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MINING RECORD

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E. JACOBS..... Managing Editor

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CONTENTS.

	PAGE.
Notes and Comments	85-89
The Record of a Traducer	89
Dominion of Canada Assay Office	91
Canadian Mining Institute	91
Mining in North Kootenay	93
Report of the Dominion Superintendent of Mines	97
Mineral Production of Canada for 1905	109
Yukon Territory	114
Company Meetings and Reports—	
Imperial Development Syndicate, Ltd.	117
Can. Mining & Smelting Co. of Canada, Ltd.	118
Canadian Gold Fields Syndicate, Ltd.	119
Richard III. Mining Co., Ltd.	121
Black-Mackay Mining Co.	121
Company Cables and Notes.	122
Certificates of Incorporation	123
Trade Catalogues, etc.	123
Machinery and Construction Notes.	123
Coal Notes	124
Yukon News	124
Mining Men and Matters	125

NOTES AND COMMENTS.

The output of ore from Boundary mines for three months to the close of March has totalled approximately 320,000 tons in the following proportions: Granby Co's mines, 210,500 tons; Dominion Copper Co's mines, 52,500 tons; B. C. Copper Co's mines, 43,200 tons; Denoro Mines, Ltd., 6,600 tons, and sundry small mines 1,200 tons; total, 320,000 tons.

The table exhibiting sources from which it was derived, quantity, and value of gold bullion received and assayed at the Dominion of Canada Assay Office, Vancouver, B.C., during the fiscal year ended June 30, 1905, shows that 76.18 per cent in quantity and 75.54 per cent in value were from British Columbia, while about 20 per cent in quantity and value came from Yukon Territory. The table is printed on another page in this issue of the *MINING RECORD*.

Franklin camp, on the north fork of Kettle River, is receiving increasing attention. A working bond on another group of mineral claims has been secured and arrangements for development work are being made. The expectation is that more work will be done in the camp this year than in the past, and full confidence is felt that so much ore will be shown to exist there that the building of a railway from Grand Forks to the camp will be proved to be amply warranted.

A public meeting was held at Dawson, Yukon, early this month to discuss three questions described in the local press as being of great moment to Yukon Territory. These were: A Federal Government gold purchasing office, cheaper freight rates into Yukon, and a mining code for Yukon. It is stated that Commissioner McInnes has met with much encouragement at Ottawa, where he has been urging upon the Government the necessity for immediate action on these important questions.

From the *Sandon Mining Standard* it is learned that the owners of the Province mine, situated on the south fork of Kaslo Creek, have contracted to ship 2,000 tons of concentrating ore to the Canadian Metal Co's custom mill at Pilot Bay, Kootenay Lake. The ore is stated to be low grade, but the price to be paid

for it is so satisfactory that it is suggested the purchasing company is adopting a liberal policy towards mine owners with a view to stimulating the production of ore.

At the annual business meeting of the American Institute of Mining Engineers held in New York on February 20, ulto., Mr. Wm. Fleet Robertson, of Victoria, provincial mineralogist of British Columbia, was elected a member of the Council of the Institute for a period of three years. This election is, doubtless, the more gratifying to Mr. Robertson from the fact that a distinct compliment has been paid him since he is the only member of the Council resident out of the United States. The total membership of the Institute on January 1, 1906, was 3,884, as compared with 3,680 on January 1, 1905—a net gain for the year of 204 members.

The recent joint visit of officials of the British Columbia Copper Co., of New York, and the Denoro Mine, Ltd. of Rossland, B.C., to the latter company's Oro Denoro mine situated in Summit camp, adjoining the Emma mine which the B. C. Copper Co. is operating, has led to the conclusion that the first mentioned company has an option on the Oro Denoro on which large ore bodies are known to occur and which has during the last three years shipped about 40,000 tons of ore to district smelters. Prospecting with the diamond drill is in progress. The mine is favourably situated in respect of transportation since the lines of both the Canadian Pacific and Great Northern railways cross the property.

The long tunnel being driven at the Rambler-Cariboo company's mine in the Slocan district is in nearly the distance it was calculated would have to be driven to reach the ore vein, which it is believed lies down to depth, so news of success having been achieved in this enterprise may be expected shortly. If it be found that there is sufficient ore for profitable working at the depth that will here be reached—about 1,400 ft. below the surface—a decided impetus will be given to deep-level mining in the Slocan, for other companies will be encouraged by the success of the Rambler-Cariboo company to follow its excellent example.

The annual review of the president of the Board of Trade of the town of Ladysmith, Vancouver Island, contains the following reference to the Wellington Colliery Co's coal mines in that neighbourhood: Our staple industry is, of course, the coal mines, and from this source alone an amount estimated at \$750,000 has been circulated in wages. Work in the mine has been uniformly steady, especially during what is usually slack times, viz., the summer, when the strike at the Nanaimo collieries kept the Extension mines busy supplying the market. The value of the coal mined is estimated at \$1,500,000. With the continued demand for coal existing in our principal market, viz., San Francisco, we may look forward with confidence

to steady work and consequently good circulation of money from this source for the ensuing year.

A writer in the *Toronto Globe* observes: "Dormant mineral claims are hidden away in title deeds in all parts of the Province. They are the worst kind of obstruction. Mr. Auld's idea of making them liable to assessment will effect far-reaching improvement." One would think he had an intimate knowledge of the condition of very many Crown-granted mineral claims—by far the larger number of that class—in British Columbia when he used the word "obstruction." Dormant claims are truly an obstruction to progress and, since their number is steadily increasing, they are likely to further retard progress each year as time passes.

The *Cranbrook Prospector* is of opinion that "the coming of the Spokane International railway will be the most potent stimulus which has been given to the mining and industrial growth of Cranbrook district." Whether the district immediately tributary to Cranbrook be materially benefited or not by the establishment of direct railway connection between the C. P. R. Co's Crow's Nest Pass railway and the City of Spokane, there is one decided advantage that is assured, viz., that the Crow's Nest Pass coal fields will have an enlarged market for their coal, especially under the condition that there will, on the completion of this railway, be competing roads between the district providing the supply and the city and districts to be supplied.

A complaint was made to the Department of Mines, Victoria, that an unlicensed assayer was making assays for the public at Hedley. The *Hedley Gazette*, in referring to the matter stated that "no charge was being made for assays and no certificates given." This, however, would not have justified the department in ignoring the complaint, so it properly required that the assayer present himself for examination or cease to make assays for the public. There are in the Province numbers of assayers who have fulfilled the reasonable requirements of the law, so in justice to them as well as for the protection of the public it is necessary that all who do assay work outside of that for the mining companies employing them should pass the provincial examination and receive the customary certificate.

According to an estimate made by the *Phoenix Pioneer* there are more than 2,000 men employed at the mines and smelters and on the railways of the Boundary district. Of this total the Granby Co. employs nearly 800, the Dominion Copper Co. about 350, and the British Columbia Copper Co. nearly 300, these figures including employees at both mines and smelters of these three companies. The Canadian Pacific Railway Co. finds work for about 300 men on its district branch railway lines, and the Great Northern Railway Co. some 120. A number of small mines together provide regular employment for between 150 and 200

men. The prospects are that a further increase in the total will take place the ensuing summer.

The *Nelson Daily News*, the leading newspaper published in the interior of British Columbia, takes an optimistic view of the future of the mining industry of the Kootenay and Yale districts, which include Boundary, Rossland, Nelson, Ymir, Slocan, Lardeau and East Kootenay mining camps. It makes the following comment: "The first quarter of 1906 shows the enormous total of 429,072 tons of ore produced in the districts of Kootenay and Yale, which is at the rate of 1,700,000 tons per year. That this rate will be maintained is more than likely and indeed the probabilities at this time in the year seem to indicate that a total tonnage of 2,000,000 tons will nearly be reached. At present there are 76 mines shipping over the whole of these districts." Incidentally, it may be mentioned that last year's total tonnage was rather more than 1,700,000 tons for the whole Province, the great bulk of the ore having been produced in the districts above mentioned.

Mr. John B. Hobson, for the past ten or twelve years manager of the hydraulic gold mining property the Consolidated Cariboo Hydraulic Mining Co. has been operating at Bullion, in the Cariboo district of British Columbia, has returned to the Province after having spent some time in New York in connection with the acquirement by capitalists of that city of the Consolidated Cariboo Co's property. He will shortly proceed to Bullion for the purpose of putting in hand the work of largely extending the water supply system so as to make provision for an abundance of water for gravel washing uses. The total value of gold recovered from this hydraulic mine during twelve years ending June, 1905, was \$1,233,936.51. During several recent years—1902-5—the water supply has been insufficient to admit of the continuation of washing without interruption throughout the respective seasons, consequently the recovery of gold has not been nearly so large as will be the case when an adequate water supply shall have been provided.

The new director of the Geological Survey of Canada has made an innovation in notifying through the medium of the public press that his department will shortly issue a preliminary report on the Rossland district, and of the intended gratuitous supply of copies to those who make application for them. Too often valuable information, prepared by specialists, does not reach more than a comparative few of those interested in the subjects dealt with, and the chief object that should be in view in having properties or districts carefully examined and correctly described is not attained, by reason of the general run of non-professional mining men not knowing where and how to obtain copies of publications that might be of assistance to them. We have little doubt that the director of the Survey will find a ready response to his intimation by numbers of residents and others interested in the Rossland district, and that it will be found that an

effective means of disseminating valuable information will thus have been adopted.

Hon. John P. Brady, late Governor of Alaska, has informed the *Engineering and Mining Journal* that the copper and smelting industry of Alaska is in a prosperous condition, and that it is likely to grow with rapidity. On Prince of Wales Island, two smelters, one at Coppermount and the other at Hadley, are in operation. The copper mines at Ellamar and Latouche on Prince William Sound are already making large shipments of ore to the Tacoma smelter. Other mines in the vicinity of these will soon be shipping ore. A great factor in the progress of these mines is the cheapness with which the ores may be transported, the mines being situated close to deep-water harbours. The copper mines of the interior are to be benefited by the railroads now under construction across Alaska. The sections drained by the Chityna River, which is the eastern tributary of the Copper River, are receiving the most attention, and a strong output may be expected from this region as soon as railroad facilities are secured.

Mining conditions at Rossland are decidedly promising. At all three of the larger properties the outlook for production is better than for years. Although recent reports of strikes of big bodies of ore in the Le Roi were greatly exaggerated, we have the general manager's assurance that on the whole the mine is looking well. Le Roi No. 2 has made important discoveries of new ore shoots or extensions of those worked in other parts of the mine, and having ore of high average value this mine is doing well. In the Centre Star group, which includes the War Eagle, there is general improvement, as particularized in the report of the directors of the Consolidated Mining and Smelting Co. of Canada, printed on page 118 of this number. Several of the smaller mines are also stated to be looking well, so that altogether the outlook for Rossland camp may be regarded as satisfactory.

It might not be amiss for the proper Federal Department to direct the attention of those having to edit official reports that are published to the fact that eight years ago there was created an official Geographic Board to which "all questions concerning geographic names in the Dominion which arise in the departments of the public service shall be referred, and that all departments shall accept and use in their publications the names and orthography adopted by the Board." In the Report of the Department of the Interior, lately received, there are several instances in connection with places in Yukon Territory in which this direction has not been observed. Mention is here made of this matter, not in any carping spirit but with a desire to avoid unnecessary confusion. It is sometimes difficult enough to intelligently follow descriptive reports when single designations are generally adhered to, but when different departments adopt "go-as-you-please" methods the wayfaring man be-

comes mystified by the use of several names to designate one and the same place.

The director of the Geological Survey Department of Canada desires it to be made known that a "Preliminary Report on the Rossland District" has been prepared by Mr. R. W. Brock of the Survey, that it is now in the printer's hands and that it will, as soon as possible, be despatched, free of cost, to any *bona fide* applicant in the Rossland district, who sends his name and address to the librarian of the Department. A full report, by Mr. Brock, is being prepared and will be put through the press as soon as the maps and plans are received from the engraver. The Preliminary Report, meanwhile, contains a large amount of useful information. It deals with the origin of the ore deposits, and with the chances of their value in depth, and it discusses the probabilities of other deposits being found outside the area now being mined. It relates the methods now being employed, or proposed, and touches lightly on the question of costs and profits. All these subjects will be dealt with more fully in the bulletin now being prepared; but it has been deemed advisable to publish the present Preliminary Report to meet the wishes of the Rossland mining public, who do not care to wait until the maps and plans can be engraved.

The Vancouver *Province* states that the old smelter building, occupying the site of P. Burns & Co.'s new abattoir, has been burned, as the cost of dismantling it would have been much greater. The following, from Bulletin No. 19, *Mining in British Columbia*, briefly tells of the smelter, the last of which has now been seen: "The first smelter erected in the Coast section of British Columbia was that built at Vancouver, but this can hardly be regarded as having been seriously intended for the reduction of ores, as there was not a single mine in British Columbia at that time sufficiently developed to warrant it. In fact lode mining was in its mere infancy, and, apparently, the lead mine at Field, which was never worked since, was depended upon for the supply of ore. The Field mine has almost been forgotten. The inside history of the smelter at Vancouver may never be written; but, whatever its real purpose, the fact remains that it was not long operated, if at all. It was supplied with a 75-ton lead stack, which eventually, in 1900, was removed to Van Anda, Texada Island, and there altered and used for copper-ore smelting."

According to a Hamilton, Ontario, despatch lately published in the *Toronto Globe*, "arrangements have been completed for the location in the Hoepfner Refining Co's buildings at Hamilton of the first silver refinery in Canada." Hamilton is a little astray on this point. The first lead, silver and gold refining on a commercial scale in Canada was done at the Canadian Smelting Works, Trail, British Columbia, at which works the first refined lead was produced in January, 1902, the silver refinery at Trail was built in 1903, and the first consignment of refined silver and refined

gold was shipped from Trail in October of that year. Doubtless a silver refinery at Hamilton would find plenty of material in Cobalt ores for the extraction and refining of silver, but whether it be established soon or late, the credit and distinction of having established and maintained in operation the first silver refinery in Canada must remain with British Columbia, in which province the Canadian Smelting Works is producing an average of about \$15,000 worth (gross value) of metal daily, of which \$4,000 is silver, representing a production of that metal alone at the rate of nearly \$1,500,000 per year, with a prospect of a larger production following an increase of the capacity of the refinery now contemplated.

In supporting the extensive movement for the creation of a Department of Mines and Mining in the United States a widely circulated mining newspaper observes: "With a Department of Mines and Mining, there would be a tendency to not only further the interests of the industry, but there would also be a desire to make the corporation a better, safer, more enduring institution." *Apropos* of the like endeavour to have a Dominion Department of Mines in Canada, the *Nelson Daily News* says: The formation and subsequent management of this new department naturally concerns British Columbians more than the residents of all the other provinces of the Dominion, since admittedly, British Columbia is and will remain the banner mining province of Canada. Beyond the fact that a Federal Department of Mines would be created this session little or nothing has been given out by the authorities at Ottawa but it is confidently expected that the new department will be thoroughly up to date in every way and that a competent staff will be employed. Mining men hardly realise out here what the new departure means to the industry and all who are connected directly or indirectly with it. The *Daily News* believes that with Hon. W. Templeman at its head the Federal Department of Mines will prove of immense value to the industry in this Province.

In the course of his address, at the annual meeting of shareholders in the Bank of British North America held in London on 6th inst., the chairman of the bank dwelt at considerable length on business conditions in Canada during the past year, and paid particular attention to British Columbia and the Yukon. Concerning mining he said: "In mining in British Columbia the approximate estimate of the mineral production for 1905, sent over in anticipation of the full returns, gives a total of \$21,403,000; these figures show an increase of more than two million dollars over the value of the output of 1904—a difference which is largely accounted for by the high price ruling in 1904, which has stimulated production of the great copper mines of the Boundary district. In the Yukon a further decline in the output of gold has to be noticed. The Government figures, calculating gold at \$15 per oz., show a total export of \$7,110,000 which is more than \$2,000,000 less than the output for

1904. This is partly accounted for by the fact that the summer season was extremely dry and good labour none too plentiful. The future of the camp, as the chairman told you last year, appears to depend chiefly upon an adequate water supply, and we understand that surveys have now been made by engineers of high reputation, who are of opinion that there are no difficulties which cannot be overcome in bringing a sufficient supply of water to the camp. Should this prove correct the life of the Yukon may be prolonged." It may be added that the final revision of the year's production in British Columbia shows the cabled estimate to have been more than \$1,000,000 short of the actual value of the output, the increase over the production of 1904 having been well on towards \$3,500,000.

