (and but one other of the same size) than the one now being installed on Bear creek by the Canadian Klondike Mining Co., while other expensive dredges have also been imported this year. The companies working dredges in Yukon are: The Ogilvie Dredge Co., whose dredge after operating two seasons on Stewart river is now at work on the Klondike river near Ogilvie bridge; the Lewes River Dredging Co., the first company to take a dredge up the mountain and start

it on a Bonanza creek claim, and which dredge is now working on Discovery claim, Bonanza; A. D. Fields, who is placing a large dredge on No. 60 below Bonanza; the Canadian Klondike Mining Co., which has two steam shovels working on Bear creek; and Frank Phiscator, one of the early Klondike mining magnates, who is working two shovels on No. 2 Eldorado.

In addition to these, several dredges are being shipped to Dawson for work on mining properties in this section, among which are the following: For the Canadian Klondike Mining Co., a dredge that cost \$200,000 and has a capacity of 2,500 yd. of dirt daily, this dredge to replace the company's two steam shovels on Bear creek; for the Williams Co., one that will cost \$100,000 and will work properties on the Klondike, and that for the Canadian Dredging & Mining Co., that will cost \$75,000 and be placed on 89 below, Bonanza creek.

Everything that is here necessary to deal with the situation as it develops will be forthcoming, for the values to warrant it are certainly in the ground.

THE POSSIBILITIES OF GOLD DREDGING IN YUKON.

Mr. J. Moore Elmer, E.M., writes: "Does the Yukon present a field for profitable investment of capital in mining gold by the dredge process?" is a query frequently propounded. As a result of six years' experience operating a three-foot Risdon dredge in the Klondike district, and by careful observation during that period, of the auriferous deposits of the country and the climatic and other conditions peculiar to it, I am convinced that the vast Yukon basin from the Rocky Mountains to Behring Sea contains immense areas in which this form of mining can be profitably carried on. Within the limits of this brief article I will endeavour to give my reasons for such belief.

The modern gold dredge is a condensed assembly of powerful machinery capable of digging the dirt, washing the gold from it and depositing the residue within a few yards of its former resting place; a process simple, yet capable, with an enormous capacity and requiring but a very small amount of human labour.

In California, where gold dredging has reached its highest state of development, extremely low-grade dirt is being profitably worked, and this after paying almost fabulous prices for land which but a few years ago was considered absolutely valueless for mining purposes. True all the conditions in California are exceptionally favourable for cheap operations. They can operate 365 days in the year, while our season is but half that length, (not taking into account that during half of that time there is continuous daylight, a feature of no inconsiderable value). Our advantage lies in the high values of the ground, and it is these high values that especially commend the field for dredging operations.

The climatic conditions are not as unfavourable as might be supposed by those unacquainted with the region. The summer climate cannot be surpassed anywhere in the world for delightfulness. It is a healthy climate, and where the most ordinary sanitary

precautions are observed, zymotic diseases are practically unknown.

The winters are cold, but not severe, due to the dryness of the atmosphere and the absence of high winds. Blizzards are unknown. While actual dredging operations cannot be carried on during the winter, that season is ideal for the cutting and yarding of wood. Men engaged in that occupation seldom find it necessary to lose a day on account of the weather. The prospecting drill can also be worked to the best advantage during the winter.

Our placer gold is found mostly in bedrock and the ground is generally frozen. This combination of circumstances may seem to the uninitiated a fatal objection. It presents a difficulty to be sure, but not an insurmountable one, as the results I have been able to accomplish will amply testify. It adds to the cost, but the high values obtained justify the expense.

There are countless thousands of acres in the Yukon basin that are suitable for dredging, and that would pay handsome returns on the investment if judiciously made. The country is capable of thorough investigation and it is the thorough and intelligent investigator that the country needs. When the true conditions become generally known, by reason of such investigation, I believe I am not too optimistic in predicting that the number of dredges in operation in the Yukon will be limited, for a number of years, only by the capacity of the manufacturers to fill orders.

It must not be inferred that all placer ground in the Yukon is suitable for dredging. On the contrary, much ground that can be profitably worked by other processes would prove a failure for dredging purposes.

In order to succeed with a dredge in the Yukon the first desideratum is careful selection of the ground as to its suitability for the purpose; then, given a dredge properly constructed to meet the conditions under which it is to be operated, and, intelligently managed, and the Yukon presents an almost limitless field for the profitable investment of capital in mining gold by the dredge process."

(Mr. Elmer is manager of the Lewes River Mining & Dredging Co., and engineer in charge of the Canadian Klondike Mining Co., Ltd. The former company has been operating a 3-ft. Risdon dredge in the Klondike district for the past six years. Its operations on Bonanza creek have been highly successful. The latter company is installing a 7-ft. Marion dredge on what is known as the "Boyle Concession" in the Klondike river valley. This dredge is expected to be in operation about September 1st of this year. Mr. Elmer is the pioneer dredge operator of the district, and writes with a full knowledge of his subject.)

QUARTZ LOCATIONS.

The pursuit of gold-bearing quartz has been undertaken as cheerfully in the Yukon as in any other country under the sun, and this in the face of difficulties that are worse than generally fall to the lot of the prospector. According to figures from the gold commissioner's office, there are at the present time

700 gold quartz claims in good standing. This means that 700 claims, each covering 50 acres of land, are being represented and developed every year; that 1,400 miners at least are putting in \$100 worth of actual work every year on each of those claims which are prospects they have faith in. Out of this total of 700, 54 claims have been crown-granted. The obtaining of a crown grant entails years of labour and an expenditure, in actual development work, of \$500 on each claim.

In some cases, mining on a much larger scale than is necessary for the obtaining of a crown grant (or patent) has been prosecuted, as much as \$30,000 having been spent on some groups of locations by the present owners, and the fact that these owners, for the most part men of large practical experience, are still spending their time and money in endeavouring to determine the extent and richness of the gold-bearing leads they have discovered, and to open up their mining properties, in a country where the mills of Nature herself have already separated so much gold from the rock which contained it, is worthy of the most serious consideration.

That gold-bearing quartz veins occur abundantly in the Klondike district is beyond dispute, and it is hardly conceivable that none of these veins will be found rich enough to pay handsome profits.

BONANZA CREEK GOLD MINING CO., LTD.

The Bonanza Creek Gold Mining Company, Ltd., Mr. Emil Weinheim, manager, is a Canadian corporation, with its main office at 29 Broadway, New York City, and its mining property and mine office on Adams hill, Yukon Territory.

Property.—Hydraulic mining locations, Nos. 2, 8, and 9, on Bonanza creek, between Adams and Boulder creeks.

Plant.—Flume and ditch, four miles in length, from Stampede gulch to head of Adams creek, and over the entire property, connecting with one large reservoir, built so far on Adams hill.

From the reservoir an 11-in. pipe line takes water to No. 1 works with two No. 1 monitors, and a 12-in. pipe to No. 2 works with two No. 2 monitors. No. 1 works is fitted with 1,000 ft. of sluice to debris bank. Size of sluice, 24 by 30 in. with block riffles. No. 2 works is fitted with a sluice 32 by 30 in., also wooden block riffles. No. 3 works is independent of the others as to water supply and debris bank, and has only a single No. 1 monitor and a short sluice, 16 by 24 in., with wooden riffles.

The wide sluice is here found best; the wooden riffles will be replaced by rock during this season. Other reservoirs will be built for storage on the various hills on the property this summer. A large impounding dam has been commenced, under directions of Mr. Moore, of Massachusetts. This dam should store sufficient water from freshets to carry the supply over the dry season. Other plants will be constructed this season ready to operate next spring. The management is highly pleased with the results of operations so far, and consequently can encourage hydraulicing in the Yukon Territory.

THE PACIFIC COAST MINING CO.

The plant and property of the Pacific Coast Mining Company, Mr. E. E. Andrews, manager, are located at Nos. 6 and 7 below, Bonanza creek. The pumping plant consists of the following machinery:

Boilers.—Two batteries of two each, water-tubed, tested at 225 lb. running pressure; total 528 h.p. Stack 54 in. by 125 ft.

Engines.—One cross-compound high duty, fly wheel, Corliss-valve, 22 by 44 in. cylinders, 36-in. stroke, 13 plungers, pumping engine. Direct-connected jet condensing boiler-feed attachment. Capacity 3,000 U. S. gall. per min. at 37 rev. to a head of 300 to 400 ft.

Smaller machinery.—Compound duplex double-acting independent jet condensing pumping engine, capacity, 1,500 gal. per min.; drill press; pipe-cutting machine, 8 in. and down; shaper; emery stone; lathe 36-in. sweep and 10-ft. centres, taper attachments; 20-h.p. upright shop engine; direct-connected electric plant, 150 lights, etc.

Points of interest about the plant.—The large engine weighs 228,000 lb., three of the pieces weighing over 24,000 lb. each; it required 50 tons of cement for the foundation. There are 384 4-in. valves, giving it a large area. Made specially, and particular attention was paid to the fact that the water to be pumped carried a large percentage of sediment. Cost of plant and installation was more than \$120,000. The pumps were started in the month of September, 1903, and have given complete satisfaction.

Cost of pumping water, etc., for one month.—Labour, \$2,200; fuel, \$2,600; supplies, etc., \$600. With 25 running days to the month, this makes an average of \$216 per day. Number of gallons pumped, 3,000, (miners' in., 270). Cost per day for one sluichead of water (60 in.), \$48.

Cost of hydraulicing, etc.—The efficiency of one miners' inch of water from the middle of June to first of December is eight cu. yd. This high duty per miners' inch is due to the fact that the gravel rests on an even bedrock high above the present creek level, thus giving plenty of grade for hydraulicing purposes, and that the condition of the gravel is such that it washes readily. Then the ground is well thawed at this time of the year, which makes a big difference in the daily output.

Cubic yards washed per day, 2,160; cost of pumping, per day, \$216; cost of hydraulicing, general expense, etc., \$200; cost of handling one cu. yd., about 20 cents.

The company has more than 1,500,000 cu. yd. of gravel which will pay to work by hydraulicing. The deep gravel claims are being worked by tunnels, shafts and drifts. The company was operating on the different faces on Chechaco hill with gravity water in the spring and expected to start the pumps the latter part of June and run continuously until it freezes.

WHITE CHANNEL GOLD HILL HYDRAULICS, LTD.

The property of the White Channel Gold Hill Hydraulics, Ltd., Mr. Edward Simpson, manager, is situated on Gold hill, at the confluence of Eldorado

and Bonanza creeks 12½ miles distant from Dawson, and accessible by stage from that city. The ground, lying in the famous "white channel," has been partly worked by the placer methods hitherto in vogue in the Klondike—good fire and steam hauling—and underground tunnelling, sometimes at a depth of more than 100 ft. On April 23 of this year, however (preparatory work for installation of a gravity system having been completed last autumn), actual hydraulic operations were commenced.

At a point some five miles distant, the waters of Bonanza creek are diverted and conveyed through 4.78 miles of ditch and 1.04 of flume, each capable of carrying 1,000 in., along the right limit of Bonanza creek, crossing the numerous tributaries *en route* and being augmented by their quota of water, until at a point just below the town of Grand Forks they are conveyed to the opposite side of the creek and on to Gold hill by means of an inverted siphon. Here they are directed through six No. 2 monitors on to a face some 1,000 ft. in extent. These monitors are arranged in pairs which each feed a lateral to the main sluiceway. By working these pairs alternately, two-thirds of the face is always exposed to the thawing influence of the sun's rays, while one-third, which has already been thawed, may be most easily moved by the action of the water. Adopting this system, with the monitors under 146 ft. direct pressure from the siphon, as near as can be estimated, the duty is 4 cu. yd. to the miners' inch.

TEN-MILE CONCESSION.

The property known as the Ten-mile Concession, Mr. A. Tarut, manager, is owned by the Syndicat Lyonnais du Klondike. It is situated on Ten-mile creek, a tributary of the Sixty-mile river, and is about 62 miles from Dawson. The property is five miles long and one mile wide.

Ten-mile creek was first prospected by the Forty-mile miners in 1894-5. They reported that the creek was spotted, but that they made wages while prospecting, despite the fact that their methods were of the most primitive kind. It was abandoned in the rush to Dawson in 1896, when the news of these discoveries there depopulated the lower river country for the time being.

