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tions to the Manager or the Secretary.

EDITORIAL NOTES.

In order to make room for several late reports the article on "Transportation and Power Supply for Mines," prepared for this month, is held over.

An unusually large proportion of space in this issue has been allotted to official and company reports, balance sheets, etc. There is in these much information of general interest, and its publication in the MINING RECORD will make it easily accessible to the many who file this journal.

The results of last year's operations at the War Eagle mine, Rossland, were that 2,220 ft. of headings were driven and 61,064 tons of ore produced of an average smelter's gross assay value of \$9.58 per ton. The excess of receipts over expenditures in mining operations was \$88,153.93. Rossland may well feel encouraged at the brightening outlook for the camp.

A bill was introduced into the New York state legislature last month to prevent "fake" mining companies not located in the state from offering their stock for sale in the state until after a statement of the financial standing, location of claims and condition of the plant of the company, shall have been filed with the Secretary of State.

Small lots of exceptionally rich silver ore have occasionally been sent out from Slocan mines, but Ontario claims a recent record that puts British Columbia very much in the shade. Four carloads of ore from a vein of silver near North Bay, shipped to New Jersey, is stated to have netted \$60,000, and two more cars are expected to also average \$15,000 per car.

Owing to existing high rates of freight on coal from Australia to San Francisco it is considered probable that British Columbian coal, which can be delivered at much lower cost, will to a considerable extent shut out the New South Wales coal from the Californian market so long as present conditions do not materially change. Coal from Vancouver Island has the additional advantage of being eagerly sought for by large consumers of steam and house coal.

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In 1904 Great Britain imported 89,288 tons of fine copper besides large quantities of copper ore and matte. More than half of the fine copper was supplied by the United States. As British Columbia last year produced about 18,000 tons of copper, the question suggests itself: When will this province have its own copper refinery and find a better market for its copper, as well as its lead, in Europe?

It has been announced that arrangements have been made for an expenditure of about \$500,000 to extend the water system of the Consolidated Cariboo hydraulic mines to a source of permanent supply equal to 5,000 miner's inches per diem. This will enable the manager, Mr. J. B. Hobson, to carry out his plans and secure results that with the insufficient supply of water available during four years last past have not been obtainable.

The production of zinc in Ainsworth and Slocan districts appears to be now on a basis that leaves a fair profit to those mining this class of ore. Already between 3,000 and 4,000 tons have been shipped to American smelters, and substantial progress is being made with the erection and equipment of zinc reduction works at Rosebery, in the Slocan, and at Frank, Alberta. Meanwhile the number of zinc shippers is increasing.

The paper on "Canadian Metallurgical Products for the Far East," read by Mr. Frederick Hobart, one of the associate editors of the *Engineering and Mining Journal*, New York, at the recent meeting of the Canadian Mining Institute, is timely and of especial interest to British Columbian producers of silver, lead and copper. A brief summary of it is printed elsewhere in this issue.

The election of Mr. H. Mortimer Lamb, for seven years associated with the active management and editing of this journal, as secretary of the Canadian Mining Institute may be regarded as a practical expression of appreciation of the value of his long-continued efforts in the interests of the mining industry of British Columbia. His accession to an office that will give him a far wider scope for usefulness similar in kind but much larger in degree, is a matter for congratulation. Doubtless he will prove the confidence felt in him to have been well deserved.

The B. C. Standard Mining Company, of Nelson, has experienced a temporary set-back, adverse weather conditions having caused such a decrease in production and increase in mining costs as to occasion a loss instead of the expected profit from operations during part of the winter. The 13,000-ft. Riblet automatic aerial tramway, put in last year, proved well adapted for conveying the ore down to the railway, but drifting and frozen snow in the open workings at the high altitude at which the mine is situated, prevented for the time a continuation of the low-cost and expeditious mining that under favourable weather conditions brought profit to the company. The return of fine

weather will, without doubt, be accompanied by a corresponding improvement in results, to the benefit of all concerned.

The reflections cast on Mr. Jas. McEvoy, geologist for the Crow's Nest Pass Coal Company, formerly of the Geological Survey of Canada, in an endeavour to justify the allegations, by the Rosslund Board of Trade, of fraud in connection with the selection of coal lands in the Crow's Nest Pass for the Dominion government, made at Nelson at the recent convention of the Associated Boards of Trade, were promptly characterised as untrue and have since been unequivocally denied by the minister of the Federal department immediately concerned. When a too lively imagination is the basis of zeal, good results can seldom be achieved.

Mr. J. Cleveland Haas, M.E., of Spokane, who was one of the pioneers in connection with mining in the Boundary district of British Columbia, recently paid a professional visit to Arizona. Before returning to Spokane he wrote to the editor "Just a line to tell you that the *MINING RECORD* appears to be popular. I found a copy at the hotel in Yuma, and another in a miner's cabin up the Gila river." The same mail brought a request from a stranger that the *MINING RECORD* be sent to Falun, Sweden, and later came a similar communication from Witten, Germany. Another mail brought a year's subscription from New Mexico. Each month sees an extension of the field in which this journal circulates.

The bulletins on the chief minerals known to occur in Canada, lately issued by the Dominion Geological Survey, will be of much use to those desirous of obtaining accurate information relative to the mineral resources of the Dominion. While the annual reports of the survey contain practically all the information published in the bulletins, it is not in such convenient form. Each important mineral is the subject of a special bulletin, the contents of which embrace accurate descriptions of mineral districts and mining industries, and, as well, references to available literature dealing with the particular mineral under notice. The adoption of this means of rendering more readily accessible to the public information gathered from various parts of the Dominion by officials of the Survey, will greatly extend the usefulness of the department.

A correspondent, writing on the subject of two per cent mineral tax, gives the following information: "I know one mine that produced in one year \$100,000 worth of ore at a cost of \$105,000. An adjoining mine, having the same class of ore, produced an equal amount at a cost of \$50,000. In the one case the two per cent tax would be added to and increase the loss, while in the other there would be a profit of \$50,000 out of which to pay the tax. Thus the tax bears unevenly on different mines and is hardest on the non-paying mine; not necessarily on

the mine having low grade ore, which may be the biggest profit payer. Of the mines above mentioned, the one that worked at a loss employed twice as many men and consequently furnished twice as much business for merchants, poll tax to the Government, etc." Both mines are in a section of the province in which are zealous advocates of the retention of the two per cent tax, but they are not of the "non-paying mine" class.

The purchase by the Granby company of a group of mineral claims, situated but a short distance from the mines the company is operating on a large scale, has been announced. If it be so it transfers to a financially strong company a property of big potentialities. The stated purchase price, \$160,000, is a large sum to pay for a group of undeveloped claims, but the Granby company is in an exceptionally favourable position to know the prospective value of its latest acquisition, and it may safely be assumed that the trend of the big ore bodies, as disclosed by extensive underground workings in the mines from which the company has taken more than 1,500,000 tons of ore, with enormous quantities in reserve, is directly towards the property recently purchased. The surface showings on the Monarch group are such that the designation "mineral farm" was given it years ago. Now that it has passed into the possession of an enterprising and progressive company, its early development may be expected.

The good effect the successful employment of local capital in the development of mines is likely to have in the direction of attracting outside capital was lately pointed out to Kootenay mining men by a Winnipeg merchant visiting the mining sections of the southern interior. There is nothing new in the opinions given by this visitor and published in the *Nelson Daily News*, yet it is well to have occasional reminders of the point of view of business men entirely free from local influences, such as may affect those who realise and dwell more upon the difficulties to be overcome than the opportunities open. To the outsider it appears that the expenditure of more local capital in developing local mining properties is necessary to convince men from other provinces or countries that there really is a good field for the employment of capital in British Columbian mines. If local money be expended in bringing mines to the point of paying dividends regularly and frequently, there will not be need to seek outside capital, for it will not be possible to prevent its coming in. At least, such is the opinion of the visitor above referred to, who mentioned the B. C. Standard Co.'s Hunter V. mine, organised and managed at Nelson, and the Pioneer Mining Co., which has lately been doing well in the Slocan City mining division, where it is operating the

Black Prince and neighbouring claims, as cases in point. These are not, however, the only locally-managed properties that have attracted the notice of men resident in other parts, for there are several mines situated near Greenwood which have done likewise, and still others could be mentioned. There certainly is a promising field in British Columbia for enterprise of this nature, and if the *bona fides* of the situation be demonstrated by self-help, with profitable results, much outside financial assistance will quickly be forthcoming.

The publication of tables showing the output of ore in the more important mining camps of the province is of much service, statistics of the kind often proving useful in the interests of the districts directly concerned as well of the mining industry generally. The most prominent instance of excellent work of this nature is that of the *Phoenix Pioneer*, which not only continuously publishes a comprehensive table showing the production of Boundary district mines covering the whole period during which they have been producers, adding each week's production as made, but as well sends out far and wide weekly statements of the output of these mines. We frequently see in New York and London publications, to give two examples of wide-spread publicity, tonnage statistics that we recognise as having been first published in the *Phoenix Pioneer* or *Rossland Miner*, the latter also, though to a smaller extent, doing good work in the direction here indicated. The task of obtaining information from mines so scattered as are those of the Boundary is by no means a light one, as our own experience has shown us, so we can better appreciate the efforts of the editor of the *Pioneer* than can many others not so well informed on the subject. We have pleasure in directing attention to the value and importance of this work, and we commend it to all interested in mining in the province as meriting more practical appreciation than it usually receives. We have already mentioned the *Rossland Miner*; other newspapers doing good service in a like direction are the *Sandon Standard* and *Slocan Drill*, while the *Kaslo Kootenaiian*, the *Lardeau Mining Review* and *Ymir Herald* have recently added the output of mines in their respective districts to the information thus made available for a much wider field of publicity than the local one. There is just one suggestion we offer, and it is made in no carping spirit but simply with a desire to add to the value of the statistics published, viz., that there be an occasional verification of the figures purporting to exhibit the output of individual mines. The adoption of this course would obviate the necessity that otherwise exists for making at the end of yearly periods corrections that tend to suggest doubt as to the reliability of the tonnage figures published throughout the year.

MINERAL PRODUCTION OF CANADA FOR
1904.

THE Geological Survey of Canada, Section of Mines, has published the following preliminary statistical statement of the mineral production of Canada for the year 1904, which has been prepared by Mr. Elfric Drew Ingall, M.E., mining engineer to the Geological Survey:

SUMMARY OF THE MINERAL PRODUCTION OF CANADA.

(Subject to Revision.)

Product.	Quantity. (a)	Value. (a)
<i>Metallic—</i>		
Copper (b)lb.	42,970,594	\$ 5,510,119
Gold, Yukon	\$10,337,000	
Gold, all other	6,003,000	
		16,400,000
Iron ore (exports)tons.	168,828	401,738
*Pig iron from Canadian ore "	68,297	901,880
Lead (c)lb.	38,000,000	1,637,420
Nickel (d)	10,547,883	4,219,153
Silver (e)oz.	3,718,668	2,127,859
Zinc (i)lb.	477,568	24,356
Total metallic		\$31,222,525
<i>Non-Metallic—</i>		
Arsenic (exports)tons.	73	6,900
Asbestos	35,635	1,167,238
Asbestic	13,011	13,000
Chromite	6,074	67,146
Coal	7,509,860	14,599,090
Coke (f)	543,557	1,884,219
Corundum	919	101,050
Feldspar	11,083	21,166
Graphite	452	11,760
Grindstones	4,509	42,732
Gypsum	340,761	372,924
Limestone for flux	200,646	176,973
Manganese ore (exports)	123	2,706
Mica		152,170
<i>Mineral pigments—</i>		
Barytes	1,382	3,702
Ochres	3,925	24,995
Mineral water		80,600
Moulding sandtons.	3,423	6,790
Natural gas (g)		247,370
Petroleum (h)bbl.	552,575	984,310
Phosphatetons.	917	4,590
Pyrites	33,039	94,797
Salt	68,777	318,628
Talc	850	1,875
Tripolite	320	6,400
		20,392,587
<i>Structural Materials and Clay Products—</i>		
Cement, natural rockbbl.	56,814	49,397
Cement, Portland	850,358	1,197,992
Flagstone		6,720
Granite		100,000
Sands and gravels(exports)tons.	399,809	129,803
Pottery		200,000
Sewer pipe		378,894
Slate		23,247
Terracotta, pressed brick, etc.		400,000
Tiles		275,000
Building material, including bricks, building stone, lime, etc.		5,667,000

Total structural materials and clay products	8,428,053
Total all other non-metallic	20,392,587
Total non-metallic	28,820,640
Total metallic	31,222,525
Estimated value of mineral products not returned	300,000
Total, 1904	\$60,343,165

*The total production of pig iron in Canada in 1904 from Canadian and imported ores amounted to 303,454 tons valued at \$3,582,001, of which it is estimated 68,297 tons valued at \$901,880 should be attributed to Canadian ore and 235,157 tons valued at \$2,680,121 to the ore imported.

The value of the total production reported for 18 years, 1886-1903, was as follows:

1886	\$10,221,255	1895	\$20,648,964
1887	11,321,331	1896	22,584,513
1888	12,518,894	1897	28,661,430
1889	14,013,913	1898	38,697,021
1890	16,763,353	1899	49,584,027
1891	18,976,616	1900	64,618,268
1892	16,628,417	1901	66,339,158
1893	20,035,082	1902	63,885,999
1894	19,931,158	1903	62,600,434

REMARKS.

In the accompanying general table it is shown that the value of the mineral products of Canada during 1904, aggregated over \$60,000,000. In comparing this record with that of previous years it must be borne in mind that complete figures are never available at this time of the year, so that in a number of items the data are necessarily partly estimated.

Allowing for this, there nevertheless remains a falling off of about \$2,250,000 in the grand total. This does not necessarily indicate a general slackening in the permanent mineral industries of the country, but rather a gradual return to natural conditions after a few years of abnormal inflation due to the rapid exploitation of the richer and easily accessible portions of the Yukon placers. To this cause can be attributed nearly \$2,000,000 of the decrease shown.

Taking the following figures of the actual variation in the values of the metallic products, this feature will be quite apparent. The items given aggregate nearly 85 per cent of the whole production, and it will be seen that, if the Yukon gold yield be eliminated, the decreases in some industries are practically offset by increases in others, bringing about practical equality.

(a.) Quantity or value of product marketed. The ton used is that of 2,000 lb.

(b.) Copper contents of ore, matte, etc., at 12.823 cents per lb.

(c.) Lead contents of ores, etc., at 4.309 cents per lb.

(d.) Nickel contents of ore, matte, etc., at 40 cents per lb.

(e.) Silver contents of ore at 57.221 cents per oz.

(f.) Oven coke, all the productions of Nova Scotia, British Columbia and the North-west Territories.

(g.) Gross return from sale of gas.

(h.) Includes crude oil sold to refiners and oil sold for fuel and other purposes.

(i.) Zinc contents of ores at 5.100 cents per lb.

12,913 tons of lead in ore, etc., and about 21 tons of pig lead.

An electrolytic lead refinery is now in operation at the Canadian Smelting Works, Trail, B. C., producing pig lead, lead pipe, sheet lead, etc.

It is said that lead corroding works are to be established in Montreal by a Chicago firm, for the manufacture of white lead and other pigments which will require a large amount of pig lead per annum.

Copper.—The copper contained in ore, matte, etc., shipped from Canadian mines in 1904 was about 21,485 tons, as compared with 21,342 tons in 1903.

In Ontario there was a falling off of over a thousand tons which was more than made up by the increased production from the Boundary district and the coast district of British Columbia. From Sudbury district, Ontario, 10,154 tons of matte were shipped, containing 2,455 tons of copper (see further under nickel). In British Columbia, ore shipments from the Boundary district were approximately 818,000 tons in 1904, and from Rossland 342,000 tons as compared with 697,284 tons from the Boundary district and 360,786 tons from Rossland in 1903.

The average price per lb. of electrolytic copper in New York in 1904 was 12.823 cents as compared with 13.235 cents in 1903.

Cobalt, etc.—The discovery of certain cobalt, nickel, arsenic and silver ores, which was made public in November, 1903, promises to add, in the near future, largely to the production of these metals. The deposits were found during the building of the Timiskaming and Northern Ontario Railway, the roadbed running almost over the top of the first of the outcrops discovered. The ores are contained in a series of very vertical veins varying in width from 8 in. up to 6 ft., although the wider portions always contain more or less rocky matter. The veins intersect the conglomerate and slate usually classified as Huronian. All of the deposits thus far discovered possess certain features in common. The minerals represented are chiefly smaltite, niccolite and native silver, with smaller quantities of erythrite dyscrasite, chloanthite and tetrahedrite. In some the native silver is abundant and a sample which was fairly representative of one of the smaller veins showed an assay value of \$5,237.60 per ton. Analysis of the ore from one of the veins composed mainly of smaltite showed from 16 to 19 per cent of cobalt, 4 to 7 per cent of nickel, 60 to 66 per cent of arsenic, and 3 to 7 per cent of sulphur. The ores are thus so rich, that comparatively small veins could be worked at a handsome profit.

Although no returns have yet been received at this office, it is stated that several carloads of ore, which realized very high values, have been shipped from this district.

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

	Tons.
Ore mined	203,388
Ore smelted	118,470
Matte produced	8,024
Matte shipped	10,154

Copper contents of matte shipped	2,455
Nickel contents in matte	5,274
Value of matte shipped....	\$2,193,198

According to Customs returns exports of nickel in matte, etc., were as follows,

According to Customs returns exports of nickel in matte, etc., were as follows:—

	Lb.
To Great Britain	2,028,908
" United States.. . . .	9,204,961
Total	11,233,869

The price of refined nickel in New York remained steady throughout the year at from 40 to 47 cents per lb.

Zinc.—About 533 tons of zinc ore worth \$3,700 were shipped during the year from the Long Lake zinc mine in the County of Frontenac, Ontario. No returns have been received of zinc production in British Columbia.

Iron.—Exports of iron ore were 168,828 tons valued at \$401,738. In addition to the ore exported, about 180,932 tons of ore worth about \$489,687, were mined in Canada and charged to Canadian blast furnaces.

Besides the above-mentioned Canadian ore, 454,671 tons of imported ore, valued at \$922,594, were used in Canadian furnaces. The total amount of pig iron manufactured from both Canadian and imported ores was 303,454 tons, of which 21,583 tons were made with charcoal as fuel and 281,871 tons with coke. The quantity of charcoal used was 3,477,470 bushels and of coke 387,392 tons.

The pig iron was made by three firms in Nova Scotia, two in Quebec and four in Ontario.

Coal and Coke.—With the exception of a small decrease in shipments, coal production in Nova Scotia in 1904 shows but little change. A smaller amount of coke was made owing to the smaller production of pig iron by the Dominion Iron and Steel Company. Efforts are being made to find new markets farther west in Ontario as well as to increase the exportation. In the North-west territories many small mines have been opened, and the output shows a substantial growth. Coke is now being made in Alberta. On December 31, 1904, 56 beehive ovens were in operation at Coleman, Alta., and 34 Belgian ovens, Bernard type, were in operation at Lille, Alta. In British Columbia, the output of the Western Fuel Company in Vancouver Island was considerably diminished owing to the destruction by fire of the head works at No. 1 mine. The Crow's Nest Pass Company, however, continued to increase its output, over 1,000,000 tons of coal being produced, of which more than half was used in making coke. This company has now 1,128 coke ovens completed.

Asbestos.—The production of asbestos divided into crude and mill stock was as follows:—

	Tons.	\$
Crude	4,239	509,001
Mill stock	31,396	658,277
Total	35,635	1,167,278

Exports of asbestos according to Customs returns were 37,272 tons, valued at \$1,160,887.

Natural Gas.—There was a somewhat increased production of natural gas in Ontario, due entirely to operations in the Welland field, production in the Essex field having dropped to very small amounts.

The development of the gas field at Medicine Hat, North-west territories, seems to have been continued with much success. The gas commission of the town of Medicine Hat has now six producing wells, one of which has been put down to a depth of nearly 1,000 ft., yielding 1 1-8 million ft. per 24 hr. The Canadian

Portland cement sold... .. 900,358 bbl valued at \$1,272,002
 " " manufactured... 908,000 "
 Stock on hand Jan 1, 1904... 124,910 "
 " " Dec. 31, 1904... 133,551 "

The imports of Portland cement in 1904 were:
 Six months ending June... .. cwt. 829,872 \$ 320,137
 " " December... .. 1,916,336 740,919

Total... .. " 2,746,208 \$1,061,056

This is equivalent to about 784,630 bbls. of 350 lb. each, at an average price per barrel of \$1.35. The duty is 12½ cents per 100 lb.



Surface Works at Coal Creek Colliery, showing Trestle and Tipples recently destroyed by fire. (See page 117.)

Pacific Railway Company has just completed drilling a well to a depth of 989 ft. with 4 5-8-in. casing to 941 ft. The pressure per sq. in. developed in 18 hr. was 525 lb.

Cement.—The production of natural rock cement, which has for a number of years been small in comparison with the output of Portland cement, shows another large decrease in 1904, the sales being only 56,814 barrels, valued at \$49,397, as compared with 92,252 barrels, valued at \$74,655 in 1903.

Although a much larger quantity of Portland cement was sold in 1904, the total value, owing to the fall in price, is only slightly in excess of that in 1903.

In the absence of complete returns, Portland cement statistics have been partially estimated. The following is, however, a close approximation:—

THE LEGISLATIVE COMMITTEE ON MINING.

THE following members of the Provincial Legislature have been named as the Standing Committee on Mining: Dr. Young, Atlin; H. Jones and Jas. Murphy, Cariboo; W. C. Wells, Columbia; R. Grant, Comox; Dr. King, Cranbrook; John Oliver, Delta; W. F. Ross, Fernie; Geo. A. Fraser, Grand Forks; J. R. Brown, Greenwood; A. McDonald, Lillooet; J. H. Hawthornthwaite, Nanaimo; John Houston, Nelson; Price Ellison, Okanagan; Thos. Taylor, Revelstoke; J. A. Macdonald, Rossland; H. Tamer, Saanich; L. W. Shatford, Similkameen; W. Davidson, Slocan; J. D. McNiven, Victoria; Stuart Henderson, Yale, and H. Wright, Ymir.

YUKON TERRITORY.

FROM the recently issued annual report of the Department of the Interior for the fiscal year ended June 30, 1904, the following information relating to mining in Yukon Territory has been taken:

REPORT OF THE COMMISSIONER.

General.

The condition of the Yukon at the present time appears satisfactory. While there can be no doubt that there is not now, and probably never again will be, the same opportunity for individuals with little or no capital to work properties and make fortunes therefrom as formerly was frequently done, it should be pointed out that there is a large improvement in the larger operations. Doubtless much small mining will still be done, but it will yearly become smaller in comparison with the operations of larger capitalists. Apart from this change, which must affect every line of business in the territory, it must not be overlooked that in 1897 and 1898, when Dawson probably had a population of not less than 30,000 people, no person was permitted to come into the city who had not at



A Gravel Mine in Yukon Territory.

least \$750 in money or money's worth. It would be safe to place the average money possessed by every one who came into Dawson at not less than \$1,000. This would set free within a very small area the enormous sum of \$30,000,000. It was inevitable that with such an amount of money the town should boom as probably no town in the world ever boomed before. Now, however, business has settled down into its various normal channels and has assumed a permanent character which bids fair for future development of the resources of the district. It should be noted in this relation that during this present season Dawson has suffered from a boom given to the Tanana, in

Alaska, and to its chief town, Fairbanks. Many substantial men have gone from the Yukon, and many more, of those who have constituted the floating population, have also departed. Dawson has also suffered from the fact that in 1902 it became incorporated and was obliged to submit to heavy taxation in order to defray civic expenses. Business men immediately began to open business places on the creeks, and each creek has become almost entirely independent of Dawson. Business houses upon the creeks have been able to compete at great advantage with similar establishments in Dawson, because the former were free from taxation and the latter heavily taxed. For this reason, business in the territory generally would appear to be better than in Dawson.

Mining.

At the present time wages upon the creeks are \$5 a day and board, and there are not sufficient men available to supply the demand. As an offset to the falling off in mining in a small way, there is a great improvement in the larger operations. At Miller creek the North American Transportation and Trading Company has expended nearly \$200,000 in constructing ditches, and will soon be prepared to carry on hydraulic mining on a very extensive scale. Around the hills in the rear of Dawson, Messrs. Acklen and McKenzie are constructing a ditch to bring in water from Moosehide creek, and ultimately from Twelve-mile river, and will be prepared, probably in a few weeks, and certainly early next season, to do a large amount of mining. These two undertakings have found it extremely easy to ditch in this country, the soil being easily removed and yet of a character to retain water. The report of the Assistant Gold Commissioner, which accompanies this report, shows great activity in regard to water grants. Nearly every such grant means increase of possibility of cheap mining.