An Associated Press despatch from London, England, is as follows: "The King has signified his approval of the recommendations of the Royal Geographical Society for the award of the royal medal to Dr. Robert Bell, Director of the Geological Survey of Canada, in recognition of his great work of exploration. This medal, which is bestowed by His Majesty as patron, was instituted by Queen Victoria in 1839. It is said that Dr. Bell has extended the knowledge of the geography of Canada more than any other living man." We heartily congratulate Dr. Bell on the receipt of this honour. Coming just as he is about to retire from the position of acting director of the Canadian Geological Survey this distinction is timely. In appreciative recognition of his valuable services it is said of him that no other living man has done so much to add to the geographical knowledge of Canada as Dr. Robert Bell. He has been engaged in topographical surveys in every part of the country. In the Great Slave Lake district, in the interior of Baffin Land, in northern Quebec—where the great Bell River perpetuates his name—on both shores of Hudson Bay, on nearly all the chief rivers and lakes of the West, he has done important work as a discoverer. British Columbia is under obligation to him for the amount of attention given to some of its mineral sections during his term of office. That more was not done by the Survey is attributable only to the comparative smallness of the appropriation made by the Dominion Legislature for its work. Had there been more money available there would certainly have been more Survey parties in the West. Still Dr. Bell kept well in view the importance of British Columbia as a mineral producer and did what he could to advance its interests. We repeat our congratulations and wish him long life in which to enjoy his well-merited honours.

The Canadian trade returns for nine months ended March 31, inst., show that there was an increase of \$2,608,440 in the value of products of the mines exported during that period as compared with the corresponding period of the immediately preceding fiscal year. The figures for the two years were, respectively: To March 31, 1905, \$22,907,006; to March 31, 1906, \$25,515,446.

THE RECORD OF A TRADUCER.

WE ask the forbearance of our readers while we once again deal with the attacks of Wm. Blakemore (who claims to be a mining and civil engineer of more than thirty years' standing) on the Crow's Nest Pass Coal Co. and then pass on to review other occasions that have come under our notice on which this man has indulged in deliberate misrepresentation or worse.

First as to the Crow's Nest Pass Coal Co. We do not intend to be drawn away from the position we have taken, which is that Mr. Blakemore's assertions that this company has "never earned a dividend out of operation" and that it is "up against reorganisation or liquidation," are utterly false. He now quotes an alleged statement of the company's chief engineer, Mr. Jas. McEvoy, that the company has only made two per cent profit out of its coal. We have thoroughly dependable assurance that Mr. McEvoy did not make that bare statement; his reply to the question put to him was one of a number bearing on the point then at issue. But even were it admitted that this statement stands without any qualification, it does not follow, as Mr. Blakemore suggests, that the company has no other sources of legitimate profit nor revenue properly applicable to the payment of dividends. First, there is its profit on coke. In 1905, 397,657 tons of coal were manufactured into coke and 397,749 tons were disposed of as merchantable coal. That is to say there was about as much coal made into coke—on which, as all honest coal experts know, this company makes much more profit than upon its coal sold as such—as was sold as merchantable coal. Then the company receives revenue from its railway, electric light, water supply and other local auxiliary enterprises, and from sales of lands, rents, etc. We have never suggested that its Reserve Fund is held in cash, for we know that it is not the custom for industrial companies to so hold their Reserves. But we do insist that its duly certified balance sheets show that its dividends have been paid out of earned profits, and no one who knows how bitter is the animosity of Mr. Blakemore against the Crow's Nest Pass Coal Co., and the lengths to which he has during several years gone in his endeavours to avenge his dismissal from its service, will accept his palpable sophistries as against the published and certified balance sheets and statements of account of men of such standing and repute as the directors and auditors of this company. We believe, therefore, that the amount the company has paid in dividends to date—\$1,493,648—has been properly paid out of earned profits.

As to the company being up against liquidation—we again draw attention to a few figures taken from its published accounts for the calendar year 1905. At the close of the year, during which it had earned net profits \$497,888 and declared dividends totalling \$349,418, its assets in accounts receivable and cash were \$630,576, and in securities owned \$328,296.98; while its liabilities in bills and accounts payable were \$594,217, and for an accrued dividend \$87,500. That

is to say, leaving out of account assets in mines, real estate, plant, etc., shown at \$5,374,644.89, it had realisable assets totalling \$958,873 as against liabilities requiring to be discharged of \$681,717, and this in connection with an expanding business earning net profits at the rate of nearly half a million dollars a year. Further, as pointed out by the chairman at the last annual meeting of shareholders, the fixed assets shown in the balance sheet "are made up almost entirely of cash investments in plant and development, while the great bulk of the company's coal areas can hardly be said to have any representation among them. And yet the machinator, Blakemore, states that failing re-organisation liquidation is imminent.

We will now turn to other matters to show what has long been the attitude of Mr. Blakemore towards some of the leading mining enterprises of this Province. We have had his personal assurance that for several years (the year or two last past excepted) the greater part of the comment on British Columbian mines that appeared in the *Canadian Mining Review*, of Ottawa, was from his own pen. In the summer of 1901 the Granby Co. was the subject of attack in the columns of that journal. The present editor of the B. C. MINING RECORD, then resident in the Boundary district and familiar with mining matters there, defended the maligned company, first having been most positively assured by its president that every statement made in the attack mentioned reflecting on the Granby Co. was "absolutely false." At that time there was an almost universal agreement among mining men in the Nelson, Rossland and Boundary districts that the *Canadian Mining Review* was notorious for its general hostility towards British Columbian mining enterprises. Mr. Blakemore was either directly responsible for this hostility or for the absence from the pages of the *Review* of any effective effort in defence of such *bona fide* undertakings as that of the Granby Co.

In October, 1904, the *Engineering and Mining Journal* of New York, a journal having a world-wide circulation, published an article by Wm. Blakemore opening with the following sentence: "The *impending exhaustion*"—the italics are ours—"of the coal mines operated for more than 30 years on Vancouver Island by the Dunsmuir family and the New Vancouver Coal Co. lends additional interest to the recent exploiting of the Graham Island coal deposits, because they represent the only coal capable of replacing them at the present time." Speaking at a public meeting held recently in Victoria this same Wm. Blakemore said, as reported in the *Colonist*, "that Vancouver Island had more potential wealth than the Island of Cape Breton, better coal and better iron ore, that if developed would make it a second Great Britain." But then, in 1904 it suited him to "boost" undeveloped coal measures on one of the Queen Charlotte Islands and depreciate the productive coal mines of Vancouver Island, while in 1906 he was trying to ingratiate himself with the citizens of Victoria, of course with no ulterior object in view.

Last year Mr. Blakemore, by that time editor

or assistant editor of the *Nelson Tribune*, published the following in that newspaper: "The able report of Horace F. Evans, of the United States Geological Survey, which we printed last night settles the vexed question of the classification of the Nicola coals. Four years ago the writer, in face of strong protest on the part of interested parties, and the production of fancy analyses, pronounced it a 'lignitic' field, and declared that a correct understanding of the formation precluded any other conclusion. One of the highest authorities on the continent now fully endorses this opinion and we imagine his report will be final." Knowing that Mr. Horace F. Evans was not "one of the highest authorities," etc., we enquired concerning his alleged connection with the United States Geological Survey and received from the acting director the following reply: "Mr. Horace F. Evans is not a member of this Survey, and has never been connected with it in any way." Mr. Evans was thus falsely described, in order to bolster up Blakemore's theories in contradistinction to the conclusions of Dr. R. W. Ells, a geologist of note and a member of the Geological Survey of Canada.

Later came an attack—also in the *Tribune*—on the Tyee Copper Co., to which the MINING RECORD replied that "the allegation in regard to payment of a dividend out of capital is a gross misrepresentation, as, too, is the implication that sinking to considerable depth has not been carried out," and we gave facts and figures that silenced the traducer for the time, though they did not shame him into showing the common honesty or sense of fairness—for he possessed neither—of doing simple justice to the company he had so grossly defamed.

Just a few lines in conclusion bearing upon the character of this man in other respects. About eight years ago he was in the employ of the Crow's Nest Pass Coal Co. as manager, but was dismissed for that species of dishonesty commonly known as "graft," and other irregularities. When on oath as a witness against the same company, at the time of the trial, in 1904, of the five test actions for damages as a result of the big explosion in the company's mines in 1902, he gave certain evidence on matters of fact that was afterwards flatly contradicted by Mr. Wm. Fernie. Anyone knowing the rugged but sterling honesty of the latter would accept his simple assurance, not to say his oath, as truth, and would find an ugly word to describe the false testimony of the other.

In undertaking the building of the Kootenay Central railway, remarks the *Revelstoke Mail-Herald*, the C. P. R. is undertaking a work that will have a big effect in increasing the mineral output of eastern British Columbia. In the Upper Columbia valley and tributary thereto, between Golden and the Crow's Nest railway, are large areas of mineral country. Several of the ore bodies in this section have been developed, and there are large quantities of ore in sight and ready to ship. These mines have lain dormant for want of transportation. This new railway will solve the difficulty.

DOMINION OF CANADA ASSAY OFFICE.

BUSINESS done at the Dominion of Canada Assay Office, Vancouver, B.C., during the fiscal year ended June 30, 1905, is shown in the report for that year of the Dominion Superintendent of Mines to have been as under:

There were received and assayed 443 deposits containing 29,673.73 oz. of bullion, valued at \$462,939.75. These deposits were derived from the following sources:

Sources.	Deposits. No.	Weights Oz.	Value.
Yukon	64	5,891.10	\$ 93,934.43
British Columbia	351	22,608.09	349,727.89
North-west Territories	3	23.95	376.93
Ontario	19	1,023.96	17,017.48
Alaska	1	13.56	217.91
Cape Horn	1	6.38	107.43
United States	2	91.91	1,301.94
Australia	1	5.60	90.78
Unclassified	1	9.18	164.96
Total	443	29,673.73	\$462,939.75

There was a loss by melting of 692.29 oz., or a percentage of 2.3330.

The following table shows the business done by the Assay Office since its establishment:

Fiscal Year.	Deposits. No.	Weights. Oz.	Value.
1901-1902	671	69,925.67	\$1,153,014.50
1902-1903	509	36,295.69	568,888.19
1903-1904	381	24,516.36	385,152.00
1904-1905	443	29,673.73	462,939.75

It will be observed that the decrease that marked the two years immediately preceding the period under review gave place to an increase over 1903-4 of rather better than 20 per cent.

From the accompanying statement it is learned that the difference in value of assays between the Seattle Assay Office, to which the gold was shipped, and those of the Dominion of Canada Assay Office gave a balance in favour of the latter of \$498.40.

Vancouver Island coal is being taken to near Keremeos, southern Similkameen, for the use of the steam shovel employed at railway grading work there. The *Similkameen Star*, after stating that 150 tons of coal from Nanaimo had been received at Penticton to be hauled thence to Keremeos, and that it will have cost \$23 per ton by the time it shall reach its destination, adds this comment: "It is about the same as shipping coal to Newcastle to bring it to the Similkameen, for at Princeton alone there is coal enough for home and export consumption to last a century with normal demand. Among the numerous owners of coal ground in this vicinity there ought to be some enterprising enough to compete with producers who ship 400 miles and requiring two handlings. In a few months railway locomotives will require fuel also and preparations should now be made to meet that demand. In doing so Princeton would have the benefit of that vital adjunct to all prosperous towns—a payroll."

THE CANADIAN MINING INSTITUTE.

DURING the first week of the current month—opening on Wednesday, 7th, and closing on Friday evening, 9th inst.—the annual meeting of the Canadian Mining Institute was held in the City of Quebec. The following summary of the proceedings has been taken from the published report of the *Engineering and Mining Journal* of New York, one of the associate editors of which (Mr. F. Hobart) usually attends annual meetings of the Institute.

The opening session on Wednesday morning was a business meeting and at this the president, Mr. George R. Smith, delivered the annual address. In this he referred to the historic ground on which the meeting was held, and in this connection he dwelt at some length on the first beginning of the mining industry in Canada. After alluding to the belief of the geologists that the spot upon which they were then met was probably the oldest land in the world, and giving some interesting information relating to the part taken by French engineers in the seventeenth and eighteenth centuries in the development of the mineral wealth of the country, he directed attention to the possibilities in north-western Quebec and north-eastern Ontario, which are now being prospected for the first time. The explorations of Messrs. J. Obalski, A. P. Low, J. E. Hardman and others, give promise of much mineral value in those regions, and the construction of the new railway through this section which is being proceeded with, will open it for development.

At the close of his presidential address, Mr. Smith expressed regret at the unavoidable absence, through illness, of the secretary (Mr. H. Mortimer Lamb), and spoke in appreciation of the manner in which Dr. J. Bonsall Porter had come to the assistance of the council by taking up the arduous duties of the secretary.

The report of the council, which was adopted, showed the Institute to be in good condition, with a total of 480 members and the financial position satisfactory.

A discussion arose over some irregularities in sending out ballots for officers. This was finally settled by a compromise resolution offered by Mr. Hobart and unanimously adopted.

Messrs F. Hobart, A. P. Low and J. J. Penhaio were elected scrutineers and the ballots transferred to their keeping.

At the afternoon session, Mr. E. D. Ingall, mining engineer to the Geological Survey of Canada, gave a brief summary of the "Preliminary Statement of the Mineral Production of Canada for 1905," prepared by the Mines Section of the Survey.

Prof. W. G. Miller, speaking for Ontario, said the output of the Province during the past year had been the largest ever reported.

Mr. J. B. Tyrrell said little could be added regarding the Yukon as a gold mining camp. It had had its extreme boom days. While much of the surface gravel has been worked out, there is still much gold in the

country. Conditions will have to change. The transportation problem was serious. The supply of water was also a problem. While the output fell off, it was in part due to the scarcity of water almost as much as to the working out of the surface mining. Systematic development has not been undertaken. That country will yet produce a vast amount of gold, but most of it may have to lie fallow for some years until conditions change and costs of living and transportation become cheaper.

Mr. E. Coste, Toronto, said: There were enormous iron-ore ranges in Canada, and a united effort should be made in the development of our own industry. The Institute might consider the question of bounties on Canadian ores.

Mr. J. Obalski reported for Quebec. There had been a great increase in mineral production in that Province last year. Asbestos had been the main increase, amounting to about \$2,000,000. Mica production amounted to \$1,000,000, the total being \$4,000,000. The cement industry was also being developed satisfactorily.

The remainder of the afternoon and part of the evening session were taken up by the reading of papers containing much information relating to the geological, mineral and other characteristics of the several districts dealt with. These papers were followed by interesting discussions.

During the evening the necessity for the establishment of a Bureau of Mines by the Federal Government was discussed, the question having been brought before the meeting by the reading of two papers upon the subject, one the work of the secretary, Mr. H. Mortimer Lamb (read by the chairman), and the other by Mr. J. B. Tyrrell. The discussion resulted in the introduction of a motion by Mr. R. G. Leckie, seconded by Mr. J. B. Tyrrell, to the effect that the president and a delegation of the Institute proceed to Ottawa to interview the Government on the subject of meeting the needs of the mining men in this respect.

The meeting on Thursday morning was largely devoted to business which had been carried over from the preceding day. A discussion arose over certain portions of the council report, but the reports were finally approved and adopted in full. After the business had been disposed of, short abstracts of several papers were given. In the afternoon the members, at the invitation of the Minister of Marine and Fisheries, embarked on the ice-breaker "Montcalm" for a trip through ice on the St. Lawrence.