In 1901 the Syndicat Lyonnais acquired the property as a concession. They cross-cut it in three places, from rim to rim, and 20 ft. deep. It showed gold, but so irregularly, and the quality of the gravels was such that together with the existing conditions of the creek, it did not warrant a continuation of operations.

In 1904, under the direction of Mr. A. J. Beaudette, government mining engineer, a search was made on the hill-sides on the left limit of the creek, which, he alleged, contained gold. In June of that year these gravels were found to contain gold in sufficient quantity for further investigation. A tunnel was driven 175 ft. in the hill-side and proved the gravel to contain pay all the way, pans taken from the tunnel giving good results. Some pieces of gold of value as high as 30 cents were washed in a pan. The whole tunnel was sluiced up and an average of the pay taken to the

cubic yard. It was then decided to install a hydraulic plant and operate on a large scale.

These gravels are situated at an elevation of 170 ft. above the level of the creek and their thickness at the deepest place will reach 75 ft. They are composed of small quartz pebbles, together with some fine material of calcite and silica easily disintegrated and devoid of large boulders. The extent of these gravels is at present unknown, but they have been observed at different places on the same side of the creek for a distance of three miles, and it is proposed to do further prospecting.

In the winter of 1904-5 the company installed a saw-mill at the mouth of the creek to cut all the lumber necessary for the construction of the conduits for the water. Two hundred and sixty thousand feet of lumber were sawed and delivered on the hill-sides along the creek, for the construction of the flume. This flume will be 4½ miles long with a capacity of 750 miners' inches.

The water will be delivered 180 ft. above the point where the operations will take place and will thus afford a good pressure. From this point the water will be conducted to the mine by a pipe 18 in. in diameter, to which will be connected four monitors of 2½ and 3-in. nozzles.

The area of dumping ground is practically unlimited, as there is a whole creek to dump in, and the end of the sluice boxes to the bottom of the creek is 90 ft. down a steep hill-side. The sluices are provided with block riffles and are 500 ft. long, with a grade of 8 per cent.

As the company has just completed the installation of this plant and is only about to start hydraulic, no clean-up has yet been made, so no data can yet be given as to the quality of the gravel to the cubic yard, or as to the cost of operation and the duty of a miners' inch.

GENERAL INFORMATION AND STATISTICS.

The following general information and statistics will, doubtless be found useful and interesting:

Claims worked.—The number of claims worked on the chief creeks during the years 1899 to 1903, both inclusive, was as under:

Creek.	1899	1900	1901	1902	1903
Bonanza	104	219	388	447	
Hunker . . . . .	...	219	308	279	
Dominion	128	145	257	202	
Gold Run	35	57	30	60	46
Sulphur	59	60	47	60	84
Eureka	11	23	17	28	15
Totals	105	472	677	1,101	1,073

Men employed.—The average number of men employed was as follows:—

Creek.	1899	1900	1901	1902	1903.
Bonanza	1,445	1,690	2,444	2,216	
Hunker . . . . .	...	927	1,316	1,126	
Dominion	906	730	1,143	945	
Gold Run	450	500	370	400	327
Sulphur	463	308	227	262	355
Eureka	30	80	70	100	50
Totals	943	3,239	4,014	5,665	5,019

GENERAL MINING NEWS.

(From Provincial Newspapers.)

CARIBOO.

The *Colonial Goldfields Gazette* (London), in its issue of July 15 had the following: "In continuation of the good news recently received from the resident manager of the Cariboo Consolidated, a cablegram has been published this week to the effect that 505 cubic yards of gravel have been washed, the value of the gold recovered amounting to \$1,130. This gravel was not taken from the centre pay lead, but was merely stuff taken in the course of driving towards the channel proper. It is expected that regular drifting will commence shortly, and in view of the substantial progress made since the statutory meeting of the company held in February last, shareholders have been invited to attend a special meeting on Tuesday next to hear the latest information concerning their company's affairs."

ATLIN.

The installation of the steam shovel and plant on the ground the Northern Mines, Ltd., has been completed and operations with this machine commenced.

The dredge of the British-American Dredging Co. is reported to be doing effective work this season on Gold Run. Last year the tough ground turned the 1-in. manganese wrought steel lips of the buckets, but this season holes have been put into the bank ahead of the dredge and the ground loosened with dynamite, electrically fired. So far as cleaned up, the results bid fair to leave a good margin on the season's work.

The Con. McKee Creek Hydraulic Co. has recovered about \$30,000 worth of gold this season and expects to add \$20,000 more during the remaining two months in which hydraulicing will be practicable.

Messrs. Ginaca & Co., of McKee creek, cleaned up their first pit at the end of July with gratifying results, having obtained some 200 odd oz.

The Columbia Hydraulic Co. on Spruce creek, is still piping through a large amount of gravel.

Work on the Spruce Creek dredge of the British-American Dredging Co., Ltd., O. T. Switzer, manager, is being pushed ahead and will be completed about the end of August.

The North Columbia Gold Mining Co., Ltd., is still keeping Pine creek gravel on the move. It is now cleaning up some of its flumes and a good return of gold is expected.

EAST KOOTENAY.

The second lead stack at the Sullivan Group Mining Co's smelter, at Marysville, was blown in on the 17th inst. This is the first Brush Columbian smelter to use the Huntington Heberlein process for the desulphurization of lead ores.

At the St. Eugene mine, Moyie, development work on a still more extensive scale than in the past is to be carried out. The deepening of the Lake Shore shaft is shortly to be undertaken and much drifting and cross-cutting is included in the work planned. The new 30-drill Canadian Rand air compressor is running steadily and more machine drills are employed underground.

AINSWORTH.

The lessees of the Bell mine, in Jackson basin, have sold their lease to Mr. John Keen for \$5,000 cash. The lease contained a bond on the property for \$10,000, and this has been taken up. The mine contains silver-lead and zinc ores.

NELSON.

The ore lately struck on the No. 5 level of the Molly Gibson mine, Kokanee creek, near Nelson, has been exposed for more than 50 ft. A stope has been commenced, and both stope and heading are producing a good grade of shipping ore. Superintendent Trethewey also reports a strike of clean ore in raise No. 2 on the Aspen vein, from which one of the miners extracted and sacked three tons the day after the ore was encountered.

Work on the Bayonne group, on Summit creek, west of the

southern end of Kootenay lake, was discontinued at the end of July. It is understood that negotiations are in progress for a transfer of the property that may result in a complete change in the plans and scale of development. Pending the outcome of these negotiations, orders were received to stop work, so Superintendent Teague and the ten men he had employed went to Nelson to there await the decision of the owners of the property.

It has been announced that the Hendryx process of electro-cyaniding is proving a distinct success at the mill of the Reliance Gold Mining & Milling Co., at the company's May and Jennie mine on 49-creek, nine miles by wagon road from Nelson. A gold-bearing pyrite is the characteristic ore, and copper, lead, or zinc, are not associated with it. Much of it is partially or wholly oxidized and carries a considerable proportion of its values as free gold. The indications are that the oxidized ore will extend to a considerable depth. Much development has been done and there is an abundance of ore ready to stope; enough to keep the mill supplied for several years. The mill plant includes a Blake crusher, set of rolls, 50-ton Chilean mill, and a 12-ft. Hendryx agitator with a capacity of 50 to 75 tons per diem. The Reliance company was organized in Nelson in the summer of 1904, since when prominent Pittsburg, Pa., men have bought a large block of its stock, thus providing ample funds. Mr. Aaron H. Kelly is president and manager; Mr. W. J. Elmen-dorf, of Spokane, Washington, consulting engineer, and Mr. Douglas Lay, mill superintendent.

SLOCAN.

A strike of rich silver ore is reported from the Ottawa mine, owned by Pittsburg, Pa., men and situated in the "dry ore" belt of the Slocan. Where encountered the vein was about 3 ft. wide, but has since widened to 5 ft. The ore was described as native silver and high-grade sulphides, and it was stated that assays ranged from 1,600 to 7,480 oz. silver per ton, while it was believed the general average will be high. A compressor is to be put in and the ore body sunk on. Last year the Ottawa shipped 1,203 tons of ore of average high grade and the returns were stated to have been about \$49,000 in excess of expenditures on development, improvements, surveys, etc.

Writing on 12th inst to the *Nelson Daily News*, Mr. W. D. McGregor, who is very well-informed concerning the mines of the Slocan City mining division, makes the following comment on the above-mentioned strike: "I notice an article on the Ottawa mine in this camp, which, while well timed and exceedingly laudatory, is certainly liable to give a reader wrong impressions of this property and thereby of this camp. In the first place the Ottawa is not a silver-lead property, but a dry ore proposition, developing one of the big north and south zones, typical of the granite range between Ten-mile and Springer creeks, such as are now being developed on the Nee-pawa, Hampton, Arlington, I. X. L., etc. These veins have been known as high-grade ore producers for some years, but many have thought that the rich ore was essentially a surface product, hence the importance to the camp of the work on the Ottawa, which has struck no new lead, but has cut the old ore shoot—worked out in the upper levels, to an approximate depth of 300 ft.—on the 520-ft. level wider, stronger, and richer than ever. As regards length, it was over 300 ft. on No. 4 and signs point to an increase in that direction also. In any case it is a marvel of richness for the 50 or 60 ft. already cut. I am sure that the manager, Mr. McPhee, will have no trouble in making all previous records look like the proverbial '30 cents' though Mr. McNaught of the Hampton, three miles above, declares that it will take away above 2,000 oz. ore to hold the record good this fall. More power to them both, and to all others who are digging diligently to open this greatest and richest of our silver camps."

The California mines, near New Denver, have been bonded for 16 months to a syndicate of German capitalists, represented in British Columbia by Mr. William Brenner. The owners of the property are Messrs. P. Burns, W. J. Wilson, F. M. Black and other Nelson people. Mr. Brenner will

manage the California group, operating it in conjunction with the neighbouring group, the Mollie Hughes, which he secured several weeks ago. His principals in each case are the same.

There are six men employed on the Mollie Hughes and 12 on the California. It is intended to shortly increase the number on both properties.

The Slocan Star is producing about 630 tons of zinc per month, which ore is being shipped to Pueblo, Colo. It averages 35 per cent zinc, 45 oz silver, and 3 per cent lead. None of the low-grade zinc ore has yet been treated. Lead ore is also being produced by this mine at the rate of 250 tons per month. Some 80 men are employed at the mine, the concentrating mill at which is running double shift.

Recently a shoot of ore assaying 120 oz. silver and 65 per cent lead was met with near the portal of No. 3 tunnel of the Payne mine. Sinking is in progress to determine the extent of ore occurring here. Ore running 150 oz. silver and 72 per cent lead is stated to have been encountered in the course of development on the St. Keeverne. Both these properties are situated near Sandon.

ROSSLAND.

In a recent weekly summary of mining operations at Rossland the *Rosslaud Miner* gives particulars of progress at the local mines. From this the following has been condensed:

At the Centre Star, the sinking of the main shaft below the ninth level is making good progress, and a cross-cut is being run from the bottom of a winze down 190 ft. deeper than that level. Development is being continued at all levels from the third to the eighth, both inclusive, and ore is being stoped at all these levels.

At the War Eagle, stoping from the big ore body on the fifth level continues, and developments show the occurrence here of a large quantity of ore. Diamond drilling is being done, with good results.

The management of the Le Roi reports that development is proceeding on several levels, with satisfactory results. Ore shipments to the Le Roi smelter at Northport are being maintained. Operations at this company's concentrator have been suspended during the installation of some machinery of greater capacity.

The Le Roi No. 2 is awaiting the receipt of some additional plant, to be used in deepening the shaft. Its concentrator is putting through a fair tonnage of second-class ore weekly. Concentrates and shipping ore are both sent to the Canadian Smelting Works, Trail.

Work was being steadily proceeded with at the White Bear, Spitzee and Lily May. The Jumbo had temporarily suspended shipping ore owing to the furnaces at the Granby smelter, to which this mine ships, having been blown out for a few days, but the stoppage of production was to have been only of brief duration.

Several small properties have been making carload shipments, and it is understood that work is to be resumed at the O. K. mine and mill.

REVELSTOKE.