Another large venture, which has invested heavily and is doing, at the mouth of Bear Creek, what appears excellent work, is that of the Detroit Mining Company, which has already two steam shovels in operation. Heretofore everything from surface to bed-rock has been taken up by steam shovel, transported to a revolving riffled cylinder, through which it passed, and was in the course of passage washed, with the result of separating the gold from the gravel. By this mode an immense amount of waste material was unnecessarily freighted and a useless burden was thus imposed upon the cylinder, matting and gold-gathering riffles. One steam shovel is now in operation solely for the purpose of removing the muck and other waste material above the gravel, leaving only the gravel to be removed by the other steam shovel, and then passed through the cylinder. The company is also putting in a tramway, and has on the ground engines and freight cars for carrying the gravel to the Klondike, where abundant water is at hand to treat it. When the company's plant is completed, there will be, in addition to the present two steam

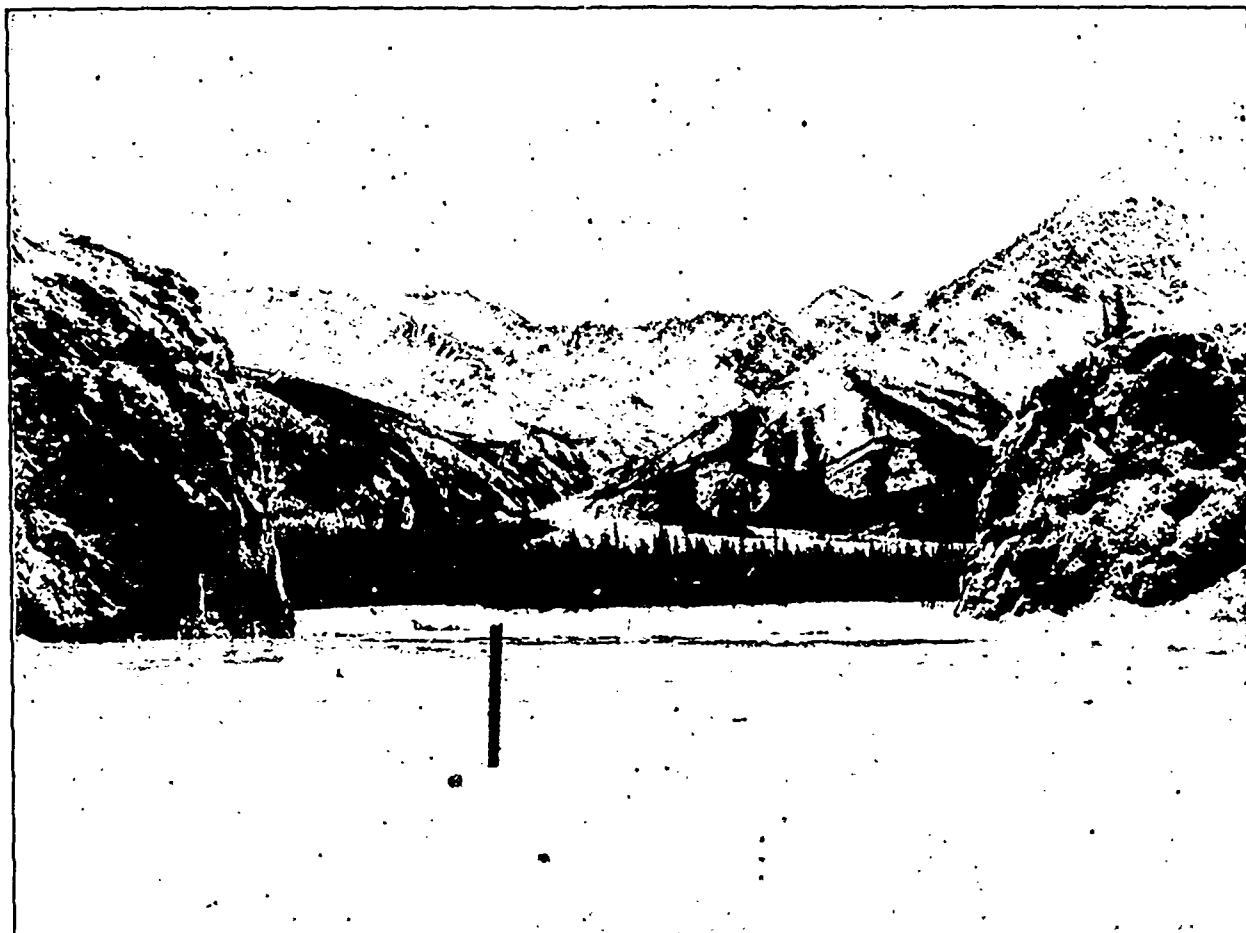
shovels, a third, of larger capacity; the tramway and abundant water to which the gravel will be carried, will then permit of all three shovels being worked to their fullest capacity. This venture appears to be one of the most promising in the Yukon. A clean-up is had every day, and in this way the company is much better able at any moment to compare its disbursements and receipts than where, as usual, a clean-up is only made at long intervals.

The Pacific Coast Mining Plant, on Cheechaco Hill, began operations early in the season, and has already

afforded for its success, without in any way infringing upon the rights of miners.

In addition to these impounding schemes, there are in course of construction a large number of ditches of from a few to many miles in length, which will make possible successful hydraulic mining in various portions of the territory.

It may be observed that the gold output for last year decreased by the sum of \$1,329,825.07 from that of the preceding year, the output of gold for the year ending June 30, 1903, upon which royalty was paid



Looking up Sheep Creek, Alsek District, Yukon Territory.

removed an enormous quantity of ground by the hydraulic method. The boilers, engines and other machinery of the company have occasioned an investment of more than \$300,000. The engine is of about 350 h.p., and with its pump is able to throw upon the face of the hill, at an elevation of 300 or 400 ft., a stream of water equal to about 250 miner's inches.

Mr. Alexander McDonald has installed a magnificent pumping plant at the foot of Dago hill on Hunker creek, and is operating on a large scale.

A large number of schemes have been initiated, and are being put into operation, for impounding some portion of the enormous quantity of waste water lost every spring. Every such scheme submitted has been examined with the greatest care, and every facility

being \$12,110,723.09, and the corresponding output for the year ending June 30, 1904, being \$10,780,898.02. The decrease was due to various causes, chief of which was the fact that the summer of 1903 was extremely dry. Upon many of the creeks for a long period of time there was not even a sluice-head of water to be obtained, and all mining was at a standstill. In addition the litigation connected with the Gold Run Mining Company caused the shutting down of that company's plant upon Gold Run creek. Further, several properties which were being worked by individuals were consolidated in order to be worked by larger plants under a single management, and produced nothing during the transition period between the old working and working under the larger method.

The present season has been very wet, and as far as can be gathered, the output for the year 1904-5 will equal that of last year. It may surpass it, if a number of ditches being constructed and plants being installed are ready for work early next spring.

Marvellous results have been obtained from reworking of old grounds on Eldorado. On that phenomenal creek the early miners found such extraordinary rich pay-streaks that they in their mines deliberately passed over ground which is now yielding wealth to new workers.

The accompanying report of the Government Mining Engineer and that of the Assistant Gold Commis-

sioner with is in relation to water disputes. Owing to the claims being so close together on the gold-bearing ground, the difficulty is that they all require water, and for the greater portion of the summer season there is not sufficient water for all miners to carry on their operations at the same time. As time goes on probably the disputes will extend more to the outlying districts, such as Whitehorse, Duncan creek, Livingstone creek and Forty-mile in the Forty-mile district. This will necessitate going to these several points at different times during the year to hear disputes, in order to save litigants the expense of travelling to Dawson.



Bullion Creek, Alsek District, Yukon Territory.

sioner give more minute information with regard to mining in the Yukon, while the report of the Gold Commissioner shows the condition of mining litigation.

REPORT OF THE ASSISTANT GOLD COMMISSIONER.

During the year past 84 protests have been filed in the Gold Commissioner's court. This is a slight reduction from the previous year, when 99 protests were entered.

On the old creeks, that is, Bonanza, Eldorado, Hunker, Sulphur, Dominion and Gold Run, the litigation has been fairly well settled. Most of the cases now being heard are with relation to conflicts of claims on the newer creeks. Three protests were heard at Duncan and one at White Horse.

The chief difficulty that litigants have to contend

REPORT OF THE ASSISTANT GOLD COMMISSIONER.

The inclosed annual financial report for the fiscal year ending June 30 last, embodies returns from the outside mining recorders' offices and from the mining inspectors' offices in the Yukon Territory for the period commencing June 1, 1903, and ending May 31, 1904, with the exception, however, of the returns from the Sixty-mile mining district for the months of April and May last which were received too late last July to be embodied in the financial statement in question.

The total receipts shown by the inclosed statement amount to the sum of \$216,833.52; the total receipts for the previous corresponding period, with the exception, however, of the two months of April and May last for the Sixty-mile mining district, as here-

inabove stated, amounted to the sum of \$289,525.14, showing a decrease of \$72,691.62.

This decrease does not mean a corresponding decrease of business, but is due almost entirely to the reduction of fees (which took effect on May 7, 1903), for placer mining fees called for by the placer mining regulations, and also to the reduction of fees for free miner's certificates, which reductions were from \$15 to \$10 for placer mining, and from \$10 to \$7.50 for free miner's certificates.

The decrease of revenue would have been much larger had it not been for the new diggings in the Alsek, Klwane and Kaskwulsh divisions of the White Horse mining district, now forming the Klwane mining district, where 23,658 mining claims were granted during the period ending May 31 last; and also for the Duncan creek and Clear creek mining districts, respectively, where a large number of placer mining claims were granted.

During the fiscal year the Dalton Trail mining district was abolished and the territory comprised within its limits was added to the White Horse mining district. The two mining inspectors, Messrs. Percy Reid and Lockie T. Burwash, who were sent out to these diggings last March with instructions to make a thorough investigation of the conditions in connection with mining, are of the opinion that although these diggings have not as yet been thoroughly proven, the country is one of large possibilities, and that there is a tract of country 100 miles by 150 which is intersected by innumerable creeks of all sizes, on many of which streams gold has been found in varying quantities, of which many may prove of value when properly prospected.

The Duncan mining district has not yet produced much gold, although the claim-owners on Duncan creek proper are satisfied that there is gold in large quantities in the creek, but the difficulties met with by reason of water have retarded the development of mining in that locality. During the summer of 1903 a large number of claims were staked on other tributaries of Mayo river, and also on some tributaries of Mayo lake which have since given good promise, namely, Hight creek and Ledge creek.

The Clear creek mining district has given since last year better promise than in the past of it becoming a good producer. The old diggings on Glacier and Miller creeks have given to the claim-owners satisfactory results for their operations since last year.

The Stewart river mining district has given poor results to the claim-owners. There were but few claims kept in good standing and the production of gold was very limited.

There was a stampede to the upper Pelly river last summer which, however, resulted in disappointment. Thirty-three claims were staked and recorded at that time, but it is doubtful if any of them will be renewed.

As regards the Hootalinqua mining district, no new ground was located, but there has been some re-location done, and there are about the same number of claims kept in good standing as during the previous corresponding period.

The Forty-mile mining district has not brought any change to the conditions as they obtained during the previous corresponding period, there being very little placer mining done in that district and no quartz mining at all.

In the Dawson district, which comprises the tributaries of the Klondike and Indian rivers, very little new ground was located during the last fiscal year. There has been, however, a deal of re-location going on, and there was about the same number of renewals as for the previous corresponding period.

There was a large increase in water grants issued during the last fiscal year. Seven hydraulic mining leases were cancelled, but no new leases were issued.

A decrease took place of \$2,742.50 in the amount of fees collected for recording documents in the placer mining branch of this office; also a decrease of \$9,650 for money paid in lieu of assessment work for placer mining claims, but this latter is accounted for by the fact that the regulations allowing the payment of \$200 in lieu of work were rescinded as from August 1, 1903.

The financial statement shows a decrease of \$3,860 in the receipts for quartz records or certificates; of \$930.55 in recording registered documents; of \$102.50 in certificates of partnership; of \$835 in certificates of work; of \$5,600 in payments in lieu of assessment work, and of \$923.89 in Crown grants, while there was an increase of \$311.07 in receipts from acreage of land covered by mineral claims.

Comparative Statement of Instruments Issued.

	1902-3	1903-4.
Free miners' certificates..	7,711	7,078
Placer grants	1,893	3,429
Renewals.	5,214	5,196
Re-locations.	2,069	1,757
Registered documents, placer	5,814	4,803
Certificates of work, placer	5,666	5,947
Lieu of Assesment	71	24
Abstracts	84	49
Amended applications	12	3
Water grants	139	126
Quartz grants	1,035	261
Certificates of work, quartz	932	669
Certificates of partnership, quartz	90	46
Registered documents	680	137
Crown grants	21	24
Lieu of assessment, quartz	21	13
Quartz acreage . . . . .	....	20
Quartz abstracts . . . . .	....	3
Hydraulics	27	18
Inspection of work performed	34	6
Gusher royalty. . . . .	....	7

Financial statement, showing receipts from July 1, 1903 to June 30, 1904.

Dawson—	
Free miners' certificates	\$27,496.50
Placer.	89,612.23
Quartz	4,460.21
Quartz, acreage	311.07
Hydraulics.	8,244.95
	<hr/>
	\$130,124.96
Dominion creek	3,999.00
Hunker creek	2,880.00
Sulphur creek	1,896.00
Grand Forks creek	6,867.25
Gold Run creek	2,750.50

Selkirk creek	6,46.50
Stewart river	2,524.00
Whitehorse	35,178.06
Hootalinqua	2,366.50
Forty-mile	752.00
Duncan	15,402.50
Dalton trail	150.00
Clear creek	8,180.50
Clear creek	150.00
Sixty-mile	3,115.75

\$216,833.52

Comparative Statement, Returns Gold Commissioner's Office.

	Year ending June 30, 1902.	Year ending June 30, 1903.	Year ending June 30, 1904.
Free miners' certificates	\$141,161.50	\$80,134.50	\$59,941.50
Placer grants	65,310.00	27,550.00	34,615.00
Renewals	75,720.00	78,135.00	55,675.00
Re-locations	39,885.00	28,765.00	17,480.00
Registered docum'ts—placer	22,076.50	18,460.25	15,717.75
Certificate of work—placer.	10,476.00	11,332.00	11,232.00
Lieu of assessment—placer.	18,250.00	14,200.00	4,500.00
Abstracts	1,419.00	633.00	294.00
Water grants	387.50	632.50	980.00
Amended applications	90.00	60.00	15.00
Court fees	3,075.00	37.50	.....
Quartz grants	5,890.00	5,250	1,360.00
Quartz—			
Registered documents	1,561.75	1,553.85	623.30
Certificate of partnership.	157.50	225.00	122.50
Certificate of work	2,072.50	2,615.00	1,780.00
Lieu of assessment	3,700.00	6,900.00	1,300.00
Crown grants	244.13	1,311.36	387.47
" " acreage	.....	.....	.....
Quartz abstract	.....	.....	7.50
Gusher royalty	.....	.....	139.75
Hydraulics	4,611.73	9,114.46	8,244.95
Inspection of work	240.00	217.00	32.50
Advance deposits	6,573.75	2,362.68	2,024.23
Government auction sale	9.00	.....	.....
Government reserve tract.	95.25	.....	.....
Gold royalty	242,186.24	1.14	.....
Forfeited fees	6,811.50	.....	.....
Leonard claim	102.87	.....	.....
No. 1 Mint gulch	.....	65.00	.....
Totals	\$624,507.02	\$289,525.14	\$216,833.52

REPORT OF THE GOVERNMENT MINING ENGINEER.

Hydraulic Leases.

The term "hydraulic" is used when water under pressure is discharged through a nozzle against a natural bank.

On account of the lack of water and the expense connected with its transmission to high levels, only a few leases have been operated on a large scale.

Bonanza creek.—Existing leaseholds on this creek are: the Matson, the J. J. Doyle, and the Bronson & Ray. The Matson and the Doyle being owned by the same people, it was proposed to work both leaseholds by a common water system, although the representation work must be done on each leasehold separately. The water system was installed during the fall of 1903 at a cost of over \$19,000. The length of the water conduits, such as flumes and ditches, is about four miles, with a capacity of 800 miner's

inches, the point of diversion being on Stampede gulch and Adams creek. This location is so situated that the dumping-ground facilities are very poor, so that claims situated on the rim had to be bought to get an outlet to the creek. These claims were bought, not only for dumping privileges, but also for the water-rights appurtenant to them. This concession has been working all summer with two giants and a force of 16 men per shift.

Miller creek.—This leasehold is owned by the North American Transportation and Trading Company. This company has done more towards developing alluvial deposits than any other company in the Yukon territory. It was proposed to instal a water system of 2,000 miner's inches of a capacity to work the Miller creek bed gravels. In the fall of 1903, 22 miles of ditch were cleared and surveyed, but on account of the shortness of the season, only 7½ miles of ditch were completed. The point of diversion is on Bed Rock creek; the water is brought to a point on the left limit of Miller creek and affords a pressure of 450 ft. As there is too little grade in the creek for the disposal of the tailings, an elevator will be used for the purpose. The cost up to date of this water system is, according to the manager's statements, \$181,700, and the force of men during the operating season is on an average 60.

Hunker creek.—This location is known as the Williams; it was operated by means of a pumping plant. This work was continued only for a short time, as the expense in connection with the fuel was too great. The company have now surveyed a ditch to convey water from the upper part of the creek to their location, a distance of 5 miles.

Ten-mile creek.—This location is situated on Ten-mile creek, a tributary of the Sixty-mile river, about 10 miles above its mouth. Prospecting has been going on for the last year and a half, without any results until recently. The creek was thoroughly prospected at a cost of over \$30,000, with a force of 12 men. It is only lately that sufficient pay was found to warrant further investigation. They are now installing a water system 4 miles long, of 750 miner's inches capacity and a pressure of 150 feet.

Klondike river.—The location situated on this river is owned by J. W. Boyle. The operations are concentrated at the mouth of Bear creek, where pay was found in claims owned by individual miners. These claims were worked for two years, apparently at a loss, and it is only within the last year that the operations were successful. This success was principally due to a change from the old primitive method to a more modern and extensive one. At present they are operating with two steam shovels, each having a capacity of 800 cu. yd. per day. Mr. Boyle prospected the ground in the vicinity of this pay during the winter of 1903-1904, and came to the conclusion that the only way to make a success was to operate on a large scale, as at present with steam shovels, as there is not enough grade and water to pursue the hydraulic method. According to Mr. Boyle's affidavits, there was \$25,000 spent on the property in prospecting and development.

Grouping of Claims.

On order-in-council was passed in 1902 to the effect that any number of claims may be grouped together for the purpose of representation, provided they are suitable to be worked by the hydraulic method. As there are many claims situated in valleys and flats which cannot be operated that way, except at great expense, but can be worked by the dredge or the steam shovel, this order-in-council was amended to suit these conditions.

Most of the claims so far grouped have been already worked by the placer method and would not pay to be operated the same way, so they are grouped to be operated systematically on a larger scale.

Of the many claims already grouped in this way and operated on a large scale, the Anglo-Klondike group is a very good example. The water system installed by the company cost about \$90,000. I consider it in perfect shape, the only drawback being the shortage of water in the dry season. Not more than 250 in. of water can be had on an average. The following data of the company's operations will show what the output could be if the same amount of water was furnished to all the hills on Bonanza creek.

A trial run of 22 days with 260 miner's in. under 160 ft. pressure gave these results:

Cubic yards removed	29,000
Average depth of bank, ft.	20
Gross output	\$35,978
Value per cu. yd.	\$1.24
Cost per cu. yd. (operating only)	\$0.201½
Duty of miner's inch, cu. yard	6.95

Another run was made with 140 in. of water under 135 ft. pressure with the following results:—

Cubic yards removed	22,000
Average depth of bank, ft.	20
Gross output	\$14,626.32
Value per cu. yd.	\$0.665
Cost per cu. yd. (operating only)	\$0.145
Duty of miner's inch, cu. yd.	6.16

A great deal more gravel was removed than here mentioned, these data being only in connection with special experiments made by the manager in charge.

As one placer claim of 250 ft. long up and down the creek and the width of the creek is too small to warrant a large plant being installed, many individual miners have taken advantage of this grouping system both with unworked and worked placer claims. The operating cost of each method employed changes in accordance with the existing conditions of the country in which the operations are carried on. The quality of the gravel controls the method to be employed, and as the best paying claims are being worked out, as far as the placer method is concerned, it appears that a transition period is being entered during which the output will surely decrease until a method is introduced that will overcome existing conditions of the territory and admit of low-grade gravels being worked at a profit. That method will be based on one principle, viz., the excavation of the greatest amount of gravel in the shortest space of time. The placer method, although the most expensive of all, requires

less outlay at first, and rich deposits can be worked at once without much preparation, but it is impossible to work gravels averaging less than \$2 a cu. yd. with men's wages at \$5 per day and board, and the output of a man's work 5 cu. yd. in 10 hours.

Much research work has been done to solve the question as to the best method to introduce here to work low grade gravels, but so far very little success has been obtained. Many have installed pumping plants to pump water from the creeks into reservoirs at high levels, but the expense in connection with the fuel is so great that this operation has been disastrous to many. All the pumping plants but two in the territory have shut down. It appears to me that the most feasible method is the hydraulic, where grade and water can be had, and the steam shovel and dredge for the flats.

New Machinery Introduced.

Of the many tons of machinery imported into the territory, the newest so far is a placer drill manufactured by the Keystone Driller Co., of Beaver Falls, Pa., made especially to prospect gravels. This drill has been operated with great success in the vicinity of Oroville, California, in prospecting large tracts of land before buying them for dredging purposes. It has a capacity up to 50 ft. per day in accordance with the condition of the material encountered. One I know of is also being operated here with success.

Quartz Mill and Assay Office.

As stated in last year's report, the mill was in a very bad condition, so I thought it not advisable to mill any ore until such time as it was equipped with proper appliances to save the concentrates. On December 15 last I inspected the mill and found that it met all the requirements of the contract, so I issued a certificate to that effect. It is under the supervision of Mr. Beraud, who has given satisfaction. During the year 34,675 lb. of ore have been treated, at an actual cost of \$19 per ton.

The Assay Office.

The office is still in the same location as last year, and it appears it would be very difficult to separate it from the mill, as they must necessarily be worked jointly. A large number of specimens for assay were brought into the office, as a result of the establishment of free assays. All kinds of rock were sent in, of which not more than 75 per cent justified a test. On November 1 last instructions were issued to the assayer to charge a nominal sum of \$1.50 per assay. This stopped the influx of undesirable matter. A few persons brought in rock which was salted; all such samples were returned without being assayed. During the year 319 assays were made and \$151 was collected since November 1.

Ordinance for the Protection of Miners.

The work in the territory has been concentrated very much during the last year. This fact, as well as the change in operation, has reduced the danger, and only one inspector is needed. Only eight persons were killed, which is a very small percentage of the number of miners employed in the territory.

ATLIN MINING NEWS.

(By J. H. Brownlee, C.E.)

An important revolution in hydraulic mining at Atlin is now under way to operate Pine creek on a large scale under one management, so as to recover gold from it more economically. Mr. J. M. Ruffner, manager of the North Columbia Mining Co., has leased the valuable property of the Pine Creek Power Co. His company also controls the Stevendyke property. What is known as the Decks ditch, already the best water carrier in the district, is to be enlarged this season to carry 7,000 inches of water giving a pressure of nearly 200 ft. All of this water will be used on the rich south banks of Pine creek, previously well opened up by the Pine Creek Power Co. and the North Columbia Co. Mr. Ruffner lately returned to Cincinnati, but will be on the coast again in about two weeks, on his way to Atlin.

Spruce Creek.—The Spruce Creek Power Co. is preparing for a season's big operations, providing the present water litigation does not choke them off from piping.

Steam Shovel Work on Spruce Creek.—Mr. A. H. Bromley, M.E., who recently came from Mexico, and Mr. R. D. Fetherstonehaugh will install the first steam shovel in Atlin camp on what is known as the Nisson and Muirhead ground. The shovel will be taken up by the first steamer; meanwhile all arrangements are being made to start digging by June 15th or 20th. The shovel will be used in some of the richest ground in the camp, which property should be a dividend payer from the start.

McKee Creek Hydraulic.—The Hamshaws will work this valuable mine extensively this year. They now practically control McKee creek and all the water, so are in the right way to work that creek to best advantage.

Dredging Operations.—The British American Dredging Co. will push work on Gold Run through the ensuing season. Mr. Switzer arranged to leave Philadelphia for the Coast and Atlin on March 10th, coming by way of San Francisco. The British Columbia Dredging Co., practically controlled by the British American Dredging Co., will complete the Bucyrus dredge at Blue Canyon on Upper Spruce creek, and should be digging by June 1st.

Australian dredge operators have taken a bond on the Gold Bottom Co.'s property and will prospect it this season, while Bull and Dixie creeks will be worked by Californians, who prospected them last year.

CANADIAN MINING INSTITUTE.

The annual meetings of the Canadian Mining Institute were held at Montreal, Quebec, on March 1, 2, and 3, inst.