In the evening the annual dinner of the Institute was held in the large assembly hall of the Chateau Frontenac. Besides the members, several guests were present. The toasts were given "The King," "The President of the United States," "The Province of Quebec," responded to by the Lieutenant-Governor, Sir Louis Jette; "The Dominion Parliament," responded to by Mr. E. D. Ingall, of the Dominion Geological Survey; "The Quebec Legislature," by Hon. Jean Prevost, Minister of Mines and Lands; "Our Mineral Industries," proposed by Dr. F. D. Adams and responded to by Mr. F. Hobart, Mr. Hiram W.

Hixon and Maj. R. G. Leckie; "Our Guests," Dr. James Douglas. After the conclusion of the formal speeches there were a number of informal speeches, songs, etc., and the occasion was much enjoyed.

On Friday morning a number of papers were read by title, and two striking papers in full.

At the opening of the afternoon session the scrutineers reported that they had duly canvassed the large number of ballots cast, and declared the following officers elected: President, Mr. George R. Smith, Thetford Mines, Quebec; vice-presidents to serve one year, Dr. F. D. Adams, Montreal, and Major R. G. Leckie, Temagami, Ont; to serve two years, Mr. Frederic Keffer, Greenwood, B.C., and Mr. G. Herrick Duggan, Sydney, Cape Breton. Treasurer, Mr. J. Stevenson Brown, Montreal. Secretary, Mr. H. Mortimer Lamb, Montreal. Members of Council, to serve one year, Mr. John Blue, Eustis, Quebec; Mr. C. J. Coll, Stellarton, N.S.; Mr. Thomas Cantley, New Glasgow, N.S.; Mr. Frank B. Smith, Edmonton, Alberta; Prof. J. C. Gwillim, Kingston, Ont.; Mr. J. McEvoy, Fernie, B.C.; Prof. W. G. Miller, Toronto, Ont.; and Mr. H. Williams, Danville, Quebec. To serve two years, Mr. W. H. Aldridge, Trail, B.C.; Mr. B. A. C. Craig, Toronto, Ont.; Mr. R. T. Hopper, Montreal; Mr. A. M. Hay, Rat Portage, Ont.; Mr. Thomas Kiddie, Victoria, B.C.; Dr. A. E. Barlow, Ottawa; Dr. J. Bonsall Porter, Montreal, and Mr. W. D. Robb, Amherst, Nova Scotia.

Two interesting papers were read, one by Prof. R. W. Brock on the Rossland district, and one by Mr. R. G. McConnell on the Windy Arm mining district. Prof. Brock's paper was illustrated by lantern slides.

A number of fine views in connection with the asbestos industry at Thetford mines were shown, as were a series of views taken by Dr. J. Bonsall Porter during a recent trip to South Africa.

After a few brief speeches the Institute adjourned until March, 1907; the place of meeting to be decided by the Council.

The usefulness of the diamond drill in mining is recognised by the three companies operating on a large scale in the Boundary. To date the Granby Co. has drilled holes totalling between 17,000 and 18,000 ft. for the purpose of determining the extent of known ore bodies and prospecting new ground. The B. C. Copper Co. during the last twelve months has drilled between 3,000 and 4,000 ft. in its Mother Lode mine and recently commenced using the drill in the Emma mine, also in this district. The Dominion Copper Co. is preparing to put in a number of drill holes from the lower levels of its Brooklyn mine at Phoenix. Drills have also been used for prospecting purposes in the Oro Denoro and Betts and Hesperus mines. Of the five drills in use in the district two or three are owned and operated under contract by the Diamond Drill Contracting Co., of Spokane, Washington, and the others by the respective companies using them. The drilling company mentioned is also operating drills in the Similkameen district.

MINING IN NORTH KOOTENAY.

SCATTERED over a comparatively large area of country there are in North Kootenay numerous mining properties, many of which give promise of proving productive whenever capital shall be available for their adequate development, and several of which have already produced appreciably large quantities of ore of a profitable grade. The *Mail-Herald*, published at Revelstoke, from time to time calls attention to the mineral resources of this part of Brit-

This is a big zinc-lead deposit in limestone alongside the main line of the Canadian Pacific railway. It was operated about 12 years ago, but on the prices of silver and lead dropping and zinc coming in to raise the cost of smelting, it was shut down. Six years ago Seattle people took it up and shipped several carloads to Everett smelter but the experiment was unprofitable. The present high prices of lead and the increasing demand for zinc-lead ores at Frank and for lead ores at Pilot Bay by the Canadian Metal Co., have created a demand for a class of ores hitherto rejected.



A Pack Train taking supplies to Mines in North Kootenay.

ish Columbia, and in continuation of its persistent policy of endeavouring to attract capital for mining purposes lately printed a summary of operations throughout North-east and North-west Kootenay, as under:

The outlook for the mining industry in North Kootenay is brighter than for some years.

NORTH-EAST KOOTENAY.

In North-east Kootenay, New York capitalists have become interested in the Monarch mine at Field.

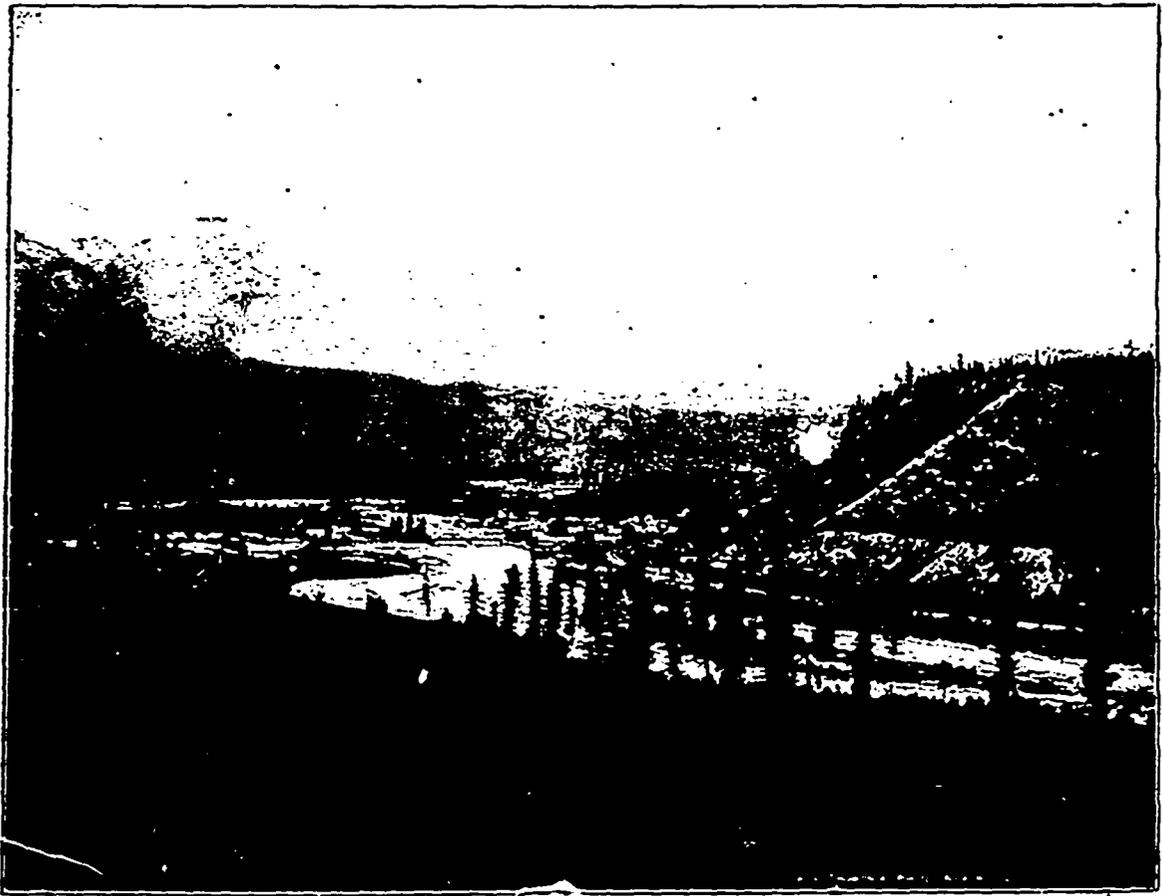
Mr. Cornell, M.E., has been engaged to investigate the Monarch mine. The facilities for shipment are such that the ore can be dumped from the mine directly into cars on the main C.P.R. line, so that transportation facilities could scarcely be better.

A little further west the Laborers' Co-operative Mining Association, a Chicago company, is developing two promising properties. These are on Ice River, which flows from the Rocky Mountains. The location is in a mineralised belt about 15 sq. miles in extent

outcropping through the limestone and the section is one which the late Sir G. M. Dawson, the eminent Canadian geologist, pointed out as likely to yield payable mineral deposits. Of the ore bodies developed by that company in that locality one shows gold-copper and the other zinc ore. Development work has been prosecuted during the past winter on the gold-copper property. The same company has a copper property on Canyon Creek near Golden on which it has a considerable amount of gold-copper ore developed, and it proposes building a wagon road to it and opening it up at lower levels so as to start shipment of

tunnels, one of 80 ft. at a level 80 ft. below the outcrop, in which zinc ore was discovered, and 40 tons taken out for shipment. The other tunnel is 125 ft. lower and has developed on the footwall a shoot of zinc ore 2 ft. wide. This zinc ore is the best yet discovered in this section, assaying over 50 per cent zinc. The property is conveniently located, being within two and a half miles of the Columbia River and accessible by a road seven miles in length all down grade from the mine to the river.

On No. 3 Creek Brown Bros. are stated to have a splendid showing of silver-lead ore and have done a



The Valley of the Columbia at Golden, N. E. Kootenay (as it appeared in 1896).

ore. Mr. Anderson, M.E., of Chicago, has been supervising the company's operations during the past year.

Considerable attention is being attracted to a big body of silver-lead ore struck on the Giant claim on Spillimachene Mountain, 42 miles south of Golden. The ore-body is an altered limestone, 175 ft. in width of which at least 125 ft. is well mineralised. The values are, of course, low, but with such an immense body of ore there should be a good opportunity for handling it by a concentration plant. A Canadian smelting company has bonded it. Capt. Armstrong, manager of the Upper Columbia Navigation Co., is the owner of the property, which he purchased at a tax sale. Since taking it over he has driven two tun-

lot of work. A good deal of ore is in sight but the difficulty is the cost of transportation. On Horse Thief Creek, in the Windermere district, the Ptarmigan mine which created such a sensation when discovered some years ago, is shut down, having proved so far a disappointment, although great expense has been incurred by Tiffany's of New York, who own it, in development and construction of an aerial tramway.

The Paradise is the banner mine of North-east Kootenay. It is a remarkable deposit of sand carbonates, carrying fairly good silver and lead values. About 7,000 tons of ore have already been mined and between 2,000 and 3,000 tons shipped to Trail smelter where it commands a specially favourable rate for

fluxing purposes. Over 5,000 ft. of development work have been done. A few men are kept steadily at work on the property but the mine will not be fully worked till better transportation shall be provided.

The Swansea, at Windermere, which was the first shipper of copper ore in this section, is again being examined by experts with a view to re-opening it in view of the high prices now ruling for copper.

Mine owners along the Columbia Valley of North-east Kootenay are anxiously awaiting the building of the Kootenay Central railway, which has been begun. When completed an improved means of transportation will be provided and mining will doubtless see a revival of its old-time activity, as there is a lot of ore

never been thoroughly prospected, but which presents strong evidences of mineralisation. Some development has been done on several prospects of silver-lead ores with encouraging results, notably the Silver Shield, Silver Bell, Keystone and others. The outlook for copper discoveries is particularly good as there are outcrops of copper on which no development has been done in the vicinity of Standard mine and Keystone Mountain. There are large showings of copper and galena ores on Downie Creek.

On Carnes Creek J. P. Kelly has developed to a depth of 700 ft. a body of ore which is now showing strongly in zinc and copper.

On Laforme Creek are extensive deposits of gold-



Head of Bugaboo Creek—Golden Division, N. E. Kootenay.

more or less developed in the Selkirk range west of the river.

A deal has just been put through whereby a New York company has acquired from J. M. Kellie, for many years representative of this section in the Provincial Legislature, a group of claims showing copper ore on Copper-stain Mountain behind Beavermouth. Deals are also on for a property on the south fork of the Spillimachene River and on Quartz Creek, 12 miles south of Beavermouth, on the Canadian Pacific railway. These properties carry copper-gold ores.

NORTH-WEST KOOTENAY.

Coming to North-west Kootenay there is likely to be an influx of South Kootenay prospectors to the Big Bend the coming spring.

The successful development of the Standard mine in that section, owned by the Prince Mining and Development Co., has attracted much attention there, where there is a large amount of country that has

bearing and silver-bearing ore, but transportation is the difficulty.

With regard to the placer deposits of the Big Bend, J. D. Sibbald is now in Duluth financing with the shareholders there the coming season's operations on the Revelstoke & McCullough Creek Hydraulic Co's property on French Creek. The Buffalo Mining Co. has 15 men on its claims on French Creek, and the American Mining Co. has just bought out E. A. Bradley's claims north and south of its property on French Creek with a view to increasing its capitalisation to \$500,000 and pushing hydraulicking operations the coming spring. Harry Howard does some work each season on the old Chicago Co's ground on Smith Creek and the Duquesne Mining Co. of Pittsburg figures on resuming its old-channel drifting next spring.

The Standard mine is the great mining property of the Big Bend. A great deal of development work

has been done on it and success has attended these operations. The ore-body has been proved from the surface to a depth of 550 ft. on the dip of the ore-body, and of the drifts run north and south on the ore-body at intervals for that depth the drifts to the north have developed a continuous shoot of ore as far as run. It is estimated this ore will average \$25 a ton, mainly in copper values, though high silver values have also been found. Leads cross the property in all directions so that it has the appearance of a stock-work with numerous outcrops of ore of as much promise as that developed. Colorado and Missouri capitalists have under consideration putting enough capital into the property to install an aerial tramway and to build a smelter on the Columbia River, there being regular steamboat communication

The Oyster-Criterion, which adjoins the Eva, and carries an extension of the same ore-body, is shut down at present pending the raising of further capital in England, whence the president and one of the directors have gone for the purpose.

The Goldfinch, belonging to Calumet, Mich., parties, is to be re-opened and considerable development work done. There are also a 10-stamp mill and first-class electric power equipment on this property and the ore milled gave the best returns in the camp. Little development was done, however, and the ore in sight was soon exhausted.

On the Silver Dollar belonging to Indiana parties, a large body of ore has been proved up and a special kind of mill is being installed for crushing and treating the ore.



Falls on Bugaboo Creeks—Golden Division, N. E. Kootenay.

between the railway and the proposed smelter site on the river during the summer months.

On the main line the zinc deposits at Illecillewaet are attracting attention and have been bonded by the Empire Zinc Co.

LARDEAU DISTRICT.

Reviewing points south of the main line of the C. P. R., Fish Creek is at present the most important mining locality. The Eva mine is steadily working and its 10-stamp mill turns out an average gold brick of about \$5,000 per month. Seattle parties are understood to be negotiating for the purchase of this property with a view to enlarging the mill, and it is simply a question of working the property on a big enough scale to ensure a good dividend payer. The property has been under development for six years, the ore-body is large, and has been proved to average about \$5 per ton in gold values.

Development is being pushed this season on the Mammoth on Goat Mountain. This is a property which has paid from grass-roots, by shipping the high-grade ore taken out in the course of development.

Development work is being steadily pursued on the Beatrice, with a view to developing at a greater depth the bodies of ore hitherto proved up. It is not intended to ship any ore for some time. Rosland people have become interested in this property.

At Trout Lake it is likely considerable work will be done this spring on the Lucky Boy and Horse Shoe.

At Ferguson a local company is operating the Broadview with good results, having shipped several carloads of ore. This property had a splendid showing of copper ore on the surface but it changed to galena at depth.

The Reward Co. is driving its long tunnel with a view to finding other ore-bodies on the same lead a

the Nettie L. and Silver Cup ore-bodies were located.