It is reported that a deal is being negotiated for the Carnes Creek Company's mining property.

Mr. C. J. Rumens, superintendent of the Prince Mining Co.'s property, lately brought to Revelstoke from the company's mine in the Standard Basin some fine samples of high-grade copper ore from the 500-ft. level.

Several directors of the American Mining Co. are expected to visit the company's hydraulic property on French creek arriving about August 20.

Mr. E. A. Bradley, superintendent of the Marshall-Schelling property, on French creek, and for the American Mining Co., has returned to Revelstoke from a trip east. Improvements are to be made on the Marshall-Schelling property, and an incline tunnel is to be run 160 ft. to bedrock, and an air compressor and hoist installed for the work. A dynamo is also to be put in to light the mine by electricity. Some 35 men will be employed on this property.

Mr. J. M. Scott, secretary-treasurer of the Prince Mining

Co., of Standard Basin, Big Bend, has returned to Revelstoke after having visited eastern Canadian and United States cities in the interests of that company. The *Revelstoke Herald* states that he made arrangements whereby the company will early next season install a plant that will admit of its copper mine becoming a shipper.

Mr. W. M. Brown, president of the Revelstoke & McCullough Creek Hydraulic Mining Co., who on 4th inst. returned to Revelstoke from his company's mine on McCullough creek, Big Bend, is stated to be well pleased with the result of the season's work. The clean-up was fully as satisfactory as could be expected considering the lack of water, which was unusually low in the mountains, and from the fact that operations were confined to the old workings of the property.

LARDEAU.

It is stated that the recent strike of rich ore in the cross-cut of the Sunshine tunnel of the Silver Cup mine at Ferguson has been followed by another rich strike in the up-raise. The management is reported to consider this the richest ore ever found on the property. The strike shows about 20 in. of clean ore which assays about 300 oz. silver and 70 per cent lead. The operations now going on are at a depth of 700 ft. thus giving great value to the find. A winze was sunk from the upper workings for a distance of 150 ft. to test the dip of the vein. The winze proved to be in ore all this distance, and this being ascertained, a drift was run on the Sunshine ground for a distance of 1,700 ft. At this point a cross-cut was made where the first ore was encountered. A raise was started to connect with the 150-ft. winze, the distance between the bottom of which and the starting point of the raise being about 250 ft. This gives 400 ft. of practically virgin ground, with ore believed to occur the whole distance. In addition to the clean ore met with below, there is a quantity of concentrating material.

A large body of concentrating ore is reported to have been found on the Baltimore, which is one of a group of eight claims on the north fork of Lardo creek.

The Kootenay Consolidated Mining Co. will probably confine its operations this year to further developing its Old Gold and Primrose properties. If developments prove satisfactory, a wagon road will be constructed up the north Fork of Lardo and Surprise creeks. The property was lately visited by a party of those interested, including Dr. Dudley and Col. H. L. Archer, of Minneapolis; Judge J. L. Miller, of Truash; Mr. F. T. Zimmerman, Auburn; Mr. W. B. Christy, Chillicoten; and superintendent Morgan of the Great Northern railway.

The Tribune shipped a car of high-grade ore about the middle of the month. A vein of ore that assays well has been discovered in the face of a high cliff on the Noble Five, and preparations are being made to open it up. The installation of the compressor plant purchased at Rossland for use in driving the big tunnel in the Nettie L. mountain, is being actively proceeded with, and more men will be employed in driving the tunnel as soon as the required power shall be available.

CAMBORNE.

James Little, formerly a bridge carpenter on the C. P. R., was accidentally killed in the Eva mine on Sunday morning, 6th inst. He was timbering in one of the tunnels when a fall of rock from the roof caught him, causing almost instant death.

Nine men are employed on Mammoth group, owned by the Edward Baillic Mining Co., Ltd. On the Crescent claim, No. 1 tunnel is in 150 ft and gives a vertical depth of 65 ft., there are 12 in. of clean ore in the face. On the Sirdar the vein has been prospected along a distance of about 300 ft., and it contains from four to twelve in. of clean ore. A drift on the vein has been started and ore is being sacked for shipment.

At the recent meeting of the Great Northern Mines, Mr. A. H. Gracey, who is in charge of the Oyster Criterion, made a favourable report of that property and recommended the

addition of another ten stamps to the mill, which recommendation was adopted.

POPLAR CREEK.

A force of men are at work on the Mother Lode drifting on the lead at about 200 ft. depth, and some ore is being encountered.

The Gold Park Mining Co., who have acquired the Marquis and Gilbert properties, are making arrangements for going to work.

Operations on the property of the Spyglass Mining & Development Co. will shortly be resumed. The property is situated seven miles up Poplar creek and has a lead of rich silver-gold ore. Regular shipments will be made to the Hall Mines smelter at Nelson. Mr. Bruce White, of Nelson, is manager for the company.

BOUNDARY.

At the Granby Co's smelter, Grand Forks, all the blast furnaces were blown out recently to admit of the necessary blast pipe and other connections being made to the two large furnaces the erection of which has just been completed. Since then the six 44 by 160-in. furnaces have been blown in, and the two 48 by 210-in. furnaces will shortly be operated for the first time. The treatment capacity of the smelter will now be 2,700 to 2,800 tons of ore per diem.

Ore containing a considerable quantity of ruby silver has lately been mined at the 400-ft. level of the Providence mine, Greenwood. The vein in the faces of the drifts is about 12 in. thick, and the ore carries exceptionally high values. The 7-drill air compressor recently installed at this mine is facilitating mining operations, in which some 30 men are now engaged. The Providence is the most prominent of the high-grade mines in this neighbourhood.

It is reported that the Granby Co. has purchased the Gold Drop group of claims and the No. 13, all lying between the company's original group and the Snowshoe. The purchase price of the former is stated to have been \$250,000 and of the No. 13, \$14,000. Including the Monarch group, acquired some time ago, the company has so increased its holdings at Phoenix as to now possess an area approximately 9,000 ft. north and south and 8,000 ft. east and west. The Gold Drop property was owned by the Gold Drop Mining Co., Ltd., of Montreal, Quebec, which seven or eight years ago did a lot of development work under the management of Mr. Stanley A. Easton.

The B. C. Copper Co. has bonded a group of eleven mineral claims situated on Buckhorn mountain, near Chesaw, Washington, and within 20 miles of Greenwood. Capt. Harry Johns is in charge of development work, under the company's general manager, Mr. F. Kefter, and 15 men have been put to work, while double that number is to be shortly added to the force. The railway the Great Northern Railway Co. is constructing in connection with the V. V. & E. line, will afford transportation facilities to the Chesaw district.

ASHCROFT.

Mr. J. D. Kendall, consulting engineer of Slough Creek Gravel Gold Co., returned to Ashcroft on August 17 and next night left for New Mexico. He left Mr. A. Stark in charge at Slough creek, vice Mr. Russell. Mr. Kendall expressed himself as well pleased with conditions at Slough creek. He says that it is proven to his entire satisfaction that the water is under control and is steadily diminishing.

Mr. Fred Williams, of London, England, returned to Ashcroft with Mr. John Hopp from visiting his Burns creek hydraulic and La Fontaine. He is a large shareholder in the latter property. He has gone to New York, thence to his home in London. Speaking of conditions at La Fontaine Mr. Williams was not at all disappointed because high grade gravel was not struck first thing.

KAMLOOPS.

Several mining men representing eastern capital have been quietly looking over the Coal Hill properties lately.

Mr. A. L. Gwin has shipped a carload of high-grade ore from the Hilltop claim. The ore, which contains high gold

values, was sent to the Tyee Copper Co's smelter at Ladysmith.

An enterprise of much importance to the mining interests of Kamloops is about to be started by Mr. John Shields, who a week ago visited the Adams river and staked off a location where 20,000 h.p. of electricity can be generated. This power, it is understood, will be available for the Iron Mask and other mining properties in the vicinity of Kamloops.

A big galena vein was recently discovered at the head of Seymour arm of Shuswap lake, and numerous claims have been located on it. From those who have been to the scene of the new mineral belt the *Inland Sentinel* learns that the ledge is about 16 ft. wide, three feet carrying the values. The ore is large-cubed galena freely mixed with iron, and carrying fair gold values. One claim-owner is so satisfied with assay returns received that he intends shipping a carload of ore to the Trail smelter as soon as it can be got out. The distance of the new camp from transportation renders the discovery of little immediate value. The vein is described as a wonderful one. It has been traced by out-croppings for at least three miles, running in a straight line and parallel to a dyke of limestone. The country rock is gneiss and granite.

NEW WESTMINSTER.

The Golden Ears, a copper property situated near Pitt Lake, has been bonded by Mr. H. A. Eastman, of New Westminster, to Messrs. Morrow, Goldworthy and Martin, of Vancouver. Preparations are being made to do further development work.

COLEMAN, ALBERTA.

Business conditions here are A 1 these days. The coal company is making better progress in every direction than ever before, the men are making high wages, and the merchants are doing a capital business. Altogether a tone of contentment and satisfaction is felt throughout the camp.

On August 12 the International Coal & Coke Co. made its record for a day's output by a single shift. The output was 1,400 tons, all of which coal was taken by the Canadian Pacific railway. The mine is now sufficiently opened and equipped to produce between 2,000 and 3,000 tons daily. In addition to a large seam of steam coal, there is a seam of coking coal now being opened. This will warrant the company in increasing its number of coke ovens to 200, which it is planned to do.

FRANK, ALBERTA.

The smelter plant of the Canadian Metals Co., presents a busy scene these days. More than 100 workmen are busy rapidly rushing to completion the extensive buildings. The walls of the furnace or main buildings are completed, and the carpenters are placing on the roof. The boilers and most of the machinery for the power house have arrived, and will be placed in position at once, in order to have them running when the plant is completed.

The electric building will be ready for the dynamos by the last of this week. Electricians are now at work wiring the town and other preliminary work. It is the intention of the management to have the plant in running order within a month's time, when the town will boast of an \$8,000 light plant.

LILLE, ALBERTA.

The West Canadian Collieries Ltd., is steadily enlarging its operations at its Lille colliery, five miles from Frank, in the eastern foothills of the Rocky Mountains. The coal measures here being developed are those of the eastern portion of the extensive Crow's Nest Pass coal fields. Some 275 men are employed at this colliery and an average of about 600 tons of coal per day is being produced at the No. 1 mine, below Lille. A tippie has recently been completed, with a capacity of 2,000 tons per day. A coal washer is being erected near the coke ovens, of which there are 54. These are Belgian ovens, of the Bernard type, and have a producing capacity of about 175 tons of coke per diem. The coke is of an average good quality, though a little higher in ash than that made at the Crow's Nest Pass Coal Co's beehive

ovens at Michel and Fernie, in the western part of the Crow's Nest coal fields.

YUKON TERRITORY.

The president of the White Pass & Yukon railway said in a recent interview: "We have handled more tonnage this year than any previous season. The Dawson trade shows an increase in heavy machinery, though there is a falling off in some other lines. It has been a warm, dry summer there, and the miners are badly handicapped by want of water. In Fairbanks we have practically a new camp, and, of course, it has brought a considerable increase of trade."

Improvements are being made on the White Pass railway. Two new steel bridges at Clifton are being placed in position, and a third one is completed. The work of construction is being done in such a way as to interfere as little as possible with the traffic over the railway.

This is the driest season on record, and there is very little water in the creeks. Plants that have been worked by damming the creeks and pumping the water are unable to continue operations. Bonanza, Eldorado, Hunker and Dominion creeks are not giving half a sluice head. The reason given for the shortage of water is that last winter the snowfall was very light in the Yukon, and the great heat prevailing recently caused what snow there was to melt quickly and rush away in a short time. The Yukon river has been higher than in other years, the heat having melted the glaciers to a greater extent than in ordinary seasons. It is the contention of many mine-owners that unless the Dominion government devises some means of providing water on the creeks, the gold output of the Yukon will in future years be much reduced.

Since the fire that destroyed so much property at Whitehorse a short time ago, that town has been rebuilt and presents a more substantial appearance than before. The place is prosperous and the outlook is encouraging. Prospecting is being done with considerable energy in some cases, and some mining is being steadily proceeded with, though not on a large scale, available capital being limited.