The attendance was large, including Mr. Eugene Coste, of Toronto, retiring president; Major Geo. R. Smith, M.L.A., of Thetford Mines, Quebec, president elect; Dr. A. E. Barlow and Mr. A. P. Low, of the Geological Survey, and Dr. Eugene Haanel, Dominion superintendent of mines, Ottawa; Professor W. G. Miller, provincial mineralogist of Ontario; Mr. Frederick Hobart, associate editor of the *Engineering and Mining Journal*, New York; and numerous other members, from the Maritime Provinces, Quebec, Ontario, and the North-west.

The annual report of the council showed that the institute made fair progress last year, the total membership having been increased to 480, which is the highest number of members yet reached for any year and 45 higher than the total at the close of 1903. Death removed three members last year, including the late Mr. B. T. A. Bell, secretary of the Institute, and Mr. Cornelius Shields, who had been a member of the council.

In course of his presidential address, Mr. Coste referred to the fact that Canada was to-day admitted to be one of the great mining countries of the world, and asked could not all of them do more than they were doing to hasten a more rapid healthy development and progress of the country's mixed mineral wealth? He had no hesitation in saying that they could do much more, and it was their duty to do it—their duty to themselves, to their fellow-professionals, and to their great country. The Dominion was growing very rapidly. Millions of dollars were to be spent in constructing railways through vast new stretches of country, and many opportunities to develop new mining districts would be opened up. The problems at present confronting mining engineers would soon multiply, and they must be ready to consider them and overcome them. Many of the mining problems of the future would, no doubt, be settled, individually, by some of those present at that meeting, but they could only hope to settle the others by uniting still more firmly and on a broader basis. Union was strength, and in his opinion the time had come for the members of the Institute to adopt the necessary changes in the constitution and by-laws as would bring about these results.

Mr. E. D. Ingall, Mining Engineer to the Geological Survey, submitted a summary of the mineral production of Canada for the year 1903, which showed that the main feature presented by the mineral industry of Canada as a whole consisted in the decrease in the grand total of production of a little over one per cent in comparison with the figures for 1902.

Among the papers read was one of especial interest to British Columbia, viz., that by Mr. Hobart, who pointed out that the mineral production of Canada was increasing on certain lines, and would soon need outlets for the surplus over domestic consumption. It had seemed to him that Canadian producers could do better than look to Europe and the United States for such an outlet. The Far East—China, Japan and India—constituted a region where new markets were to be found to the best advantage. One of the more important products of Western Canada was lead, and at times there had been complaints of an insufficient market. It was shut out of the United States by a high duty, and practically out of Europe by the long railway haul to the Atlantic seaboard. Some Canadian lead had already gone to the East, but there was no reason why more should not be sent. Lead prices in the East were governed usually by the London market; Canadian lead would be ruled by the same prices if carried to Europe, and the chances were that it would bring a better return if shipped across the Pacific. British Columbia was getting to be a large copper producer, and why should not that product go to China, when there was little more to pay than ocean rates, leaving a profit to the producers? A market could also undoubtedly be found for spelter across the Pacific, where brass and bronze were in great demand. Iron and steel could also find a market in China and Japan. There were great prizes waiting in the East for American iron-makers, and the advantage would be with those who could locate themselves on the western part of the continent. The Far East needed more metals, why should not Canada have her share in supplying the demand.

Other addresses given or papers submitted were as follows: "Artesian and Other Deep Wells on the Island of Montreal," by Dr. Frank D. Adams, Montreal; "The Needs of a Provincial Museum in Ontario," by Dr. W. A. Parks, Toronto; "Mineral Deposits to be found in the Canadian Arctic," by Mr. A. P. Low, Ottawa; "Electric Smelting," by Dr. Eugene Haanel, Ottawa; "A New Mining District in the North of Quebec," by Mr. J. A. Obalski, Inspector

of Mines, Quebec; "International and Inter-provincial Boundaries of Canada," by Mr. Jas. White, Dominion Geographer, Ottawa; "Iron Pyrites in Eastern Ontario," by Mr. E. L. Fraleck, Belleville; "Mining Statistics," by Mr. F. Hobart, M.E., New York; "Uniform Mining Statistics in Canada," Mr. Eugene Coste, E.M., Toronto; "Mining Laws," Mr. J. M. Clarke, K.C., Toronto; "The Bornite Ores of the Pacific Coast, in British Columbia and the Yukon," Mr. Wm. M. Brewer, M.E., Victoria; "A Correction in the Classification of our Gold-rock Formation," Mr. F. Hille, M.E., Port Arthur; "Bankhead Coal Mines," Mr. C. M. Henretta, M.E., Fernie; "The Stratigraphy of the Cascade Coal Basin," Mr. D. B. Dowling, geologist, Ottawa; "Notes on the Life History of Coal Seams," Prof. J. G. Gwillim, Kingston; "Cheap Production of Pigments Direct from Sulphide Ores," Mr. C. B. Jackes, Toronto; "The Bedrock of the Gilbert River Gold Fields, Quebec," Mr. John A. Dresser, M.A., Montreal; "A Note on Varieties of Serpentine in South Eastern Quebec," Mr. John A. Dresser, M.A., St. Henri de Montreal; "The Cobalt-Silver-Nickel-Arsenic Ores, near Lake Temiskaming," Prof. W. G. Miller, Toronto; "Los Reyes Gold Mines, Mexico," Mr. Alex. Smith, Oaxaca, Mexico.

President Coste presented to Mr. C. W. Knight, of Kingston, the gold medal of the institute, which had been awarded him for his paper read at last year's meeting on "Some Deposits in the Gold Belt of Eastern Ontario."

The ballot for the election of officers and members of the council in place of those retiring resulted as follows:

President—Mr. George R. Smith, M.L.A., Thetford Mines. Vice-presidents—For Nova Scotia, Mr. Thomas Cantley, New Glasgow; for Ontario, Dr. L. Goodwin, Kingston; for Quebec, Dr. Frank D. Adams, Montreal.

Secretary—Mr. H. Mortimer Lamb, Victoria, British Columbia.

Treasurer—Mr. J. Stevenson Brown, Montreal.

Council—For Nova Scotia, Messrs. Charles J. Coll, Stellarton; Mr. C. A. Meissner, Sydney; and Mr. W. B. Robb, Amherst. For Ontario, Dr. A. E. Barlow, Ottawa; and Mr. A. B. Wilmott, Sault Ste. Marie. For Quebec, Messrs. R. T. Hopper, Montreal; J. Obalski, Quebec; and Harry J. Williams, Danville. For British Columbia, Mr. R. R. Hedley, Nelson.

PROVINCIAL MINING ASSOCIATION.

The executive committee of the Provincial Mining Association of British Columbia met at Victoria on February 20 and continued its session at intervals until the night of 22nd. The members who attended were: Mr. John Keen, Ketchikan, president; Mr. Rowland Machin, Victoria, second vice-president; Mr. E. Jacobs, Victoria, secretary; Mr. H. Mortimer Lamb, Victoria, treasurer; Mr. J. J. Campbell, Nelson; Mr. J. West Collis, Lower Nicola-Coutlee; Hon. E. Dewdney, Victoria; Mr. Colin F. Jackson, Vancouver; Mr. F. Keffer, Greenwood; Mr. Thos. Kiddie, Ladysmith; Mr. Alfred McMillan, Rossland; Mr. D. W. Moore, Trail; Mr. P. J. Pearson, Chemainus; Mr. G. A. Taylor, Victoria, and Capt. Clive Phillippis-Wolley, Islands. The name of Mr. Wm. M. Brewer, M.E., Victoria, was added to the committee.

The secretary submitted a report which was a resume of the work done by the association since the second annual convention in February, 1904. Changes in the personnel of the committee were caused by the death of the late Hon. Senator Reid, and the departure from the province of Messrs. S. F. Parrish and E. B. Kirby, Rossland, general managers of the Le Roi Mining Co., and the Centre Star and War Eagle companies, respectively. Mr. Robt. R. Hedley, superintendent of the Hall Mining & Smelting Co.'s smelter, Nelson; Mr. A. H. Kelly, manager of the Reliance Gold Mining & Milling Co., Nelson, and Mr. Alfred McMillan, Rossland, have been appointed to the vacancies.

It was resolved to present to the Legislative Assembly a petition asking for amendment of the Placer Act so as provide against the occupation of the same ground at one and the same time by different locators under the Mineral Act and the Placer Act.

A committee appointed to look into the question of the purchase of gold and silver bullion by the Dominion government at some suitable point or points in British Columbia, and to elicit information as to why bullion appears to flow to United States purchasing points rather than to those in British Columbia, reported having found that though the Dominion and Provincial governments are buyers of gold bullion in British Columbia, the gold is finally sold to United States mints owing to there not being a mint in Canada.

A committee appointed for the purpose prepared a circular to the branches of the association asking them to compile reports on their respective districts, obtain maps, etc., for presentation to the American Institute of Mining Engineers, when the members of the body shall visit British Columbia next summer.

A committee was appointed to prepare subjects for the work of the association's third annual convention, to be held at Vancouver next summer. A series of resolutions submitted by Poplar creek branch were included in the matters held over for the consideration of the convention, which, it was decided shall be held on dates to be fixed between July 24 and 31.

Members of the committee on incorporation of the association, reported that there was not now time to have a Bill introduced into the Legislature this session, and recommended that no action be taken at present. The committee was requested to complete the proposed Bill and lay it before the next convention.

In connection with a proposal to endeavour to secure the earlier issue of the annual reports of the Minister of Mines, the secretary was instructed to ascertain how soon the mines' reports are issued in other provinces, and whether it is practical to have quarterly bulletins issued by the Department of Mines.

A petition from Barkerville and Stanley branches, re amendment of mining laws, for presentation to the Legislative Assembly, having been found to be not in order, the secretary was instructed to have copies of it made and placed in the hands of hon. members individually.

A resolution forwarded by the Nelson branch in respect of the two per cent mineral tax, was referred to a committee, which afterwards reported recommending: "That suggestion be made to the Provincial government that the mine operators of the province be asked to furnish the following information for its assistance in investigating the taxation of mines, and that this executive take steps to secure the co-operation therein of the mine operators: Name of mine or company; number of tons shipped during last financial year; total revenue for year from sale of products (with the interpolation of an explanatory note, that in the case of a mine selling its products to a custom smelter or mint, that this return means the net amount received therefrom after deduction of the purchaser's charges, and that where ores are treated at a smelter controlled by the parties operating the mine producing them, the return means the net amount after deduction of freight and marketing costs); pay roll of mine for year; pay roll of smelter if operated by mine owners; supplies at mine, mill and also smelter, if operated by mine owners; office and general expenses; transportation to mill and smelter." This recommendation was adopted.

"A petition to the Legislative Assembly, praying that action be taken at the present session of the Legislature as will lead to the construction of a railway into the Similkameen and Nicola districts within the present year, was adopted and ordered presented.

The president was requested to communicate with the Dominion government regarding the exhibition at Portland Exposition next summer of large specimens of British Columbia ores sent to the St. Louis Exposition.

The treasurer's report and statement of accounts were presented and adopted. A cheque for \$100, being its proportion of dues for 1905 payable to the association, was received from the Victoria branch. A lot of minor matters were also disposed of, and the meeting adjourned to the call of the chair.

ASSOCIATED BOARDS OF TRADE.

The seventh annual convention of the Associated Boards of Trade of Eastern British Columbia was held at Nelson on February 22 and 23. Delegates attended from Fernie, Cranbrook, Fort Steele and Moyie, in East Kootenay; Kaslo and Sandon, in the Slocan; Nelson, Trail, Rossland, and Phoenix, the last-mentioned being the only Boundary town represented.

In the course of his opening address, the president, Mr. G. O. Buchanan, of Kaslo, said that the Associated Boards had been narrowed by the probably permanent withdrawal of the Vernon, Kamloops and Revelstoke boards. The district represented by Yale-Kootenay measured some 300 miles by 100, and was isolated from the rest of Canada by natural barrenness. It had a population of 40,000 people, 10 incorporated towns, 20 newspapers, 15 lines of railway, 7 smelters, 100 important mines and a multitude of others in process of development. This vast district was only bound together by the Associated Boards of Trade, which could be considered as an informal parliament. He further directed attention to the fact that last year's mining operations in the province had shown increased production in gold, silver, copper, lead and coal and coke. The production of silver and lead had been largely augmented by the bounty paid upon lead by the Dominion government, the amount earned under its provisions during the one and a half years to December 31, 1904, it had been in operation having been \$363,000.

The business dealt with by the convention covered a wide range of subjects. That affecting the mining industry included the following:

A motion "Resolved that this board views with alarm the proposal to establish an 8-hour law for smelters, and is of the opinion that such legislation would have the effect of transferring the smelting of British Columbia ores to Washington State, and so deprive Canadian workmen of the opportunity of working in Canadian smelters," was adopted and it was telegraphed to the Premier of British Columbia.

It was resolved that the Provincial government be asked to appropriate a sufficient sum of money to construct a wagon road from the most convenient point on the line of the Crow's Nest branch of the Canadian Pacific railway, to some central point in the Flathead valley, on or near the Flathead river, such road being necessary to facilitate the further exploration and development of the coal and oil fields of the Flathead country.

The request that the Dominion government appoint a zinc expert to examine into and report upon the zinc resources of the province, adopted last year, was re-affirmed, with the addition that immediate action in this matter is what is required.

It was resolved: "That the Dominion government be memorialized to create as a branch of the public service, a department of mines; and that such new department would be most fittingly presided over by a minister to be selected from amongst the representatives in parliament of the province of British Columbia."

A resolution asking that the benefit derivable from the granting of a bounty on the production of lead be pressed to a logical conclusion, by raising the duty on corroded lead, which is now practically free of duty, was carried.

A motion dealing with the purchase of Canadian gold was carried, it having been pointed out that if the Canadian government did not buy the gold it would continue to go to the United States. In this connection, Mr. W. H. Aldridge, general manager of the Canadian Smelting Works, Trail, said that the Trail smelter's interest was to ship gold and silver to the United States. If the Dominion would buy gold at Trail or Rossland it would place those localities in a similar position as Seattle, through its assay office was placed by the United States government.

A resolution asking for a bounty on copper was referred to the several Boards of Trade to report to the president

of the Associated Boards within a month. If a majority of these boards endorsed the proposition it will be adopted as a memorial of the Associated Boards and forwarded to Ottawa.

In regard to the two per cent mineral tax, it was resolved: "That the Provincial government appoint a commission of one mining representative from each district and one government assessor, to investigate the subject of mining taxation and to arrive at an equitable basis for such taxation, and that it was the belief of the board that the best form of taxation was on the gross value of the product as recovered by smelters or mills, and that the tax should be one-half per cent."

The question of representation at the Lewis and Clark Exposition, to be held at Portland, Oregon, next summer, was considered and it was resolved: "That the mineral and other resources of this Province be represented by a Provincial exhibit, to which the Dominion government be asked to contribute."

Included in one resolution adopted was the following: "That the 50,000 acres of coal lands selected for the Dominion government in the Crow's Nest Pass coal fields were not fairly selected and that the public are not getting a suitable supply of coal at a fair price, not exceeding \$2 per ton, and that the freight rates upon coal from said fields are excessive; therefore, be it resolved, that the Dominion government be asked to investigate the selection of the said 50,000 acres of coal lands and the prices of and freight-rates on the coal, and to provide such remedy as in their judgment may seem just and equitable."

During the convention Mr. G. O. Buchanan was unanimously re-elected president, thus giving him a fourth consecutive term in that office. It was resolved to hold the 1906 convention at Cranbrook.

WESTERN ASSOCIATION OF TECHNICAL CHEMISTS AND METALLURGISTS.

The Western Association of Technical Chemists and Metallurgists, with headquarters at Denver, Colorado, U.S. A., has issued the first number of its monthly journal, the *Western Chemist and Metallurgist*. This contains papers, by members, as follows: "A Method for the Determination of Uranium and Vanadium," by Justin H. Haynes, Denver; "The Alkali Lakes of the San Luis Valley," by Professor Herman Fleck, Golden, Col.; "The Estimation of Arsenic in Sulphuric and Muriatic Acids," by Mr. R. S. Beall, Denver; and "A Method for Iron," by Mr. J. C. Bailar, Golden. Abstracts on "Metallurgy" and "Analytical Chemistry" by Mr. V. H. Gottschalk, are also given, and a history of the inception of the movement leading up to the organization of the association, together with its constitution, by-laws, and a list of its members, comprises the remaining contents of a publication of especial interest to assayers, technical chemists and metallurgists.

From the historical note published it is gathered that early in 1904 a number of Colorado chemists and metallurgists discussed privately and informally the desirability of forming an organization which should represent the chemists and metallurgists of the Rocky Mountain region. West of Nebraska no society at that time existed in the United States for the purpose of discussing matters which appealed particularly to assayers, technical chemists and metallurgists, although in no part of the United States was there relatively a larger number of men engaged in those occupations than in the Rocky Mountain region. About the same time chemists and metallurgists, were seriously considering the lack of uniformity of method of analysis adopted by different mining sections, with the corresponding disagreements and annoyances. It was believed that a society of the character suggested could take up such matters and deal authoritatively with them. The various phases of metallurgy requiring discussion could be discussed and investigated by such an association, to the benefit of the industry generally. Several meetings were held at intervals and before the close of the year the association

had been properly and permanently formed, a constitution and by-laws adopted, and the question of incorporation under the laws of the State of Colorado placed in the hands of a committee for action thereon. The objects of the association are thus stated in the constitution: "The association shall work for the general improvement of technical chemistry. It shall endeavour to improve, and promote uniformity in, methods of metallurgical analysis and assaying, and shall encourage research in the metallurgy of precious and rare metals." In regard to membership, it is provided that the association shall consist of members, student members, life members and honorary members, and any person interested in its objects may be nominated for election as a member. Local sections may be established by the board of control. Annual dues for members are \$7.50 and for student members, \$2.50, both payable in advance. The published list of members contains 177 names, distributed as follows: Colorado 85, California 15, Utah 10, Nevada 9, South Dakota 9, Arizona 8, Oregon 6, New Mexico 5, Mexico 5, British Columbia 5, Texas 4, Washington 3, Idaho 2, Missouri 2, Montana 2, Nebraska 2, Pennsylvania 2, Illinois 1, Kansas 1, and New York 1.

Meetings are held each month. In addition to those above-mentioned, papers have been received as under: "The Determination of Arsenic and Antimony in Lead Bullion," by Mr. H. C. Parmelee, Denver; "The Influence of Fine Grinding on the Metallurgy of the Precious Metals," by Mr. A. W. Warwick, Denver, and "The Separation of Minerals by Static Electricity," by Mr. W. G. Swart, Denver. The papers are published (subject to revision) soon after receipt, together with discussion thereon, the latter adding to their value. The membership of the association is increasing and it appears to have a wide field for extension and for useful work.

COMPANY MEETINGS AND REPORTS.

B. C. STANDARD MINING CO., LTD.

The directors' report for the year ended December 31, 1904, was accompanied by detailed statements giving particulars of each month's operations and analysis of mining costs. These showed that after making a charge for wear and tear of tramway cable and for plant depreciation, there had been a loss of \$3,400 on the operations for the year on shipments of 17,168 tons. The report further stated that:

"In November when we made an interim report to you, few returns for shipments during that month had been received, and it was expected that after having defrayed the initial expense of opening up the quarries we would have a few thousand dollars profit with the prospect of profitable operations throughout 1905, as the freight and treatment charges and mining costs had been considerably reduced and a market secured for a greatly increased output. Almost immediately after arrangements had been made for this increased tonnage the winter storms began, costs were increased, and it was found difficult to accomplish more than an average of about 75 tons a day, and the grade of the shipments fell. The latter is largely attributed to the dipping of the mineralized strata in such a way as to leave a barren capping, which, however, the superintendent found it expedient to blast with the ore. The result of the increased cost and lower grade during those two months was a loss of \$3,500. If the November and December shipments had earned a profit equal to the average profit of the shipments during August, September and October, the net profit for the year would have been about \$7,400.

"The market outlook is very satisfactory. Experience seems to have satisfied the smelters of the fluxing value of our ore, and we could to-day dispose of 250 tons of the high lime ore and 50 tons of the more silicious ore daily, while we consider this is not by any means the limit of the probable market.

"In view of the low grade of the shipments at the end of the year and early part of January, we are at present restricting the output to about 40 tons daily, which we are

shipping to Nelson as being our most profitable market and one from which we can most quickly ascertain the grade of the shipments. We have also arranged to begin shipments to the Sullivan Company's smelter at Marysville, East Kootenay, on such favourable terms that ore of the analysis which we are now shipping will pay its way even if of as low grade as the average of November and December shipments. The rates of both smelters, though varying somewhat in terms, yield about the same on this class of ore.

"Our experience this winter, and the present appearance of the deposit, point to the desirability of developing the mine underground before next winter. This accentuates the need of working capital referred to in our November report, and it will be the duty of the Board to devise means to raise the capital at an early date. Had the grade of ore shipped been as high as of that taken out in development work, the profits on the last year's shipments would have provided the necessary working capital, and the value of the holdings of the present shareholders would have been greater than if a larger amount of treasury stock had been disposed of.

"We must now deal with the matter as it stands. The unanimous opinion of the mining experts who have visited the property is that it promises to prove to be a very large deposit. The 17,000 tons shipped during the year should be a fair index of the grade which we may expect to ship during 1905, and with such a grade and our present freight and treatment rates and mining costs, and the daily tonnage which we hope to ship, the profits would be very fair.

"With the expenditure of capital on additional development and plant, the cost of mining should be appreciably reduced, so that we feel that, though we have been disappointed in the past year's results, we have an enterprise in which we can fairly invite capital to invest."

Assets.

Mines, mineral claims and water rights.....	\$120,569.53
Aerial and auxiliary tramways, railway spur and mine buildings	35,588.70
Plant and machinery, permanent improvements and equipment	3,056.82
Mine supplies and stores on hand per inventory...	1,549.10
Accounts receivable, unexpired insurance and proportion of preliminary expense account.....	1,337.88
Loss and gain account	3,483.54
	<u>\$165,585.57</u>

Liabilities.

Capital stock	\$200,000.00
Less treasury stock	\$44,000.00
Less due on shares	76.99
	<u>44,076.99</u>
Accounts payable	\$155,923.01
Bills payable	5,400.21
Bank of Montreal	2,413.53
	1,848.82
	<u>\$165,585.57</u>

Profit and Loss account.

To cost of mining and aerial tramway transportation	\$29,928.17
To freight and treatment charges	29,181.31
To depreciation of plant and machinery and aerial tramway	1,112.96
To amount written off development, 50 per cent of \$2,204.06	1,102.03
To interest, discount, organization expenses and taxes	859.40
	<u>\$62,183.87</u>

Cr.

By value of ore extracted	\$56,472.71
By profit on operation of boarding house	711.12

By profit on stocks and shares	1,500.00
By receipts for transfer fees	16.50
By balance	3,483.54
	<u>\$62,183.87</u>

The report and balance sheet were adopted and the retiring directors were re-elected. Mr. J. J. Campbell was re-appointed managing director. The directors and officers for the year are: Messrs. James Johnstone, M. E. and C. E., president; J. J. Campbell, managing director; S. S. Fowler, E. M., J. Laing Stocks and Norman Carmichael, M. E.

Mr. Campbell, after thanking the shareholders, gave an explanation of the difficulties that had been met with in carrying on open quarry work during the winter. The plans by which the superintendent had intended to overcome these had not proved successful, and work was at present not being carried on at the Double Standard. Blasting brought down much snow in addition to snow that drifted in, and when compelled to stop for some days the ore froze solid in the shaft which was used as an ore chute. For some time past the faces of the workings had differed greatly in grade in different parts, adding to the difficulty of the superintendent in ensuring that only profitable ore should be shipped. Another feature had been the increasing depth of barren limerock overlying the ore body, owing to the downward dip of the mineralization. The superintendent had attempted to get in underneath this, but on account of the crevices the blasting shattered the upper rock, so that for safety's sake it had to come down, and it was then sometimes a question of how much it should be sent over the dump and how much of it should be left mixed with the ore. Mr. Campbell thought it would be proper at this point to inform the shareholders that owing to the confidence of the board as to his special fitness to cope with some of these difficulties and to his ability to do his own assaying—and thus avoid the expense of an assayer or the delay by waiting for the results from outside—R. W. Brigstock had been engaged as superintendent. Mr. Brigstock's record in connection with the development of other properties was good, and Mr. Fowler had had special opportunities of satisfying himself as to his capacity. If definite contracts for a large tonnage of ore could have been arranged with the smelters in the summer he would have felt justified in spending a considerable amount of money in preparation for winter's work, but it took a long time and a great deal of trouble and worry before the other smelters, outside of the Nelson smelter, had so satisfied themselves as to the merits of the ore as a flux at the rates which we required to give sufficient assurance of this larger market at the same time. We have now arranged to ship 1,000 tons of ore to the Marysville smelter on such a basis that 3 oz. ore will pay its way, and under the present arrangement with the Hall Mines smelter recent shipments carrying 2½ oz. silver to the ton will yield a profit of 50c.

CONSOLIDATED CARIBOO HYDRAULIC MINING CO., LTD.