The mill connected with the Nettie L. and Silver Cup mines is at present shut down, but development work is being pushed from the low level tunnel which gives 700 ft. of depth on the property. Good bodies of ore have been found in the lower levels and the mine will probably start shipping again this spring. This mine has already sent out about \$500,000 worth of ore, the values being mostly in silver but the gold values are fairly uniform at about \$10 per ton as well.

ARROW LAKE.

With the active enquiry for zinc ores there is some probability of the zinc deposits on Arrow Lake being worked. These deposits have been favourably reported on by the Canadian Geological Survey and are owned by A. M. Symons and Spokane parties. A good road has been built to the property on which

REPORT OF DOMINION SUPERINTENDENT OF MINES.

INCLUDED in the Annual Report of the Department of the Interior for the fiscal 1904-1905, recently issued, is the report of the Superintendent of Mines for the Dominion of Canada, Dr. Eugene Haanel, which is accompanied by the reports of Mr. A. J. Beaudette, Government Mining Engineer at Dawson, Yukon, and Mr. Robert Smart, Government Assayer at Whitehorse, Yukon.

The Superintendent's report gives particular of (1) the field work done during the year by the Mines Branch, (2) an unsuccessful examination for lignite coal deposits in the Northwest Territories, (3) the gathering by Mr. Fritz Cirkel, M.E., of material for



Near Head of Middle Fork of Spillimachene River, N. E. Kootenay.

there is a large quantity of ore in sight. The Canadian Zinc Commission is paying some attention to devising the best means of handling this ore and has taken samples to experiment upon at Denver, Colo.

GENERAL.

The remarkable thing about mining in this section is that it is almost entirely in the hands of American capitalists. Our American cousins tell us we have no appreciation of the wealth of the country we live in, and they are certainly showing the people on this side of the line how to utilise the timber and mineral wealth.

The largest nugget of platinum exhibited in the United States is that in the National museum (Washington, D.C.) mineral collection. It weighs 444 gr.

reports on mica and asbestos, and (4) of the several magnetic surveys made. The office work of the branch included voluminous correspondence, the preparation of drawings, etc., for reports and the editing and proof-reading of the reports. Details of the business done by the Dominion of Canada Assay Office, Vancouver, are supplied. An account of the seventh annual session of the American Mining Congress, held at Portland, Oregon, in August, 1904, together with information concerning its objects and a copy of a resolution petitioning Congress to create a Department of Mines and Mining (by the way, the Congress held its 1905 annual session last November) is given. The appended reports relate to the Yukon, and these are of interest on the Canadian Pacific coast. That of the Government Mining Engineer follows:

Report of A. J. Beaudette, Government Mining Engineer.

Dawson, Y.T., September 28, 1905.

Eugene Haanel, Esq., Ph. D.,
Superintendent of Mines,
Ottawa.

Sir,—I beg to submit herewith my annual report for the fiscal year ending June 30, 1905, under the following heads:—

1. Alluvial deposits.
2. Mining methods — Placer, hydraulicking, dredging, steam shovel.
3. Machinery.
4. Coal deposits.
5. Population.
6. Assay offices.
7. Quartz mill.

Alluvial Deposits.

The exact superficial area of the auriferous gravels in Yukon Territory is, at present, unknown. Summing up the areas within which auriferous gravels have been found of sufficient value for placer mining, I would put it at 2,000 sq. miles.

The auriferous gravels best known and of the greatest importance are situated in the immediate vicinity of Dawson in what is known as the Dawson district. This district, which contains 800 sq. miles of the richest gravels in the world, is comprised of the following creeks and their tributaries:—

Bonanza Creek.—Its gold-bearing tributaries are: Eldorado, Victoria Gulch, Big Skookum, Little Skookum, Adams Creek, Fox Gulch, American Gulch, Trail Gulch and Lovett Gulch.

The gold-bearing tributaries of Eldorado are as follows: French Gulch, Nugget Gulch, Ora Grande and Chief Gulch.

The gold-bearing tributary of Victoria Gulch is No. 7 Pup.

Hunker Creek.—Its gold-bearing tributaries are as follows: Henry Gulch, Last Chance Creek, Dago Gulch, Hattie Gulch, Independence Gulch, Hester Gulch, Gold Bottom Creek and Mint Gulch.

Bear Creek.—Lindow Creek is the gold-bearing tributary.

Dominion Creek.—Its gold-bearing tributaries are as follows: Lombard Creek, Caribou Creek, Gold Run Creek and Sulphur Creek. Sulphur Creek has one small gold-bearing tributary known as Green Gulch.

Indian River.—Its gold-bearing tributaries are as follows: Eureka Creek, with its two forks, one of which has a tributary known as the 18 Pup; Quartz Creek, with its gold-bearing tributaries: Classy Pup, Little Blanche, the latter has a tributary known as Canyon.

The gold-bearing rocks belong to either the Cambrian or Silurian age, and are composed of quartzite mica schists. No fossils have been found to determine the age of the rocks in the vicinity of the mica schists, although a Brachiopod, well preserved, was recently

found in the White Channel gravels at a depth of 75 ft. below the surface, and which appears to be *Orthis Lynx*, one of the Silurian fossils. This fossil cannot belong to the mica schists, but there is a possibility that it came from the top rocks and lodged into cracks below in the lower strata and then was mixed with the gravels at the time of their deposition.

The mica schists, which are so prominent within all the gold-bearing areas, contain an unusual amount of quartz. This quartz, in the form of stringers of 2 or 3 ft. thickness follows the contortion of the schists. These stringers run in different directions and form a net work which is, undoubtedly, the crigin of the placer gold. There are many dykes cutting the schists which are perhaps responsible for the concentration of the gold in these small stringers. I have seen quartz *in situ*, in small stringers, showing native gold adhering to its sides associated with iron pyrites, in cubical crystals, which upon assay, after the removal of the iron, and the gold visible to the naked eye proved to contain only traces of gold. It appears that the gold is situated between the quartz and the mica schists in a native state or associated with iron, but not contained in the quartz itself. I have assayed many of these iron pyrites crystals, and found them all, without exception, gold-bearing. It is a common occurrence to see small specks of gold in the iron pyrites crystals which have been decomposed into oxides.

According to Messrs. McConnell and Tyrrell the gravel deposits of this Territory are sea deposits belonging to the Pliocene and Post-Pliocene age. The presence of gold in the gravels is due to the erosion of the rocks and sericite schists, containing many gold-bearing stringers, situated on the side hill in the form of a net work. The gravels are composed of quartz pebbles, diorite, granite, and pieces of mica schists deposited very irregularly. It appears that after these gravels were deposited in the valleys, an elevation took place which diverted the water to its present channels. The water cut through the gravels and rocks, at places, as much as 350 ft. in depth. The gravels in the creek bed are much younger than those at higher levels where they were originally deposited. Some time after these gravels were deposited the country was subjected to severe cold which froze, with but very few exceptions, both the top and lower gravels.

The different creeks contain different classes of gravel, and should be studied separately, but in this report only a general description of them can be given, as the summer months, during which time the gravels should be studied, are taken up with other work in connection with my duties.

The most important creek in the Territory for its bench and creek gravels is Bonanza Creek. This creek is about 22 miles long, 7 miles of which do not contain gravels of sufficient value to warrant placer mining. The average depth of the bench gravels is from 20 to 125 ft. At the lower end of the creek these gravels attain a depth of over 300 ft., 160 ft. of which belong to the Klondike River deposit, which

appears to be much more recent. The bench gravels start at No. 20 above Discovery, and continue on the right limit of the creek for a distance of half a mile, thence from Gold Hill on the left limit down to No. 49 below Discovery, thence from No. 60 below Discovery to the Klondike River. The pay in these gravels is not evenly distributed, most of it lies on bed rock, and its width also varies. I here give a cross section of these bench gravels as follows:—

1. The top is covered by a little moss of a few inches thick, under which there is a depth of 2 ft. of very fine silt composed of a little organic matter, sand and some decomposed mica schists.

2. The next layer is composed of pieces of country rock, diorite and quartz pebbles not over 6 in. in diameter. This has a depth of from 10 to 50 ft. and contains a few colours of gold; it is, however, not suitable for placer mining.

3. The next layer has a depth of from 20 to 50

with the bed rock of all hills is that it is lower than the rim of the hill. To this my attention was called by Mr. Tyrrell, who observed it on many of the hills of the White Channel. He states that this "sagging" of the hill under the gravels is due to the weight to which it is subjected while the rim is not subjected to such pressure. This is very important, for if hills are prospected by means of tunnels these must be driven some distance below the rim in order to arrive at bed rock pay and have sufficient grade to wheel out the dirt.

The depth of bed rock in the creek bed varies from 15 to 40 ft. A cross-section of the creek gravels is as follows:—

1. The surface is covered by a thick bed of moss under which there is a layer of "muck" varying from 3 to 15 ft. in depth.

2. The next layer is composed of heavy gravel varying from 3 to 8 ft. in depth. In this there are



Bobbie Burns Basin—Middle Fork of Spillimachene River, N. E. Kootenay.

ft., and contains the heavy deposit of quartz pebbles and boulders. The lower 4 ft. of this layer is called the bed rock and contains the best pay. This bed rock is rather rough and forms a good riffle for the gold. At places on Gold and Cheechaco hills it was exceptionally rich. I am informed by many that the bed rock pay averaged \$50 per cu. yd.

In the vicinity of Trail Gulch, a distance of about 4 miles above the mouth of the creek, the White Channel gravels have a depth of nearly 200 ft., on top of which there is a fine deposit of sand which appears to have been mixed with iron solution. On top of this there are about 160 ft. of Klondike gravels which are barren and easily distinguished from the gold-bearing gravels of the White Channel.

Something very important to know in connection

a few colours of gold, but not considered rich enough to work.

3. The next layer is called the bed rock, which is from 2 to 4 ft. in depth and contains the best pay. On Eldorado Creek this layer was very rich. I am informed by many who worked on No. 16 and 17 that pans worth \$1,000 were taken on bed rock. The pay gravels in Bonanza Creek bed start at No. 43 above Discovery and extend down to the mouth of the creek, it being a distance of about 15 miles. The gold in the creek bed is, with very few exceptions, concentrated on bed rock.

The gold in the upper end of the creek, viz., from No. 43 above Discovery to No. 7 above, is of a higher quality than that found at the lower end. The gold is very coarse at the head of the pay, and it gradually

gets finer coming down stream, and at a point where Eldorado meets Bonanza it is rather fine and considered of a lower grade.

Below the junction of Eldorado and Bonanza Creeks the gold is again coarse, but gradually gets finer as going down stream. I find that there are two different kinds of gold in the Bonanza Creek bed below its junction with Eldorado, and this gold is of a lower quality than that of the upper Bonanza. The mixture is due to the Eldorado pay. I here give the fineness of the gold found on Eldorado and Bonanza Creeks:

Upper Bonanza Creek	825
Eldorado Creek	765.
White Channel, hillsides.	787.
French Gulch (Eldorado)	674.
Lower Bonanza Creek.	787.5

The next important creek valuable for its creek and bench gravels is Hunker Creek. This creek is about 18 miles long, 2 miles of which have not been found gold-bearing. It has two important tributaries: Last Chance and Gold Bottom Creeks, both being on the left limit of the creek, the former entering it at a point about 10 miles above its mouth and the latter 4 miles above its mouth. The same conditions prevail on this creek as on Bonanza and Eldorado Creeks, viz.: An elevation took place which diverted the water to its present channel which has cut through the gravels and rocks leaving the gravels behind which are to-day at a higher level than the present creek bed. All the gravels are frozen. There are less bench gravels on this creek than on Bonanza.

As near as I can calculate I find that there are 125,000,000 cu. yd. of gravels on this creek, which are gold-bearing. The deposition of the gravels on this creek is the same as on Bonanza Creek. The most interesting part of the Hunker bench gravels is in the vicinity of Last Chance Creek, where they are mixed up with cretaceous clay which renders them very difficult to wash. This difficulty has been overcome by the invention of new appliances to wash the gold therefrom. In this vicinity the bed rock is composed of quartz porphyry and cretaceous shale, the latter forming a good riffle for the gold.

On the lower part of Hunker Creek the sericite schists contain considerable quantities of graphite which give the gravels a black appearance. The gold is coated with a film of oxide of iron, which together with the graphite renders the gold difficult to recognise. The pay in the creek bed appears to start at No. 41 above Discovery, and continues uninterrupted down stream to its mouth. The width of the pay is not at all regular, at places it is 40 ft. and at others it reaches 250 ft. Where there is no pay on the hillside the creek claim opposite contains more pay than is usually the case with the other creek claims situated opposite hillsides that contain pay gravels. The pay on the hillsides starts at No. 4 on the right limit, and continues on the same limit as far as No. 13 below Discovery, then it crosses the creek to the left limit at No. 23 below Discovery, and continues on the same limit down to a point opposite No. 35 below Discov-

ery. Below this there is very little auriferous gravel until a point opposite No. 50 below Discovery on the left limit is reached, it then continues down to a point opposite No. 82 below Discovery known as Last Chance Creek. From this place down to the mouth of the creek there are numerous interruptions. The pay in the gravels on the right limit of the creek has not yet been proven except at one place, viz.: Hattie Gulch.

I here give the fineness of the gold on Hunker Creek and its tributaries, from which the difference of quality between the Hunker Creek gold and the Last Chance will be noted, the principal impurity being silver, viz.:—

Upper Hunker Creek.	809.
Middle Hunker Creek.	834.
Lower Hunker Creek	844. to 792.
Last Chance Creek.	689.
Gold Bottom Creek.	804.
Henry Gulch.	839.
Mint Gulch	808.
Mouth of Hunker Creek	715.5
Bear Creek	718.

Dominion Creek heads at the dome just on the other side of the divide of Hunker Creek, and is generally described as being tributary to Indian River. A more correct description of it would be to call it a continuation of Indian River, and not a tributary of it. The mouth of Dominion Creek is taken to be at a point where it joins Sulphur Creek, below this point it is called Indian River. If the latter description be taken as correct, Dominion Creek is 30 miles long. This creek is different from the others in that it was not elevated, therefore the deposit in the creek bed is at the same level as it was at the time it was deposited. There are no gravel benches on this creek except at the mouth of Caribou Creek, a tributary at No. 27 below upper Discovery. The creek gravels are different from those on Bonanza and Hunker Creeks in that they contain a larger amount of quartz pebbles. A cross section of the creek gravels is as follows:—

1. The top is covered by a little moss under which there is muck or soil of from 2 to 20 ft in depth.
2. Gravels composed of sericite schist, quartz pebbles and diorite from 2 to 9 ft., which contain a certain amount of gold, part of which is suitable for placer mining.

3. This layer is called the bed rock, and it is from 1 to 3 ft. of very soft material composed of small grains of quartz and sericite schist reduced to a powder, together with some iron-stained material. Large quantities of black sand (magnetic iron) and cassiterite are found in this layer.