Mining operations on a quartz property in the Little Windy arm country, on the upper Yukon, ten miles from Caribou crossing, on the White Pass & Yukon railway, are to be prosecuted with great vigour, if reports may be depended upon. Mr. J. H. Conrad, who is at the head of the enterprise, is credited with the statement that a mining plant to cost \$100,000 has been ordered and the work of construction of a 4-mile tramway commenced. It is stated to be the intention to employ 300 to 500 men through next winter, and that after the property shall have been opened up a daily production of 100 tons of gold-silver ore will be practicable. The lode is described as quartz, of considerable width and known to be continuous for a long distance.

At the Tantalus coal mine, on the upper Yukon river, 15 men are employed getting out coal for the White Pass steamers, several of which burn coal as well as wood. Coal is also being mined on the lower river—at the Coal Creek mine below Forty-mile, at near Nulato, and on Roy creek below Eagle. A traction engine, to be used in hauling coal to the river bank has been sent down the river.

The newly appointed Commissioner for Yukon Territory, Hon. W. W. B. McInnes, has returned to Dawson from an extended trip to mining camps on the various creeks. He went as far as Granville, on Lower Dominion, and was everywhere well received by the miners.

The construction of the Klondike Mines railway is being hindered by applications for injunctions to prevent its continuance. Applicants allege that the grading of the railway across their respective properties causes considerable damage, and they ask for compensation.

July 27 was the warmest day of the season, the thermometer on that day having registered 83 in the shade. As the coldest day last winter was 55 below zero, this gives a range between the middle of winter and now of 138 degrees difference in temperature. The temperature has been known to be as low as 71 below zero at Dawson, so the greatest range noted has exceeded 150 degrees.

SIMILKAMEEN.

(Special Correspondence.)

Development work on the Sunset, at Copper Mountain, by the British Columbia Copper Co., is proceeding satisfactorily, and fine ore is being met with in two drifts on the lead. The drift into the porphyry has been run 118 ft. without reaching the contact. A few tons of ore were lately shipped, for the purpose of having tests in concentration made. The ore is high in silica and low in lime and iron, so it presents a more difficult smelting problem than the copper ores of the Boundary. Some effective method of concentration would greatly simplify the treatment of this ore. The management are considering the feasibility of driving a tunnel from the Princess May claim with the object of striking the Sunset lead at greater depth. This tunnel would have to be nearly a mile in length and would pass through a number of claims having good surface showings. Between 20 and 25 men are now working at the Sunset.

Regarding the bond on the Ada B. the Granby Co. failed to take up—a letter received by the owners states that Mr. W. Yolen Williams, consulting engineer for the company, was greatly pleased with the appearance of this property, but considered that other claims surrounding it which the company would also require, are too high-priced.

Messrs. Pouwels and Bonnevier have just completed the sinking of a 50-ft. shaft on the Red Star, at Roche river. The ore was not followed all the way down, so it was necessary to make a short cross-cut from the bottom of the shaft. This exposed 2 ft. of massive chalcopyrite and black oxides of copper that will assay about \$75 per ton.

Within two miles of Princeton, on One-mile creek, Mr. W. C. McDougall is employing several men on the United Empire group. During the past six months, on this group, a tunnel was run 150 ft., and a shaft sunk on a vein carrying copper and gold. Average assays are said to show values of \$24.65 to the ton. A wagon road is being constructed to connect the property with the main trunk road up and down the valley.

Between Princeton and Granite Creek, on the Tulameen river, Mr. Oswald Coulthard is working a few men on the Roany claim, as it was originally called when first located a number of years ago. The lead on the Roany was uncovered by placer miners in the bed of the river. Where it is exposed on the river bank, assays \$8 to \$10 in gold are obtained, but the ore in the bed of the stream gave assay returns of \$192 to the ton. Mr. Coulthard is engaging Chinese placer miners to do some wing-damming with a view to getting at the rich ore during the season when the water is lowest.

Mr. C. C. Clay has located a gold and copper-bearing quartz vein at the head of Roche river. The lead is from 2 to 8 ft. wide, cutting slate and porphyry, and is traceable through five claims.

An important resource that promises to be of commercial value is found in connection with the coal in this district, in the shape of an excellent fire clay that approaches closely in quality the best Scotch and English clays. A seam between 2 and 3 ft. in thickness, has been exposed in the tunnel the Vermilion Forks Mining & Development Co. has driven on its large coal cropping near the Similkameen bridge. A test of this clay was made by Messrs. Pellew-Harvey, Bryant & Gilman, of Vancouver. Following is the analysis, together with that of typical English clays:—

<i>V. F. M. & D. Co's Clay.</i>		<i>Typical Clays.</i>	
Silica	72.99 per cent	72.5 to 74.5	per cent
Alumina	14.97 per cent	14 to 16	per cent
Iron Oxide	2.18 per cent	2 to 3.5	per cent
Water	7.40 per cent	5 to 7.5	per cent
Lime	1.70 per cent	Traces of lime, sulphur, magnesia, soda and potash.	
Magnesia . . . . .	.76 per cent		

COMPANY MEETINGS AND REPORTS.

THE HASTINGS (BRITISH COLUMBIA) EXPLORATION SYNDICATE.

The eighth ordinary general meeting of shareholders of The Hastings (British Columbia) Exploration Syndicate, Ltd., was held in London, England, on August 3, inst., Mr. James Head, chairman of the company, presiding.

The secretary, Mr. E. Holt, having read the notice calling the meeting.

The chairman said: The report and accounts before you cannot fail to be as satisfying to you as they are to us, and Mr. Leslie Hill's statement will be read by you all with much interest. It contains many hopeful passages which come with all the more force and meaning when Mr. Hill's consistent conservatism is taken into account. It is particularly satisfactory to read "that there is more ore now exposed than at any previous time during Mr. Hill's management." Such a remark augurs well for the future, but I am not going to indulge in any prophecies to-day. With the information contained in Mr. Hill's report you will be quite capable of making your own predictions. It is, however, satisfactory to find corroborative evidence of the condition of the Arlington mine recorded in the Annual Report of the Minister of Mines of British Columbia, where it receives a favourable notice. I will now formally move that the report and accounts as presented be adopted.

The following is a copy of the directors' report submitted in the meeting.

The directors have the pleasure to submit the seventh annual statement of accounts and balance sheet for the year ended May 31, 1905, which gives a clear recital of the receipts and expenses for the period under review. It will be seen that the financial position of the company shows still further improvement.

The balance of cash on hand at the bank in London and Nelson amounts to £6,572 19s. 1d. The administration expenditure shows no material increase, but £461 8s. 3d. more has been spent on development work, as compared with the balance sheet of the previous year. The ore shipped to smelters realised £10,099 16s. 10d. net, that is after deduction of freight and treatment. No account has been taken of the value of ore in bin at the mine.

Your board are of opinion that the figures now presented to you justify the recommendation of a dividend at the rate of 5 per cent, free of income tax, equal to one shilling per share, payable on the 5th August, and the shareholders will be asked to approve the same.

Mr. Leslie Hill, the company's local representative and consulting engineer, to whose able management the above satisfactory results are largely due, has furnished a comprehensive report to the directors, and they submit the following extracts therefrom as being of prime interest to the shareholders:

"*Arlington Mine*.—During the year 1,688 ft. of development work was done, consisting of drifts, cross-cuts, raises and winzes, the total cost of which for labour was \$10,324.11, equal to \$6.12 per ft., which compares favourably with previous years.

"During the year 1903-4 I followed up a small streak of high-grade ore which had been exposed above the No. 1 or main tunnel, and which assayed well, but was considered too small to work. This streak enlarged and spread, and finally developed most of the ore which was shipped during this year. This new ore body extended to within 5 ft. of the ore previously mined in the large stope known as the 'Bullpen,' and was only separated from it by a thin layer of barren slate. The development of this ore body necessitated the continuance of the old 770-ft. north level, and afterwards of the No. 2 prospect adit. The 770-ft. north level has been continued, with the bends, for a distance of 550 ft., which places the present face 280 ft. in a straight line to the north-east of the former workings. Ore was found a short distance from the face of the old workings, and has continued, with occasional interruptions, to the present face. I continued the No. 2 prospect adit in order to further develop

the mine in the direction of this new ore body, and to drain the water from the workings which follow the ore to the west, and below the 770-ft. north level. This adit has been continued a distance of 176 ft., and is now connected for air by means of a raise to No. 1 tunnel, a distance of 78 ft. Some small bunches and stringers of high-grade ore were met with in driving this level, but so far no regular ore shoot has been exposed. The adit will have to be driven another 100 or 150 ft. to come under the ore body on the 770-ft. north level, and will give about 100 ft. on the vein between the two levels.

"Freighting by wagon was commenced on June 2, 1904, and continued with some interruptions until November 22, during which period 581.4 tons of ore were hauled to Erie. Hauling was resumed on sleighs on December 26, and continued to the end of February, and 525.7 tons were hauled to Erie. This year hauling by wagon commenced on May 10, and 70.7 tons were shipped by May 31. Hauling by wagon was commenced earlier than usual this year, but rain has kept the road soft and in bad condition, and the government has not done any repair work at all on the government road, which has caused delay and extra expense to the company.

"During the year returns were received from the smelter on 1,128.75 tons of ore, the gross value of the contents being \$66,140, and the net smelter returns, after deducting the cost of freight and treatment, and the usual smelter deductions, \$52,700.57. The average gross value was \$58.60 per ton, and the average net smelter value \$46.70. Of this ore, 112 tons shipped were taken from the Head Arlington workings, the average net smelter value of this ore being \$59.33 per ton, and 1,016 tons were from the Arlington workings, the average net smelter value of which was \$45.30. These values were slightly higher than those obtained last year.

"In addition, a sum of \$1,200.12 was received from the Dominion government as a bounty on the lead contents of the ore, making a total received from ore of \$53,900.69.

"The total cost of mining and hauling to Erie was \$34,746.08, leaving a gross profit of \$19,154.61, equal to 36.34 per cent. of the net smelter returns.

"The detailed mining costs per ton of sorted ore were as follows:—

	Per ton.
Development (labour)	\$9.15
Stoping (labour)	9.04
Sorting and tramping	3.98
Timbering . . . . .	.40
Supplies	2.25
Surface and general expenses, including assaying and surveys	1.93
Hauling to Erie and loading on cars	2.77
Ore tax . . . . .	.87
Insurance . . . . .	.40
	\$30.79

The cost per ton for development has been increased, owing to the greater amount of development necessitated by the opening up of fresh ground, and the cost per ton for stoping is greater than that for the previous year, caused chiefly by the extra expense of stoping small high-grade sheets of ore in the Head Arlington. The total cost per ton of sorted ore is 20 cents higher than in the previous year; the average net smelter value, however, was greater by \$2.38 per ton, which is further increased by \$1.06 per ton lead bounty, making a total increase of value per ton of \$3.44.

"Altogether 1,246 mine cars of ore, and 13,283 mine cars of waste were trammed out of the mine during the year, and in addition the stopes were filled up solid with waste, so that, allowing for the difference in weight between a car of ore and a car of waste, there was mined 10 tons of waste for every ton of ore shipped. The total quantities of rock mined and of ore shipped would therefore be in the proportions of eleven to one, and the cost of mining, tramping, sorting and timbering, including supplies, would be \$2.25 per ton of rock mined.

"The above costs include all the expenses incurred at the

mine, and in connection with mining and shipping, but do not include the expense of the Nelson office and of the general manager.

"The development of this new ground on the 77-ft. north level is of very great importance to the future of the mine, as it opens up large possibilities. There is a large block of ground belonging to the company lying to the north of the present workings, and if the vein carried ore throughout the ground lying between the present stopes and the old Micawber workings, it will be seen that there is a large area of the vein to be developed. The ore shoots now exposed are narrow, but more continuous than in the portion of the vein already stoped. It is impossible to give any estimate of the quantity of ore in sight; the shoots are only exposed on one side, and also they generally turn out more ore in stoping than the exposed side would indicate, but there is more ore now exposed than at any previous time during my management, and there is a large block of ground in which it would be reasonable to expect development to find fresh ore shoots.