The seventh annual report, balance sheet, etc., of the Consolidated Cariboo Hydraulic Mining Co., Ltd., for the financial year ended November 30, 1904, submitted at the annual meeting of shareholders, held in Toronto, Ontario, on January 26, last, was as under:

Assets.

Mines, leases, etc., per balance sheet, Nov. 30, 1903	\$4,253,288.33
Permanent improvements, as per report, Nov. 30, 1903.....	\$111,548.13
Less 20 per cent depreciation written off drain tunnel account	\$ 231.36
Less 20 per cent depreciation written off riffles account ..	1,057.41
	<u>1,288.99</u>
	<u>\$110,259.14</u>

Development account, season ending Nov. 30, 1904	34,319.22
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Total permanent improvements Nov. 30, 1904	144,578.36
Inventory, as per manager's report...	93,115.49
Accounts receivable	20,722.51
Gold specimens on hand	773.61
	<u>114,611.61</u>
Profit and loss account, balance at debit, November 30, 1904	51,707.90
	<u>\$4,564,186.20</u>

Liabilities.

Capital stock	\$4,000,000.00
Bonds	400,000.00
Interest on bonds	46,000.00
Accounts payable at mines	14,768.19
Accounts payable at Toronto office ..	59,105.76
Bank of Montreal, Toronto	44,312.25
	<u>\$4,564,186.20</u>

Profit and Loss.

	Dr.
To balance at debit Nov. 30th, 1903	\$24,535.82
“ Operating expenses for season as per statement from mine	88,423.75
“ Drain tunnel, 20 per cent written off for depreciation	231.56
“ Riffles, 10 per cent. written off for depreciation	1,057.43
“ Head office expenses	1,341.99
“ Interest on bonds accrued to 1st December, 1904 ..	24,000.00
“ Interest and exchange	1,945.43
	<u>141,535.98</u>
	Cr.
By Bullion recovered	\$85,936.30
“ Profit on stores	3,891.78
“ Balance at debit	51,707.90
	<u>\$141,535.98</u>

Manager's Report.

Herewith is my annual report, which reviews briefly the operation of the company's mines during the season of 1904.

The past season turned out a most disappointing one, for the reason that the fall precipitation and the winter snow failed to afford the quantity of water expected at the opening of the season. The lack of the usual summer precipitation, and the heavy evaporation from the reservoir lakes caused by the unusually hot, dry weather that prevailed throughout the summer months, worked a great reduction in the season's water supply, and left only sufficient to operate the mine 88 days and 16 hours—from April 15 to September 2—out of a possible season of 212 days, counting from the opening of the canals to November 15; when the winter set in. The snow on the watershed tributary to the canals below the reservoir lakes went off under very unfavourable weather conditions, and afforded only sufficient water to clear out the ice and slides from the rims that accumulated in the hydraulic pit during the winter months.

Washing commenced on April 15 and continued for a period of 16 days and 4 hours, ending May 9. During the progress of the work 40,308.9-10 miner's in. of water was used to wash out 120,936 cu. yd. of slide rock, ice and frozen gravel.

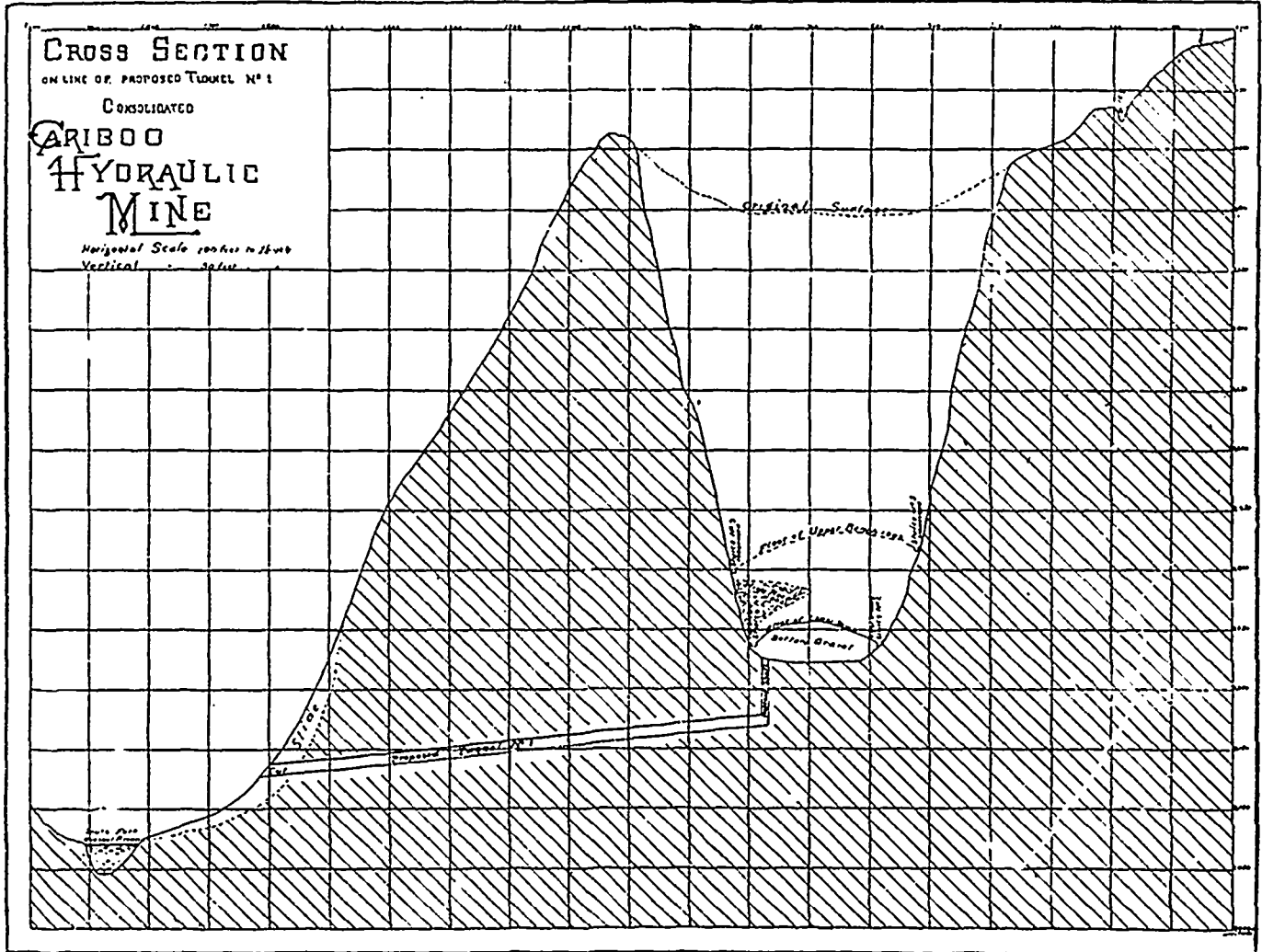
Washing gravel from the main bank with water from the reservoir lake commenced on May 9 and continued for a period of 38 days and 19½ hours, ending June 23. During the progress of the run 103,389.1-10 miner's in. of water was used to wash out 920,000 cu. yd. of top gravel and indurated volcanic mud, from which was recovered 3,425.09 oz. of gold valued at \$58,358.09—an average yield of 6.34-100 cents per cu. yd.; the duty attained for the water used was

about 889-100 cu. yd. per miner's in. Considerable time was occupied during the run in excavating cuts for the advancement of sluices and for rock cut on northeast rim to accommodate removal of hydraulic pipe line from Bench No. 4 to make room for placing the derricks and hydraulic elevators required to work the lower deposits and to facilitate the opening of the new tunnel when completed in 1905.

The second run commenced immediately after the removal of the hydraulic plant and advancement of sluices, on July 16, and continued for a period of 33 days and 16½ hours, ending with the exhaustion of the water supply on September 2. During the progress of the run 81,500 miner's in. of water was used to wash out 407,817 cu. yd. of top gravel and indurated volcanic mud, from which was recovered

ings are carried up channel towards the south fork pit. The rapid decrease in the depth of the low-grade top deposits, together with the inclusion of about 70 ft. of high-grade deposits lying between the floor of the present excavation and bedrock, will greatly increase the average grade of the deposits, which will be worked in one bench from surface to bedrock as soon as the sluice tunnel is completed and opened into the hydraulic excavation.

Prior to the closing run of season 1904, the best pay was recovered from the north-east or left-hand side of the mine, while the right-hand or south-west side of the mine produced the best result for the gravel washed during the closing run for the season. This change indicates that the crossing of pay from left to right-hand side of the mine is complete,



Cross-section as at beginning of season, 1904.

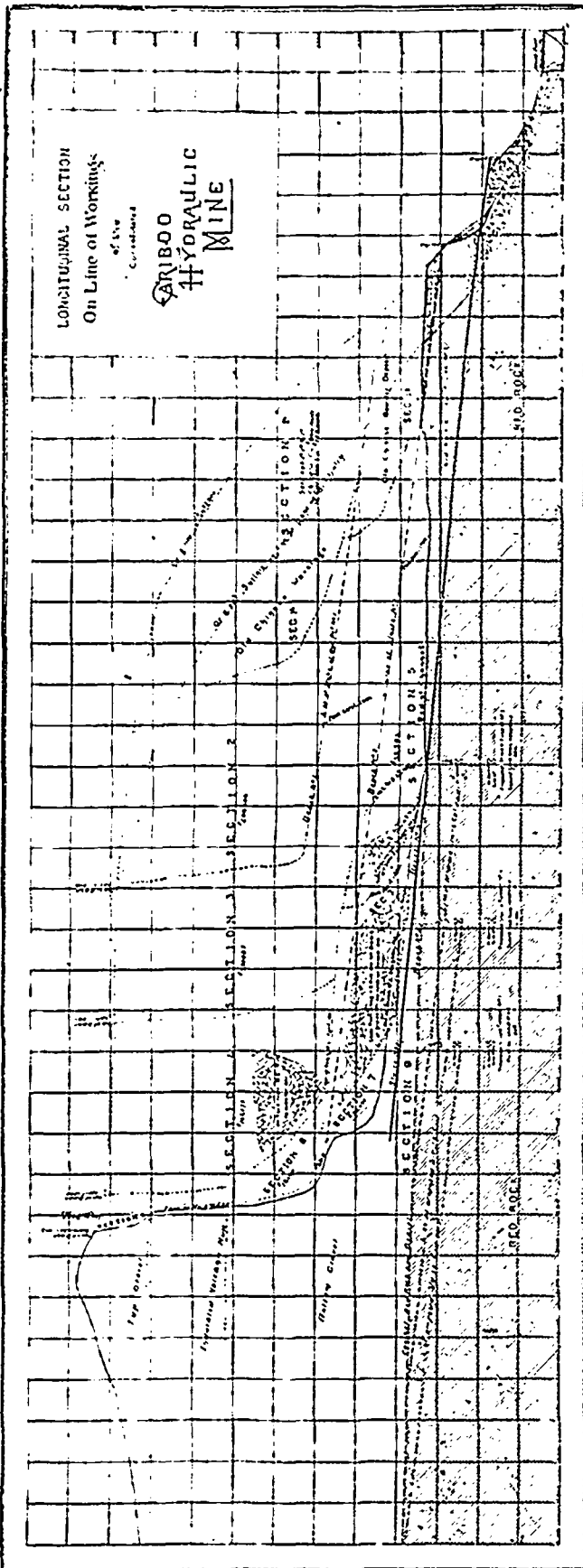
1,552 15-100 oz. of gold valued at \$26,508.12—an average yield of 65-10 cents per cu. yd.; duty attained for water used was about 5 cu. yd. per miner's in. The falling off in the duty of water below that attained during the first run was caused by the increase of about 90 ft. in the thickness of the indurated volcanic mud which replaced the deposits of light gravel and went up to the surface on the right-hand side of the mine.

During the progress of the season's operations the face of the excavation was advanced 160 ft. across the apex of the high divide on the left-hand side of the mine; a run of about 30 days' washing will be required to carry the excavation across the high divide on the right-hand side of the mine; and, when the excavation is advanced across the apex of the divide, the top deposits will decrease rapidly as the work-

and that as good results may reasonably be expected from the deposits as were produced after the crossing encountered at the big bend of the channel was passed in the upper deposits by the Chinese company in 1891 and 1892, and in the second bench deposits by the Consolidated Cariboo Hydraulic Mining Company in 1899.

By reference to the longitudinal section on line of workings it will be noted that section No. 2 produced \$400,000 from 500 ft. of workings in top gravels—an average yield of \$800 per lin. ft. of channel worked; section No. 3 produced \$350,085 from 350 ft. of workings in top gravels—an average yield of about \$1,000 per lin. ft. of channel; section No. 4 gave \$142,273 for 400 lin. ft. of workings in top gravels—an average yield of \$355 per lin. ft. of channel—immense slides of bedrock were encountered in this section of the

mine, which cut out and replaced the high-grade strata and accounts for the reduced average yield per ft. for the sec-



tion; and sections No. 6 and No. 8, including about 100 ft. of workings, gave \$34,990—an average yield of \$349 per lin.

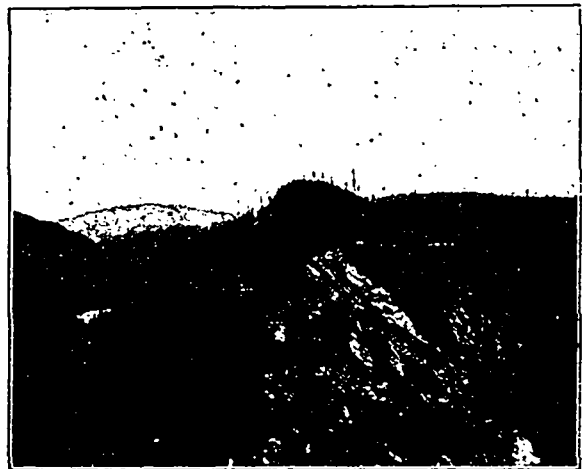
ft.; section No. 10 washed out during season 1904, includes 160 ft. of workings which produced \$84,866.21—an average yield of \$530 per lin. ft. of channel.

To the above must be added \$71,427 recovered from the third bench and included in sections numbered 5 and 7, making a total of \$998,775 in gold recovered from about 1,410 ft. of workings in top gravels—an average of about \$708 per lin. ft. of channel. To this sum there is to be added the product of the fourth or bedrock bench included in section 9.

At the close of the season of 1903, a practical test was made of 638 cu. yd. of bottom gravel from bench No. 4, from which was recovered 54,21-100 oz. of gold valued at \$970.09—an average yield of \$1.52 per cu. yd. This bench of gravel commences at a point just above the junction of the branch sluices, extends for a distance of 1,200 ft. to the face of the bank, and varies from ten to seventy-five ft. in depth.

The change of the high-grade gravels from the left to the right-hand side of the mine indicates that the current-crossing, and its accompanying rock slides which interfered so much with the progress of the hydraulic work since the opening of the season of 1901, has been passed, and that the mine, with an ample supply of water, may reasonably be expected to produce better results than it has done since the season of 1900.

Sluice Tunnel.—The sluice tunnel required for the second outlet from the mine to the dumps into the south fork of the Quesnel river when completed will be 1,200 ft. in length. The dimensions of the tunnel are 10 ft. by 10 ft. in the clear



Wedge-shaped wall of rock, separating present South Fork of Quesnel River from ancient channel.

and large enough to accommodate a sluice 7 ft. wide by 3 ft. deep and a walk 2 ft. 6 in. wide placed on one side for the sluice tenders. The wet and loose condition of the surface rock on steep side hill delayed the starting of the work until late in the spring. Considerable difficulty was encountered in driving through the loose ground, which required timber with heavy sets placed 3 ft. apart for a distance of 63 ft. When the loose ground was passed, two shifts of miners were set to work with two electric drills, and advanced the tunnel 197 ft. in hard rock, making the total distance driven to the close of the season 260 ft. at an average cost of \$12 per ft. Better progress was made as the men became more familiar with the use of the electric machines, their duty improving gradually until the advance of tunnel increased from 21 ft. to 38 ft. per week. At this rate of progress, the tunnel can be completed in time for use before the close of the season of 1905.

Water Supply.—The quantity of water available for use during the season of 1904 was 225,198 miner's in., exceeding that of the season of 1903 by 98,115 miner's in., and that of season 1902 by 45,678 miner's in., but was 33,022 miner's in. less than that of the season of 1901, and 235,680 miner's in.

less than the quantity of water used during the season of 1900.

Precipitation for season of 1903.....17.48 100 in.
 Precipitation for season of 1904.....24.39 100 in.
 Exceeding precipitation of 1903 by..... 5.81 100 in.
 Quantity of water available and used during
 season of 1903127,083 miners in.
 Quantity of water available and used during
 season of 1904225,198 miner's in.
 Exceeding that of the season of 1903 by... 98,115 miner's in.

Gold Product and Precipitation.—By reference to the following tabulated statement of product of the mine since completion of the water supply system in 1898, as compared with precipitation, it will be noted that the gold product is dependent mainly upon copious precipitation and on abundant supply of water:

Year.	Precipitation in inches.	Water used in miner's inches.	Time run.	Cu. yards gravel washed.	Product.
1899 ..	28 65-100	353,056	144 days, 8 hrs.	1,952,535	\$ 92,678.93
1900 ..	30 67-100	460,378	171 days, 13 hrs.	1,843,938	350,085.77
1901 ..	20 30-100	258,250	104 days, 13 hrs.	2,420,288	142,273.41
1902 ..	23 40-100	179,520	65 days, 15 hrs.	690,442	61,395.19
1903 ..	17 48-100	127,083	53 days, 7 hrs.	373,000	44,943.70
1904 ..	24 39-100	225,198	88 days, 16 hrs.	3,411,461	85,936.30

The above figures indicate that the largest quantity of water used during those seasons produced the largest results, making it evident that if the past season's water supply had been sufficient to operate the mine 200 days with 2,500 miner's in. of water, the season's output would probably have reached \$193,800, which, after deducting therefrom the operating expenses and cost of development work—estimated at \$150,000—would have left a net profit of \$43,800. Increase the quantity of water used to 5,000 miner's in. for a period of 200 days and assume the duty of the water and grade of gravel to be the same as the past season, then the quantity of gravel washed would approximate 6,490,000 cu. yd. and the gross product \$381,612; deduct therefrom the estimated cost of operation (\$200,000) and there is left a net profit of \$181,612. Years of experience in hydraulic mining proves that it costs no more to discharge water through ten-inch nozzles than it does to discharge it through five-inch nozzles; that the moving power and duty of the water increases wonderfully with the increase of the quantity of water used, and that the cost of mining is materially decreased by an increase of the quantity of water used.

The total quantity of auriferous gravel and overlying deposits washed from the hydraulic excavation of pit No. 1 to date amounts to 12,535,009 cu. yd. The Chinese companies recovered from their old workings gold valued at \$900,000, and this company has recovered during the time extending from 1894 to 1904, inclusive, gold valued at \$1,208,734.66, making a total gold product of \$2,108,734.66 and an average yield of 16 8-10 cents per cu. yd. for the total quantity washed from the excavation to date. There is nothing in sight to indicate that this average will not be maintained, and, assuming that a 16 8-10 cent average will be maintained, the average product to result from the use of 5,000 miner's in. of water for a season of 200 days will be as follows:

Quantity of gravel washed in 200 days.....6,245,000 cu. yd.
 Average yield per cu. yd.....16 8-10 cents
 Gross product\$1,049,160
 Deduct therefrom the estimated cost of operation
 at \$1,000 per day for 200 days 200,000
 Leaving a net profit of\$ 849,160

The precipitation, as reported in 1892 by government agents and old settlers, ranged from 30 in. to 40 in. per annum. These statements were found correct so far as the seasons of 1892, 1893 and 1894 are concerned, but since 1894 the

precipitation decreased gradually until the minimum of 17 48-100 in. was recorded for the season of 1903, the only exception in ten years being the season of 1900 when the precipitation reached 30 67-100, and afforded a water supply ample to produce satisfactory results.

While it is true that the precipitation for season of 1904 exceeded that of 1903 by 5 81-100 in., it proved insufficient to afford a water supply ample to produce satisfactory results. It is, therefore, evident that dependence upon the precipitation over the area of watershed now under control is accompanied by too much uncertainty to insure the financial success desired, and that the present water supply system must be extended to a permanent source that will afford an abundant supply of water throughout the open season. Since the close of the season of 1903 hydrographic surveys have been made to determine the possibility and cost of increasing the company's water supply by the construction of a canal along the westerly slope of the Morehead range from Morehead lake reservoir, a distance of about 15 miles, to the creek known as Three-mile creek, as measured from the Beaver Lake house, or by the construction of a system of canals and inverted siphons from the company's mines, a distance of about 17 miles, to Spanish lake, which is situated in the mountains at the head of Spanish creek, a tributary of the north fork of the Quesnel river.

The watershed of the westerly slope of the Morehead range tributary to a canal constructed from Morehead lake reservoir to Three-mile creek, as approximately determined, has an area of about 20 sq. miles, which is drained by Three-mile, Four-mile, Five-mile, Six-mile, and Eight-mile creeks,



Morehead Lake Reservoir, after practical exhaustion of Water Supply.

all of which flow north-westerly across the Quesnel Forks and Bullion wagon road and empty into Beaver river. This watershed also includes two lakes, one on Three-mile creek at an altitude of 3,015 ft., and one near the head of Eight-mile creek, at an altitude of 3,512 ft. These lakes have areas of about 300 acres each and can be utilized as storage reservoirs by the construction of timber crib dams at their outlets. While the area of this watershed is larger than that drained by Morehead lake, the timber has been burned off from about half its area, and it cannot for this reason be expected to deliver so large a percentage of the precipitation as the heavily-timbered watershed of the north-easterly slope of the range tributary to Morehead lake. I am, therefore, inclined to the opinion that this watershed cannot be relied upon to deliver into Morehead lake reservoir more than about 2,500 miner's in. of water for a period of about 75 days from 30 in. of precipitation. The ground on the line of a canal to control this watershed is mainly a compact, gravelly clay and presents no difficulties to interfere with economical construction.

Cost of Canal.—The estimated cost of a canal having a

Total quantity of water used.....225,198 miner's in.
Quantity of top gravel, clay and slide rock washed:

Winter accumulation of ice and slide rock
from rims 120,986 cu. yd.
Gravel from face of bank, Bench No. 3....1,327,817 cu. yd.
Bedrock gravel 638 cu. yd.
Bedrock cut in north-east rim for pipe lines.. 6,700 cu. yd.
Bedrock cut for advancement of sluices 5,300 cu. yd.

Total quantity washed1,461,341 cu. yd.

Average duty of water per miner's in.....6 49-100 cu. yd.
Average yield per cu. yd. washed5 88-100 cents
Average daily product for water used.....\$969.27
Gold product for season5,037.89-100 oz.
Value of gold\$ 85,936.30
Value of gold recovered prior to 1904 1,122,798.36
Total product of mine from 1894 to date 1,203,734.66

The receipts and expenditures attending the operation of the company's mines for the season will be found distributed in detail in the following statements:

Operating Expenses.—

Mining	\$30,815.05
Explosives	21,148.20
Sluice maintenance	6,493.09
South fork ditch maintenance	5,786.34
Morehead ditch maintenance	4,401.72
Camp maintenance, fuel, etc.....	1,288.91
Line and camp light maintenance	605.73
Wagons and harness maintenance	212.67
Telephone maintenance	109.51
Roads and trails	64.47
Stationery and printing	138.13
Postage and telegraph	410.67
Legal expenses	15.00
Lands and leases (lease rentals)	2,048.75
Licence	110.00
Insurance	803.00
Office expenses	1,684.77
Bullion expense (royalty, insurance, etc.)	3,624.50
Management	6,712.41
Stable expenses	541.08
Tools and implements (loss for season).....	519.03
Horses (loss for season)	400.00
Quicksilver (loss for season)	490.72
Total	\$88,423.75

Receipts.—

Gold recovered for season	\$35,936.30
Profit on stores sold	3,891.78
Total	\$89,828.08

*Inventory.—*There is on hand at the company's stores and mines, as per inventory made September 4, 1904:

Miscellaneous provision, stores, mining supplies, etc.	\$45,892.94
Explosives	15,366.79
Blacksmith stores	1,693.20
Quicksilver	2,153.88
Horses	1,152.00
Wagons, sleighs and harness	2,560.67
Saw logs, flats, lumber, fuel, sluice blocks, etc	5,052.21
Tools and implements	19,243.80
Total as per inventories	\$93,115.49

During the progress of the season's operations, the following expenditures were made for surveys to determine the possibility and probable cost of extending the water supply system to a source of abundant and permanent water supply, and for doing development work actually necessary for the future operation of the mine:

Hydrographic surveys: Labor and stores	\$1,293.22
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Driving 260 ft. of 10 ft. by 10 ft. sluice tunnel:

Labor, stores and lumber	\$2,511.00
Explosives	661.00
Total	3,172.00

Procuring water supply for camp, power house and tunnel:

Labor and stores	3,529.00
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Removing and relaying hydraulic plant to make room for hydraulic elevator and derricks required to work bedrock deposits, construction of trestles, bridges and excavation of rock cut of 6,700 cu. yd. required for pipe bench on north-east rim:

Labor, hewed timber, lumber and stores...	7,500.00
Explosives	3,194.00
Total	10,694.00

\$18,679.22

Extension of sluices:

Excavating 5,200 cu. yd. of rock cuts— Labor	3,243.00
Explosives	2,477.00
Total	5,720.00

Extension of 3 ft. by 7 ft. sluice—

Labor, lumber and stores	5,720.00
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Construction of chutes and 12-lb. rail tramway, required to reduce cost of delivering mining timbers, lumber, hydraulic plant, sluice blocks and other material at workings, which are now over half a mile distant from point of delivery by wagon:
Labor, hewed timber, lumber, stores, etc...