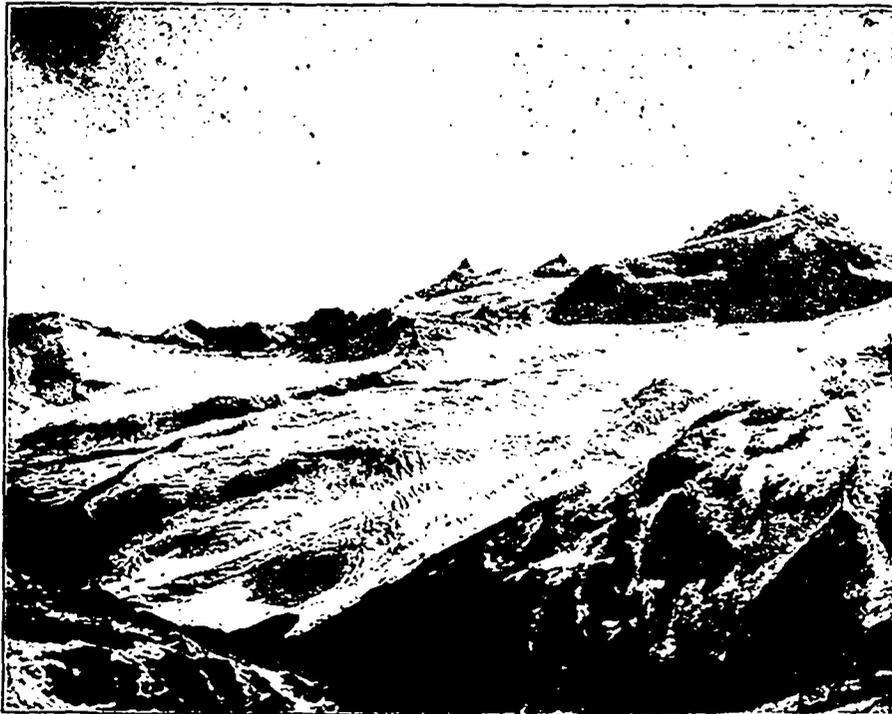
The pay on this creek starts at a point about one mile from the dome and continues down stream to a point at No. 90 below lower Discovery, or about a distance of 12 miles. Here there is an interruption of 10 miles where the pay is rather poor, and it does not appear that these gravels can be, at present, worked by placer methods with profit. At the end of these

10 miles, or at a distance of 22 miles from the head of the creek, the pay starts again and continues down to the mouth of Sulphur Creek, and is of sufficient richness to warrant placer mining. There has not been sufficient prospecting below this point to determine the value of the gravels. At the mouth of Gold Run Creek the pay extends over a very wide area, in fact at one place I know of it is 500 ft. in width, but it is rather low grade. The gold at this point is mixed with the Gold Run gold, as will be seen from the fineness hereunder given:—

Upper Dominion Creek	801.
Middle Dominion Creek.. . . .	828.5
Lower Dominion Creek	861.5
Gold Run Creek	861.
Caribou Creek.. . . .	825.
Sulphur Creek.. . . .	808.

a distant point from the workings and conducted there by means of a ditch or a flume. The length of the conducts of water depends on the supply and on the elevation required for the disposal of the tailings.

The frozen state of the auriferous gravels and the shortness of the season are difficulties met with in Yukon mining operations. Still the frozen condition of the gravel has certain advantages. Deep placer diggings would have to be very rich to bear the expense of placer mining if they were not frozen. It would require timber of the best quality available, which is very expensive here, and the necessity of installing pumps to control the water at that depth. This is particularly noticeable on Duncan Creek, a tributary of the Stewart River, where at places the bed rock is 105 ft. deep, and the bottom gravels are not frozen. A certain amount of pay was found which would have warranted continued operations had



View from International Basin—Middle Fork of Spillimachene River, N. E. Kootenay.

Many fossils have been found imbedded in the gravels and muck on almost all the gold-bearing creeks except Bonanza and Eldorado Creeks. On these last two mentioned creeks it does not appear that any fossils or organic matter of any kind have been found.

Mining Methods.

Placer mining is the removal of auriferous alluvial deposits mostly by hand labour. The gold is extracted from the gravels by means of water in sufficient quantity to effect a complete disintegration of the gravel material which is carried away by the water, and the gold on account of its higher specific gravity is left behind. The water used for this purpose must have sufficient elevation for the disposal of the tailings. This water is either pumped up from the stream into the sluice boxes or diverted from the stream at

they not been troubled with water at that depth which could be controlled only by large pumps at a considerable expense.

I consider the frozen condition of the gravels an advantage in deep diggings, but an objection in shallow ones.

Within the last three years a new method of mining called the "open-cut" method has been introduced to work shallow diggings. It consists of removing the overburden down to the pay gravels and then the pay is either hoisted or shovelled into sluice boxes. In removing the overburden the frost is a great drawback. It necessitates the thawing of the muck either by steam or its exposure to the sun after the moss is removed. The next layer below which is immediately below the muck and above the pay streak must be ex-

posed to the sun for a certain length of time before it can be removed by the scraper. I consider that the frost is objectionable whenever this method is employed.

Another hardship experienced with frozen gravels is in connection with the dredging operation, which is the coming industry, as it appears to be the most successful method to work flats and valleys which contain low grade material. It is impossible to wash frozen material with the expectation of recovering gold therefrom, it requires to be thawed before it is excavated. Stagnant water in a dredge sump-hole will have a tendency to thaw the gravel, but the amount of thawing is so small that it should not be taken into consideration, and from an operative standpoint should not be recommended.

The only three successful methods of thawing which have been already introduced, and will hereafter be described, are: open wood fires, steam, and exposure to the sun.

In the early days of this camp only the most primitive method of placer mining was used. It consisted of thawing with wood fires and then the thawed material would be hoisted to the surface and dumped into a heap and left there until the spring time to be washed. The hoisting was done by hand with a windlass and a bucket containing from 5 to 8 pans of dirt. The amount of dirt that can be hoisted by one man with a windlass depends entirely on the depth of the shaft and size of the bucket. A good man can hoist 200 buckets of 6 pans each up a shaft 30 ft. in depth in one day. The average is a little below this.

To wash this material in the spring time sluice boxes were set up having a total length of 48 ft., giving a grade of from 9 to 10 in. to each box length of 12 ft. Situated at the required elevation for the disposal of the tailings, and provided with riffles to catch the gold, they were set up along the side of the dump and the material was shovelled into them. The riffles were made of small poles from 1 to 3 in. in diameter and from 4 to 5 ft. in length, placed side by side in the sluice box, leaving a space of from 1 to 2 in. between them. The poles were held together by means of a small piece of board nailed at each end to keep them in position, as well as to facilitate their removal at the time of the clean up.

When a clean up was made all the riffles were removed except the last at the end of the box, then nothing else was left but the gold and the fine material caught by the riffles. The water was then turned on to this in small quantities at a time while one of the men shovelled the material towards the head of the box and thereby concentrated this residue until there was only the gold left in the box. The gold was then put into a pan, dried, cleaned from the black sand, and weighed. This process was repeated until the whole dump was washed.

The black sand above mentioned which remained in the sluices with the gold could not be avoided on account of its high specific gravity, it being magnetic iron.

Of late years this method has been greatly improv-

ed in many different ways. The sluices are now set up and covered with small battens before the dump is started. The material is dumped into the boxes so that in the spring time the dirt is pushed into them in greater quantity than if they had been set up along side of the dump. Care must be taken not to thaw too much of the dump at a time, as there is danger of the dirt being too heavy for the boxes, which would render them useless for sluicing.

Steam-thawing.—A new era has been created in mining by steam-thawing the gravels and hoisting them with self-dumper buckets. This has proven a more economic method applicable to the working at a profit lower grade dirt than heretofore.

Thawing with steam was introduced here for the first time shortly after the discovery of this camp. The apparatus employed consists of an iron pipe called "point," about 5½ ft. in length, one end of which is drawn out into a point. The other end is connected with the steam from the boiler. The steam from the boiler is transmitted by means of a 1-in. iron pipe which is stationery. The connection of this iron pipe and the point is made with a small rubber pipe in order to enable the operator to move the point to the required position without having the rigidity of an iron pipe to contend with. One boiler will furnish many points with steam. It is considered that one-half a cord of wood in a good boiler will furnish 16 points with steam for 10 hours, which is equal to one and a-half horse-power per point.

The self-dumper is the greatest labour saving device we have, and it is considered indispensable. This device has already been described by you in the appendix to your annual report for the year 1902.

The points and self-dumper above mentioned are adapted to both deep and shallow diggings. It is considered deep when it is over 25 ft. to bed rock *i. e.*, it must be worked by means of a shaft and drift. The success of working deep placers depends a great deal on the use of the apparatus above mentioned. In shallow diggings a new method has been introduced of late years called the "open-cut" method, and proves to be very successful. This method of mining cannot be resorted to when it is deeper than 20 ft. to bed rock, as there is too much overburden to remove. It consists of removing the moss and the muck and thawing the remainder by steam or leaving it exposed to the sun for some time. This latter layer, except the lower 3 or 4 ft., is called the waste, and it is not suitable for placer mining as it will not pay to handle under present conditions. After the waste is removed the remainder is either hoisted or shovelled into the sluice boxes and washed in the ordinary way.

The output of a man's work is on an average 4½ cu. yd. per 10-hr. day, and the wages are \$4.50 and board. Counting the expenditure of the plant and other incidentals it is impossible to work ground worth less than \$2 a cu. yd. by the placer mining method.

Fuel.—The only fuel used on the creeks, with one exception, is wood. Wood is very expensive here, and it is responsible for the many failures we have already had. Its price at any particular point on the

creeks depends entirely on the source of supply of the particular locality in which the work is going on. The price of wood on each creek is as follows:

	Per Cord.
Lower Bonanza Creek	\$10
Grand Forks	12
Upper Bonanza Creek	12
Eldorado Creek	\$12 to 17
Hunker Creek	\$7.50 to 11
Sulphur Creek	\$8 to 11
Upper Dominion Creek	\$12 to 13
Lower Dominion Creek	\$7 to 8
Gold Run Creek	8

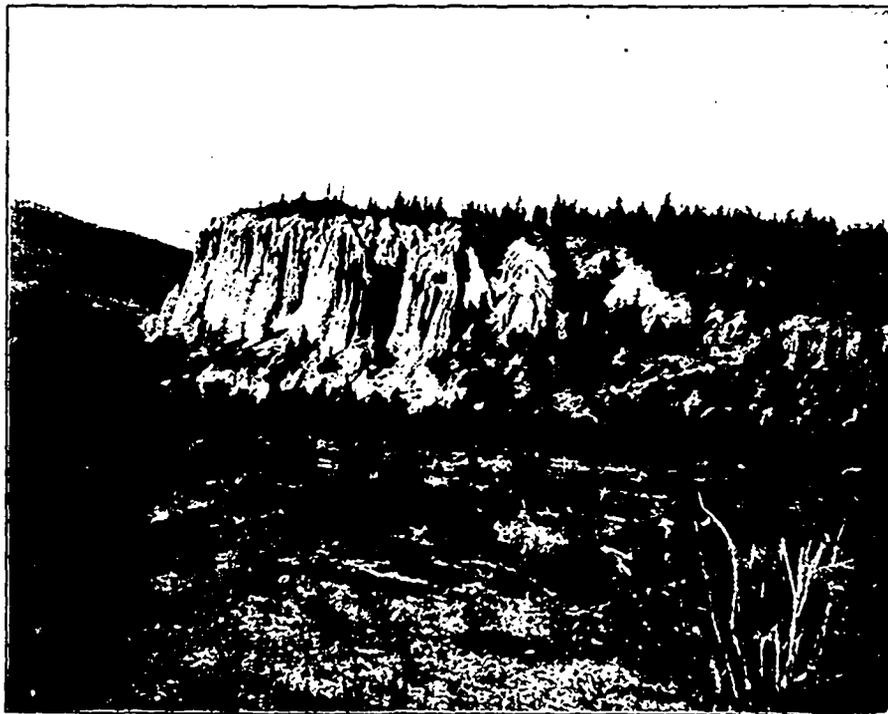
Coal is used for fuel only at one place on the creeks, and that is at Mr. Andrews' pumping plant.

a ton, duty at 5 cents a gallon, and the transportation at \$40 per ton, a barrel of oil will cost \$9.61. The ratio of efficiency of these fuel agents is as follows:

Two cords of wood (hard) will generate as much steam as one ton of good Wellington coal or 4½ barrels of oil of 17½ gravity.

Our native wood and coal are much inferior to the outside wood and coal, and therefore a larger quantity will be required of our material to equal 4½ barrels of oil than in California. After taking everything into consideration I still believe that the wood is the cheapest fuel at present.

Hydrauliclicking.—In 1902-3-4 the territory experienced a transition period which has had a tendency to decrease the output. The best claims were being worked out, and the rich spots together with the lower



Cut Bank at Mouth of Dutch Creek—Windermere Division, East Kootenay.

The price paid in Dawson for coal is \$10 per ton, and a charge of \$6 per ton is made for the freight from Dawson to the plant which is situated on No. 6 below Discovery on Bonanza Creek, a distance of 10½ miles from Dawson.

An experiment was made here at the electric plant to determine the comparative efficiency of wood and coal to generate steam. As a result of this it appears that the proportion is 1⅛ cords of wood to one ton of coal. I might here mention that the coal was a lignite containing 44 per cent of fixed carbon, with a large percentage of ash and moisture, while the wood was soft and not to be compared with hard wood.

While in California I investigated the price and the efficiency of oil as a fuel agent in order to compare its cost with wood and coal. I find that the success of using oil in the Territory as a fuel agent depends entirely on the transportation. Taking 6 barrels of oil to

grade material left in the vicinity necessitated a change of method from the old and primitive methods of placer mining to more modern ones like pumping, hydrauliclicking, hydrauliclicking with gravity water, steam shovel and dredging.

Some of these methods require some necessary conditions to be successful. While these methods are being considered it is needless to say that much ground is left idle from which there is no output. These are the conditions that are responsible, in greater part, for the decrease of the output, and not because there is no more gold in the ground.

This country is exceptionally dry in the summer months, and without a proper water supply many of the hydraulic companies have had to shut down their operations and wait for rains. These conditions affect the benches and hillsides, while in the creek there is always enough water to avoid a complete stop.

The first experiment that was made to overcome these conditions and to work low grade material on a large scale was by pumping hydraulicking. This method consists in installing the plant in the creek bed and pumping the water into a reservoir on the hillside, from there the water would be conducted to the gravel pit in pipes. The efficiency of the water is very high, but the cost of the fuel is so great that it has not been a success. There are still three plants of this kind in operation, but I am not informed regarding their success.

Many have learned, partly through the mistakes of others and partly through the advanced knowledge of the existing conditions here, that there are two feasible methods to work low grade gravels at a profit, and these are: hydraulicking with gravity water and dredging or steam shovel. These methods require different conditions for their success.

Hydraulicking requires a constant water supply, good grade to conduct the tailings and dumping ground for the disposal of the same. When there is not sufficient grade for the tailings an elevator is used for the purpose. One of these elevators is installed on a hydraulic leasehold situated on Miller Creek which I have not yet witnessed, and I cannot, therefore, offer an opinion as to its success. It is a very unfortunate thing when one is compelled to use an elevator, as much of the water must be used to operate the elevator which would otherwise be used in the giants. The proportion of water used in the giants to the amount used in the elevator is one to two. Water at 100 ft. pressure will elevate the tailings 10 ft. There has not been enough work of this nature to give an opinion as to the cost of such operations.

The difficulty of furnishing an adequate supply of water for hydraulicking entails the heaviest item of expense in connection with this method of gold extraction. It is particularly costly when deep and large ravines have to be crossed, as it necessitates the installation of many thousand feet of piping and trestling to convey the water across. Of the many ditches constructed in this Territory for hydraulicking purposes I here mention the principal ones as follows:—

Company.	Length. Miles.	Capacity. Inches.
Anglo Klondike Co.	7	500
Fuller Norwood Co.	9	1,000
White Channel Hyd. Co.	5½	1,000
O. R. Brener	6	250
N. A. T. & T. Co.	7½	2,200
Bonanza Mining Co.	5	600
Delhie, Hunker Creek.	5	150
Lyonnaise Synd.	4½	800
Aeklen Co.	9	2,000
O. R. Brener, Hunker Ck.	7	500
Dolen, <i>et al.</i> , Last Chance.	4	200

There are many small ditches of one and two miles in length and from 50 to 100 in. in capacity that are too numerous to mention here.

The Anglo-Klondike Co. has an inverted syphon

across Boulder Creek, a distance of 1,900 ft. The difference in elevation between the intake and the outlet of the pipe is 67 ft. The Fuller Norwood Co. has an excellent ditch having its intake at No. 57 above Discovery on Bonanza Creek, and its outlet at No. 19 below Discovery. On account of bad ground encountered it was considered necessary to construct a flume part of the way. As the conducts of water are on the right limit of the creek and the property to be worked is on the left limit it was necessary to install an inverted syphon across Bonanza Creek of 3,000 ft. long.

The White Channel Hyd., Ltd., is operating on Gold Hill, on the left limit of Bonanza Creek, at the junction of Eldorado and Bonanza Creeks. Its point of intake is at No. 51 above Discovery on Bonanza Creek. The water is conducted to a point opposite Gold Hill, then piped across through pipes of 24 and 26 in. in diameter. The head is 150 ft. above the rim.