"The Head Arlington workings, while worked by the company, have turned out 112,113 tons of ore, which realised net smelter returns of \$6,652, and the total amount expended on these workings has been \$4,225.50. The vein as shown in these workings is very difficult to understand. The ore shoots have been dipping at a much greater angle than the regular dip of the vein. The streak of ore has usually been very narrow, but the ore has been high-grade. The ore shoot which we have been following has been stoped out, and I have not been able to connect it with the other vein worked by Muffet during his lease. From the present development it would appear that it is a spur or slip that we have been following, and in which we have found the ore shoots, and I believe that the main vein continues on the other side of the porphyry dyke which cut it off. I am in hopes that the seam which we are now following will prove to be the main vein."

The directors, recognising Mr. Hill's habitual policy of cautious conservatism, are inclined to regard his report, not merely as satisfactory, but extremely hopeful.

With regard to the East Kootenay and other mineral claims, Mr. Hill advises as follows:—

"No work has been done during the year on your mineral claims in East Kootenay, or on the Sunlight fraction mineral claims in the Slocan district. With regard to the claims in East Kootenay, I am informed that the North Star Mining Co. is now doing development work on its claim the Midnight. This is the most northerly of their claims, and adjoins your claims Melton fraction and Big Chief. Some ore has been shipped from the Midnight claim, and some float ore has been found in the wash on your claims, and any ore body developed in the Midnight will increase the value of your claims. The smelter at Marysville is now in operation, and treating ore from the Sullivan group, which adjoins your property on the other side."

Mr. E. Jacobs, Editor of the MINING RECORD, Victoria, B. C., and Secretary to the Provincial Mining Association, who has recently issued a pamphlet on the Crow's Nest Pass Coal Fields, thus writes as regards the Blairmore coal lands, which are known locally as Head and Martin's coal lands:—

"One of the most promising properties in the district (Blairmore) is that known as Head and Martin's, whose lands run for practically eight miles on the coal measures, overlapping for two miles those of the International Coal & Coke Company in such a way as to make it appear that it would be to mutual advantage to work them together, at any rate so far as the southern part of the company's lands is concerned. There are five known workable seams here. The biggest is 43 ft. 6 in. thick, there being first 24 ft. 8 in. of clean coal, then 13 ft. 4 in. in which there is some shale, and then 5 ft. 6 in. more of clean coal. This seam has been opened about two miles south of the International Company's southern boundary line, and where cut by a 60-ft. cross-cut tunnel through solid rock is undisturbed. It has the mountain rising about 700 ft. above it, consequently the coal is superior in quality to that where the measures are nearer the surface. This property is advantageously situated

in regard to comparative nearness to railways, for the Crow's Nest railway is within 4½ miles in one direction, while the surveyed route of another railway passes within two miles in the opposite direction," thereby confirming the reports previously obtained as to the value of the property.

Mr. Leshe Hill, impressed with the prospects of these coal lands, has for some time past recommended the Board to proceed with a certain amount of development work, which he is of opinion would materially assist in negotiations for the sale of the properties, and your directors are urging his views on the company which holds one-half interest with this company in the lands referred to.

The following is a copy of the balance sheet, as at May 31, 1905:—

		<i>Capital and Liabilities.</i>		
		£.	s.	d.
Capital Account—				
Nominal.. . . .	£100,000	0	0	
(100,000 shares of £1 each.)				
<hr/>				
Issued—				
60,375 shares of £1 each				
fully called up	60,375	0	0	
Less calls unpaid	138	12	4	
				60,236 7 3
<hr/>				
Sundry creditors in British Columbia	728	13	6	
Sundry creditors in London.	30	0	0	
				758 13 6
				<hr/>
				£60,995 1 2

		<i>Assets and Expenditure.</i>		
		£.	s.	d.
Purchase account				3,500 0 0
Property account—				
Mining claims at East and West Kootenay, as per last balance sheet. . . .				10,481 6 3
Blairmore coal lands (expenditure in respect of interest in)				4,242 1 0
Plant, machinery, buildings, live and dead stock				9,636 5 5
Sundry debtors—British Columbia	199	16	9	
Sundry debtors—London . .	5	1	3	
				204 18 0
Cash at bank, London (deposit account)	1,000	0	0	
Cash at bank, London (current account)	75	0	3	
Cash at bank, British Columbia (deposit account). . .	5,000	0	0	
Cash at bank, British Columbia (current account). . .	494	3	10	
Cash in hand, London	3	15	0	
				6,572 19 1

<i>Expenditure—</i>				
Balance brought forward from last balance sheet, May 31, 1904	25,077	19	0	
Expenditure (London) from June 1, 1904, to May 31, 1905, and (British Columbia) from May 1, 1904, to April 30, 1905:—				
London office expenses	350	0	0	
Audit fee, 1904 (London)	36	15	0	
Petty cash, stationery, cablegrams and legal expenses (London)	46	5	11	
Income tax	30	0	0	
Insurance, accident and fire (British Columbia)	93	7	7	
Government ore tax (British Columbia)	196	4	3	

Salaries in British Columbia and Nelson office expenses	1,593	3	11		
General expenses (British Columbia)	136	9	2		
Development expenses—					
Fort Steele claims	15	17	0		
Sunlight fraction	2	14	2		
Arlington group	5,547	15	4		
Head Arlington	405	17	2		
	33,532	8	6		
Deduct—Interest	93	15	3		
	33,438	13	3		
Less Bullion account, proceeds of ore shipped to smelters	10,387	13	9		
Deduct expenses	492	5	5		
	9,895	8	4		
Lead bounty	204	8	6		
	10,099	16	10		
				23,338	16 5
Dividend of 1s. per share on 60,375 shares (March 1, 1902)				3,018	15 0
				£60,995	1 2

The directors' report and the statement of accounts and balance sheet were unanimously adopted; a dividend at the rate of one shilling (25 cents) per share on the share capital was declared; the sum of £500 (\$2,500), as remuneration for their services, covering a period of nearly eight years, was voted to the directors, to be divided by them in such proportions as they shall agree upon; Mr. Jas. Head was re-elected a director; the auditors were re-appointed, and the proceedings closed with the customary vote of thanks to the chairman.

TYEE COPPER CO., LTD.

The sixth ordinary general meeting of the shareholders of the Tyee Copper Company, Ltd., was held in London, England, on July 18, Mr. T. H. Wilson (chairman of the company) presiding.

The secretary (Mr. W. Gardner) having read the notice convening the meeting and the report of the auditors,

The chairman said: As promised you last year, we have given you a revenue account, which explains fully how the money earned has been disposed of. The first two items in this account refer to dividends paid, the one of 5 per cent being on account of the year ending April, 1904, and the other the interim dividend paid in December, 1904. The amount of £11,062 6s. 5d. has been placed to reserve, as agreed in July, 1903. The next item of £6,760 8s. 6d. is placed on deposit at our bankers, and may be used for the requirements of the mine, but not for dividends. The amount written off plant, mine and smelter is £9,937 7s. This is the amount spent upon new buildings, machinery, etc., but as we have no spare capital, your directors felt that the best way to deal with it was to write it off. With regard to income-tax, this is divided over three years as to payment, but must be provided for. On the credit side there is one item of £836 1s. 10d., which is the interest received from the reserve fund investments, and is credited to that fund. Coming now to the balance sheet—sundry creditors have been all paid, with the exception of income tax. The item sundry debtors is chiefly due on matte sales, by this time duly received. When addressing you last year I expressed a hope that new ore bodies would be discovered before we met again. I regret such has not taken place. Although much development work has been done, success has not up to the present

time crowned our efforts, but it is fully believed by those capable of judging that in a short time our hopes will be realized. Last, but not least, is the matter of dividend. Your board feels that the shareholders will be greatly disappointed at their decision not to recommend the payment of further dividends until a fresh ore body is cut and proved; but they hope they will soon be able to resume and pay periodically that which we all desire.

The adoption of the report and accounts having first been moved and seconded,

Mr. E. B. Livingston said: I should like to make a statement in reference to Mr. F. W. Hodges and myself not seeking re-election. We were willing to offer ourselves for re-election, but have been forced off the board against our wish. Mr. Loeffler is the largest shareholder in the company, and his holding has recently been considerably increased. Still he does not even now own the majority of the share capital, and his interest has hitherto been fairly represented on the board by his two nominees, Mr. Hancke and Mr. Straube, who hold respectively 500 and 400 shares. Up to the last moment not a whisper was breathed by Mr. Loeffler's nominees on the board, with whom we were working on amicable terms, that any opposition was to be raised against our re-election. At the meeting held on June 30, when the audited accounts were finally agreed to, the question as to dividend settled, and the draft directors' report submitted to the board, in which the retiring directors, Mr. Hodges and myself, were mentioned as offering ourselves for re-election, not a word was said against this particular paragraph, as it then stood. As you are doubtless aware, since Mr. Loeffler started the practice three years ago, the original directors have been in the habit of obtaining proxies in defence of the other shareholders. Now Mr. Hancke asked us what we intended doing as regards proxies on this occasion, and finally proposed to us that if they did not lodge proxies we should also agree not to do so. Under the circumstances, and not, therefore, anticipating any opposition from Mr. Loeffler, we agreed. On attending a board meeting on July 4, summoned to pass the final print of the report and accounts and to fix the date of this meeting, we were told of Mr. Loeffler's decision to oppose our re-election, and to nominate himself and Mr. Nicol Brown in our places. Having regard to the shortness of time at our disposal, and to the fact that on a poll Mr. Loeffler could cast a very large number of votes in one hand, we found ourselves powerless to resist. As Mr. Loeffler and his friends do not own half the shares, I fail entirely to see the justice of his annexing four seats out of five on the board, and leaving the chairman in a minority of one to represent the majority of the shareholders. On the other hand, Mr. Hodges and myself, together with our immediate relations, are, by far, the next largest shareholders, representing between us nearly 20,000 shares. In conclusion, allow me to thank you on behalf of Mr. Hodges and myself for the confidence you have so kindly placed in us in the past. We regret that the circumstances which I have detailed prevent our continuing to serve you.

Mr. Hancke said: Mr. Livingston has stated that we were working on the board in an amicable way, but that is far from the fact. As regards his remarks as to he and Mr. Hodges being forced off the board, I think ample notice was given to both gentlemen. No notice was required to be given to them, but we showed them consideration by letting them know beforehand. However, that is not the matter on which I wish to dwell. There are two points on which during the time I have been associated with the Tyee I have been at loggerheads with them. One is with regard to the interim dividend. When the matter of the 10 per cent. interim dividend came up for consideration by the board, my colleague Mr. Straube, and myself found that we were at variance with our three co-directors. We felt that in face of the results of exploration work at our mine our company's position did not warrant at that time the payment of an interim dividend. We considered it a wiser policy to postpone the matter until the end of our financial year, when we should have an opportunity to view the position of the mine in the light of practical results obtained in the meantime. We were, however,

not able to bring our co-directors round to our views. They appeared to be determined to pay the dividend under all circumstances, and knowing that they were in the majority, they took up the extraordinary position to make the question a matter of voting only. I regret to say that Mr. Straube and myself had to content ourselves with recording our protest. The folly of declaring this interim dividend showed itself very soon. The dividend was paid in December last, and in January this year Mr. Clermont Livingston had to propose, in consequence of the failure to find fresh ore bodies, to reduce our output from 5,000 to 4,000 tons per month, which proposal was very soon followed by a new proposal to restrict the output to 2,000 tons per month, in order to gain more time for the development work in view of our limited ore reserves. It was, in my opinion, extremely bad finance to pay this interim dividend, leading the shareholders to anticipate, and rightly so, that a still better distribution, or at least an equally good one, would come forth at the end of the company's financial year.