4,200.00

Total expenditures on development work

\$34,319.22

CROW'S NEST PASS COAL CO., LTD.

The eighth annual meeting of shareholders in the Crow's Nest Pass Coal Co., Ltd., was held in Toronto, Ontario, on February 10, ulto. The report for the calendar year 1904, including statement of profit and loss account and of assets and liabilities, was as follows:

The balance at the credit of the profit and loss account brought forward from 1903 amounts to \$1,870,813.13. To this has been added the sum of \$406,049.56, being the company's net profits from the operations of the year (after providing for the costs of litigation, \$32,697, in connection with the explosion of May, 1902), also the sum of \$38,865, representing the premium received on calls paid on new stock issues, the whole making an aggregate to the credit of the profit and loss account of \$2,315,727.69. From this amount the directors have paid four dividends of 2½ per cent. each, making 10 per cent for the year, and amounting in all to \$347,807.25; have transferred to reserve the sum of \$1,764,600, representing the income derived from the premium on calls on stock, and have carried forward to 1905 \$203,320.44 to the credit of the profit and loss account. This amount represents the net profits of the company from operations, after payment of dividends. All the income derived from premium on stock has been set aside as a reserve fund.

The increase in coal mined this year over last amounts to 31,000 tons, and the coke exported shows an increase of over 78,000 tons.

During the year there has been spent on improvements (not including those of subsidiary companies) the sum of \$254,000, as against \$810,000 in the preceding year. The Crow's Nest Pass Electric Light & Power Co., Ltd., and the Morrissey, Fernie & Michel Railway Co. are subsidiary companies, formed for the purpose of taking care of some of the company's necessary auxiliary projects. The capital stocks of these are owned, practically exclusively, by this company, and are referred to in the balance sheet as "Securities owned."

Ninety-three actions for damages brought against the company by the dependents of the miners killed in the explosion of May, 1902, at Coal creek, for sums amounting in the ag-

gregate to a large figure, were disposed of in the company's favor last June, after two years of litigation and a twenty-one days' trial at Nelson. Later the plaintiffs appealed to the Supreme Court of British Columbia, but later still abandoned their appeals, which finally relieves the company from all liability.

In December the final settlement of all outstanding questions between this company and the Canadian Pacific Railway Co. was arrived at, and the deeds transferring 250,000 acres of land to this company executed. Since the year 1897 a number of intricate questions had accumulated and presented themselves for settlement, but these were disposed of to the mutual satisfaction of the parties.

A lease for twenty years of the Coal creek branch of the Canadian Pacific railway to the Morrissey, Fernie & Michel railway has been executed, and an additional mile of track constructed, which gives the mines at Coal creek and the coke ovens at Fernie connection with both the Canadian Pacific railway and the Great Northern railway. On December 15th the Great Northern Railway Co. commenced operating the extension of its line to Fernie.

On July 1 Mr. T. R. Stockett, acting general manager, resigned to accept the position of general manager of the Western Fuel Co., with headquarters at Nanaimo, and Mr. G. G. S. Lindsey, K.C., was appointed general manager. Mr. R. G. Drinnan, M.E., who had been with the company for four years, latterly as inspector, and whose eighteen years' experience in mining has been otherwise gained in Scotland, England and Vancouver Island, was appointed general superintendent, the coke department placed under the care of Mr. George L. Pearson, an experienced coke maker, and the land department transferred to the care of Mr. James McEvoy, M.E., C.E., the company's geologist.

Some advance has been made in extending the domestic trade of the company, which it is expected will yield much larger results during the present year.

The staff at Fernie and the collieries is capable and efficient, and is contributing well towards the company's success. Complete harmony exists between the company and its men, and everything points to a continuance of friendly relations.

Profit and Loss Account.

Balance at credit, 31st Dec., 1903 ..	\$1,870,813.13	
Net profits for 1904	406,049.56	
Premium received on calls paid on new stock	38,865.00	
		\$2,315,727.69

Appropriated as Follows:

Dividends paid	\$ 347,807.25	
Transferred to reserve fund	1,764,600.00	
Balance carried forward to 1905 ..	203,320.44	
		\$2,315,727.69

Assets.

Mines, real estate, plant, development, etc. ..	\$5,064,201.25	
Securities owned	479,984.48	
Accounts receivable	472,431.08	
Cash on hand and in banks	47,863.68	
		\$6,064,480.49

Liabilities.

Capital stock	\$3,500,000.00	
On which has been paid		\$3,476,400.00
Bills payable	323,297.55	
Accounts payable	209,952.50	
		533,250.05
Dividend No. 10, payable 1st Jan- uary, 1905		86,910.00
Reserve fund		1,764,600.00
Profit and loss		203,320.44
		\$6,064,480.49

The following gentlemen were elected directors for the

ensuing year: Hon. Geo. A. Cox, Robert Jaffray, Lieut.-Col. H. M. Pellatt, Wm. Fernie, J. A. Gemmill, J. D. Chipman, David Morrice, E. R. Wood, Thos. Walmsley, Lieut.-Col. James Mason, Frederic Nicholls, G. G. S. Lindsey, K. C., and C. C. Dalton.

At a meeting of the directors, held immediately after the meeting of the shareholders, Hon. Geo. A. Cox was elected president for the ensuing year; Robert Jaffray, first vice-president; Col. H. M. Pellatt, second vice-president; G. G. S. Lindsey, K.C., third vice-president, and E. R. Wood, treasurer.

IMPERIAL DEVELOPMENT SYNDICATE, LTD.

The fifth general meeting of the Imperial Development Syndicate, Ltd., was held at Nelson, B. C., on February 14, ulto. The directors' report, manager's report and financial statement for the year 1904 were submitted and adopted.

Directors' Report.

Our mining operations during the past year are fully dealt with in the manager's report. As you are aware, at the time of our last general meeting the Calumet and B. C. Gold Mines, Ltd., had a bond on the Eva group and were operating the property. On May 1st, last, they relinquished this bond and the property reverted to us. Your board realized that at that time it would be practically impossible to again bond or sell outright the property and that we were obliged to operate it ourselves in some manner or allow it to stand idle. After careful consideration it was thought advisable to form a subsidiary company to be called the Eva Gold Mines, Ltd. This was done and the new company is now in possession of the property.

The basis upon which the Eva Gold Mines was organized is as follows: Capital stock, \$500,000, in shares of a par value of \$1.00 each. The Imperial Development Syndicate have taken 220,000 fully paid and non-assessable shares in payment for the property. An opportunity was given the Calumet and B. C. Company to subscribe for 190,000 assessable shares, one-half to be issued as paid up to 50 cents per share and one-half as paid up to 75 cents per share, the balance to be subject to calls not exceeding 2½ cents per share per month. Over 92,000 shares were thus subscribed for and allotted to shareholders in the Calumet and B. C. company.

In order to place the new company on the strong financial footing necessary to permit the addition to plant and improvements needed on the property to place it on a profit-paying basis we subscribed for 32,000 shares on behalf of the Imperial Development Syndicate, to be issued with 50 cents per share paid up and the balance subject to the same calls as the other assessable stock. The Imperial Development Syndicate have, therefore, 252,000 shares, the majority of the Eva Gold Mines stock. Up to the present time we have paid \$5,500 in calls on these 37,000 shares, leaving a balance still subject to call of \$10,500.

Owing to the disastrous forest fire referred to in the manager's report the new company received a severe setback in regard to carrying out the improvements referred to, especially as to the installation of a compressor and enlargement of the mill. It is quite probable therefore that the Eva Gold Mines will find it necessary to make further calls in the near future to complete this work, necessitating a further call on Imperial Development Syndicate shareholders.

We are pleased to say that the heavy damages caused by the fire have been fully repaired, and not only has the original equipment been much improved upon, but a valuable subsidiary tram has been added and a large amount of underground development done, which has much improved the mine. The mill is now running on ore produced nearly entirely from development work, and up to the present time has more than paid all operating expenses.

This, we think, a very satisfactory state of affairs with the present equipment, and we look forward with renewed hope and confidence to the time in the near future when with larger equipment we may expect substantial profits..

Manager's Report.

The direct mining operations of the syndicate have not

been very extensive during the past year and consisted of extending No. 2 tunnel on the Cholla a short distance. This tunnel, as previously reported, was started as a crosscut to tap the vein showing in No. 1 tunnel at a depth of 100 feet.

In 1903 we drove some 140 feet, the distance at which we expected to strike the vein. Although when we quit at that time we had encountered a change of formation indicative of the close proximity of the vein, we did not encounter ore. Last summer, however, we continued a few feet and struck a vein having a width of from 12 to 20 in. carrying low values. We drifted on this vein a short distance, finding that both width and values increased, the last average sample running \$8.50 per ton. A fault was encountered, however, which offset the vein a couple of feet, and we have only uncovered it a short distance on the other side, but it there looks stronger and better. We have over 100 feet to drive yet to get under the ore shoot exposed in No. 1 tunnel above.

On May 1, when the Calumet & B. C. Gold Mines threw up their bond on the Eva group, I was instructed by you to take charge of this property pending the formation of a subsidiary company to operate it. The mill has been running steadily since the previous October, during which time some 7,600 tons of ore were mined and milled, producing in bullion about \$50,000 besides 70 or 80 tons of concentrates, worth from \$20 to \$30 per ton, gross value. With the permission of the directors of the Eva Gold Mines, Ltd., I quote as follows from my report to them last September regarding operations from May 1 to that date:

"For some time previous to May 1, development had been practically suspended in the mine and the mill was supplied with ore from a large body of quartz opened up by a crosscut from No. 5 tunnel. This ore body was mined for a width varying from 6 and 8 to 20 feet, and all the ore was delivered from the mouth of No. 5 tunnel by a long wooden surface chute to No. 7 level, there transferred to another chute connecting with the bin at the upper terminal of the wire rope tram. This doubling handling and passing of the ore down these long wooden chutes not only added to the cost, but caused considerable trouble in the mill on account of the chips and splinters from the chutes interfering with the discharge through the battery screens. We continued milling, under these conditions, until July 5, in order to make test runs on different ore bodies. The results were satisfactory, demonstrating that the large bodies of the low grade ore existing could be handled at a profit. During these two months 1930 tons were milled which produced \$8,270 in bullion, besides \$400 (estimated), in concentrates, at a total cost, including \$1,200 development, of \$6,800, or \$3.50 per ton; thus ore yielding \$4.50 per ton was demonstrated to be profitable under rather unfavourable conditions in regard to mining which was done by hand work, and the size of the mill ten stamps.

We decided it would be advisable on July 1 to stop mining and milling until such time as we had completed certain development which would save the extra cost of handling the ore through the chutes previously mentioned. This work was in part to connect No. 7 level with the winze previously sunk from No. 5, thereby making it possible to drop all the ore from above No. 5 and from the surface right down to No. 7, where it can be trammed direct to the upper terminal of the tramway. This raise has been pushed vigorously and is now nearly completed.

In addition to this, we are continuing No. 1 (the upper tunnel) to connect with the Eva shaft, a total distance from the portal of 275 feet. This will give us a vertical depth of over 100 feet at this point. It is also our intention to cross-cut from No. 1 and connect with the Highland Mary shaft, in which a large body of ore has been exposed. The mouth of No. 1 is some 650 feet above and beyond the point where the raise from No. 7 is connected through to the surface, and our idea is to install a light two-bucket wire rope tram to transfer the ore from No. 1 to this connection. This will simplify and cheapen very much the handling of the ore.

We have also opened up by open cuts and quarry a promising body of ore in No. 1 vein, and have built a surface track, 175 feet in length, around to the same point on

the surface, connecting with No. 7 raise. When all this work is completed we will be able to handle all ore mined above No. 5 level from both veins quickly and economically to one main chute in No. 7 raise and from there tram to the terminal with large cars.

In August forest fires destroyed all our mine buildings, including the upper terminal of the wire rope tramway. For some days it looked as though we might lose the mill, flumes and pipe line, as well as the balance of the tram, but after a hard fight we managed to get the fires under control.

The loss of our mine buildings, although not serious, was unfortunate, as it interrupted our operations. However, underground work at the mine was continued within a week after the fire, and new bunk houses, blacksmith shops, ore bins, etc., are now under construction.

The most serious loss was in connection with the wire rope tramway. The upper terminal was completely destroyed and the cables were damaged at several points. The loss on the tram is protected by insurance, and arrangements are now being made to reconstruct it. We expect before winter sets in to again have everything in good running order, under more favorable conditions than any previously obtaining."

Since the above report was written the Eva Gold Mines have carried to completion the improvements suggested both underground and surface. The aerial tram has been rebuilt and is working well. The necessary buildings have been erected and a subsidiary wire rope tram of the two-bucket type has been built connecting the upper workings directly with the upper terminal of the big tram. It is now possible to transport ore from any part of the property cheaply and quickly to the mill. The main tram was finished about January 1 and the mill was started on the 5th. The sub-tram was finished at the beginning of this month, and both are giving satisfaction. It is expected that the 10 stamps can be fully supplied for some time with ore from development work alone. At present drifts are being extended in ore at six points from No. 1 tunnel down to No. 7.

During the 21 days of actual running time in January there were milled 725 tons of mixed ore and waste which had collected in various parts of the mine. This yielded \$4.32 per ton in bullion, and \$265 worth of concentrates, or a total recovery of \$4.68 per ton. Judging from the mill tests so far made, it seems certain that there are several very large bodies of ore in the Eva which will average from \$4.50 to \$6.00 per ton besides which there are several small veins from 12 in. to two ft. in width, which are much higher in grade.

The total mining, milling and development costs per ton have been from \$3.50 to \$4.00, but these may be materially reduced from now on. If the ore bodies continue to develop as everything indicates at present, it will be necessary, in order to get best results, to increase the milling capacity and install a compressor plant.

Balance Sheet.

Cholla group—

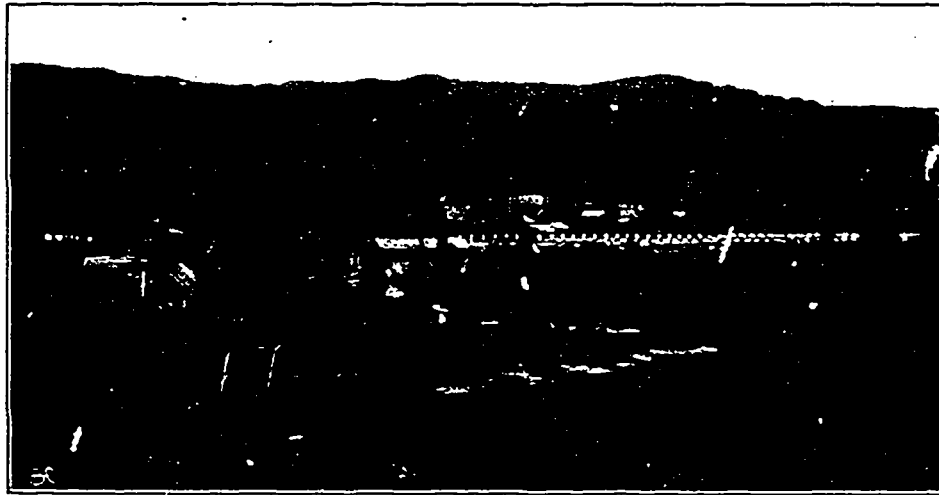
Balance brought forward	\$29,127.06	
Development	283.20	
		\$ 29,410.26
Tools and supplies		178.91
Office furniture		213.25
Mining stock (shares in the Eva Gold Mines, Ltd.)		252,000.00
Cash on hand		5.86
Shareholders' liability on uncalled stock		45,600.00
		<u>\$327,408.28</u>
Nominal capital divided into 200 shares of \$1,000 each, of which 144 have been issued ..		\$144,000.00
Stock discount, (32,000 shares of Eva Gold Mines, Ltd., issued with 50c. paid up)		16,000.00
Eva Gold Mines, Ltd. (liability for calls)		10,500.00
Profit and loss (as per account)		156,908.28
		<u>\$327,408.28</u>

Eva group—	
Balance brought forward	\$ 67,446.29
Balance crown grant fees	81.90
Water rights	209.55
Profit and loss	152,262.26
	<hr/>
	\$220,000.00
220,000 shares fully paid stock, Eva Gold Mines. Ltd.	<hr/>
	\$220,000.00
<i>Profit and Loss.</i>	
	Dr.
Balance brought forward	\$ 17,768.82
Management	500.00

During the year we have practically completed equipment, developed the mines and brought our tonnage up to a respectable amount. This property, with its equipment and development, has been pushed with greater vigor and shown better results within the time specified than many others in this Western country.

On January 1, 1904, your superintendent, Mr. Edward E. Reynolds, C.E., took charge of the property, and actual work was begun. Plans for buildings and equipment had previously been made, but no work, other than preliminary, had then been done. During the year the machinery was received, placed in position, buildings erected, railway switches constructed, water-works installed, and generally the whole plant got ready for operation.

Plant.—We have constructed on our property 1.56 miles



Tipple. Power House. Coke Ovens.
International Coal and Coke Co's Colliery at Coleman, Alberta.

General expense	295.16
Balance carried forward	156,908.28
	<hr/>
	\$175,412.26
	Cr.
Eva group	\$152,262.26
Balance at credit bond payments account	23,150.00
	<hr/>
	\$175,412.26

of railway track, which runs by our coke ovens and tipple, and connects with the main line of the coast branch of the C.P.R. Company's Crow's Nest railway. We have a battery of 104 standard beehive coke ovens, 86 of which are completed, and the remaining 18 will be finished so soon as some crown bricks are received. The boiler and power house are built of solid masonry, with stone walls separated. This building is 82 by 78 ft. and contains four 100-h.p. boilers, with foundations and connections already in for two additional boilers, heaters and pumps.

The following were elected directors for the ensuing year: Messrs. Geo. Gillies, W. W. Beer, Harry Bird, P. Lamont, E. C. Arthur, Geo. Robertson, A. H. Gracey, A. L. McCulloch, J. Laing Stocks, A. H. Kelly. Mr. A. H. Gracey was elected managing director and Mr. F. W. Swannell re-elected auditor. At a subsequent meeting of the directors the following officers were elected: President, Geo. Gillies; first vice-president, E. C. Arthur; second vice-president, W. W. Beer; secretary, A. H. Gracey; treasurer, Harry Bird.

INTERNATIONAL COAL & COKE CO., LTD.

At the annual meeting of the International Coal & Coke Co., Ltd., which is operating a colliery situate at Coleman, Alberta, officers and trustees for the ensuing year were elected as follows: Trustees, A. C. Flumerfelt, H. N. Galer, Clement S. Houghton, Will G. Graves and Daniel Shultz. The officers are as follows: President, A. C. Flumerfelt; vice-president and treasurer, H. N. Galer; secretary, Will G. Graves.

The president submitted the first general report of the operations of the company. From this the following has been taken:

In the power room we have two 250-k.w. Westinghouse electric generators, which are directly connected with two 400-h.p. engines; also a compressor for air-haulage system, which compresses to a pressure of 1,000 lb. The electric current generated runs a 150-h.p. motor; this drives an 11-ft. Capell fan, with a guaranteed capacity of 150,000 cu. ft. of air per min. The fan is located about one-third of a mile from the power-house, on an outcropping of No. 2 seam. An air locomotive does all our haulage from inside the mine to the tipple, and this is working very satisfactorily. The tipple is a well-built structure, containing about 300,000 ft. of timber. The bins have a capacity for about 2,500 tons, and are so arranged that the coal and slack drop into separate bins. As the mine-cars of coal approach the tipple, they run over a weigh scale, and from there on to a self-dumping cage, which is raised to the top of the tipple by a 100-h.p. hoist. When these cages arrive at the tip, they dump the coal on to 16-ft. screens, the slack goes through into the slack bins, and the coal on to the picking tables, of which there are two, each 5 ft. wide by 40 ft. long. These are run by a 25-h.p. motor, and as the coal passes over these picking tables, all rock refuse material is picked off. The

machine shop, blacksmith shop and wood-working shop are all under one roof, and we are able to do all our own repairs, which is necessary in a new place. We have a warehouse and stock supply, also duplicate parts of machinery, which stock amounts to about \$15,000.

The coal runs out of the tippie bins by gravity, through a chute into railroad cars. Railway weigh scales are in front of the tippie, so that all coal is weighed as fast as loaded. We have also installed an Ottumwa box-car loader, with a guaranteed capacity of 150 tons per hour; this handles the coal without breakage. The slack for the ovens is conveyed from the slack bins to the coke ovens by electric larries.

At the slope we have a 50-h.p. boiler and a 5 by 7 hoist; these we have used for development work. A larger hoist will be required should shipments be increased, as a large share of our tonnage will come from this slope.

Water System.—We have installed, at a cost of about \$9,000, a water system, to supply the town of Coleman, and our coke ovens and boilers. We have a good supply of pure water, and a pressure of 130 lb. The income from this amounts to \$30 per month, and we expect an increase as the town grows. It is our intention to put in wiring for electric lighting the town. The cost of installing this will be about \$2,000, and the estimated income at first about \$300 per month.

Other buildings belonging to the company are the manager's, superintendent's and foreman's residences, and the office building.

Market.—During the year we shipped 51,060 tons of coal and coke, estimating, of the foregoing amount, 5,000 tons of coke.

Development.—The following figures are self-explanatory:

	Ft.	Ft.
Main entry, No. 2 seam, driven	2,776	
Airway, No. 2 seam	2,685	
Cross-cuts between levels	2,364	
		7,825
Main entry, No. 4 seam	947	
Airway, No. 4 seam	925	
Cross-cuts between levels	653	
		2,523
Top lift, No. 2 seam, entry	314	
" " " " airway	244	
" " " " cross-cuts	242	
		800
Slope, No. 2 seam	284	
Slope, No. 2 airway	313	
Cross-cuts between slope and airway	233	
		830
Total footage of entries, airways and cross-cuts driven in coal		11,978
Rock-work done in the mine is as follows:		
	Ft.	
Slope in rock, 7 by 10 ft.	160	
Tunnel from No. 2 to No. 4 entries, 7 by 14 ft.	240	
Tunnel from No. 2 to No. 4 seams, between airways, 7 by 14 ft.	182	
Tunnel from No. 2 to No. 1, 6 by 8 ft.	55	
Second tunnel from No. 2 to No. 1, 6 by 8 ft.	52	
		699

Output.—No. 2 seam is now sufficiently developed to produce 600 tons daily, and No. 4 seam about 250 tons daily. We can easily push our headings and airways much faster than is necessary to maintain this output, so that by this means the capacity for production of No. 2 could be raised to probably 1,000 tons in a period of four months, while the capacity of No. 4 could be doubled in the same time. No. 4 seam will average about 6 ft. in thickness, and No. 2 seam 12 ft.

The machinery and buildings are all planned to handle 2,000 tons daily, so that with a small additional expenditure, if the market can be secured, it will be but a short

time before the capacity for 2,000 tons product per day can be reached.

General.—We have experienced difficulties incident to all coal mining operations, but during the past year there have been no serious accidents and no loss of life or limb. We have given special attention to safety in every regard—as to timbering, general work in the mines and particularly as to ventilation.

Authority will be asked to issue bonds on the property, for a sum to be decided upon, in order that existing liabilities and ways and means for further development when conditions shall justify it, may be provided for, as if obligations are met from the earnings of the company, it will be a considerable time before a dividend may be expected, whereas, if bonds for the amount of our indebtedness are issued at a fixed rate and disposed of, we shall look forward to early dividends from our general operations.

ROSELLA HYDRAULIC COMPANY.

The published balance sheet of the Rosella Hydraulic Company, of Victoria, the operations of which are carried on in North-eastern Cassiar, shows the following figures as at November 30, 1904:

<i>Liabilities.</i>	
Authorized capital	\$250,000.00
Capital account (viz. shares at par in purchase of property)	100,000.00
Other shares allotted	15,730.33
Accounts payable	5,940.34
	<u>\$121,670.67</u>

<i>Assets.</i>	
Property (purchase price in shares)	\$100,000.00
Machinery, plant, ditch, trail, stores, etc.	17,508.08
Office furniture, typewriter, etc.	200.00
Accounts receivable	121.55
Cash on hand and in bank	92.93
Balance due company on shares	3,748.11
	<u>\$121,670.66</u>

The directors elected for 1905 are: W. K. Houston, Victoria (president); L. Manson, Nanaimo (vice-president); Dr. Elliott S. Rowe (treasurer), Dr. G. L. Milne, W. Dee, W. A. Sprinkling, J. T. Croot, Victoria; Geo. H. Cowan, J. Ley, Vancouver. H. H. Jones is secretary of the company and J. W. Haskins, manager.