O. R. Brener who is operating on French Hill is at present in the best position to make use of the water at all times during the year. He has constructed a dam at a point on French Gulch about 2½ miles above the mouth to conserve the water during the dry season. The water is conducted to a reservoir back of the claims then piped to the gravel pit through pipes of 10 and 12 in. in diameter affording 100 ft. head. Mr. Brener constructed another from Eldorado to increase the supply.

The N. A. T. & T. Co., operating on Miller Creek, has a splendid ditch with intake on Bed Rock Creek, a tributary of Sixty-mile River. This water is conducted to a point on Miller Creek about 420 ft. above the creek bed. It is then conducted down to the creek bed through pipes to supply the giants and the elevator to elevate the tailings.

The Bonanza Creek Mining Co., operating on the Matson and Doyle leaseholds, Bonanza Creek, has constructed in the neighbourhood of 3 miles of flume and ditch with intake at No. 25 Adams Creek. To assure a good water supply during the dry season the company is constructing a dam in the creek at No. 37 Adams Creek, a small distance above the intake of the flume. This dam, when finished, will be 50 ft. high, 4-ft. crest and 120-ft. toe and will hold 60,000,000 gall. of water. It is constructed as follows:—

Excavation for the foundation of the dam was made to bed rock upon which, across the creek, rest grooved boards in a vertical position to serve as a core. These boards are hammered to the bed rock until they conform to it, to prevent any possibility of leakage. On both sides of this core fine material is shovelled in and puddled, then finished with rock to the top. Very little cement was used on account of its expense and the difficulty of obtaining the desired quality. This dam will be finished this year, in order to impound the waters of the freshets of the spring.

As there is frost to contend with every precaution must be taken in selecting ground that will stand running water. It has been the practice in this coun-

try to construct ditches on the sunny side of the stream. When the moss is removed and the excavated material exposed to the sun it will thaw rapidly and settle, if it is built on the side of the stream where the sun shines very little it will thaw very slowly and the material will move continuously. This experience was no doubt gained in building the many miles of roads in the country.

The length of time required to build ditches here is much longer for the same distance than it is on the outside or in any country where there is no frost to contend with. The seasons are very short, and a great deal of preparatory work must be done, to cope with the conditions, which is necessary in a frozen country. The main delay is in connection with the removal of the moss, which has to be done to expose the material to the sun for a certain length of time to thaw. A ditch of over 10 miles long cannot be constructed in less than two seasons, in taking the magnitude of the ditch and the existing conditions into consideration. The time of the year during which the excavation can be done is between May 15 and October 15 of each year, provided the preparatory work has already been done the previous fall.

No definite length of time can be set within which ditches should be constructed. As the conditions on one creek differ much from those of another, the time within which the construction should be completed fluctuates. The size and length of the ditch as well as the difficulty of the project must be considered.

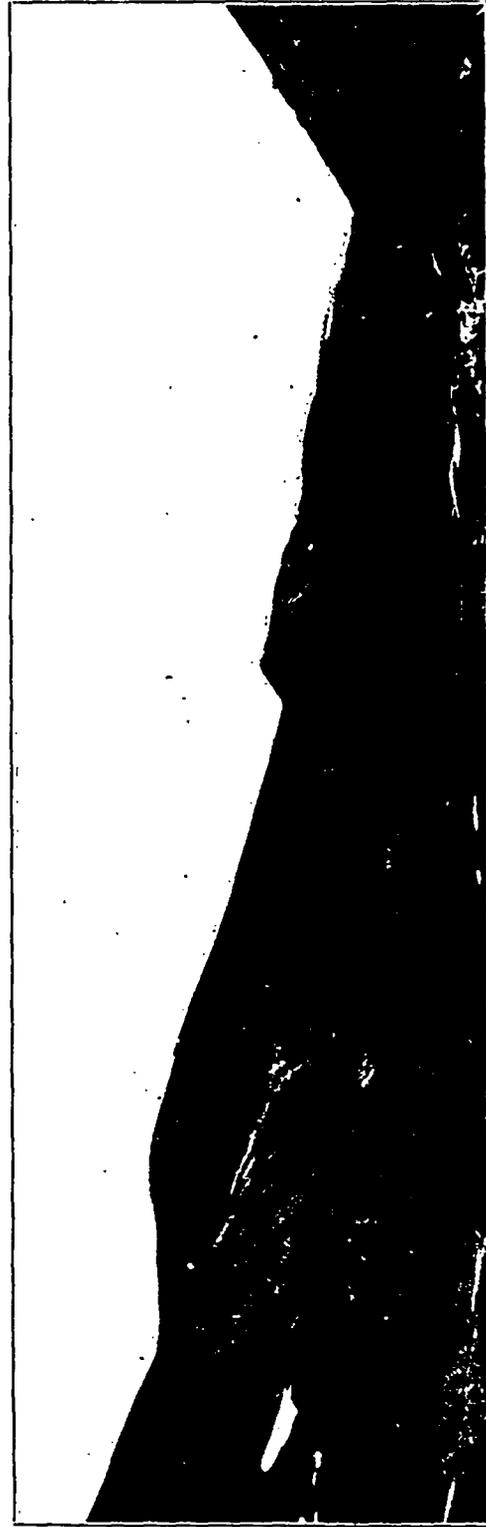
The extreme cold of the winter and the great heat of the summer have very little effect on ditches and flumes. This is not the case with iron or steel pipes. I find that when pipes are installed to convey water across deep depressions in the shape of inverted siphons the extreme cold of the winter will not affect the pipes very much, and they do not, therefore require to be disconnected, but it is advisable to cover them with a thick sod to prevent expansion during the summer months. When a pipe is laid horizontally on the ground it has to be disconnected in the winter in order to avoid the joints from breaking, which is due to the contraction of the iron.

As all the hydraulic operations are conducted on benches and hillsides there is no difficulty in finding enough grade for the disposal of the tailings. The general grade given is between 8 and 10 per cent, regulated by the amount of water and the size of the boxes used.

It is to be regretted that there are no undercurrents installed at any of the hydraulic plants which would, no doubt, collect a great deal of gold which at present is lost for lack of such appliances. The riffles used in the boxes are made of wooden blocks and have been found very satisfactory.

The average duty of a miner's inch cannot be given with accuracy on account of the fluctuations of the water supply. There are in this country two seasons, viz.: the summer and the winter season. The summer season starts about May 1 and lasts until October 1, the winter season being the balance of the year. During the summer season there is a dry and a wet

season. The wet season is from May 1 to June 15, then it starts again on August 15 and lasts until the close of the season. The water supply in the early part of the season is dependent on the snow waters,



View Looking down Paradise Basin—Windermere Division, East Kootenay.

and in the latter part on rains. The dry season is from June 15 to August 15. All the creeks within the Dawson district are dependent altogether on rains for their water supply. To increase the water supply

small dams have been constructed at the head of the streams to conserve the waters of the freshets to be used during the dry season. Two very large ones have already been constructed, and one is under construction. From these considerations it will be apparent that it is difficult to give the average duty of a miner's inch with accuracy. During the wet season it has been found to be 5 cu. yd., although I have heard of a duty of 8 cu. yd., which I think, however, too high. Under the present conditions and taking into account the amount of water available every year between the months of May and October, the duty is very much reduced. One inch of water is 1-12 of the amount of water going through an orifice 2 in. high, 6 in. wide under a head of 61.4 in. pressure, measured above the centre of the orifice. The amount of water that will go through this orifice is 1.5 cu. ft. of water in one minute. When we speak of a miner's inch it is generally understood to be a certain amount of water flowing past a certain point in one minute unless otherwise specified.

The cost of hydraulicking in the Territory varies every year, as it fluctuates with the amount of water at hand. A fair way of averaging the operating cost per cu. yd. would be to divide the working season into two parts, viz.: The wet season and the dry season. This will show the necessity of looking for a water supply proportionate to the life of the property to be acquired.

The data I have at my command here are from the most reliable company operating on Bonanza Creek. This cost might look high to some of the hydraulic companies operating on the outside, but it is considered low here.

The operating cost to hydraulic, per cu. yd., the White Channel gravels with 240 in. of water under 165 ft. head, and the duty of a miner's inch taken at 6.5 cu. yd., is 14½ cents. During the dry season, which lasts 8 weeks, only a couple of hours run can be had out of the 24. In this case the operating expenses per cu. yd. are high.

We have the most favourable conditions for hydraulicking such as small gravels with no boulders, banks not too high, good grade and dumping ground and very high values. The only thing lacking is the water, which is the great drawback to the country.

Dredging.—We have at present three dredges in operation, viz.: Two on Bonanza Creek (also one in construction) and one on the Klondike River at the mouth of Bear Creek. Those operating on Bonanza Creek have been very successful, particularly the one on Discovery. The latter is the first that was brought to this country by the Lewes River Mining Co., which first operated in 1901 on No. 42 below Discovery on Bonanza Creek before it moved to its present position. It is a dredge of the old type of 3¼ ft. capacity, operated with steam. It is not operated with full efficiency on account of the frost in the gravel, which is being thawed ahead of the machine. Two 50-h.p. boilers have been installed to run 80 points to thaw this gravel. The expense in connection with the

thawing is just as great as the operating expenses of the dredge itself.

Bonanza Creek, or any of the gold-bearing creeks in this district, is not an ideal dredging proposition as the bed rock is hard and uneven and there is also frost to contend with, but the gravel is of such high quality that it is a paying proposition where it can not be worked in any other way at a profit. All the ground available in Bonanza Creek for dredging is that which did not contain sufficient values to be worked by the placer mining method. Taking the cost of placer mining operations at \$2 a cu. yd. it is reasonable to think that what is left must contain values from a few cents to \$1.75 a cu. yd., plus the fine gold carried away by the tailings of the placer mining operations, which is considerable.

Another dredge is operating near the mouth of Bonanza Creek by Messrs. Segbers and Moncrieff. This dredge was installed on the property this year and is operating now with great success, but I am unable to give the operating costs. A part of this dredge was manufactured in San Francisco, while the other part was constructed here with native material. It has a capacity of 2½ cu. ft. and is operated with steam.

By far the finest dredge in the Territory and equal to any operating in the Oroville gold fields in California, is the one belonging to the Canadian Klondike Mining Co., operating on the Klondike River at the mouth of Bear Creek. This dredge has a bucket capacity of 7 cu. ft., close buckets and can dig 65 ft. below the hull. It was manufactured in Ohio, and differs very little in principle from other dredges now in operation. Taking its construction, mode of operation, ladder and stacker it resembles the Bucyrus type of dredges more than any other. It is operated with electric power generated in the vicinity by means of a steam turbine which can develop 600 h.p. This machine has only been in operation for the last 16 days, and I cannot give correct figures regarding its efficiency. Sister dredges in California have an output of 80,000 cu. yd. a month. The company is prospecting the ground in the vicinity and if enough pay gravels can be found to warrant the installation of another dredge the manager informed me of his intention to order one at once. The dredge is operating at the mouth of Bear Creek where it has been found very rich, as it has been worked by the placer method for many years. It appears at present that another run of gold has been found of a higher quality to that which had been found heretofore. As this spot is situated at about two miles below the mouth of Hunker Creek, and the gold found is of the same quality as Hunker Creek, I believe it to be the same gold. If this proves correct it is of the greatest importance, as it increases the area to be worked. The company did not anticipate that new run of gold, but only low grade dirt, representing the refuse of the gold-bearing streams.

There is another dredge under construction at the mouth of Bonanza Creek which will be ready to oper-

ate next season. It has a theoretical daily capacity of 3,600 cu. yd.

Steam Shovels.—Other machinery to work alluvials on a large scale is represented by the steam shovel. Of these there are two working on Eldorado Creek and another on No. 60 below Discovery on Bonanza Creek.

Those on Eldorado Creek are owned by Mr. Phiscator, who has been operating them for the last two years with great success. The method of working these shovels is different from those on other creeks in that no special washing plant is used, only a common sluice box such as is used in common placer methods. The shovels are 2-3 cu. yd. capacity. The gravel is delivered directly into the sluice box.

which accumulated in the early days of the camp. It was found to be just as cheap to sluice the waste and tailings as to remove them with a horse and scraper, as the water would carry the material to the desired place. This material was sluiced up, and out of 300 cu. yd. 118 oz. of gold were recovered which would otherwise have been lost. For that reason I believe that much is lost by removing too much of the overburden, and if worked by a dredge would more than compensate for what it loses in the cracks of the bed rock.

The shovel operating on Bonanza Creek is used to excavate the material which is dumped into a large bucket to be hoisted and dumped into a hopper, after which it is washed in a rotating screen on each side



A Prospector's Camp in the Lardeau District.

The steam shovel is especially applicable to the treatment of deposit with hard and uneven bed rock over which the pay is distributed. In using a shovel there is no chance of losing any gold which might be secreted in the cracks of the bed rock and which could not be recovered by dredging operations. By means of the steam shovel the bed rock can be cleaned as effectively as in the open cut method. The dredge people contend that there is as much gold recovered from the waste which is thrown away by the shovel to repay for all that is lost in the cracks of the bed rock which cannot be recovered by the dredge. The following instance which came under my observation confirms this. On a certain claim on Eldorado it was proposed to work by open cut and in order to do that it was necessary to remove the old waste and tailings

of which the gold saving tables are situated. This arrangement is known as the Ledgewood machine.

Population.

This year has experienced a great decrease in the population of the Territory, due to the recent discoveries of the Tanana and Fairbanks districts, situated on the United States side of the line.

It appears that this camp was discovered about two years ago, but the rush from this Territory did not start until last fall. A new field is always inviting to a stamper or a prospector, as he expects to be there the first one and stake a claim to contain a little better values than the claim he is leaving. There is no doubt that many were disappointed and were left

worse off than they were when they started from here.

Taking all the districts in the Yukon Territory into consideration, regardless of the floating population, I estimate the population at not more than 10,000.

I might say that the population in the winter months is less than in the summer, as many of the operators and their families go outside for the winter and return in the spring time, during the months of March and April, in order to be ready for the spring operations.

Development of Coal Deposits.

Some progress has been made in the development of the coal deposits of the Territory. This is of great importance since the timber is being cut away very rapidly, and it will be a matter of only a few years when coal will have to be used altogether.

A new and very promising coal deposit is situated near Tantalus. Upon assay it is found to contain 66 per cent of fixed carbon.

The Five Fingers coal mines are being prospected thoroughly with the Government diamond drill.

Most of the White Pass steamers are using Tantalus coal with great success, and it has been found to be very much cheaper than wood, as the steamers do not have to stop so often to wood up.

The Quartz Mill.

The mill was not in operation at any time during the year and therefore there are no returns to be made in this regard.

The contract entered into between the Government and Mr. Matheson will expire on December 11 next, and I would recommend that the same be not renewed for I believe it is at present a useless expense as there is not enough work to justify the maintenance of the same.

The Assay Offices.

During the year there were made at the Dawson Assay Office 200 assays, of which 169 were for gold and silver, 17 for copper, 5 for lead and 4 for tin. The office is still situated alongside the mill, but it has been proposed to move it to the Administration Building, and have it under Government control altogether, where it will be more satisfactory to me and more convenient to the public.

The number of assays made at the Whitehorse Assay Office during the fiscal year was 363, of which there were 270 for gold and silver, 68 for copper, 4 for tin, 16 for lead, 1 for antimony, 2 for platinum and 2 for carbon. Mr. Robert Smart, the assayer in charge of the assay office at Whitehorse, has proved himself a very competent officer, his work having been favourably commented on by many of the smelting establishments.

REPORT OF ROBERT SMART, GOVERNMENT ASSAYER.

Whitehorse, Y. T., July 1, 1905.

A. I. Beaudette, Esq.,

Government Mining Engineer,

Dawson, Y. T.

Sir.—I have the honour herewith to submit my

report of the transactions of the Whitehorse Government Assay Office for the year ending June 30, together with a short summary of the mining conditions of this district.

During the year a total number of 363 assays were made, in addition to which a great number of tests have been made for the quantitative determination of metals.