There is another matter which, as regards the position of these two gentlemen, should be brought before the meeting. I dare say many of you who have called at the office have seen the name of the Vancouver Island Mining & Development Co. written on the door. It was first put up in 1902. I asked Mr. Gardner, our secretary, at the time what the meaning of this was, and I was told that it was only a small syndicate, and would not in any way interfere with the interest of the Tyee Co. Mr. Gardner also told me that he himself was a director of the company, and that Mr. Livingston was the local director in Vancouver Island. I did not take much notice of the matter at the time, because I thought that that company would not interfere with the Tyee. Ever since 1902 nothing has been mentioned as to how the property of the Vancouver Island Mining & Development Co. was getting on, nor did I inquire about it. But on June 17, last the *B. C. Review* published the following paragraph: "A mining deal, which means much for the industry on Vancouver Island generally, and Mount Sicker district particularly, was completed recently, when the Vancouver Island Mining & Development Co. took up the option which it had on 26 claims, known as the Westholme group, on Mount Sicker. Prominently identified with the above-mentioned company are many of those chiefly interested in the Tyee Copper Co. An option was obtained on this promising group of claims eighteen months ago, and during that period the Vancouver Island Mining & Development Co. has had a considerable number of men at work developing the claims, with the idea of establishing their value. Shafts have been sunk distances of 500 and 600 ft., with a series of cross-cuts, with the result that the disclosures of mineral richness have been sufficient to demonstrate that the properties are exceedingly valuable. Further development work will be continued on a comprehensive scale, and employment given to an augmented force of men. The group of claims in question lies adjacent to the Tyee property, the worth of which has already been established." I showed this paragraph to Mr. Gardner at a board meeting, and he admitted the truth of it. At the same time, he mentioned that the place where the strike had been made actually adjoined the property of the Tyee Company. I cannot agree that it is fair and proper for Mr. E. B. Livingston and Mr. Hodges, while acting as directors for the interest of the shareholders of the Tyee Co.—and the same remark I wish to apply to our local director, Mr. Clermont Livingston—to be largely interested in the Vancouver Island Mining & Development Co. when that company extends its work of exploration to ground adjacent to the boundaries of the Tyee Co. In my opinion, directors of the Tyee Co. should in such cases act in the interest of the Tyee alone, and it should not happen, as it has, that when the company competing with the Tyee has some success in its exploration work close to our claim we, the co-directors of these two gentlemen on the board of the Tyee, should hear of it first, and only through the newspapers. The duty of gentlemen connected so closely with the Tyee Co., and more especially so in the case of our local director on the spot, should be to act in the interest and for the benefit of the

Tyee Co. when there is a chance of ore finds in close proximity to our own mine, and the knowledge and experience gained at the expense of the Tyee should not be utilised for the benefit of another concern in which these gentlemen are interested.

Mr. F. W. Hodges stated that he held 150 shares in the Vancouver Island Mining & Development Co.

Mr. Ludwig Loeffler said he considered it wrong on the part of directors to whom they entrusted their affairs to act in the interest of another company, and take advantage of all the money they had spent and all the work they had done. Such an act might not be legally wrong, but certainly it was morally wrong.

The chairman stated that he heard of the Vancouver Island Mining & Development Co., but as the chairman of the Tyee Co. he considered it his duty to have nothing to do with it, because questions with regard to smelting might arise which would be of a conflicting character.

Mr. E. B. Livingston remarked that he was not a director of the Vancouver Island Mining & Development Co.

The chairman said he was sorry that there should be any aspersion cast on Mr. Clermont Livingston, for he was quite sure that he would do nothing derogatory to the Tyee Co. It might be the feeling of some shareholders that he ought not to have associated himself with the Vancouver Island Mining & Development Co., but he was absolutely certain that he would not tie himself solely to the Tyee Co. without having an opportunity of engaging in other enterprises. He was sorry that this point had been raised, because he felt certain that the Tyee Co. had not suffered thereby. With reference to the last interim dividend, perhaps he might receive a certain amount of blame for agreeing to pay it, but they had plenty of money to spare at that time, and there was no idea that they would be advised to reduce the output during the next two or three months. He spoke with all due respect to Mr. Loeffler, because he was a rich man, but there were other shareholders in the company who liked to receive a small dividend, and he (the chairman) felt that the directors were justified in paying it. Had he known that things were not going to pan out better he would perhaps have delayed the payment, or given only 5 per cent, instead of 10 per cent. At the same time they had plenty of money to go on with, and he did not think there was much to blame him for.

Mr. Jackson asked why 10 per cent had been written off the buildings, which were most substantial, and would probably last 50 years. They were thoroughly well kept up, their maintenance being paid for each year. He also inquired why the plant, machinery and tools, which were kept in thorough order, were also depreciated. He observed that 10 per cent had also been written off the smelter, although, according to the manager's report, the machinery and plant had been kept in thorough order. With reference to Mr. Clermont Livingston, he knew that gentleman well, and on one occasion when he visited Vancouver Island he learned that Mr. Livingston and the Tyee mine were synonymous terms. When anyone spoke of the Tyee mine Mr. Livingston was always associated with it. Having visited the property he knew exactly how the buildings were put up, and also the smelter. No expense had been spared, and everything was kept in thorough order, and he did not see why they should have been depreciated to the extent of 10 per cent. Their directors, it seemed to him, were always checking the market and causing distrust by either excessive caution or a desire to build up an extraordinary reserve fund. Personally he had the greatest belief in the possibilities and probabilities of the mine. In his opinion, they had one of the best properties out there. He knew nothing about the Vancouver Island Mining & Development Co.; but as far as Mr. Clermont Livingston was concerned, he thought that gentleman had a perfect right to associate himself with that undertaking. He asked why, with £32,000 on deposit, and in view of the statement that 2,000 tons would pay all expenses and give them 10 per cent on the nominal capital, the directors wished to hold back the money in hand.

Mr. A. J. Johnston asked Mr. Ludwig Loeffler to state

what policy he intended to carry out in regard to the Tye mine. They all knew that Mr. Livingston was the originator of the mine, and that Mr. Loeffler came forward at a critical time and provided cash for development of the property. He did not wish Mr. Loeffler to turn out two of the directors. The board might be increased to six, so that Mr. Livingston might remain on.

Mr. E. B. Livingston: No, thank you; I do not wish to remain.

Mr. Johnston (continuing) remarked that Mr. Loeffler was a little more conservative than some of the shareholders with regard to the matter of dividends. At present the company had about £73,000, and he thought the shareholders ought to have a little bit of that to go on with.

Mr. Ludwig Loeffler said that some gentlemen appeared to take a very sanguine view of the future of the property, and he hoped their anticipations might be correct, for the sake of all the shareholders. He, however, was not sanguine, and he would give his reason for saying so. Quite in the early history of the company, in 1901, a note of warning was sounded as to the character of the mine in depth by Mr. Thompson, the well-known mining expert, who then acted as consulting engineer to the company, and had examined the mine on different occasions. He did not feel satisfied with the appearance of the ground at the 200-ft. level when reached, and recommended to the board the sinking of a shaft to a greater depth to ascertain the character of the formation below the surface ore body. Some time after the most sanguine hopes of finding ore bodies were entertained by the management in respect of the 400-ft. level; but, notwithstanding extensive exploration, they proved a disappointment. The same occurred at the 600-ft. level, and, unfortunately, they had experienced the same disappointment at the 800-ft. level—the lowest point they were able to reach with their present hoist and power. Under these circumstances they ought not to act on hopes and expectations of so uncertain a nature, but only on existing facts and data. Such were contained in the report of their mining engineer, Mr. E. C. Musgrave. As far as it was possible to arrive at figures from his statements, he (the speaker) concluded that their present ore reserve, at the reduced output of 2,000 tons per month at which they were now working, might only last for another year or eighteen months. If by that time they had not found new ore bodies, either in depth or in any of their other claims, their position would be a very serious one. Their other claims had yet to be proved. The most promising amongst them, the X L., had been seriously taken in hand during the year with which they were dealing. Considerable work had been done by way of sinking and cross-cutting; but, to their great disappointment, the result had been practically nil, and no ore body had been found. The business of their smelter for custom ores was at present too small to be taken into consideration. They therefore had to face the situation that at a very near period they might find themselves without ore, and that they would require all the cash reserves which they had accumulated. They would soon have to meet heavy expenditure to increase their plant and provide for sinking and other exploration work, and if all their endeavours to find ore should prove unsuccessful, as was quite possible, they might have to consider what other arrangements could be made under the circumstances in which they might then be placed. Should they be lucky enough to meet with large ore bodies, such a fortunate incident would, of course, at once change their position for the better, and would enable them to appropriate such part of their savings for dividends as the improved circumstances might reasonably warrant. On May 9, 1902, the colonial holding amounted to 19,013 shares; on April 20, 1904, the total colonial holding was 12,233 shares; and on June 26, 1905, when the caving-in and the reduction in the output took place, it was reduced to only 2,926—that included the shares held by Mr. Clermont Livingston and others—and the holding was the same at the present time. He would ask the shareholders to draw their own conclusions from these figures.

The chairman stated, in reply to Mr. Jackson, that the directors considered it a wise policy to write down the buildings and machinery, and so place the balance-sheet on a sound basis. He did not think the shareholders need despair about the property.

Mr. Jeffreys asked if the chairman could explain how information with regard to the mine had leaked out before it reached the shareholders.

The chairman said the directors had been making inquiries on that subject, and measures had been taken to prevent any leakage in the future.

The motion for the adoption of the report and accounts was then put and carried.

Mr. Ludwig Loeffler and Mr. Nicol Brown having been appointed to the board, the retiring directors were thanked for their past services, and the auditors re-elected. A vote of thanks to the chairman concluded the proceedings.

GREAT NORTHERN MINES, LTD.

The annual general meeting of the Great Northern Mines, Ltd., which was organized two years ago, was held at Nelson on August 9. A statement of accounts was submitted and, after a long discussion, adopted. Mr. A. H. Gracey's report on the company's Oyster-Criterion group, near Camborne, Fish River district, was read; this was a favourable review of the position and prospects of the property. A recommendation it contained to add ten more stamps to the 10-stamp mill at Camborne was adopted.

About 280,000 shares received by promoters of the company as profits on promotion, were returned to the company to be sold as treasury stock. Some 30,000 of these were subscribed for, at 30 cents a share, by shareholders present at the meeting, and it was arranged that shares shall be offered to the public at the same price.

Mr. J. J. Young retired from the directorate, and the board now consists of Messrs. W. F. Cochrane, F. W. Godsal, J. G. Matthews, T. Kilpatrick, W. A. Jowett, W. Gosnell, B. Crilly and W. B. Pool. Mr. Cochrane was afterwards appointed president, and his appointment as manager continued; Mr. Gosnell, vice-president, and Mr. Robert Hodge remains secretary and solicitor to the company.

ELK RIVER COAL & OIL CO.

The annual general meeting of the Elk River Coal & Oil Co. was held at Fernie, south-east Kootenay, on August 8, inst., with the president, Mr. W. A. Bleasdel, in the chair.

The report submitted showed the financial condition of the company to be satisfactory, and its coal properties to be looking well. The company holds 45 coal claims in the upper Elk valley; on these several seams of coal have been uncovered and prospecting work has shown them to contain coal of good quality and in large quantity.

The election of officers for the ensuing year resulted as follows: In the place of the three retiring directors, Messrs. Tuttle, Shaw and Scott, there were elected Messrs. J. R. Lawry, Chas. Klingensmith and W. S. Fairfield, Mr. W. R. Ross, M.P.P., also retired and was appointed the company's solicitor, and Mr. P. Van Dusen was elected director in his stead.

Mr. W. A. Bleasdel was re-elected president, Mr. J. R. Lawry vice-president, and Mr. W. S. Fairfield was re-elected secretary-treasurer.

At a recently held meeting of the Last Chance Mining & Milling Co., owning the Last Chance mine, near Sandon, Slocan, the annual election of directors and officers resulted as follows: Directors—Dr. W. A. Hendryx; Mr. W. H. Stimson, Los Angeles, California; Mr. Biggerstaff Wilson, Victoria, B.C.; Mr. Blake Wilson, Nelson, B.C., and Mr. Louis Pratt, Sandon, B.C. Dr. Hendryx has been appointed president, and Mr. Pratt is again secretary-treasurer.

The Northwest Oil Co. has elected officers as follows: President, Mr. W. J. Snodgrass, Okanagan Falls; vice-president, Mr. Elliot S. Rowe, Victoria; secretary and treasurer, Mr. A. Maxwell Muir, C.E., Victoria; manager, Mr. David A. Kelly, Seattle; directors, Messrs. T. M. Henderson, David Black and R. E. Bittancourt of Victoria.

COMPANY CABLES AND NOTES.