BRITISH COLUMBIA (ROSSLAND AND SLOCAN) SYNDICATE, LTD. A meeting of the British Columbia (Rossland and Slocan) Syndicate, Ltd., was held on February 9 in London, England, Mr. Geo. S. Waterlow presiding.

The chairman explained that the holding of the meeting had been somewhat delayed owing to the absence from England of the managing director and himself, who had been detained in Canada in connection with negotiations for consolidating several important mining and other interests there, which it was thought would be generally beneficial to Rossland, and to British Columbia as a whole.

As regards the accounts, he called attention to the fact that they had been set out in more detail than in former years, in accordance with the wishes expressed by a shareholder at the last annual meeting, and did not therefore seem to require any further explanation. He was hopeful of the outlook in British Columbia, and added that though there had been many difficulties to deal with, he was glad to say that things were looking better now as regards the future; and he hoped by the time they met again the directors would be able to report much satisfactory progress. The report and accounts were adopted and the retiring director, Mr. H. Beauchamp, was re-elected.

PRINCE MINING CO., LTD.

The sixth annual meeting of the Prince Mining Co., Ltd., owning copper properties in Standard Basin, Big Bend, north of Revelstoke, was held at Revelstoke on 8th inst. Besides

a number of local stockholders, there were present from Missouri, U. S. A., Dr. G. A. Delamater of Rich Hill, Mr. Jerry Culbertson of Harrisonville, and Mr. H. P. Smith of St. Louis. There were represented at the meeting nearly 600,000 shares, personally and by proxy. The annual statement presented by the directors showed a satisfactory financial condition, amounts owing to the company exceeding its liability by \$9,349.

The number of directors was increased to seven, the following now forming the board: Messrs. W. M. Brown, president; Hardie P. Smith, vice-president; J. M. Scott, secretary-treasurer; C. J. Rumens, superintendent; H. J. Bourne, Jerry Culbertson and Dr. G. A. Delamater, fiscal agents.

GOLD REEF MINING & MILLING CO.

The seventh annual general meeting of the Gold Reef Mining & Milling Company was held at Rosslaud on February 13. In the absence of Mr Conrad Wolfe, the mining expert, who was unavoidably absent, the president, Mr. W. B. Townsend, presented a report on the work done on neighbouring properties.

It was decided to make a trip to the property, which is in Ymir camp, as soon as the snow was gone, and some dozen shareholders present said they would be of the party, which probably would be under the leadership of a practical engineer. The excursion would be in June. It was determined also that stock would be offered so as to create a fund for developing the Rainy Day claim, to ascertain where it would be proved up sufficient to command a fair figure, and during development to send the ore to the neighbouring Fog Horn concentrator when that shall be built. The old board of directors was re-elected by acclamation.

BRITISH COLUMBIA COPPER CO., LTD.

At the general meeting of shareholders in the British Columbia Copper Co., Ltd., held in New York last month, the report of the directors and the balance sheet as at the close of business on November 30, 1924, were submitted. The audited statement of accounts covered a period of two years. The directors' report follows:

Since the last annual meeting your company has operated its two furnaces with fair regularity with ore from your own mines and with some custom ores from neighboring mines valuable to our own fluxes.

The development of your mines has been favorable and you have quite as much ore in sight and proven as at the time of the last report submitted to you.

Up to this time the net earnings have been variable but, barring accidents, we anticipate more regular and improving results.

Our converter plant has been in operation for some time, and has proven to be of material benefit in enabling us to ship blister copper 99 per cent fine instead of matte carrying 45 per cent copper.

The large accumulation of flue dust made a briquetting plant absolutely essential, and it is now being installed and will be in operation shortly. The extraordinary cold weather prevailing has delayed its completion.

We have equipped our whole plant for operation by electricity as motive power and we have also installed an electric locomotive and system for the economical handling of our slags.

There have been some serious obstacles to continuous operation of our plant, besides some unavoidable accidents during the past two years, yet we believe that our costs for mining, smelting and converting will compare favorably with those of any similar plant.

The company has disposed of 73,250 shares of treasury stock during the two years aforesaid and has expended upon additions to plant and in acquiring new mining interests in the same period \$320,780.

The company has also recently obtained interests in options on important properties in our region believed to carry good copper values, the ores of which can be cheaply mined and reduced.

We purpose doubling immediately our blast furnace capacity.

The statement of assets and liabilities is as under:

<i>Assets.</i>		
Mining property, mines, smelter buildings, machinery, real estate, etc.		\$1,580,780.90
Greenwood City debenture bonds.	\$ 3,600.00	
Accounts receivable	53,282.25	
Finished products, supplies, ores, etc., on hand	122,947.59	
Cash on hand and in banks	13,817.82	198,647.66
		\$1,779,428.56
<i>Liabilities.</i>		
Capital stock, authorized issue	\$2,000,000.00	
Issued		\$1,576,750.00
Accounts payable	110,106.76	
Bills payable	3,650.00	113,756.76
Surplus earnings for 2 years		88,921.80
		\$1,779,428.56

This company owns the Mother Lode mine and adjoining group of mineral claims situate near Greenwood, in the Boundary district, a three-fourths interest in the Emma mine, Summit camp, in the same district, and the smelter and copper converting works at Greenwood. Arrangements are already in progress for the doubling of the furnace capacity, mentioned in the report.

LE ROI MINING CO., LTD.

The report of the directors of the Le Roi Mining Co., Ltd., was published in the February number of the *MINING RECORD*. That of the managing director (condensed), together with the balance sheet and statement of profit and loss account for the same period are now given:

During the fiscal year ending June 30, 1924, the operations of your company were carried out upon an extensive scale. As the principal officials who were responsible for the work of the year are not now in the employ of the company, it is somewhat difficult to prepare a comprehensive report.

Mining Properties.—The mining properties owned by the company are the Le Roi and Black Bear mineral claims, and the Le Roi Star, Pearl, Ruby and Le Roi-Annie fractional mineral claims. These together cover an area of 71.45 acres. Upon the recommendation of Mr. S. F. Parrish, the company during the winter acquired an interest in the Pack Train mineral claim, which adjoins the Le Roi.

The principal tonnage of ore extracted during the year came from what is known as the middle vein, though a larger tonnage than heretofore was taken from the south vein. A small amount of high grade ore came from the north vein, and from the old workings in this part of the mine.

During the year exploration work was vigorously carried on with a view to the discovery of new bodies of ore of payable value; this demonstrated the existence of large bodies of ore, particularly on the 600, 700 and 800-ft. levels of the south vein.

On the 1,350-ft. level, 2,564 ft. of exploration and development work was done, in addition to a large amount of diamond drilling, and, while the results were not so satisfactory as Mr. Parrish hoped, they have been of value in demonstrating the existence of ore in the lower levels of the mine. The official records show that up to June 30 2,620 tons had been shipped from this level, of an average value of \$8.29 per ton. Whilst the area of mineralization on the 1,350-ft. level is extensive, the ore of smelting value, so far as at present known, is limited in extent. Efforts are being made to locate ore at greater depth in the mine.

Mr. Parrish, who was general manager for the greater part of the year under review, did not, before leaving, make any estimate concerning the ore reserves, whilst Mr. Mackenzie in his cable published on May 9th, estimated the values, but did not touch upon the questions of quantities of ore in the mine. The following extract from a letter

written to me by Mr. Parrish, at the time he left the service of the company last summer, may be of interest:

"When I came to the mine in February, 1903, its life had been limited to the coming summer, and, as the slang phrase has it, 'I was up against it;' this seemed to be quite true at first until a new body of ore was found on the 1,050-ft. level further to the west than anything heretofore found on this level. After this, systematic prospecting was followed to the south on the upper levels and 1,350-ft. level, with the result of disclosing large bodies of ore heretofore not discovered. The importance of this work in adding to the life

(the refiners paying for the same at the price current nearly three months after the ore reaches the smelter), it largely explains how the operations of the company have resulted in a loss. Since April last, the sampling has been done by the new sampler installed at the Northport smelter, and a check system has been established upon both sampling and assaying, making a repetition of such discrepancies highly improbable.

Operating Expenses.—The subjoined table gives the comparative costs under this head for the years 1901, 1902, 1903 and 1904:



Head—Frame 85 ft. high, and Power House at Combination Shaft, about 1,500 ft. deep.

Headworks over Old Shaft, about 1,000 ft. deep (not now used.)

Part of Le Roi Mining Co.'s Surface Works at Rosslund, B. C.

and future of the mine I consider very great.

"The discovery of ore at 1,350 ft. is valuable in many ways, opening up as it does possibilities as to the future.

"Between the 1,050-ft. level and the bottom or 1,350-ft. level, there is, so far as known at present, a barren zone, the only work done here being on the 1,200-ft. level, where nothing has yet been found."

In addition to the ore reserves from which we are constantly shipping to the smelter, there are very large bodies of ore in the mine of a grade too low to bear the cost of mining and smelting, which we hope to concentrate at a profit.

Ore Production, etc.—The books of the Rosslund office show that the ore mined and shipped to Northport during the year amounted to 160,109,944 dry tons, its metal values averaging: Gold, .387 oz.; silver, .49 oz.; and copper, 1.155 per cent per ton. Its gross value was \$1,752,024.57, equal to \$10.94 per ton, and the entire operating expenses for the same period was \$10.57 per ton. The second class ore shipped from the dump to Northport during the year amounted to 19,013,657 dry tons, its metal values averaging: Gold, .279 oz.; silver, .38 oz.; and copper, .645 per cent per ton. Its gross value was \$143,078.17, equal to \$7.525 per ton, and the total expense of handling and treatment was \$6.196 per ton.

Whilst the books of the Rosslund office show the contents and value of the ore shipped from the mine to the smelter to be as above stated, yet, in the light of investigation made last spring, it is quite clear that the figures are based on over-estimates of the metallic contents of the ore. This matter has already been referred to in various cables and reports, showing that faulty sampling and assaying at the mine were chiefly responsible for this, and for the shipment from the mine to the smelter of considerable ore of a grade too low to yield any profit. If to the above be added over-estimates of the metallic contents of nearly 50,000 tons of ore and other products on hand at the smelter at the beginning of the fiscal year, and the losses caused by realizing upon our copper on a falling market

	Per ton, 1901.	Per ton, 1902.	Per ton, 1903.	Per ton, 1904.
Stopping and loading on railroad	\$ 3.487	\$ 3.100	\$ 2.715	\$ 2.654
Exploration and devel'm't	.423	.451	.899	.944
Depreciation—				
Mine equipment . . . . .	.080	.138	.081	—
Surface improvements . . . . .	.050	.061	.064	.070
Mine machinery . . . . .	.106	.125	.144	.130
Pearl and Ruby claims and sundries . . . . .	.....	.....	.011	.007
Freight on ore to smelter . . . . .	.510	.400	.367	.340
Smelter expense	4.465	4.205	4.319	3.922
Depreciat'n of smelter plant	.232	.119	.208	.183
Interest and discount on ore in yard and matte in transit . . . . .	.239	.233	.375	.223
Freight on matte to refiners	.536	.404	.440	.204
Sacking and crushing matte	.044	.043	.054	.032
Eastern representation, as- saying, etc. . . . .	.028	.013	.022	.016
Penalty for low copper . . . . .	.....	.....	.091	.043
Refiners' Tolls . . . . .	.534	.579	.741	.462
Metal losses in smelting . . . . .	.....	.781	.839	1.340
	\$10.724	\$10.652	\$11.370	\$10.570

Notwithstanding that nearly \$49,000 of the exploration costs carried forward in capital account from the years 1901, 1902 and 1903 have been charged to the present year's costs, and that an allowance of over 75 per cent has also been made for the depreciation of development performed in the year ending June 30, 1904, it will be noticed that there is a reduction in most of the items of expenditure enumerated in the above table, these amounting in the aggregate to a reduction in costs of 80 per cent as compared with the preceding year. The improvement in this respect is particularly noticeable in connection with smelting costs.

Exploration and Development.—The amount written off capital account on June 30, 1904, for work performed during the years 1901, 1902, 1903 and 1904, segregated as below, was \$151,202.66:—

1901	\$18,393.51
1902	7,208.44
1903	23,268.70
1904	102,332.01
	<hr/>
	\$151,202.66

During the year the sum of \$134,571.84 was expended on the exploration and development of the mine. The details of the work performed and costs are as follows:—

Work.	Ft.	Cost. \$	Cost per Ft.
Combination shaft		561.24	....
Station-cutting		59.87	....
Pocket-cutting		488.60	....

	\$152,917.89
Less credit for machinery, sold, etc.	2,606.00
	<hr/>
	\$150,311.89

The sum charged to profit and loss, distributed as follows, was \$609,247.97
 Stopping ore from mine. \$424,932.97

Depreciation:—

Surface improvements and buildings..	11,203.51
Machinery and plant	20,728.53
Exploration and development.. . . .	151,202.66
Assay and surveyor's instruments.. . .	174.87
Furniture	357.87
Pearl and Ruby claims..	410.28
Horse, vehicle and harness..	237.28



Le Roi Mining Co.'s Smelting Works at Northport, Washington, U. S. A.

Raising	513.5	15,918.15	\$31.00
Winzing	32.5	1,579.34	48.59
Cross-cutting..	3,212.5	45,432.47	14.14
Drifting	2,813	40,237.47	14.30
Diamond drilling..	8,693	30,294.70	3.48
	<hr/>	<hr/>	
	15,264.5	\$134,571.84	

Review of Mine Expenditure.—During the year the gross expenditure for operating and equipping the mine amounted to \$580,735.70.

The amount expended on revenue account, segregated as below, was.	\$430,423.81
Stopping ore from mine..	\$424,932.97
Loading second-class ore..	5,490.84

The amount expended on capital account, segregated as below, was.	\$150,311.89
Surface improvements and buildings..	719.66
Furniture..	639.66
Horse, vehicle and harness	545.30
Machinery and plant	527.00
Mine equipment	4,522.76
Exploration and development.. . . .	134,571.84
Pack Train mineral claim	11,391.66

Northport Smelting Works.—These works are admirably situated on the Columbia river at Northport, Washington, U.S.A., and are distant about 17 miles from the Le Roi mine, with which they are connected by the Spokane Falls and Northern railway, a branch of the Great Northern railway system. The plant is large and well equipped and consists of six large water-jacket copper matting furnaces, three calcining furnaces, sampling works, pug mills, briquetting machines, etc.

In October, 1903, machinery for new sampling works was ordered. This should have been shipped by the manufacturers within 60 days, but various delays occurred, owing to which the plant was not installed until March, 1904. It is a thoroughly up-to-date plant and is doing excellent work.

Our contract with the Nichols Chemical Company, of New York, having expired on June 1st, Mr. E. J. Wilson, at that time smelter manager, arranged a temporary contract with the Tacoma Smelting Company, which was much more favorable to this company than the former one.

The ores smelted during the year amounted to 226,298.732 tons. The matte shipped was 3941.359 tons, of the net value of \$1, 852,243.06, equal to \$469.95 per ton.

The company's holdings in the name of the Northport Smelting and Refining Company remain the same as on June 30th, 1903.

For reasons referred to in an earlier part of this report, the smelter was closed down for about five weeks in March and April, thus adding considerably to the average working costs of the year. The details of the expenditure are given below:—

The total working expenses for the year, segregated as follows, amounted to..	\$953,706.28
Smelting ores	\$887,652.80
Matte charges.. .. .	71,053.48
<hr/>	
The total expenditure on capital account, made up as follows, was .. .	15,194.68
Buildings.. .. .	409.23
Bins, trestles and roast yards .. .	190.82
Flume for water supply.. .. .	7,568.62
Water and fire protection system..	53.80
Machinery	\$7,388.37
Credited with.. .. .	400.00
	<hr/>
	6,988.37
Telephone system	219.12
Flora mineral lode	97.99
Furniture and furnishings	125.73
	<hr/>
	\$15,453.68
Tramway and equipment credited with	259.00

Concentration.—During the fiscal year the question of concentrating the low grade ores of the mine has received careful attention. In the month of June a small mill was leased near Rossland in which to carry out tests, but the results did not prove to be very satisfactory. Further investigation is being made, and though the question of treating Rossland ores to the best advantage by concentration is a difficult one to solve, I am hopeful of ultimate success.

Concluding Remarks.—My visit Rossland, in May and June last, made it quite clear to me that I could not assume responsibility for the acts of others unless I were invested with a larger measure of authority than heretofore, and it further convinced me that I could only hope to straighten out the affairs of the company by acting as general manager myself. Accordingly I was appointed general manager on September 1st, since when I have thoroughly reorganized the staff, and now have as heads of the mining, melting and accounting departments, experienced and capable men who are working harmoniously together. I have made it my special business to place the finances of the company upon a sound basis, and have succeeded in very greatly reducing the amount due to the Bank of Montreal, with the result that the finances of the company are to-day in better condition than they have been for years past. By the introduction of more economical business methods the cost of mining and smelting has also been reduced.

As this report is for the year ending June 30th, I will not say anything more regarding the business of the current fiscal year.

Balance Sheet.

	£		s. d.		Dr.	
	£	s. d.	£	s. d.	£	s. d.
To Capital Authorised—						
200,000 Shares at £5 each..	1,000,000	0 0				
Less calls in arrear..	38	0 0				
			999,962	0 0		
To Sundry Creditors—						
London.. .. .	355	14 1				
Rosslaud	14,660	5 8				
			15,015	19 9		
To Bills payable,						
Bank of Montreal—						
Rosslaud			110,520	16 0		
Secured by charge on ores and matte at smelter and in transit, and stores in hand.						
To Unclaimed dividends.. .			37	10 0		

To profit and loss account—						
Balance brought forward from last year	188,992	10 11				
Less Loss for year ended 30th June, 1904, as per account	88,194	16 6				
			100,797	14 5		
Subject upon distribution to the percentage payable to the directors under special resolution of 2nd December, 1898.						
			£	s. d.	£	s. d.
By Property—						
Balance at 30th June, 1903	972,871	1 11				
Add—Interest acquired in further claim	2,348	16 10				
			975,219	18 9		
Less—						
Sale of Town-sites, etc.	19	16 0				
Amount written off sundry mining claims..	84	11 10				
			104	7 10		
					975,115	10 11
By machinery and plant, at 30th June, 1903	29,220	19 11				
Add—Expenditure during year	108	13 2				
			29,329	13 1		
Less—Machinery sold	515	9 3				
Depreciation	4,273	18 5				
			4,789	7 8		
					24,540	5 5
By mine equipment, at 30th June, 1903	4,184	2 1				
Add—Expenditure, less sales during year.. . . .	920	19 7				
					5,105	1 8
By surface improvements and buildings, at 30th June, 1903	15,438	8 8				
Add—Expenditure during year	148	7 9				
			15,586	16 5		
Less—Depreciation	2,310	0 0				
					13,276	16 5
By smelter plant and buildings, at 30th June, 1903	40,218	6 2				
Add—Expenditure during year	3,107	0 0				
			43,325	6 2		
Less—Depreciation	8,213	7 7				
					35,111	18 7
By mine exploration and development, at 30th June, 1903.. . . .	32,637	9 3				
Add—Expenditure during year	27,746	15 5				
			60,384	4 8		
Less Amount written off.	31,175	16 2				
					29,208	8 6

By expenditure on concentration tests, carried forward	668	9	2	To interest	10,419	11	8
By furniture, fixtures, etc., at London and Rossland, at 30th June, 1903	1,669	8	0	To London expenditure—			
<i>Add—</i> Expenditure during year	186	1	10	Rent, etc.	\$1,089	6	8
	1,855	9	10	Salaries	1,318	6	7
<i>Less—</i> Depreciation—					2,407	13	3
London	86	0	10	<i>Less</i> rents received	641	13	4
Rossland	231	17	0		1,765	19	11
	317	17	10	Sundry office charges	644	17	7
	1,537	12	0	Managing directors's salaries and travelling expenses	625	0	0
By horses, vehicles and harness	195	13	11	Depreciation on office furniture	86	0	10
<i>Less—</i> Depreciation	48	18	6		3,121	18	4
	146	15	5	To income tax	1,779	16	8
By ores and matte at smelter, in hand and in transit, as estimated by the general manager	79,670	4	7	To audit fees in London and Rossland	183	14	6
<i>Less</i> drafts against shipments	20,156	14	0	To exchange	39	0	1
Charged against advances as per contra.					£572,594	18	7
By stores in hand at mine and smelter	13,930	1	6		Cr.		
<i>Less—</i> Depreciation	206	9	6	£	s.	d.	
Charged against advances as per contra.				By matte sales (net proceeds)	403,170	12	7
	13,723	12	0	By rents received from Rossland properties	1,149	12	1
By ores on dump at mine	18,180	2	11	By ores and matte at smelter, in hand and in transit, as estimated by the general manager	79,670	4	7
By unexpired insurance	383	1	0	By dividend received upon claim against the British America Corporation	280	16	4
By sundry debtors—				By transfer fees	128	16	6
London	347	3	4	By balance carried to balance sheet	88,194	16	6
Rossland	45,184	8	0		£572,594	18	7
	45,531	11	4				
By Cash at bankers and in hand—							
London	2,162	15	0				
Rossland	1,628	9	3				
	3,791	4	3				
	£1,226,334	0	2				

Profit and Loss Account.

	£	s.	d.	Dr.	£	s.	d.
To ores and matte at smelter, in hand and in transit, at 1st July, 1903, as estimated by the then manager				185,918	19	1	
To ore production—							
Mining, including management and general expenditure in Rossland	87,604	14	9				
Amount written off sundry mining claims and mine development	31,260	8	0				
Depreciation on machinery and plant, surface improvements and buildings, and furniture, fixtures, etc., at Rossland	6,742	13	10				
	125,607	16	7				
To Smelting—							
Working expenses at smelter, including freight and ores purchased from public	236,982	4	6				
Depreciation on smelter plant and buildings	8,335	7	8				
Depreciation on stores account	206	9	6				
	245,524	1	8				

To interest	10,419	11	8
To London expenditure—			
Rent, etc.	\$1,089	6	8
Salaries	1,318	6	7
	2,407	13	3
<i>Less</i> rents received	641	13	4
	1,765	19	11
Sundry office charges	644	17	7
Managing directors's salaries and travelling expenses	625	0	0
Depreciation on office furniture	86	0	10
	3,121	18	4
To income tax	1,779	16	8
To audit fees in London and Rossland	183	14	6
To exchange	39	0	1
	£572,594	18	7
	Cr.		
	£	s.	d.
By matte sales (net proceeds)	403,170	12	7
By rents received from Rossland properties	1,149	12	1
By ores and matte at smelter, in hand and in transit, as estimated by the general manager	79,670	4	7
By dividend received upon claim against the British America Corporation	280	16	4
By transfer fees	128	16	6
By balance carried to balance sheet	88,194	16	6
	£572,594	18	7

The report and accounts were adopted, and Sir Henry Tyler was re-elected a director of the company.

REVENUE FROM MINING.

From a return, made last month to the order of the House, giving an abstract of the receipts and expenditures of the province for the half-year ending December 31, 1904, the following items of revenue derived from mining have been taken:—

Free miners' certificates	\$ 6,381.67
Mining receipts, general	57,559.57
Mineral tax	42,497.19
Royalty and tax on coal	36,947.50
Bureau of mines	272.50
Crown granted mineral claim tax	26,554.61
Total	\$170,213.04

The mining industry also contributed an appreciably large proportion of the revenue tax receipts and, too, some of the property tax.

ZINC NOTES.

Mr. Geo. W. Hughes is shipping 1,200 tons of zinc ore from his Lucky Jim mine, near Bear lake, in Ainsworth mining division, to Kansas. He is reported to have made a contract for further shipments after he shall have delivered the quantity above-mentioned.

The Bell mine, near Whitewater, is stated to have contracted to ship 300 tons of zinc ore to an American smelter.

The Last Chance mine, near Sandon, is shipping zinc ore to Pueblo, Colorado. The American Boy, also near Sandon, has made its first shipment of zinc ore, having sent 65 tons to Kansas.

Up to the first week in March the Lucky Jim mine had shipped 2,175 tons of zinc and the Slocan Star 1,110 tons.

The machinery is being installed at the zinc enriching works

at Rosebery, Slocan lake, and more building is to be done shortly at these works.

Preparations are being made at Kaslo for putting in the plant for dealing with zinc ores at the Kaslo sampling works. Part of the machinery has been received from Denver, Colorado.

Some 50 men are reported to be employed on construction work at the zinc smelter the Canadian Metals Company is erecting at Frank, Alberta.

MINING LABOUR UNIONS IN 1904.