The number of assays made during the month of June was very largely in excess of any other month of the year; this was in consequence of quartz measures being opened up in the southern part of this district, to which reference will be made hereafter, and to the inquiries of outside capitalists respecting the copper properties directly adjacent to Whitehorse. The samples of ore assayed and treated in the office have been received from an area of territory bounded on the North by Selkirk, on the South by the Province of British Columbia, on the East by the Nisutlin River and on the West by the White River.

In the Mounteagle range west of Tantalus an interesting and valuable discovery has been made of gold-bearing chalcopyrite carrying as high as \$20 per ton in gold, 24 oz. of silver, together with 18 per cent. of copper. The ore body is said to be of considerable extent, and from the continuity of formation is thought to be a continuation of the bornite deposits of the Whitehorse copper belt. Contiguous to the discovery extensive deposits of coal have been located, bituminous in character, containing 80.23 per cent carbon, and which by satisfactory tests produces a first-class quality of coke.

Owing to the distance of this recent discovery from the Yukon River (about 40 miles westerly), only prospect work of a superficial character has yet been done, but it is reasonable to suppose that as development guarantees expenditure, facilities for transporting supplies will be improved, and this very promising discovery will fully justify the expectations of the locators.

Bodies of auriferous copper ore have also been found on the divide between the Donjek and White Rivers, but further than the receipt of samples at this office, nothing definite can be stated in this report. With the improvement of facilities for getting in supplies, however, this district promises some rich discoveries.

In the Klunne placer district from 150 to 350 men have been working during the past year, and considerable sluicing has been done; reports are exceedingly satisfactory from Burwash, Sheen and Fourth of July Creeks. Considering this extensive placer area as a whole, however it is safe to say that the deposit of gold is spotted, and that the method for successfully extracting the auriferous deposit must be by hydraulicking.

The Bullion Creek Hydraulic Co. has adopted this method on Bullion Creek, and has completed a plant at a cost of upwards of \$130,000. Its operations will cover some \$2 claims on that creek, and it reports that its considerable expenditure is fully justified by the

excellent showing it has had. It expects to begin operations about July 15.

In the mountainous district which lies between Lake Tagish and Lake Bennett, contiguous to the British Columbia boundary line, discoveries of rich silver ore and argentiferous galena have been made during the last year. Active development has recently determined the great richness of this area, and in consequence the prospectors are locating new ground, and from the satisfactory assay result obtained from the new locations, the area is much greater than was at first supposed.

During the past three months the Conrad and Singer Co. has been carrying on extensive prospect work on the Pelly and Pooley groups consisting of 16 claims in the locality. The results are considered exceedingly satisfactory; samples of ore assayed at this office give as high as 2,000 oz. per ton. The purely silver ores contain only small quantities of gold, the argentiferous galena carries values up to 200 oz. of silver, 45 per cent of lead, and as high as \$75 per ton in gold. The various ore bodies ranging in width from 16 in. down have been traced throughout the entire group of claims. At a depth of 80 ft. a rich vein of 6 ft. in width was struck. The company is so elated with the prospects that it has contracted for the erection of an aerial tramway from the mines to Windy Arm, and a railway from its terminus to connect with the White Pass and Yukon Railway at Carcross.

Within the last ten days several applications for placer claims have been made on Willow Creek, a tributary of the Nisutlin River. The discoverer brought at the same time \$280 in gold taken by him from his claim, and applications for 84 entries. This has caused the usual stampede of prospectors and miners, and it is reported by the discoverer that several locators were actively at work, whip-sawing lumber and making vigorous preparations for active work. The gold shown is very bright and appears to be of good quality. It is distinguished from other placer gold found in the Territory in that the larger nuggets shown have associated with them as a gangue, magnetite instead of quartz. This new district is easily reached from Whitehorse by steamers up the Houtalinqua River to Lake Teslin, thence about 25 miles from the easterly shore. I am personally acquainted with the vicinity of this new discovery, having spent some four months in the neighbourhood four years ago, and I was very favourably impressed with the possibilities of the country. The formation is slate and mica schist, and it was then my opinion that the contact between the granite of the Big Salmon and the slate of the Teslin countries was in the vicinity of the Nisutlin.

In the Big Salmon district, Livingstone Creek is a good producer of placer gold, more claims are being worked than in any previous year. A new pay streak was found during the past winter on the left limit of the creek, having an advantage over the previous workings in that it was free from the enormous granite boulders which so impeded work in the creek

proper. Other creeks in the same locality are being worked this season, but reports from them have not yet reached this office. Some work has been done on a body of auriferous copper ore found near the head of Fish River, a tributary of the Big Salmon, but as in many other cases, owing to the lack of transportation facilities and the consequent enhanced cost of getting supplies to the required points it is impossible for the prospector to do more than to locate and thereafter keep his claim alive by complying with the mining regulations.

Float cinnabar assaying 32.90 per cent of mercury has been found on Livingstone Creek: many efforts have been to locate the lead but without success.

Very little development has been done in the Whitehorse copper belt since January last, owing principally to the lack of capital, but I am informed that negotiations are now pending which will in all probability result in the introduction of a large amount of capital from the outside for the purpose of working some of the claims actively. Many claims upon which development work has been done give smelter returns very high in copper and carrying percentage of gold and silver.

In conclusion I beg respectively to submit that in my opinion the outlook for the near future for the southern Yukon as a producing district of great value is exceedingly bright, and that the intelligent working of the extensive placer areas will determine that they are of a richness and extent that will warrant the introduction of hydraulicking machinery with a profitable result.

SUMMARY OF THE MINERAL PRODUCTION OF CANADA FOR 1905.

WITH the usual promptitude that annually marks the issue by the Section of Mines of the Geological Survey of Canada of the Summary of the Mineral Production of Canada, the preliminary statistical statement of production for the calendar year 1905 has been issued under date March 2. This was prepared by Mr. Elric Drew Ingall, M.E., mining engineer to the Geological Survey, and his assistant, Mr. J. McLeish, B.A., statistician. In his letter of transmittal Mr. Ingall remarks:

"Although the figures given herewith are subject to revision, they may still be taken as a very close approximation to those which will be given in the final report.

"The completed Annual Report will follow later and, besides containing a revise of the general table of production, will include other details relating to exploration, development, exports, etc.

"Much of this information is not available till several months after the close of the year: the compilation and printing necessarily occupy some time; the Annual Report therefore cannot be completed till well on in the year following the one covered."

SUMMARY OF THE MINERAL PRODUCTION OF CANADA IN 1905.
(Subject to Revision.)

Product.	Quantity. (a)	Value. (a)
<i>Metallic—</i>		
Copper (b)lb.	47,597,502	\$ 7,420,451
Gold, Yukon	\$8,327,200	
" all other	6,159,633	
		14,486,833
Iron ore (exports, est.) . . Tons.	116,779	125,119
*Pig iron from Canadian ore "	70,554	1,047,860
Lead (c)Lb.	55,961,000	2,634,084
Nickel (d)"	18,876,315	7,550,526
Silver (e)Oz.	5,974,875	3,605,957
Cobalt		100,000
Other metallic products including zinc		180,000
Total metallic		\$37,150,830
<i>Non-Metallic—</i>		
AsbestosTons	50,670	\$ 1,486,359
Asbestic"	17,594	16,900
Chromite"	8,575	93,301
Coal"	8,775,933	17,658,615
Corundum"	1,644	149,153
Feldspar"	11,700	23,400
Graphite"	541	17,032
Grindstones"	5,172	57,200
Gypsum"	435,789	581,543
Limestone for flux in iron furnaces"	341,614	258,739
Manganese ore (exports) . . "	22	1,720
Mica"		168,943
Mineral pigments—		
Barytes"	3,360	7,500
Ochres"	5,105	34,675
Mineral water		100,000
Natural gas (g)		314,249
Petroleum (h)Bbl.	634,095	\$49,687
PhosphateTons	1,300	8,435
Pyrites"	32,744	123,574
Salt"	45,370	310,853
Talc"	500	1,800
Tripolite"	200	3,600
		\$22,266,393
<i>Structural Materials and Clay Products—</i>		
Cement, natural rockBbl.	14,184	\$ 10,274
" Portland"	1,346,547	1,913,740
Flagstones		7,650
Granite		209,555
Sands and gravels (exports) Tons	366,935	152,805
Sewer pipe		382,000
Slate		21,568
Terra-cotta, fireproofing, etc. . .		64,892
Building material, including bricks, building stone, lime, etc		6,095,000
Total structural materials and clay products		\$8,857,484
Total all other non-metallic		22,266,393
Total non-metallic		31,123,877
Total metallic		37,150,830
Estimated value of mineral products not returned		300,000
Total, 1905		\$68,574,707

*The total production of pig iron in Canada in 1905 from Canadian and imported ores amounted to 527,932 short tons valued at \$6,492,972, of which it is estimated 70,554 tons valued at \$1,047,860 should be attributed to Canadian ore and 457,378 short tons valued at \$5,445,112 to the ore imported.

The value of the total yearly production reported for 20 years past has been as follows:—

1886	\$10,221,255	1896	\$22,584,513
1887	11,321,331	1897	28,661,430
1888	12,518,894	1898	38,697,021
1889	14,013,913	1899	49,584,027
1890	16,763,353	1900	64,618,268
1891	18,976,616	1901	66,339,158
1892	16,628,417	1902	63,885,999
1893	20,035,082	1903	63,226,510
1894	19,931,158	1904	60,073,897
1895	20,648,064	1905 (estimated)	68,574,707

REMARKS.

In the accompanying general table it is shown that the mineral production of Canada during 1905, aggregated more than \$68,500,000. 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 year, so that in a number of items the data are necessarily partly estimated. Allowing for this, however, there is found to be a considerable increase of approximately \$8,500,000 or about 14 per cent. This is the more remarkable, as the falling off in the output of gold from the Yukon continues and as will be seen amounted to more than \$2,000,000 in value.

Notwithstanding this, the metallic class shows an aggregate increase of about \$6,250,000 and leaving the Yukon placer gold out of consideration, the general mineral industry of the rest of the provinces shows a very considerable augmentation approaching \$11,000,000.

	Increase.	Decrease.
Copper	\$2,117,875	
Gold, Yukon		\$2,172,800
" all other	197,116	
Pig iron (from Canadian ore)	39,996	
Lead	1,016,863	
Nickel	3,331,373	
Silver	1,558,862	
Other metallic products	140,707	
Asbestos	276,907	
Coal	1,066,384	
Corundum	39,608	
Gypsum	203,069	
Limestone for flux in iron furnaces . .	81,164	
Petroleum		\$6,208
Natural cement		35,973
Portland cement	625,748	
Granite	59,555	
Other net increases	35,564	
Total	\$10,795,791	\$2,294,981
Net increase	\$ 8,500,810	

The proportional increases and decreases of various mineral products constituting nearly 95 per cent of the production are given in the subjoined table:—

- (a.) Quantity or value of product marketed. The ton used is that of 2,000 lb.
- (b.) Copper contents of ore, matte, etc., at 15.500 cents per lb.
- (c.) Lead contents of ore, etc., at 4.707 cents per lb.
- (d.) Nickel contents of ore, matte, etc., at 40 cents per lb.
- (e.) Silver contents of ore at 60.352 cents per oz.
- (f.) Oven coke, all the production of Nova Scotia, British Columbia and the North-west Territories.
- (g.) Gross returns from sale of gas.
- (h.) Deduced from the amount paid in bounties and valued at \$1.34 per bbl.

Product.	Quantity.		Value.	
	Increase.	Decrease.	Increase.	Decrease.
<i>Metallic—</i>				
	%	%	%	%
Copper	15.02	.....	39.91	.....
Gold . . . . .	.....	.....	.....	12.00
Pig iron (from Canadian ore only) . . .	3.30	.....	3.97	.....
Pig iron (from both home and imported ores)	73.97	.....	76.06	.....
Lead	49.11	.....	62.88	.....
Nickel	78.96	.....	78.96	.....
Silver	67.01	.....	76.15.	.....
<i>Non-metallic—</i>				
Asbestos and asbestic	40.85	.....	22.58	.....
Chromite	41.18	.....	38.95	.....
Coal	6.32	.....	6.43	.....
Gypsum	25.96	.....	55.71	.....
Petroleum	25.94	.....	.....	9.21
Portland cement	47.91	.....	48.58	.....

1904.		1905.	
Products.	Per cent of total Mineral Production.	Products.	Per cent of total Mineral Production.
1 Coal	27.62	1 Coal	25.77
2 Gold	27.40	2 Gold	21.14
3 Brick, stone, lime	9.67	3 Nickel	11.02
4 Copper	8.83	4 Copper	10.83
5 Nickel	7.02	5 Brick, stone, lime.	8.62
6 Silver	3.41	6 Silver	5.26
7 Lead	2.69	7 Lead	3.84
8 Cement	2.22	8 Cement	2.81
9 Asbestos	2.04	9 Asbestos	2.19
10 Pig iron (from Canadian ore).	1.68	10 Pig iron (from Canadian ore).	1.53
11 Petroleum	1.56	11 Petroleum	1.24

The foregoing table is intended to convey an idea of the relative importance of the various industries as contributors to the grand total of the mineral income of the country. It will be noticed that coal now occupies the largely predominant position and that when added to the total value of the metallic products, about 80 per cent of the production of the country is accounted for.

Gold.—The gold-producing industries of all the provinces show an encouraging increase in comparison with previous years. The largest contributor, as for several years past, has been the Yukon Territory which is to be credited with over 57 per cent.; British Columbia coming next with nearly 40 per cent. Nova Scotia and Ontario together with a little from Quebec and Alberta, completed the remainder of a little under 3 per cent necessary to make up the total.

In Nova Scotia there was a slight recovery from the general decrease in the production, which has been apparent for a number of years. The explanation would seem to lie in the fact that the immediately accessible surface ores of most of the districts have been mostly worked out, and the revival of the industry will depend upon the inauguration of a radically different policy to that which has been followed so far. It is believed that consolidation of many of the

numerous smaller mines and the inauguration of new methods and plant suitable for the economical mining of ore from greater depths, will lead to renewed activity. As these matters seem to be receiving serious attention, a revival of the industry is looked for.

In Ontario, activity was evident in prospecting and developing at numerous points both in the old districts in the eastern parts of the province and in the newer gold-bearing districts west of Thunder Bay.

In British Columbia, a dry season is said to have affected the production of placer gold, but as a whole the industry is about as last year.

The output of the Yukon Territory placers continued to fall off as expected and will probably continue until under favourable conditions the more permanent forms of mining of the lower grade bodies of gravels are fully established.

Silver.—For a considerable time now, the production of silver has been nearly altogether accounted for by the silver contents of the various ores of other metals mined and treated in British Columbia. This province furnished 90 per cent of the metal during 1905. Owing, however, to the discovery and working of the exceedingly rich silver-cobalt-nickel ores near the northern end of Lake Temiskaming in Ontario, that province has suddenly attained almost to an equality with British Columbia and between them they now furnish over 98 per cent of the total output.

The shipments made so far from the silver camp at Cobalt, Ont., have been to smelters, chiefly in the United States. The results have not apparently been satisfactory to the shippers, and efforts are being made towards the erection of smelters to treat the ores locally. At Copper Cliff the Canadian Copper Co. has already erected a plant capable of partially treating these ores with elimination of the excess of arsenic.

The silver occurs mostly in the metallic condition and although the veins worked are small, being measured in inches of thickness instead of feet, the silver values are so high that although only in the second year of its existence, the aggregate value of the shipments has been extraordinary, especially in view of the comparatively limited amount of the development work done. Carloads of ore reported at from \$60,000 to \$100,000 in value have not been unusual.

For the first six months of 1905, official figures give the shipments as 891 tons, aggregating \$688,004, or a little over \$772 per ton. These results, it is important to consider, were due to the work carried on at some six mines in a camp the existence of which dated only from the previous fall.