U. S. A.

Alaska Mexican.—June: 20,630 tons ore; estimated realisable value of bullion, \$30,488. Saved 391 tons sulphurets; value \$26,912. Working expenses, \$35,227.

Alaska Treadwell.—June: 240-stamp mill ran 29½ days; 300-stamp mill ran 29¾ days; crushed 88,928 tons of ore; estimated realisable value of bullion, \$81,378. Saved 1,770 tons sulphurets; estimated realisable value, \$75,268. Working expenses, \$95,061.

Alaska-United.—June: 19,480 tons ore; estimated realisable value of bullion, \$21,804. Saved 331 tons sulphurets; value, \$12,789. Working expenses, \$26,823.

British Columbia.

Arlington, Erie.—The following were the shipments and returns for the months of June and July:

	Shipments.	Net Smelter	Expenses.
	Tons.	Returns.	
June	118.8	\$4,701.12	\$4,249.27
July	63.18	2,997.35	3,688.31
	181.26	\$7,698.47	\$7,937.58

From June 25 to July 5, shipments were stopped, as the government wagon road was not fit to haul ore over, no repair work having been done on it since the previous summer.

Cariboo Consolidated.—Cable from the resident manager: "During the entire month of July, washed 922 cu. yd. of gravel, yielding 115 oz. of gold; during the past week marked improvement in value." Office Note.—During the month of June, when drifting first started, 565 cu. yd. were washed, yielding 70¾ oz., valued at \$1,300.

Tyce.—July: Smelter ran 11 days and smelted 1,793 tons of Tyce ore, giving a return, after deduction of freight and rehning charges, of \$31,472.

The British Columbia Development Association has declared a dividend of 5 per cent. The profit last year amounted to £2,492.

At Nelson, on July 12, ulto., on the petition of George H. Barnhart, of Nelson, it was ordered that the Broken Hill Mining & Development Co. Ltd., operating the Wilcox mine, at Ymir, B.C., be wound up under the provisions of the "Winding Up Act," and that Albert Hervey Tuttle, of Ymir, be appointed provisionally official liquidator of the said company.

At Vancouver, on August 10, inst., on the petition of Chas. T. Hancock, of Vancouver, it was ordered that the Iowa-Lillooet Gold Mining Co., Ltd., be wound up under the provisions of the "Winding Up Act," and that Chas. T. Hancock, of Vancouver, be appointed provisional liquidator until the appointment of an official liquidator.

Mr. Paul Sidney Couldrey, of Rossland, mine superintendent, has been appointed the attorney of the "Le Roi No. 2, Ltd., in the place of Mr. Ernest Levy.

Mr. Edgar Milton Hand, resident mine manager of the company at Ymir, has been substituted for the attorney of the Ymir Gold Mines, Ltd., and that the former substitution of Mr. Savannah Johnson Speak has been revoked.

CERTIFICATES OF INCORPORATION.

Ark Group Mining & Milling Co., Ltd., with a capital of \$100,000, divided into 400,000 shares of 25 cents each.

Alaska Pumice Stone Hydraulic Cement & Trading Co., Ltd., with a capital of \$50,000, divided into 50,000 shares of \$1 each.

Wellington Coal & Wharfage Co., Ltd., with a capital of \$100,000, divided into 1,000 shares of \$100 each. Objects include the following: To acquire and take over the good-will of the business now carried on in the City of Vancouver under the style or firm of Macdonald, Marpole & Co., and all benefits, rights and liabilities of the said firm under their existing contract of agency with the Wellington Colliery Co., Ltd.

REGISTRATIONS OF EXTRA-PROVINCIAL COMPANIES.

Marcel Gold Mining Co.—Head office at Bellingham, Washington, U.S.A. Capital, \$15,000, divided into 1,500,000 shares of one cent each. Head office in British Columbia, at Vancouver. Attorney (not empowered to issue and transfer stock), D. G. Marshall, solicitor, Vancouver.

Ellis Granite Co.—Head office at Seattle, Washington, U.S.A. Capital, \$30,000, divided into 300 shares of \$100 each. Head office in British Columbia, at Victoria. Attorney (not empowered to issue and transfer stock), Frank Higgins, barrister-at-law, Victoria. Objects include the business of quarrying, dressing, buying, selling and building with granites, sandstones, marble and all other classes of stone and other material for building.

NEW REGISTRATION IN ENGLAND.

Princess Royal Gold Mining Co., Ltd.—Registered July 11, by Waterlow & Sons, Ltd., London Wall, E.C. Capital, £500,000, in £1 shares. Objects: To acquire from the Princess Royal Gold Mines, Ltd., certain mineral areas, to adopt an agreement with the said company and the Hon. W. Pugsley, and to carry on, in British Columbia, or elsewhere, the business of miners, prospectors, metallurgists, etc. Minimum cash subscription, 500 shares. 400,000 shares are to be allotted to the vendor under the above-mentioned agreement. The number of directors is not to be less than four nor more than nine; the signatories are to appoint the first. Qualification (except first directors), £1,000. No qualification required for first directors. Remuneration £1,500 per annum, divisible, and 10 per cent, of any surplus available for distribution after 20 per cent dividend has been paid in any year. Registered office: 34 Castle Street, Liverpool, England.

PATENT OFFICE REPORT.

The following particulars of a patent recently issued to a British Columbian inventor have been supplied by Mr. Rowland Britain, patent attorney, Vancouver:

Mr. Henry Harris, assistant smelter manager for the Hall Mining & Smelting Co. at Nelson, received last week a Mexican patent on his improved device for effecting the separation and distribution through separate outlets of the matte and slag of a smelting furnace. The advantage of Mr. Harris' invention lies in the fact that the separation which has been effected in the furnace under favourable conditions of heat and quiescence is maintained during the outflow, and that the molten material is maintained at a constant head in the furnace in relation to the tuyeres—advantages which will be readily appreciated by those acquainted with smelter practice.

(Note.—This device has been in use at the Hall M. & S. Co's smelter since the beginning of the current year, with very satisfactory results. It is not confined in its use to lead smelting, but can be used as well in connection with the reduction of other metals. It has been patented in several European countries, and application has been made for a patent in the United States.)

TRADE NOTES AND CATALOGUES.

By an unfortunate mistake made last month the name of the Canada Foundry Co. was placed at the beginning of the paragraph relating to the exhibit made by the Canadian Westinghouse Co., at the meeting of the Canadian Electrical Association, held in Montreal in June. It was an evident printer's error, yet the result was that the company which showed such enterprise in making the comprehensive display referred to did not receive the credit due to it.

Recently received publications of the Canadian Westinghouse Co. are the following: Circular No. 1111, Direct Current Engine Type Generators 125, 250, 550 volts; Instruction

CORRESPONDENCE.

Books: No. 5,047, for the Installation and use of Westinghouse Multiple Alternating Current Arc Lamps; No. 5,080, for the Installation and Operation of Westinghouse Type 167-A Auto-Starters for Constant Speed Induction Motors (various voltages); No. 5,081, for Operating Westinghouse Portable Lamp Testing Wattmeter; and No. 5,082, for the Installation and Operation of Type R. Motors. Also illustrated pamphlets relating to Westinghouse Multiple-Alternating Arc Lamp System, and Type B Westinghouse Integrating Wattmeters, respectively.

The Kilgore-Peteler Co., of Minneapolis, Minn., has issued its illustrated Catalogue No. 3, Dump Cars.

The Colorado Iron Works Co's Catalogue No. 12 "Some Details as to Smelting Practice and Equipments, for the Reduction of Gold, Silver, Lead and Copper Ores," is the fifth edition of this useful and freely illustrated publication, which contains 152 pages of reading of particular interest to smelting men. The contents are important notes and data in regard to modern blast furnace smelting, illustrating the various types of furnaces and equipment as built by the Colorado Iron Works Co., and now in successful operation in almost all parts of the world where smelting is carried on to any extent; the design and construction of plants, with brief articles relating to or descriptive of the smelting of ores.

The Department of Marine and Fisheries, through its consulting engineers, the Standard Construction Co., of Montreal, has paid the Canadian Rand Drill Co. a distinct compliment in selecting one of its Imperial type XI-1 air compressors for the forthcoming expedition to Greenland. This machine is for the S.S. Arctic, which is being fitted out at Halifax for its long and perilous journey in search of the North Pole. The compressor is to be operated by a windmill, since it will be impossible to obtain fuel for steam, and the air will be discharged into several receivers at a high pressure; the air, in turn, being used in place of steam to generate electricity.

BOOKS, ETC., RECEIVED.

Department of Agriculture, Canada, Statistics Division.—Statistical Year Book of Canada for 1904. By George Johnson, D.C.L., statistician. Pages, 763; illustrated with diagrams.

Department of the Interior, Canada.—Canadian National Park, Rocky Mountains, Banff, Alberta. Pages, 63; profusely illustrated, partly in colours.

Geological Survey Department of Canada.—Summary Report of the Department for 1904. By Dr. Robert Bell, acting director. Pages, 392; illustrated with maps.

Geological Survey of Canada.—Section of Mines Annual Report for 1903. By Elfric Drew Ingall, mining engineer in charge. Pages, 175; illustrated with diagrams.

Columbia University, New York City.—School of Mines Quarterly, July, 1905. Pages, 142; illustrated.

University of Washington.—The Bulletin of the University of Washington, Seattle. University Views; Series 2, No. 23.

United States Geological Survey.—

Economic Geology of the Bingham Mining District, Utah. By John Mason Boutwell; with a Section on Areal Geology, by Arthur Keith, and an Introduction on General Geology, by Samuel Franklin Emmons. Pages, 393; illustrated by numerous half-tones, maps and diagrams.

The Fairhaven Gold Placers, Seward Peninsula, Alaska. By Fred H. Moffit. Pages, 79; illustrated by half-tones and maps.

The Gold Placers of the Forty-mile, Birch Creek, and Fairbanks Regions, Alaska. By Louis M. Prindle. Pages 34; illustrated by half-tones and maps.

Methods and Costs of Gravel and Placer Mining in Alaska. By Chester Wells Purington. Pages, 262; illustrated by half-tones, maps and diagrams.

Report of Progress of Steam Measurements for 1904. Parts II, VII and IX.

(Note.—Reviews of several books recently received are unavoidably held over until next month.)

VERMILION FORKS MINING & DEVELOPMENT CO., LTD.

To the Editor:

Sir,—The somewhat harsh criticism of the Vermilion Forks Mining Co., which appeared in your June issue warrants a reply.

The policy of the Vermilion Forks Mining Co. has, for a very good reason, been that of rigid economy, and, possibly, had you been a shareholder in the company and understood the conditions under which its affairs had been carried on, you would not have stigmatized it as "a dog in the manger" policy. This statement is not only unfair, but it is not warranted by facts. The operations of this much maligned company, so far from deterring others, have, owing to their borings and other development of their coal properties, been the chief incentive in inducing many others to take up coal locations in the district, as shown by the fact that over 24 sq. miles of coal lands are held under lease and licence in this vicinity, whereas until the Vermilion Forks Co. commenced work there was no licences applied for, although the existence of the coal had been known for more than 20 years. It is hardly necessary to point out that coal is a commodity of little value without some cheap form of transportation, and developing a coal property becomes an expensive matter when there are no facilities for reaching a market, while the installation of plant becomes almost prohibitive when the wagon freight alone amounts to 3 cents per lb. The same may be said of the mineral claims, which as you remark, are lying unworked. I quite agree that there is a very serious side to the matter when a district of such potential wealth as the Similkameen can be left so long without railway communication; serious to British Columbia, and equally serious to those companies and individuals who have been struggling on for 10 years and more, hoping against hope that the lethargy displayed by those in power would at last be dispelled, and communication with the outside world be accorded. Until this takes place the interests of the province and the shareholders is best served by economy. Too many hillsides in British Columbia are decorated with abandoned mines and machinery, telling their own tale of lavish and useless expenditure, and causing the pocket of the would-be investor in British Columbia mines to be buttoned up with greater precaution.

It is a relief to find that your strictures on the economical working of the Vermilion Forks Co. are not shared by the English papers who have commented on the report, and I am under the impression they are at variance with earlier comment which appeared in your own paper.