From the *Labour Gazette*, issued by the Department of Labour, Ottawa, it is learned that during 1904 fourteen mining labour organisations were formed and four dissolved. Four of the new unions were in affiliation with the United Mine Workers of America and were reported from the North-west Territories, or British Columbia, two were branches of the W. F. of M., formed in British Columbia, and six were new lodges chartered by the Provincial Workmen's Association of Nova Scotia. The remaining new organization was a rock drillers' union, formed at Niagara Falls, Ont., chartered by the American Federation of Labour. The dissolved unions included a branch each of the Western Federation of Miners, the United Mine Workers of America, the Provincial Workmen's Association, and the Quarrymen's Protective Association.

PERSONAL.

Mr. Frank B. Smith, inspector of coal mines for the North-west Territories, is in Victoria.

Mr. W. E. Zwicky, of Kaslo, general manager of the Rambler-Cariboo Mines, Ltd., has gone on a business trip to mining centres in Colorado and Montana.

Mr. Gust. Sundberg, at one time chief chemist at the B. C. Copper Co.'s smelting works, Greenwood, and later with the Alaska Smelting & Refining Co., Hadley, Ketchikan district, South-east Alaska, is now at Guadalajara, Jal., Mexico.

Mr. W. R. Rust, general manager of the smelting works at Tacoma, Washington, has returned to his post after having visited Los Angeles, California.

An interested spectator at all the meetings of the Canadian Mining Institute, held recently in Montreal, was Mr. W. J. Johnston, of New York, publisher of the *Mining Magazine*, who was elected a member of the Institute.

Mr. Geo. Alexander, manager of several mining companies operating in the Ainsworth and Slocan districts, and of the Kootenay Ore Co.'s sampling works at Kaslo, was expected to return from England about the 14th inst.

Mr. Geo. D. Potter, manager of the Blue Bird mine, Slocan, has gone to Spokane for a few weeks' change.

Mr. M. S. Logan, manager of the Juno mine, Nelson, was in Victoria recently, en route north on a business visit to the Port Simpson district.

Mr. F. C. D. Haggard, a director of the Le Roi No. 2, and Mr. Alexander Hill, consulting engineer for the same company, have arrived in Rossland from London, for the purpose of looking over the properties of the Le Roi No. 2.

Mr. S. F. Parrish, formerly general manager of the Le Roi Mining Co., lately visited southern Arizona to examine a group of mining properties for clients.

Mr. Wynne Meredith, consulting engineer to the Vancouver Power Company, has returned from San Francisco.

Mr. J. Cleveland Haas has returned to Spokane from a professional visit to Arizona, whence he went for parties interested in mining properties down there.

Mr. M. E. Purcell has been appointed assistant superintendent of the Centre Star and War Eagle mines, Rossland.

Mr. F. Hobart, one of the associate editors of the *Engineering and Mining Journal*, New York, attended the recent annual meeting of the Canadian Mining Institute, held at Montreal, Quebec.

Mr. Allan McLean, of London, a director of the Velvet-Portland, and Mr. William Thompson, consulting engineer

for the same company, were expected to arrive in Rossland about the middle of March.

Mr. T. L. Savage, of Northport, Washington, who with others is opening up the Big Ledge group, a promising zinc property in the Arrow Lake mining division, was in Victoria late last month.

Mr. A. J. McMillan, general manager of the Le Roi Mining Co., Rossland, and Mr. T. G. Blackstock, of Toronto, passed through New York two or three weeks ago, on their return from London, England, where they attended the annual general meeting of the Le Roi company. Mr. McMillan is now in Rossland.

Mr. Geo. S. Waterlow was in New York about the first of this month, on his way to Canada. It is understood that this visit is in connection with the furthering of the scheme for the amalgamation of British Columbian mining and smelting properties, to which he has given for some time almost unremitting attention.

Mr. Sam W. Hall, at one time superintendent of the Iron Mask mine, Rossland, is now general manager for the Madison Lead & Land Co., near Fredericktown, Mo.

Mr. J. E. McAllister, superintendent of the B. C. Copper Co.'s smelter, went to New York last month in connection with the intended doubling of the furnace capacity at the company's works at Greenwood, Boundary district.

Mr. P. J. Hickey has retired from the management of the Minnesota Silver Co.'s mine and mill at Sandon, Slocan, and has been succeeded by Mr. J. B. Kendall, who came from the Coeur d'Alene district of Idaho.

Mr. Emil F. Voigt, C. E., of Voigt's camp, Similkameen, spent a week of last month in Victoria before proceeding to Montreal on business affecting the opening up of the district he is so largely interested in.

Mr. A. D. Wheeler has resigned the management of the B. C. Standard Mining Co.'s Hunter V. group of mines, near Ymir, and has been succeeded by Mr. R. W. Brigstock.

Mr. W. Thibaudeau, who recently resigned the office of territorial engineer for the Yukon, is down from the north.

Mr. Simon Guggenheim is reported to have given the trustees of the Colorado State school of mines \$50,000 for a new school building.

At a late meeting of the California Mining Association, Senator Campbell read a paper on "Working gravel mines with hydraulic elevators."

Mr. Paul Poliski, one of the national officers of the United Mine Workers of America, reached Coleman, Alberta, from Mount Carmel, Penn., last month in connection with the strike of coal miners at Coleman.

Mons. Pierre Maris, manager of the Cork mine, south fork of Kaslo creek, is expected to return to Kaslo from France next month.

Mr. Oliver Hartline has arrived at Rossland from California. He has just graduated as a mining engineer from the California State University, where he took the full course.

Mr. Melbourne Bailey, manager of the Cariboo Consolidated mining properties, has returned to La Fontaine, after having visited Baltimore, New York, Philadelphia and other eastern cities.

Mr. E. W. Keith, of Denver, Colorado, representing the Empire Zinc Co., was in the Slocan lately on zinc purchasing business.

Mr. L. A. Thomas, of Bellingham, Wash., manager of the International Gold Mining Company, operating near Yale, has returned from a trip to California.

Mr. F. M. Tweedie, manager of the Princess Royal Gold Mine, Princess Royal Island, has returned north, after a short visit to Victoria and Vancouver.

Mr. J. M. Jenckes, of the Jenckes Machine Company, of Sherbrooke, Que., accompanied by Mr. R. P. Williams, the company's agent at Rossland, is visiting the coast. En route they stopped off at Kamloops to see the Iron Mask mine.

Mr. J. L. Retallack, of Kaslo, is in Ottawa on business. While there he will urge on behalf of the Associated Silver-lead Mines, the appointment by the Dominion government of a competent expert to report on the zinc resources of British Columbia.

Mr. Earl F. Salisbury, late assayer at the Eva mine, Cam-

borne, has accepted a more important and remunerative position in Mexico.

Mr. J. A. Darragh, manager of the Silver Dollar mine, Fish river camp, has returned from a four months' visit to the middle States. During his trip through the south and west he did useful missionary work in the interests of the mining industry of Lardeau and Big Bend.

Mr. E. J. Roberts, who was chief engineer of the Spokane Falls & Northern, and Nelson & Fort Sheppard railways, but who is now general manager of the Federal Mining & Smelting Company, was in Victoria last month. Part of his duties is to look after the construction of the Sullivan mines' smelter at Marysville, East Kootenay, in which some of the Federal people are financially interested.

The marriage took place in Victoria last month of Mr. James Porter, gold commissioner for Telegraph creek, Cassiar district, to Miss Georgina Richardson, third daughter of Mr. George Richardson. The ceremony was performed by the Ven. Right Rev. Bishop Cridge. Mr. and Mrs. Porter left the same evening by the steamer Umatilla on a honeymoon tour to California points.

Mr. E. T. Corkill, B.Sc., who was appointed inspector of mines for Ontario last month, in succession to Mr. W. E. H. Carter, resigned, has commenced his duties. He is a native of Frontenac county, is 25 years of age, and a graduate of Queen's University in mining and engineering. He has had practical experience in Canada and the United States as a working miner and as a superintendent, and his qualifications for the position both in experience and technical training are excellent.

It is understood that three members of the staff of the Geological Survey of Canada will work in Yukon Territory through the 1905 field-work season. Mr. R. G. McConnell will again give attention to the Alsek country. Mr. Joseph Keele will also spend the season in the Yukon, and probably Mr. Chas. Camsell, who joined the survey staff last June. It is stated that these geologists will shortly reach the coast from Ottawa and proceed north, so as to be able, by making an early start, to take full advantage of the whole season.

Among the representatives of smelting works who were in Victoria last month to oppose the passing of the bill introduced into the local Legislature, the object of which was to secure an 8-hour day for all smelter employees, were Mr. Jules Labarthe, superintendent, and Mr. D. W. Moore, of the Canadian Smelting Works, Trail; Mr. J. J. Campbell, manager of the Hall Mining & Smelting Co., Nelson; Mr. Frederic Keffer, general manager of the British Columbia Copper Co., Greenwood, and Mr. Thos. Kiddie, manager of the Tyee Copper Co.'s smelter, Ladysmith, Vancouver Island. Mr. E. J. Roberts, manager of the company about completing the lead smelter at Marysville, East Kootenay, was also down, but made his visit short.

ASSAYERS' EXAMINATIONS.

The result of the examinations of assayers held at Nelson on December 5, 1904, has been gazetted and certificates of efficiency, under section 2, sub-section (2) of "Bureau of Mines Amendment Act, 1899," have been issued to the following:

Cavers, Thos. Williard, Trail, B. C.
McMurtry, Gordon O., Rossland, B. C.
Sullivan, Michael Henry, Trail, B. C.
Swinney, Leslie A. E., Ferguson B. C.

In accordance with the Act, examinations for efficiency in the practice of assaying will be held at Victoria, B. C., on 25th April, prox., and on such following days as may be found necessary.

Examinations will cover the following subjects, and candidates must be prepared to be examined in all of these subjects:—

(a.) A knowledge of the principles of inorganic chemistry. (b.) Sampling. (c.) Qualitative determination. (d.) Quantitative determination—assaying. Any additional information desired may be obtained from Mr. H. Carmichael, secretary to Board of Examiners, Victoria.

EXAMINATIONS FOR COAL MINE MANAGERS.

Examinations, under the Coal Mines Regulation Act, for coal mine managers, were held at Nanaimo and Cumberland, on Vancouver Island, and Fernie, in the Crow's Nest Pass, on February 14-16. The following candidates were successful in the respective classes in which their names appear, and certificates will be issued to them, according to their classification, by the provincial Department of Mines:

First class—Elijah Heathcote, Norman Fraser and Robert Strachan.

Second class—A. Summerville, J. F. Webb, Thomas R. Jackson, Charles Grahame, Evan Evans and David Nellist.

Third class—William McLellan, R. H. Hodgson, James W. Jenson, John Doney, James Perry, Joseph Smith, John Weeks, David Crawford, C. M. Taylor, Duncan Thomas, A. G. Watson, John McAlpine, T. A. Spruston, W. A. Jones, Joseph Cook, Joseph Thomas and John Biggs.

The examination at Nanaimo was conducted by Mr. E. Priest, M. E., and Mr. T. Boyce; that at Cumberland by Mr. Thos. Budge, assisted by Mr. A. Dick, and that at Fernie, by Mr. F. H. Shepherd assisted by Mr. John John and Mr. Thos. Morgan.

The board of appointment of examiners consists of Messrs. Andrew Bryden, Thos. R. Stockett, Tully Boyce, George Williams, R. G. Drinnan, John John and A. Dick; with Mr. F. H. Shepherd as secretary.

COAL NOTES.

San Francisco Coal Market.—Mr. J. W. Harrison's circular of February 23, says: "Since our last, no Australian coal has arrived at San Francisco. This shows only two arrivals, with 4,604 tons, since the beginning of the year to date. There are 23 vessels on the chartered list to carry coal from Newcastle to this port; their carrying capacity is about 65,000 tons, but six of the above vessels are already on the way; their cargoes should come to a good market, as the stock of Australian now on hand is becoming very light. Freight quotations from the colonies remain firm, so that no low-price coal can possibly arrive here for several months to come. Local jobbers report good sales at fair figures: our continuous rainy weather has created a liberal demand for household coals during the month. There have been so far this month six coal deliveries by steamers from British Columbia, aggregating 14,432 tons. Fuel oil is still in control of the market for steam uses, and is offered at prices to suit the consumers, so that the small deliveries of coal here since the first of January have made no change in values."

Washington Coal Statistics.—The eleventh biennial report of C. F. Owen, Washington State inspector of coal mines, gives the following figures:

	1903. Tons.	1904. Tons.
Coal mined	3,190,477	2,905,689
Exported from coast	948,909	838,298
Coke made	47,916	46,175

Exports have been affected by the Russian-Japanese war and by the rapid advance in the use of petroleum fuel in California. Local consumption has suffered from the installation of water-driven electric generators, but the utilization as domestic fuel is rapidly growing. All the coke is made in Pierce county.

Nova Scotia's Production.—Nova Scotia's coal output during 1904 showed a very slight gain over the record of the previous year, amounting to 4,622,823 tons, as compared with 4,586,649 tons. This failure to indicate the heavy increase that was confidently expected, is attributed to the severe weather that prevailed during the spring by which shipments were diminished by 300,000 tons from the corresponding amount during the same season of 1903, and to the lighter demand from United States ports. Shipments up the St. Lawrence increased by 211,000 tons, but this advance was offset by a decrease of 200,000 tons in export to the States.

Strike at Coleman Settled.—The labor troubles at the International Coal & Coke Company's mines at Coleman, Alta., have been satisfactorily settled and work is now in full swing again. Mr. A. C. Flumerfelt, president of the company, was reported late in February to have said: "The unfortunate conditions that have existed at Coleman were brought about by a misunderstanding which has happily been adjusted and an amicable settlement has been reached, a contract for two years having been signed on the 21st inst. I was there two days in conference with the representatives of the local and district unions and there were also in attendance two members of the National Board of the United Mine Workers of America, one from Kansas City and the other from Pennsylvania. It is to be hoped, now that an arrangement has been reached with the International Coal Company, that further difficulties will be averted, and that peace and quietness will reign and the industry continue to develop. Work has already been resumed and as speedily as the machinery can be put into operation, the full force will be employed. It is expected, if the markets will take the product, that within two or three weeks the tonnage will reach 1,000 tons per day."

St. John's Ambulance Class.—The St. John's ambulance class started at Nanaimo last September has since been attended more or less regularly by 35 to 40 members. At the examinations, held a few days ago, the following passed: First class honors: W. Kendall, T. Budge, G. Yarrow, H. Allsopp, G. Bradshaw and Jas. Hardy. Second class honors: W. Neave, C. Manifold, Geo. Johnston, Thos. Mills, J. Newton, C. Drake, J. McCourt, Jas. Aitken, Harry Devlin, J. McKenzie, A. Manifold, R. Adam, J. Handlen, J. Tunstall, A. Andrews and F. Green. The gold medal offered by Mr. T. R. Stockett, general manager for the Western Fuel Company, as a prize for the member obtaining the highest average marks, was awarded to Geo. Yarrow, whose average percentage was 85. W. Kendall and T. Budge each had a higher percentage, but, having previously taken the course in England, they were not eligible for the local competition. The course included elementary teaching in anatomy, physiology, bandaging, disinfection, poisonous gases, and first aid in emergencies.

Taxation on Coal Lands.—Among the recommendations contained in the report of the Commission on Assessment Act are the following: "That coal and timber lands should not be assessed as wild land, but should be separately classified." "That the rate of taxation on all coal lands from which coal is being mined, and in respect of the coal mined therefrom, the taxes and royalties paid to the crown amount to at least 25 cents per acre, one per cent. on the assessed value thereof; on all other coal lands 2 per cent. on the assessed value thereof."

Miscellaneous.—A Fernie newspaper reports that on February 27 a serious collision occurred in No. 1 mine, Coal creek, two motors colliding with considerable force. One of the motors was badly smashed up. The accident retarded the work in that mine for a couple of days.

The Wellington Colliery Co. lately made a change in its working arrangements at its Extension colliery, Vancouver Island. Until recently there were 425 miners and about 400 pushers, drivers, etc., in all some 825 men, all white labour. Henceforward the principal part of the mining here is to be done with one shift, a second shift working but few men. About 200 men have been discharged, but employment will yet be found for some of these. It is understood that the amount of the payroll will not be lessened; the men employed will work every day, and not intermittently.

The following notes appeared in the correspondence for January of the *Labour Gazette*, Ottawa:

Coal mining was being prosecuted with great vigour in Western Alberta, especially at Bankhead, where a town is being rapidly built up.

In the coal mining sections of Nanaimo, conditions are improved, and while there are still a number of men out of work, the local company is steadily putting on additional men, and the output is increasing. The demand for coal from the Island shows a healthy firmness. The same conditions apply to the other coal mines in the district.

COAL CREEK COLLIERY TIPPLE BURNED.

It is reported that a large part of the surface works at the Crow's Nest Pass Coal Co.'s Coal Creek colliery was destroyed by fire on the evening of March 11, causing a loss estimated at \$150,000. The mines on both sides of Coal creek valley were connected by a high trestle, about 900 ft. in length. Built in this trestle were two tipples each having a Mitchell automatic cross-over car tip, chutes fitted with double sets of shaking screens, and a picking table 55 by 4 ft. The tables and screens were operated by electric motors, 30-h.p. and 25-h.p., respectively. Under the tipples were five separate railroad tracks—three for shipping coal and two for the slack for the coke ovens at Fernie. Under No. 2 tipple was a 30 by 40 ft. building containing a 20 by 36-in. compound-gear, quadruple-drum, tail-rope haulage engine, having 7-ft. drums and plow steel ropes, used in hauling coal from "the deeps" in No. 2 mine. This colliery was the largest producer of the three operated by the company, having an output capacity of 2,000 tons per diem. Until a new tipple shall have been built and equipped the output of Michel and Carbonado collieries will be largely increased.

COMPANY NOTES AND CABLES.

Arlington, Eric.—January: Smelter returns from the Hall Mining & Smelting Co., Nelson, on 129.4 tons of ore, gross contents of which were: Gold, 404.735 oz.; silver, 771.25 oz., and lead, 8,372 lb. Average contents per ton were: Gold, 3.128 oz.; silver, 5.95 oz.; lead, 54.7 lb. Net smelter returns amounted to \$7,012.44, and expenses, including development work, to \$4,107.22.

Arlington, Eric.—February smelter returns for 280.27 tons of ore, gross contents, were: Gold, 837.2 oz.; silver, 1,635.5 oz.; lead, 19,057 lb. Average contents per ton were: Gold, 2.894 oz.; silver, 5.6 oz.; lead, 65 lb. Net smelter returns amounted to \$14,347.27; expenses, including development, were \$4,391.17.

Alaska-Mexican.—January: 120 stamps 30 $\frac{1}{4}$ days, 18,872 tons; estimated realisable value, \$30,106. saved 362 tons sulphurets, estimated realisable value \$24,600. working expenses, \$35,438.

Alaska Treadwell.—January. 240 stamps 30 $\frac{1}{4}$ days, 300 stamps 17 days, 61,185 tons. estimated realisable value, \$81,524; saved 1,270 tons sulphurets, estimated realisable value, \$65,485; working expenses, \$89,424.

Alaska United.—January: Ready Bullion claim, 120 stamp mill, ran 30 $\frac{1}{2}$ days, crushed 19,190 tons ore; estimated realisable value, \$22,055; saved 337 tons sulphurets, estimated realisable value, \$9,456; working expenses, \$29,619.

Le Roi (Rossland).—January: Shipped from the mine to Northport smelter 10,058 tons of specially selected ore, containing 4,813 oz. of gold, 4,286 oz. of silver and 225,600 lb. of copper. Estimated profit on this ore, after deducting cost of mining, smelting, realisation and depreciation, \$27,000. Expenditure on development work, \$8,750. Development of the mine continues to be satisfactory, principally on the 900 and 1,450-ft. levels.

Le Roi No. 2.—January: Shipped 700 tons. Net receipts are \$34,338, being preliminary payment for 1,483 tons shipped, \$4,853 being deferred payment on 1,314 tons previously shipped, \$2,983 being payment for 28 tons concentrates shipped—in all \$42,174. In addition to 700 tons shipments, 900 tons were broken and remained in the underground workings for want of railway cars. (Office note—the reduction in the amount of ore shipped for the month was due to severe weather, the ore in the bins at the shaft-house, tramway head and railway having become frozen and given much trouble. For the same reason the smelter was unable to release the cars, and consequently the railway authorities notified our manager that they could not supply more until some had been emptied.)

Tyee.—January: 23 days; smelted—Tyee ore, 5,065 tons; custom ore, 652 tons; total, 5,717 tons. Matte produced, 496 tons. Gross value of contents (copper, silver, and gold)

after deducting costs of refining and purchase of custom ore, \$68,662.

Ymir.—January: 30 stamps 28 days, 2,150 tons (2,000 lb.), 466 oz. bullion; estimated realisable value (gross), \$5,750; 160 tons of concentrates, shipped, gross estimated value \$3,335; cyanide plant 1,700 tons (2,000 lb.) of tailings producing bullion, estimated gross, \$1,390; 16 tons of crude ore shipped, \$880; sundry revenue, \$332; total \$11,587. Working expenses, \$12,700. Loss, \$1,113. There has been expended during month on development, \$1,120. Cost of treating ore excessive on account of severity of the weather.

Dividends.—Alaska-Mexican, payable February 28, rate \$1, amount \$180,000. Alaska-Treadwell, payable February 28, rate \$1.50, amount \$300,000.

Second Relief Co.—The new owners of the Second Relief mine, near Erie, in the Nelson mining division, which well-known property was recently sold by the Relief Mining Co., of Spokane, Wash., for \$75,000, have formed a company, called the Second Relief Mining Company, capitalized at \$500,000, the par value of the shares being \$1. The officers are A. B. Cooper president and treasurer; G. H. Barnhart, general manager and secretary; O. E. McElfrish, U. S. postal inspector, Lawrence, Kansas, vice-president. E. C. Legge is also a director. Associated with the company are J. E. Hyde and Senator H. B. Miller, both of Kansas.

Molly Gibson.—Mr. Bruce White of Nelson, liquidator of the Molly Gibson Mining Company, Limited (in liquidation), by notice in the *B. C. Gazette*, requires creditors of this company on or before April 10, prox., to send particulars of their claims to him.

Boundary-Helen Gold Mining Co., Ltd., will hold a special general meeting of the shareholders at the office of the company at Greenwood, B. C., upon 29th day of March, 1905, to consider, and if deemed advisable, to pass a resolution to authorize the sale of the mineral rights of the Helen mineral claim for cash.

Iowa-Lillooet.—At a general meeting of the Iowa-Lillooet Gold Mining Co., Ltd., held at Iowa, Ia., a new board of directors was elected. Mr. J. Mulholland was afterwards appointed manager, and Mr. J. W. Tool, dredge-master.

Enderby Coal.—On February 18 the Enderby Coal Mines, Ltd., elected the following officers: President, H. W. Harvey; vice-president, M. Carlin; secretary-treasurer, George Heggie. As soon as the snow is off the ground an expert examination of the company's property at Enderby will be made and a point decided upon for permanent workings and buildings, then development work will be commenced on a large basis.

Van Anda.—A meeting of the debenture holders of the Van Anda Copper & Gold Co., Ltd., was called for March 16, at Vancouver, B. C., for the purpose of discussing and regulating the affairs of the debenture holders and of the trustees thereof.

Labourers' Co-operative.—The annual meeting of the Labourers' Co-operative Gold, Silver & Copper Mining Co., Ltd., was held at 153 La Salle St., Chicago, Illinois, U.S.A., on January 31. The secretary's report of the meeting, as published in Chicago, was as follows: "The sense and spirit of the meeting was that the company during the year shall prosecute the work at the mines with all possible vigour, and build a new wagon road to connect with the railroad now under survey which is to be built from Golden to Windemere. The report from the manager at Golden, B. C., set forth that the copper vein in Good Luck mine has increased four per cent in value, making the ore worth about \$104 per ton, and that the ore vein appears to be stronger and wider the further the same is explored or opened up and we anticipate that before the end of the year the company will be in position to run its smelter to its full capacity." The new directors of the company are: D. B. Bisbee, Gust. L. Young, Aug. Nelson, C. E. Nylin, N. P. Strandberg, A. E. Martin, O. D. Hoar, G. P. Wells, M. Diarmid, L. A. Levine, John Holm, Prof. C. O. Larsen, T. A. Holmgren, Ed. Grant and Charles E. Sweiberg, the last-named also being secretary.

Hydraulic at Big Bend.—An important mining transaction was completed at Revelstoke last month, when Mr. J. R. Bottorf, president of the American Mining Co., of Indiana, closed a deal whereby his company acquired the leases and hydraulic plant on French creek from Mr. W. Cowan. Mr. Bottorf, who is also secretary of the Elwood Tinworkers' Gold Mining Co., paid a visit to that company's Silver Dollar mine, near Camborne, before returning to Indiana.

Lucky Boy.—The Chesnut Hill Mining Co., of Philadelphia, which took over the bond of the old Lucky Boy Company, is reported by the *Lardeau Mining Review* to have entirely freed from debt the Lucky Boy property, near Trout Lake. The company is stated to have ample working capital and every prospect of a good mine.

Mammoth.—The owners of the Mammoth group, a promising mining property on Goat Mountain, in northern Lardeau, last month decided to incorporate a company to be known as the Edward Baillie Syndicate, Ltd., with a nominal capital of \$40,000 in 400 shares of \$100 each. There are four claims in the group, which is distant about 10 miles from Camborne, Fish river camp. Some \$14,000 have been spent in purchasing and developing the Mammoth, from which a first shipment of 24 tons of ore was made about the end of 1904. Returns from this shipment are stated to have been \$2,634, after payment of freight and treatment charges. Drifting snow, the property being above timber line, prevented more ore being rawhided down during the winter, but some 35 tons are awaiting shipment, with plenty more available for mining when the season shall be favourable to a resumption of operations.

Triune.—Mr. R. H. Battey, manager for the Metropolitan Gold & Silver Mining Co., of Minneapolis, Minnesota, owning the Triune and Metropolitan groups of claims, in the Ferguson section of the Lardeau, has returned from attending a meeting of the company at Minneapolis. It is stated that 50 men will be employed at the Triune next summer in further development and ore production. A contract has been let for the construction of a Riblet patent automatic aerial tramway, from the mouth of the tunnel at the mine to the wagon road below.

Sunset (Similkameen).—It has been announced that shareholders in the company owning the Sunset mine, Copper Mountain, Similkameen, recently decided to give an option on 51 per cent of the stock to a syndicate organized by Mr. O. N. Scott, M. E., of Roseland. Mr. R. A. Brown, of Grand Forks, has been re-elected president, and Mr. Alex. Miller, of Greenwood, one of the directors.

Ballarat Hydraulic.—The Ballarat Hydraulic Mining Co., organized in Toronto, will shortly commence hydraulic on Ballarat creek, a tributary of Yukon river. The company is capitalized at \$300,000. The following Toronto men are its officers: Dr. Brown, president; F. E. Davison, vice-president and general manager; A. E. Davison, treasurer. Other promoters and shareholders are Messrs. Wm. S. Henry and John T. Rea, of Toronto, and E. E. Stoner and Andrew Bruce, of Vancouver, B. C. Ballarat creek is situated about 55 miles north of the junction of the Selkirk and Yukon. The company has secured the right to 5 miles of the creek, commencing at a point about 5 miles from its mouth.

CERTIFICATES OF INCORPORATION.

American & B. C. Hydraulic Placer Co., Ltd., with a capital of \$50,000, divided into 500,000 shares of 10 cents each.

Dease Creek Hydraulic & Developing Co., Ltd., with a capital of \$50,000, divided into 200,000 shares of 25 cents each.

Enderby Coal Mines, Ltd., with a capital of \$250,000, divided into 250,000 shares of \$1 each.

Skyhawk Development Co., Ltd., with a capital of \$250,000, divided into 250,000 shares of \$1 each.

South Yale Copper Co., Ltd., with a capital of \$450,000, divided into 450,000 shares of \$1 each.

Western Power Co., Ltd., with a capital of \$25,000, divided into 5,000 shares of \$5 each.

Whatshan Lake Power Co., Ltd., with a capital of \$250,000, divided into 250,000 shares of \$1 each.

Canada Zinc Co., Ltd., with a capital of \$200,000 divided into 200 shares of \$1,000 each.

Skeena Development Syndicate, Ltd., with a capital of \$25,000, divided into 25,000 shares of \$1 each.

Boundary-Elkhorn Mining Co., Ltd., with a capital of \$200,000, divided into 200,000 shares of \$1 each.

Silver Peak Mining & Milling Co., Ltd., with a capital of \$500,000, divided into 1,000,000 shares of 5 cents each. Incorporated by Messrs. Bailey, Bowes, Kalkwarf and Wolfe, of Ritzville, Wash., and J. L. Winslow and A. B. Buckworth, of Ymir, B. C., to take over a group of mineral claims on Wild Horse creek, lying close to the Foghorn mine, Ymir district.

REGISTRATION OF EXTRA-PROVINCIAL COMPANIES.

Spokane Boundary Mining Co., with a capital of \$100,000, divided into 1,000,000 shares of 10 cents each.

South-east British Columbia Land and Oil Co., Ltd., with a capital of \$375,000, divided into 1,500,000 shares of 25 cents each.

APPLICATIONS FOR CERTIFICATES OF IMPROVEMENTS.

Mineral Claim.	Mining Division.	Applicant.
Alpha.....	Ainsworth.	Beaver Canon Min. Co.
Omega.....	Ainsworth.	Beaver Canon Min. Co.
Omega No. 2.....	Ainsworth.	Beaver Canon Min. Co.
Fern.....	Alberni	Lawrence Manson
Fern No. 1.....	Alberni	Lawrence Manson
Sunshine.....	Alberni	Lawrence Manson
Sunshine No. 1.....	Alberni	Lawrence Manson
Sunshine No. 2.....	Alberni	Lawrence Manson
Sunshine No. 3.....	Alberni	Lawrence Manson
Sunshine No. 4.....	Alberni	Lawrence Manson
Sunshine No. 5.....	Alberni	Lawrence Manson
Wasp.....	Alberni	Lawrence Manson
Last Chance.....	Atlin.....	W. H. Brown
Queen Charlotte.....	Atlin Lake.....	Henry Nicholson
Golden Fleece.....	Fort Steele.....	William S. Forsyth
Stanley.....	Fort Steele.....	William S. Forsyth
Collingwood.....	Fort Steele.....	Judson B. Langley
Dixy.....	Fort Steele.....	Judson B. Langley
Emma Fraction.....	Fort Steele.....	Judson B. Langley
Mayflower.....	Fort Steele.....	Judson B. Langley
Buller.....	Grand Forks.....	E. J. Flett
Coronet Fractional.....	Grand Forks.....	C. M. Crouse
Lancaster.....	Grand Forks.....	C. J. Magee
Mayflower.....	Grand Forks.....	J. A. Macdonald
War Cloud.....	Grand Forks.....	Forbes M. Kerby
Wallace Fractional.....	Greenwood.....	Forbes M. Kerby
Porto Reco.....	Greenwood	Jane Russell
E. Pluribus Unum.....	Greenwood	William T. Hunter
E. P. U. Fractional.....	Greenwood	William T. Hunter
Gold Standard.....	Greenwood.....	W. M. Law
Humming Bird.....	Greenwood	Isaac Skidmore
Lancashire Fraction.....	Greenwood.....	W. T. Hunter
La Tour.....	Greenwood.....	Kenneth C. B. Frith
Little Ruth.....	Greenwood	Frank J. Miller
No. 7.....	Greenwood	Pat Hickey
San Juan.....	Greenwood	Joseph Martin
Champion Fractional.....	Greenwood	Joseph Martin
Cascade Fraction.....	New Westminster..	Chas. E. Crane
Homestake.....	New Westminster..	Wm. McHarrie
Independence.....	New Westminster..	Chas. E. Crane
Mayflower.....	New Westminster..	Emma Churchill
Puritan.....	New Westminster..	W. A. McAdam
Washington.....	New Westminster..	W. A. McAdam

Saturday.....	Osoyoos.....	H. A. Whillans
No. 1.....	Similkameen.....	M. A. Voigt
No. 4.....	Similkameen.....	M. A. Voigt
No. 5.....	Similkameen.....	M. A. Voigt
No. 18.....	Similkameen.....	M. A. Voigt
No. 19.....	Similkameen.....	M. A. Voigt
No. 23.....	Similkameen.....	M. A. Voigt
Yellow Jacset.....	Similkameen.....	M. A. Voigt
R. S.....	Similkameen.....	M. A. Voigt
S. Elmo.....	Similkameen.....	Jessie R. Hunter
Silver Star Fraction.....	Slocan.....	Byron N. White
Klondyke.....	Vernon.....	Vancouver & Boundary Creek Developing & Mining Co., Ltd.
Torpedo.....	Vernon.....	do.

MACHINERY NOTES.

The *Camborne Miner* states that Mr. R. P. Williams, Kootenay agent for the Canadian Rand Drill Co., was at Camborne last month, looking over the Eva mine and mill for the purpose of submitting an estimate of cost of installing an air compressor for the Eva Gold Mines, Ltd.

At the Silver Dollar mine, near Camborne, the Elwood Timworkers Gold Mining Co. is putting in a compressor and a saw mill plant.

A second 200-ton lead furnace is being built at the Sullivan Group Mining Co.'s smelter at Marysville, East Kootenay. A Haberlin converter, for the same works, is being manufactured at Spokane. The latter is described as being designed to reduce the sulphur in the ore and facilitate the extraction of the zinc.

The *Hedley Gazette* states that Electrician Cootes has been busy setting up the new 20,000-lb. electric motor for the electric tramway from the Nickel Plate mine. This motor will be equal to any duty required of it from yanking a saw-log out of the woods to handling a trainload of ore. The motor formerly in use will henceforth be employed only on the lighter work of the road.

At the Cork mine, on south fork of Kaslo creek, the 100-ton concentrator is completed. After the return of the manager, Mons. P. Maris, from France, he having lately visited Paris, to confer with the directors of the company, preparations will be made for operating the mill as soon as water shall be available for it.

It is understood that two additional furnaces have been ordered for the British Columbia Copper Co.'s smelter at Greenwood. These will bring the number at this smelter up to four, leaving an aggregate treatment capacity of 1,400 to 1,500 tons per diem.

The Hinton Electric Co., of Victoria and Vancouver, has been awarded a contract to instal a plant at Vernon for the Okanagan Telephone Co.

The two new blast furnaces ordered by the Granby Co. for its smelting works at Grand Forks, will each have a capacity of about 400 tons, which will be 50 tons greater capacity than that of the six furnaces for some time past in operation, these treating about 350 tons each per diem. An enlargement of the company's converter plant is being planned.

Construction work has been started, says the *Miner*, on the Le Roi concentrator on the Black Bear ground, Rossland, and it is thought it will be in operation within 60 days. The ground dimensions of the structure are 40 by 120 ft., and it will be arranged like all mills of this character, so that the ore will fall by gravity from one process to the other. The capacity will be about 150 tons of ore a day, but during the experimental stages not more than 60 tons will be put through per day. It is thought that the best results will be obtained by water concentration, but if, during the experiments, any other form of concentration than water is found more suitable for Le Roi ore, it will be used. The plant to be installed at first will consist of crushers, rolls, Huntington and Chilian mills for crushing, and jigs and Wilfley tables for concentrating. These will be so arranged in the mill that if it is found necessary to put in additional machinery there will be room for it.

TRADE NOTES AND CATALOGUES.

The Hardsocg Wonder Drill Company, Ottumwa, Iowa, U. S. A., have issued a new catalogue descriptive of the Little Wonder Air Hammer Rock Drill. This catalogue will be sent to anyone applying for it to either the main office, Ottumwa, or any of the agencies mentioned in advertisement on page VI. of this issue of the *MINING RECORD*.

Catalogue No. 7, of the Aldrich Electric Pumps, manufactured by the Allentown Rolling Mills, of Allentown, Penn., has been prepared by that company. This catalogue cancels all former ones conflicting with it, including Pump Datas 1 to 5.

The self-filling grab buckets, made by the Jeffrey Manufacturing Co., of Columbus, Ohio, are described in a neat little catalogue, which contains also several half-tones illustrations showing the buckets in operation.

The Denver Laboratories is the title of an organization formed by Messrs. H. C. Parmalee, Rudolf Gahl and Charles H. Bryan, to do assaying and work in industrial chemistry. Its location is at Denver, Colorado.

Mr. E. W. Widdowson has removed his assaying business from Ymir to Nelson, where he will be able more conveniently to represent shippers at the sampling of ores they send to the Hall Mining & Smelting Co.'s smelter there.

Messrs. W. F. Stanley & Co., of Great Turnstile, Holborn, London, England, who were awarded the gold medal for surveying and drawing instruments at the St. Louis Exposition, continue to advertise their combined mining dial, level and theodolite. This instrument is fitted with sliding stand, with solid head, and an improved form of Hoffman head, clamp and tangent movement to the limb, which is outside reading by two verniers to single minutes. The gimbal is cranked so that the telescope will read 90 deg. both ways.

The Joshua Hendy Machine Works, of San Francisco, California, U. S. A., noted for its improvements in hydraulic mining machinery, has added yet another improvement to its already effective double jointed ball-bearing giant. The addition of "Bouery's Safety Attachment" (patented) adds materially to the efficiency of this giant, because it insures the greatest safety to the men operating it, and guarantees that work may proceed without possibility of interruption on account of breakage of any kind. This firm invites correspondence from all interested.

The Canadian Westinghouse Co., Hamilton, Ont., has published in the form of a booklet a paper read before the Ohio Electric Light Association at Sandusky, Ohio, convention, August 18, 1904, entitled "Points for Consideration When Purchasing Series A.C. Arc Lamps," by G. Brewer Griffin. The same company has closed a contract with the Grand Trunk Pacific Railway Co. to provide air brakes for the rolling stock and equipment of the Trans-continental Railway, to cost \$700,000. It has also lately received an order for the equipment of a power house for the electrical operation of gold dredging boats on Alaskan rivers. A visit was made by members of the recently-formed Canadian Klondike Mining Co. to the works of the Westinghouse Co., at East Pittsburg, Pa., to ascertain if electrical machinery could be used in the gold mining plant. A 400-kw. turbo-generator was chosen to be installed in the power house and to be driven by a 600-hp. Westinghouse-Parsons steam turbine. The power house will be located at Dawson, and the dredges will operate on the Yukon river and its tributaries. Lines for transmitting power will be strung from the station to the boats, wherever they may be working. Electrical machinery is used extensively in mining operations, but this plant will be watched with unusual interest, owing to the remoteness of the country in which it will work and the new engineering field to be opened by it.

The Canadian Rand Drill Company, Montreal, Que., has just issued a new edition of its Air Compressor catalogue (Catalogue C. 1904), which contains much valuable information relating to compressed air, with the increasing use of which has come the recognition of the air compressor as one

of the most important of prime movers. Attention is called to the fact that the diversity of compressed air application now requires compressors of increasing range of design and terminal pressure. In addition to its standard designs for mining, contracting, pneumatic tool and other industrial work, the Canadian Rand Drill Co. now builds many compressors for special purposes, from the four stage high pressure compressor, for compressed air locomotive systems, to the low pressure compressor, for agitating or pumping liquids, pneumatic transmission systems and other work. Full particulars of these compressor designs and construction will be found under the various headings in this catalogue, which may be obtained upon application at the Advertising Department of this Company at Montreal, Que.

PUBLICATIONS RECEIVED.

Geological Survey of Canada. Nickel and Copper Deposits of the Sudbury Mining District, Ontario. By Alfred Ernest Barlow, M.A., D.Sc. Pages 236. Illustrated. Maps accompanying. *Mineral Resources of Canada*, 13 Bulletins on, and reports of Department.

United States Geological Survey. Across the Cascade Range. By George Otis Smith and Frank C. Calkins. Pages 97, illustrated. *Geological Survey of the Cripple Creek District, Colorado*, report of progress, by Waldeman Lindgren and Frederick L. Ransome. Pages 34. *Water Resources of the Philadelphia District*, by Florence Bascom. Pages 69, illustrated by maps. *Water Powers of Alabama*, by Benjamin M. Hall. Pages 248. *Economic Geology of the Iola Quadrangle, Kansas.* By George I. Adams, Erasmus Hawthorn and W. R. Crane. *Geology of the Hudson Valley Between the Hoosic and the Kinderhook*, by T. Nelson Dale. *Report on the Operations of the Coal-Testing Plant of the U. S. Geological Survey. Twenty-fifth Annual Report, 1903-1904.* Pages 371. *Zinc and Lead Deposits of Northwestern Illinois*, by H. Foster Bain. Pages 151.

Government Stationery Office, Ottawa. Statutes of Canada, Vol. I. and II., 1904.

Royal Colonial Institute (Journal) No. 3. Session 1904-05. *School of Mines Quarterly*, Vol. XXVI. No. 2. Columbia University, New York City.

Notes on Assaying and Metallurgical Laboratory Experiments, by Richard W. Lodge. New York, John Wiley & Sons, 8vo., VIII., 287 pages. \$3.

Western Association of Technical Chemists and Metallurgists. Paper by A. W. Warwick, Editor *Mining Reporter*, Denver, Colorado, on "The Influence of Fine Grinding on the Metallurgy of the Precious Metals;" and one by Howard C. Parmelee, Denver, Colorado, on "The Determination of Copper, Arsenic and Antimony in Lead Bullion."

A Plain Talk on Trade Journals, an address by Arthur Warren, manager of publicity for Allis-Chalmers, delivered at a meeting of the American Trade Press Association, New York, on February 17, ulto., has been issued in pamphlet form and is instructive reading.

Miscellaneous.—Stovel's indexed vest-pocket map of Manitoba, stated to be the first map made in Canada by the "cerotype" or wax process. Its details are clear-cut and its lettering symmetrical.

The Canadian Westinghouse Co., Hamilton, Ontario, manufacturers of electrical apparatus, air brakes, etc., have sent us their very artistic calendar for 1905.

BOOKS REVIEWED.

The Chemistry of Cyanide Solutions, Resulting from the Treatment of Ores.

By J. E. Clennell, B.Sc. (Lond.). New York and London.

The Engineering and Mining Journal. Pages 160. Price \$2.50.

The use of cyanide is at the present day a most important factor in the mining and treatment of the precious metals

and is increasing rapidly, as the cost of extraction is being lowered by improved methods. At the same time, it is necessary for the economical working of a cyanide plant to thoroughly understand the chemistry of the extraction and subsequent precipitation of the gold and silver; as also the interference of some of the base metals, which will occur in the ore under treatment. In order to work to the best advantage, the solution in the tanks, etc., before, during, and after the extraction from the ore, must be analyzed to determine accurately its composition, viz., active cyanogen, alkalis, reducing agents, auxiliary agents, etc.

The book appears to meet a long-existing requirement, as it concisely and clearly compares the best standard methods known for the analysis of the solutions, and gives valuable data as to their worth, also offering some new methods, with discussions as to their advantages. It is well-filled with equations, showing the various reactions, thus greatly increasing its value from the chemists' standpoint. It comprises chapters on the Ingredients and Analysis of Cyanide Solutions, to wit, Active Cyanogen Compounds; Alkaline Constituents; Reducing Agents as Sulphides, etc.; Auxiliary Agents, as for example Oxygen, the value of which as an aid, and in fact a necessity, to cheap extraction is well understood; Inactive Bodies, as the Chlorides, Sulphates, Silicates, etc.; The Noble Metals; Base Metals; and the Various Solids in Suspension and Solution.

This manual will prove a most timely aid to chemists, who are engaged in that line of analysis, as it shows great care and thoroughness in its selection of subjects, discarding the valueless and condensing proved and accurate methods, so that they can be grasped quickly and followed up without the loss of time, caused by the reading through of large quantities of unprofitable matter in order to obtain the kernel. In fact this book is a valuable addition to any library on the same subject. The print and paper are excellent; qualities, unfortunately, too often lacking.

A Manual of Mining.

By M. C. Ihlseng, C.E., E.M., Ph. D., and Eugene B. Wilson, M.E., New York: John Wiley & Sons. London: Chapman & Hall, Ltd. Pages, 723; illustrated. 337 figures. Price, \$5.

The contents of this recently-published, interesting volume are based on a course of lectures on mining delivered at the school of mines of the State of Colorado, by Mr. M. C. Ihlseng, formerly dean of the school of mines of the Pennsylvania State college, and in his work he has been assisted by Mr. Eugene B. Wilson, a well-known mining and metallurgical engineer. The present issue is practically the fourth edition, but the previous editions received only such additions and changes as were necessary in its use as a text-book in mining schools. The author, however, in the edition under review presents a complete revision of the work, which now assumes the form of a collaboration by Mr. Wilson, who brings to the original work a wide range of experience and ability, an accuracy of detail, and a discrimination in description, contributing highly to the value of the revision. Originally planned for metal mining, the first issue of the book gave small place to coal and its extraction. The new edition has, of necessity, been enlarged to include coal mining in all its phases, with full descriptions and many illustrations of modern methods and machinery. The later devices in power generation and distribution, as the steam turbines, oil and compressed-air engines, with such appliances as have proven themselves meritorious in economy and safety, are elaborately treated. The chapters upon "Electricity in its Application to the Mining Industry," prepared by Mr. Roland W. Hutchinson, whose work on "Long Distance Transmission of Electricity" has secured recognition in this field, will prove invaluable to the student.

The Mineral Industry During 1903.

The Engineering and Mining Journal, New York and London. Pages 527. Price \$5 or £10:10.

This is Vol. XII of *The Mineral Industry*, its statistics, technology and trade in the United States and other coun-

tries. It is an annual technical encyclopedia, incorporating the most recent developments and advances evolved in the mining and metallurgical world up to the time of its preparation for the press. It embraces statistics relating to the production and prices of the various minerals and metals throughout the globe, and includes, in addition, exhaustive reviews compiled by authoritative international experts on the technical progress made in the metallurgical field, together with detailed accounts of new processes. While the work on this volume has been prepared by the editorial staff of the *Engineering and Mining Journal*, it has been more particularly under the supervision of Mr. D. H. Newland, one of the associate editors of that journal. Besides articles by members of the staff there are others from 33 special contributors, most of them recognised authorities on their respective subjects.

The introductory chapter reviews and summarises the position generally in regard to the mineral and metal production of the United States. Twenty-seven chapters, each dealing with separate minerals or closely allied minerals, follow, these including much information relating to the subjects thus treated. The last four chapters in the volume comprise reviews of (1) the general literature on ore deposits, (2) literature on ore dressing, (3) mining progress, and (4) dividends paid and assessments levied by American mines and industrial companies.

While the delay in publication of this valuable work is to be regretted, it should be remembered that it takes much time and labour to revise statistics and bring them up to a late date, especially when they cover so extensive a field as that of a mineral production aggregating in 1903 the enormous value of \$1,670,317,995, which was the total value at the place of production of the mineral and metal output, from both domestic and foreign ores and bullion, of the United States, in the year under review.

Mineral Resources of the United States

United States Geological Survey: David T. Day, Chief of Division of Mining and Mineral Resources. Pages 1,024.

This is the twentieth annual report of the series on the Mineral Resources of the United States published by the Survey. The arrangement and scope of this volume are practically the same as in the nineteen preceding reports of the series. Each report records the development of the mineral industries of the United States since the time covered by the immediately preceding number of the series; the reports should, therefore, be consulted together.

Every chapter in this report is a census of the productive features of the industry under discussion. The statistics of the production of gold and silver were prepared in conjunction with the Director of the Mint, Treasury Department. The statistics of the imports and exports of minerals, which form an essential part of the volume, were obtained through the Chief of the Bureau of Statistics, Department of Commerce and Labour. Besides the statistics for the calendar year 1903, considerable descriptive and technical matter, obtained while the statistical canvass was in progress, is included.

The table of contents shows the arrangement of the numerous chapters, thus facilitating reference to any subject upon which information is sought. Each of the various minerals is, with few exceptions, allotted a separate chapter. A very full index completes an authoritative volume of exceptional interest and much practical usefulness.

PATENTS

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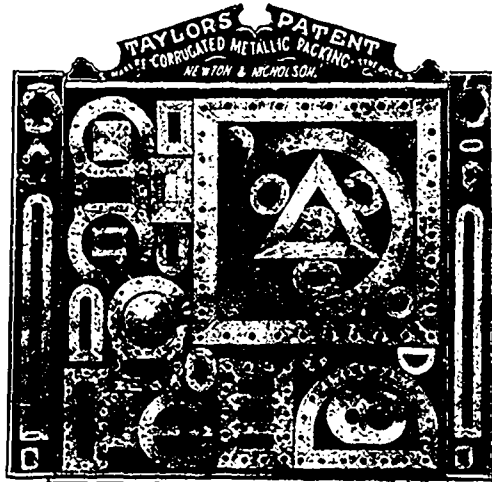
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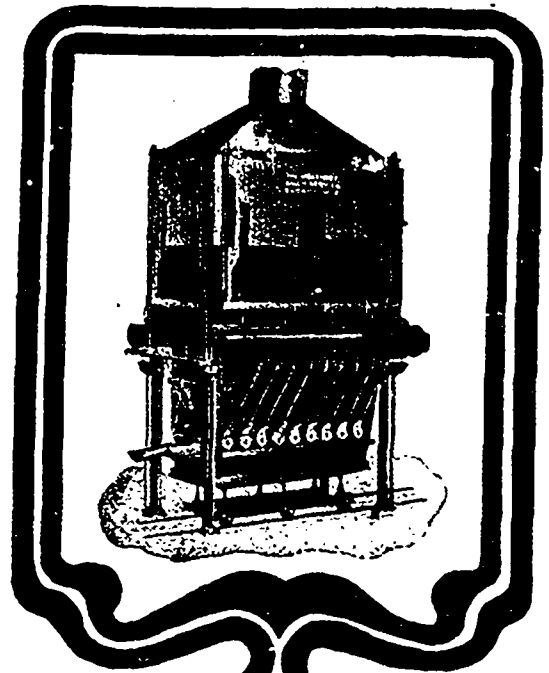
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