In conclusion I would say that my directors do not anticipate any difficulty in providing ample funds for the development of our various properties as soon as railway facilities are available.

ERNEST WATERMAN,
Manager.

Princeton, B.C., August 8, 1905.

[Far from our comment, above complained of, having been "harsh criticism," we purposely avoided criticism of some features of this company's policy that we think we might fairly have taken exception to. We certainly did not suggest that anything but "rigid economy" had been practised; on the contrary, we pointed out that for the comparatively small outlay of \$77,000, spread over seven years, the company had "a big showing," embracing mineral claims, coal lands, hydraulic leases, a ranch, a smelter site, water rights, and a townsite. We think, though, that the commercial morality of a company continuing to add to its holdings, the while admitting that it had not made provision for payment in full of its small expenditure of \$7,180 during its last financial year, and that one-third of its manager's salary had for a

long time remained unpaid, even though this latter liability may be but a contingent one, is open to serious objection. There are other points as well, but turning from these, we state that our opinion is—and we reiterate it, as generally applicable—that any company possessing large holdings and yet unable to promptly pay its debts is neither a benefit to its shareholders nor a credit to the province. The Vermilion Forks Co. is not alone in having transportation difficulties to contend against, as witness several Boundary companies. For instance, the British Columbia Copper Co., now extending its *bona fide* mining operations to the neighbourhood of the holdings of the Vermilion Forks Co., in 1898 had about 85 tons of mining machinery hauled by horse-teams from Marcus, Washington, to the Mother Lode mine, near Greenwood, at a cost of at least \$3,000 freight charges between those two points. It could have waited a year or so for the construction of the Columbia & Western railway, but it meant business and had no Micawbers on its directorate. Mr. Waterman's management of the affairs of his company has doubtless been, and still is, creditable to him, and he has increased its assets and generally conserved its interests in a way that few others would have done with such restricted financial resources, but freely admitting this, his company appears to lack energy and enterprise and is a poor example in a country needing such qualities for its development.—
Editor B. C. MINING RECORD.]

PRODUCTION NOTES.

The output of the Crow's Nest Pass Coal Co's mines for the month of July was as follows:

Coal Creek	40,260.06
Michel	23,745.15
Carbonado	9,028.01
Total	73,034.02

The Phoenix Pioneer gives the production of Boundary mines during July as 69,081 tons. Of this large production 54,320 tons were from the Granby Co's mines, 13,532 tons from the B. C. Copper Co's Mother Lode mine, 1,619 tons from the Emma, Mountain Rose and Oro Denoro, and 210 tons from the high-grade mines around Greenwood. The total output for seven months to August 1 was 527,874 tons.

The production of Rossland mines during the seven expired months of 1905 totalled nearly 200,000 tons. According to figures published by the Rossland Miner, the year's output had by August 12 reached an aggregate of 207,000 tons.

OBITUARY.

Mr. G. Hawkins Emmett, manager of the Schaake Machine Works, New Westminster, died suddenly in Victoria on August 14.

Mr. Emmett had for years been associated with the Schaake Machine Works, in the capacity of draughtsman. Some months ago he discovered how to manufacture an alloy that for hardness excels all other known metals, and which can be, by means of a secret process, turned out very cheaply in large quantities. Since his discovery he had been giving his whole time to the exploitation of this metal, which he named "Hardite," and it was finding a ready sale for rock crushers and similar machinery.

Mr. Emmett was a native of England, but had been in British Columbia for many years. He was about forty years of age.

Dr. R. B. Ells, of the Geological Survey Department of Canada, has returned from Graham Island, of the Queen Charlotte group, whence he went last spring to examine and report on the coal measures of that island. Before going back to Ottawa he will again visit the Quilchena and Nicola districts, where he last year examined the coal measures, and proceed thence to the Tulameen, Similkameen, and Okanagan districts, in each of which coal is already being prospected, or indications of its occurrence have been found.

MONTHLY AVERAGE PRICES OF METALS.

(From The Engineering and Mining Journal, New York.)

SILVER.

Month.	New York		London.	
	1904	1905	1904	1905
January.....	57 056	60.690	26 423	27 930
February.....	57 592	61 023	26 665	28 047
March.....	56 741	58.046	26 164	26 794
April.....	54 202	56.600	24 974	26 106
May.....	55 430	57.832	25 678	26 664
June.....	55 678	58.428	25 644	26 910
July.....	58 095	58.915	26 760	27 168
August.....	57 806	.....	26 591	.....
September.....	57 120	.....	26 349	.....
October.....	57 923	.....	26 760	.....
November.....	58 453	.....	26 952	.....
December.....	60 563	.....	27 930	.....
Year.....	57 221	.....	26 399	.....

The New York prices are in cents per fine ounce; the London quotation is in pence per standard ounce, .925 fine.

COPPER IN NEW YORK.

Month.	Electrolytic		Lake.	
	1904	1905	1904	1905
January.....	12.410	15.008	12 553	15 128
February.....	12.063	15 011	12 245	15 136
March.....	12.299	15 125	12 551	15 250
April.....	12.923	14.920	13 120	15 045
May.....	12.758	14.627	13 000	14 820
June.....	12.269	14.673	12 399	14 813
July.....	12.380	14.888	12 505	15 006
August.....	12 843	.....	12 468	.....
September.....	12 495	.....	12 620	.....
October.....	12 993	.....	13 118	.....
November.....	14 284	.....	14 456	.....
December.....	14 661	.....	14 849	.....
Year.....	12 828	.....	12 990	.....

Prices are in cents per pound. Electrolytic quotations are for cakes ingots and wire bars; cathodes are usually 0.25c. lower.

COPPER IN LONDON.

Month.	1904		1905	
	January.....	57 500	68 282	57 256	66 887
February.....	56 500	67 963	56 952	.....
March.....	57 821	68 174	57 645	.....
April.....	58 247	67 017	60 012	.....
May.....	57 821	64 875	65 085	.....
June.....	56 396	65 381	66 384	.....
Av., year.....	.....	.....	58 857	.....

Prices are in pounds sterling, per long ton of 2,240 lb., standard copper.

TIN IN NEW YORK.

Month.	1904		1905	
	January.....	28 845	29 325	26 573	31 760
February.....	28 087	29 262	27 012	.....
March.....	28 817	29 523	27 780	.....
April.....	28 132	30 525	28 596	.....
May.....	27 718	30 049	29 185	.....
June.....	26 325	30 329	29 286	.....
Av., year.....	.....	.....	27 986	.....

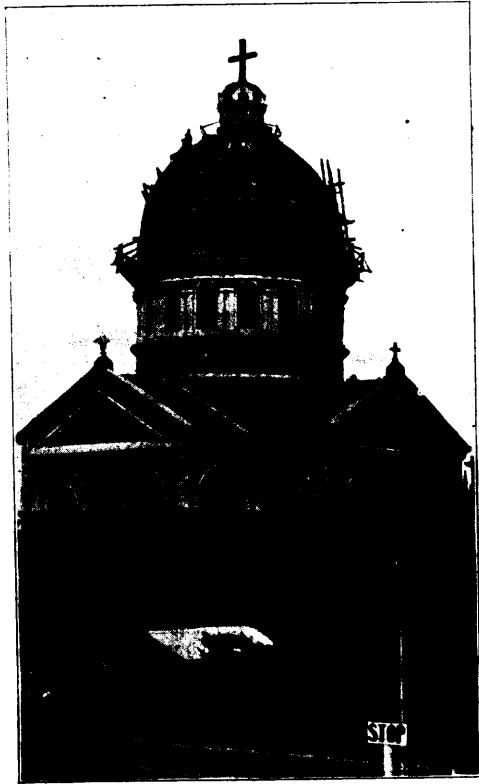
LEAD IN NEW YORK.

Month.	1904		1905	
	January.....	4 847	4 552	4 192	4 524
February.....	4 375	4 450	4 111	.....
March.....	4 475	4 470	4 200	.....
April.....	4 475	4 500	4 200	.....
May.....	4 423	4 500	4 200	.....
June.....	4 496	4 500	4 600	.....
Av., year.....	.....	.....	4 309	.....

SPELTER.

Month.	New York		St. Louis		L'nd'a
	1904	1905	1904	1905	
January.....	4 863	6 190	4 673	6 032	25 063
February.....	4 916	6 139	4 717	5 989	24 594
March.....	5 057	6 067	4 841	5 917	23 825
April.....	5 219	5 817	5 038	5 687	23 813
May.....	5 031	5 434	4 853	5 284	23 594
June.....	4 760	5 190	4 596	5 040	23 375
July.....	4 873	5 396	4 723	5 247	23 938
August.....	4 866	.....	4 716	.....	.....
September.....	5 046	4 896
October.....	5 181	5 033
November.....	5 513	5 363
December.....	5 872	5 720
Year.....	5 100	4 931

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MINING MEN AND MATTERS.

Mr. Jas. D. Sword, formerly of Rossland, is now at Goldfield, Nevada.

Mr. O. E. S. Whitesides, manager of the West Canadian Collieries, Ltd., Blairmore, Alberta, was in Calgary lately on business.

Mr. W. M. Brewer has returned from Yukon and south-eastern Alaska points, whence he went on an ore-buying trip for the Tye Copper Co.

Mr. H. L. Frank, president of the Canadian-American Coal & Coke Co., Ltd., Frank, Alberta, is expected shortly to return to that town.

Mr. Thos. Russell, formerly superintendent of the New Vancouver Coal Co.'s colliery, Nanaimo, is stated to be about to visit Scotland, and probably South Africa as well.

Mr. H. E. Croasdaile, of Nelson, recently went to Winnipeg, Manitoba, in connection with the sale there of Crow's Nest Pass coal.

Mr. M. S. Davys, of Nelson, has been making arrangements for resumption of work at the Wakefield mine and concentrating mill, Slovan lake.

Mr. Wm Graham McMynn, gold commissioner for the Greenwood division of the Boundary district, has returned from a three months' visit to England and Scotland.

Mr. G. H. Grant, of Victoria, B.C., has gone to Juneau, Alaska, to examine some mining properties in that locality for United States clients.

Mr. H. J. Scott, of Victoria, manager for British Columbia for the Hamilton Powder Co., has gone to Montreal, Quebec, on a business visit.

Mr. A. O. Wheeler, in charge of the topographical survey of the Canadian Rocky Mountains, has been authorized to make an exploration and survey of the caves recently discovered near Glacier, B.C.

Professor J. C. Gwillim, of the Kingston School of Mines, Ontario, has been visiting mining properties in the Boundary and Slovan districts since his recent return from the Yukon, whence he went with the A. I. M. E. excursion party.

Mr. E. G. Hadow, secretary of the Ferguson Mines, Ltd., Ferguson, Lardeau, has gone to England, after having been associated for about four years with the mines now held by that company. It is hoped that he will return ere long to resume his duties at Ferguson.

Mr. W. J. Sutton, geologist for the Messrs. Dunsmuir, of Vancouver Island, last month visited some mining properties at Quatsino sound, and early this month proceeded to the Nicola country to look over some of the coal showings in that neighbourhood.

Mr. John G. Sullivan, formerly assistant construction engineer on the Canadian Pacific Railway Co's Columbia & Western railway, and afterwards promoted to the position of assistant construction engineer in that company's general construction department, is stated to have been appointed assistant engineer for the Panama canal, at a salary of \$20,000 per annum.

Mr. H. Cecil, of the V. I. Exploration and Development Co., who in June went to England to endeavour to raise capital for the development of the Victoria claim, situated near Ladysmith, Vancouver Island, is stated to have satisfactorily concluded his business and is on his way back to British Columbia.

Mr. D. C. Corbin, of Spokane, for years actively associated with railway and mining interests of the southern Kootenay and Boundary districts of British Columbia, was lately in the Flathead country, looking over coal and oil properties in that part of south-east Kootenay. He was accompanied by Mr. E. J. Roberts, for years his chief lieutenant in some of his enterprises.

Mr. R. A. Bainbridge, for some time resident engineer in the Kootenay for the Canadian Pacific Railway Co., has been promoted to the position of assistant divisional engineer on the Pacific division, which embraces all C. P. R. lines from the Rocky Mountains to the Pacific. Mr. E. E. Coley, of Revelstoke, succeeds Mr. Bainbridge in the Kootenay division.