A recent bulletin, issued by the Geological Survey, draws attention to another most important and recent discovery on the west side of Windy Arm, a southerly branch of Lake Tagish. This is situated in the southwesterly part of the Yukon Territory and is the more important as it is easily reached from the White Pass and Yukon railway. The report describes the veins as strong, persistent, and already traced for considerable distances. The widths mentioned are of from 1 to 5 ft. in one case, up to 9 ft. in another. The

minerals contained are native silver, argentite, stephanite, freibergite, pyrrargyrite, galena, tetrahedrite, chalcopyrite, native copper, malachite, azurite, iron pyrite, arsenopyrite, pyrrhotite and sphalerite. The antimonial and arsenical silver minerals seem to be the most common form of occurrence of that metal. The main values are in silver and gold.

In British Columbia, considerable quantities of fine silver and of base bullion and other products carrying the metal are produced at the Trail smelter.

Cobalt.—Mention has already been made in connection with silver of the discoveries of cobalt ores in the northwestern part of Ontario. Whilst the great richness in silver of these deposits is the feature giving them their great importance, the occurrence of these arsenide ores of cobalt is of great interest. Unfortunately, the supply thus rendered available has proved too great for the consumption at present, but it is hoped that this very abundance will lead to new uses being found for this metal and to its becoming later a valuable asset.

Copper.—In the production of this metal, British Columbia still retains the pre-eminence. In 1904, the province was credited with over 80 per cent of the whole, and although still maintaining a very long lead, increased production both in Ontario and Quebec have considerably reduced that held by the western province.

The copper of Quebec still represents the content of the pyritous ores mined for so long a period of years; whilst the Ontario output is, as formerly, produced in operating the nickel and copper ores of Sudbury. A number of small mines are worked upon deposits of chalcopyrite and the recent change of ownership of the Bruce Mines would seem to promise the early re-entry of these old mines into the field of activity. So far, however, the Sudbury mines must be credited with the bulk of the results.

In British Columbia, the figures show a continued increase in the output of copper-bearing products. In 1904, the Boundary district produced over 61 per cent; the Rossland camp about 20 per cent; the Coast district over 16 per cent, the remaining approximation (3 per cent) being derived from Yale, Kamloops, Nelson and various other districts. It is locally estimated that the Boundary district increased its output by probably \$1,000,000, the other districts remaining practically stationary or showing slight falling off, so that the prominence of the first-named camp must have been considerably increased.

The increase in the total value of the output of copper for the Dominion has been greatly enhanced by the rise in the average price of the metal of about 3 cents.

Iron.—About 116,779 short tons of iron ore, being

*Recent figures published in the *Toronto Globe* give the value of output of this metal during 1905 at \$100,000. From information recently to hand, it would also seem possible that the difficulties with regard to marketing the cobalt may be less than anticipated.

a part of the output of the Helen mine at Michipicoten, were exported during 1905. In addition to the ore exported, about 173,171 tons of ore were mined in Canada and charged to Canadian blast furnaces.

Besides the above Canadian ore, 861,847 tons of imported ore, valued at the furnaces at \$1,168,420, were used in Canadian furnaces. The total amount of pig iron manufactured from both Canadian and imported ores was 527,932 tons, valued at \$6,492,972 as compared with 303,454 tons valued at \$3,582,001 in 1904.

The total amount of bounty paid on iron and steel by the Dominion Government during the calendar year 1905 was \$1,900,206.

Although the production of pig iron from Canadian ores only does not show a very large growth, the industry as a whole shows large proportional advancement and new furnaces at several points are contemplated or in course of construction. With the new iron ore districts more recently brought to light and the greater accessibility of many discovered in past years, the home ore mining industry promises to take a far more prominent and fitting position.

Lead.—Assisted by the Dominion bounty, lead production again shows a large increase, nearly 50 per cent more lead having been produced in 1905 than in the previous year. The production in 1905 was approximately 27,980 tons as compared with 18,765 tons in 1904.

The total amount paid in bounties during the calendar year 1905 was \$334,224. The payment of bounty on lead in ore exported to Europe ceased on June 30, and owing to the rise in the price of lead, the rate of bounty payable in other cases, was gradually diminished and all payments ceased in November, when the price of lead reached \$16 per long ton.

The average price of lead on the New York market in 1904 was 4.309 cents per pound and in 1905 it had increased to 4.707 cents, an advance of .396 or 9.2 per cent.

Exports of lead in ore according to Customs returns, were 7,284 tons to the United States and 12,891 to other countries; exports of pig lead were 21 tons to the United States and 632 tons to other countries or a total export of lead of \$20,828 tons.

The Canadian Smelting Works at Trail, B.C., has had an electrolytic lead refinery in operation for two years producing pig lead, lead pipe, sheet lead, etc., of exceptional purity. At the present time, about 50 tons per day are being treated, and lead is being supplied to the corroding works recently established by the Carter White Lead Co. of Canada, at Montreal. This latter plant is equipped with machinery for an immediate capacity of 7,000 tons per annum, but is designed for an ultimate capacity of 15,000 tons and will use Trail lead exclusively.

Nickel.—The following were the aggregate results of operations on the nickel-copper deposits of Ontario in 1905:—

	Tons of 2,000 lb.
Ore mined	277,766
Ore smelted	251,421
Matte produced	17,388
Matte shipped	17,405
Matte in stock at end of year	2,675
Copper contents of matte shipped	4,386
Nickel contents of matte shipped	9,438
Value of matte shipped	\$4,019,814

According to Customs returns, exports of nickel in matte, etc., were for the twelve months ending December 31, as follows:—

	Lb.
To Great Britain	1,281,594
To United States	16,036,465
Total	17,318,059

The price of refined nickel remained fairly steady throughout the year. According to the *Engineering and Mining Journal*, of New York, quotations for large lots, New York or other parallel delivery, were 40 to 47 cents per lb., according to size and condition of order. For small quantities prices ranged from 48 to 60 cents, also according to size for order and delivery.

Some of the ores from the now famous Cobalt district contain from 4 to 7 per cent of nickel in addition to the silver, cobalt and arsenic, but no statistics of production of nickel from this district have been included in the table of production.

Zinc.—The zinc ores of British Columbia, which were formerly regarded as merely detrimental constituents of the combined lead and zinc sulphuret ores of the province, have for some time been the subject of great interest on account of the demand which has recently arisen for ores of this metal. Already attention has been turned towards utilising the zinc blende associated with the argentiferous galena of the various camps in East and West Kootenay. Mill practice has been altered at some of the mines already operating so as to give a satisfactory separate zinc product, and attention is also being turned toward the opening up of various claims where the large proportion of blende present had formerly debarred profitable work. The *Daily News*, of Nelson, B.C., estimates a production for the province of over 13,000 tons with an average content of 42 per cent of the metal.

The recently erected smelter at Frank in Southern Alberta, owned by the Canadian Metal Co., will ensure the utilisation of much of the ore in the country. The production of zinc ores in this province is likely to increase very largely in the future should the active demand continue, as their existence in quantity is already known at very many places.

The whole question of supply and utilisation of

these ores is now under investigation by a commission instituted by the Federal Government.

Coal.—The coal output represents the result of operations in the old established fields of Nova Scotia and on Vancouver Island, British Columbia as well as in the comparatively recently opened districts of South-eastern Kootenay and South-western Alberta. Smaller amounts have been contributed by a number of operators at various points throughout the provinces of Alberta and Saskatchewan, as well as from New Brunswick and Yukon Territory. The whole industry shows an increase of over a million dollars or about six per cent as compared with 1904.

The different provinces contributed to the total as follows:—Nova Scotia over 60 per cent; British Columbia nearly 20 per cent; the remainder being attributed to the other districts before mentioned. In all districts the output showed an increase over that for 1904.

Natural Gas and Petroleum.—Prospecting for these minerals has been very active and word comes from numerous points from all over Canada of test borings in progress, while in very many places the glowing newspaper reports are greatly exaggerated; still, the prospects as a whole are hopeful for finding these substances in paying quantities outside and far removed from the present well-established fields as well as for the extension of the known productive areas of these latter.

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

	Tons.	
Crude	3,768	\$ 472,859
Mill stock	46,902	1,013,500
Total asbestos	50,670	1,486,359
Asbestic	17,594	16,900
Total products	68,264	\$1,503,259

Exports of asbestos according to Customs returns were 47,031 tons, valued \$1,386,115.

This industry continues much as usual, the two general features of interest being the very considerable increase in output and the promising discovery of long fibre of good quality in the Chibougamau Lake district, about 150 miles Northwesterly from Lake St. John, in Northern Quebec.

Cement.—The production of natural rock cement which in 1904 had decreased to 56,814 bbl., valued at \$50,247, fell off in 1905 to the comparatively small amount of 14,184 bbl., valued at \$10,274. This was made by three firms in Ontario.

The production of Portland cement, however, continues to increase steadily. Thirteen companies were operating plants during 1905 with a total daily capacity of about 8,000 bbl., viz.: one in Nova Scotia, two in Quebec, nine in Ontario and one in British Columbia, while another in Ontario was engaged in reconstruction work.

Detailed statistics of production in 1904 and 1905 are as follows:—

	1904.	1905.
Portland cement sold Bbl.	910,358	1,346,548
" " manufactured "	908,990	1,533,628
Stock on hand, Jan. 1 "	113,419	112,086
" " Dec. 31 "	112,051	299,166
Value of cement sold	\$1,287,992	\$1,913,740

The average price per barrel at the works in 1905 was \$1.42, being only a fraction of a cent higher than the average price in 1904.

The imports of Portland cement into Canada in 1905 were:—

	Quantity.	Value.
Six months ending June. Cwt.	1,043,659	\$405,182
" " " December "	1,470,306	599,428
Total.	2,513,965	\$ 914,610

This is equivalent to 718,275 bbl. of 350 lb. each at an average price per bbl. of \$1.27. The duty is 12½ cents per 100 lb.

The imports of 1904 were equivalent to 784,630 bbl. of 350 lb. each valued at \$1,061,056, or an average price per bbl. of \$1.35.

As there is very little cement exported from Canada, the consumption of this product in the county in 1905, would be approximately 1,346,548 bbl. of home product and 718,275 bbl. of imported, or a total of 2,064,823 bbl.

YUKON TERRITORY.

OWING to the fact that the late Commissioner of Yukon Territory retired from that office before the close of the fiscal year ended June 30, 1905, and that his successor did not arrive at Dawson until July, the customary general report of the year was not prepared by the Commissioner and, consequently, was not included in the published Report of the Department of the Interior. The reports of several Yukon officials, however, review the year's operations and from these the following information has been taken:

REPORT OF THE GOLD COMMISSIONER.

"During the year 137 protests have been issued in the Gold Commissioner's court. This is an increase in the number of cases over the two previous years. For the year ending June 30, 1904, 84 protests were entered, and during the previous year, 99. All protests were heard at Dawson, with the exception of three that were heard on Duncan Creek, in the month of March, 1905.

"A large proportion of the litigation is due to the scarcity of water. As time goes on the necessity for water to work the lower grade properties at a profit increases. The supply is far less than the demand, and the result is many disputes arise as to the right of priority to what water there is in the creeks and streams in the vicinity of the gold-bearing ground,

"The production in future, especially on the creeks that have been worked for some time, will depend largely on the supply of water. It can be safely said, from the information we have, that these creeks still

contain very large quantities of low-grade gravel, but in order to work at a profit water must be brought by gravity from the most available sources.

"The expense that will be incurred in carrying out water schemes properly will be very great, and it is in my opinion, the chief problem confronting the Territory at the present time."

REPORT OF THE ASSISTANT GOLD COMMISSIONER.

"I have the honour to submit herewith the annual financial report of the Gold Commissioner's office, Yukon Territory, for the fiscal year ending June 30 last, which embodies the revenue of the head office at Dawson for the fiscal year in question, and also the revenues received at this office during the last fiscal year from the offices of the mining inspectors, and from the sub-agencies throughout the Territory.

"At the same time I beg to submit a comparative statement between the fiscal year in question and the previous one, and also a statement showing the number of instruments issued in connection with the said revenues.

"As you will see by the comparative statement, the principal items where a decrease of revenue is most noticeable are the following, viz.: Free miners' certificates, \$15,889.50; placer mining grants, \$26,765; renewals of placer mining claims, \$6,875; relocations of placer mining claims, \$6,140; registered documents (placer mining), \$5,868.75; quartz records, \$130; certificates of work (quartz mineral claims), \$587.50.

"The decrease in the revenue from mining dues paid at this office and at the several offices above mentioned is accounted for by the fact that the diggings in the Dawson mining district on Bonanza, Eldorado, Hunker, Gold Bottom, Last Chance, Bear Creek, Dominion, Gold Run, Sulphur, Quartz and their tributaries, do not give at present to the individual miner the same opportunity for staking new ground or for re-locating old ground as in the past, and that there has not been any new strike of placer diggings of any importance in the Territory during the last fiscal year, and that as a consequence a large portion of the population of miners in this Territory left the country during the last fiscal year, for the Tanana diggings, in Alaska, and a certain proportion of the population went back to the outside.

"Notwithstanding the decrease referred to with respect to re-locations and renewals of placer mining claims in that portion of the Dawson mining district above described, one should not come to the conclusion that this portion of the Territory is worked out or about to be abandoned. The creek claims are far from being worked out, and operations will be carried on on the creeks for a considerable period longer by ordinary placer mining methods, or by some other mining method. The hill and bench claims in the Bonanza and Hunker watersheds cover a very large area of ground which can be worked profitably by gravitation water, but as the supply of such water at the present time is very limited only a small portion of the claims in question has been worked so far. If, however, large conducts of water bringing a steady

supply during the whole of the summer season, are constructed, the owners of these claims will be enabled to carry on mining operations for a large number of years, and to increase materially the production of gold in the Territory.

"There is also a large area of ground in the same portion of the Dawson mining district which will very likely be worked by means of dredges in the near future, in view of the successful results achieved by dredging operations on Bonanza Creek during the last four years, and also in view of the large dredge which is being installed at the mouth of Bear Creek, and of other installations of that kind now being made.

"Owing to the decrease of revenue, the Department of the Interior found it necessary last December to close up and abolish the several mining inspectors' offices on Bonanza Creek, Hunker Creek, Sulphur Creek, Gold Run Creek, upper Discovery division of Dominion Creek and lower Discovery division of Dominion Creek, and also the several mining recorders' offices at Forty-mile, Glacier Creek, Stewart River, Selkirk and Livingstone Creek, and to dispense with the services of the several men employed in connection with said offices, and to merge into the Dawson mining district the mining districts of Forty-mile, Sixty-mile Stewart River and Pelly, and into the Whitehorse mining district the Hootalinqua mining district.

"An arrangement was made at the same time by the Department of the Interior to the effect that the non-commissioned officers in charge of the Royal North-West Mounted Police detachments at these several places be appointed as agents to the mining recorder for the Whitehorse mining district as regards Livingstone Creek detachment, and as agents to the mining recorder for the Dawson mining district as regards the districts at Forty-mile, Glacier Creek, Stewart River, Selkirk, Bonanza, Hunker, Sulphur, Gold Run and Dominion, with power to receive moneys and documents from the miners in their locality and forward the same to the Whitehorse or the Dawson office.

"Under this arrangement which took effect on February 1 last, the miners on Bonanza, Hunker, Sulphur, Gold Run, Dominion and Quartz Creeks have received the same attention as they used to receive from the mining inspectors, except that the police do not issue free miners' certificates, but are only authorised to receive moneys in connection with the issue of free miners' certificates, and to forward the same to this office, where such free miners' certificates are issued from as regards the Dawson mining district. The miners in the portion of the present Dawson mining district which constituted the several mining districts of Forty-mile, Sixty-mile, Stewart River and Pelly are receiving the same attention from the police as the miners on the creeks above mentioned, situated in the Dawson mining district, and the miners in the Hootalinqua mining district, now abolished, are receiving the same attention from the police in connection with the Whitehorse mining district, except that they have not so easy access to the records as they had before the said districts were abolished.

"The police, besides receiving moneys and documents as above mentioned, receive affidavits of representation in their capacity of commissioners to take affidavits under appointment from the Commissioner of the Yukon Territory, and forward the same to the Dawson or Whitehorse office whenever requested to do so.

"The arrangement in question has materially increased the clerical work in the Dawson and the Whitehorse offices and specially the correspondence in this office, and since the staff of this office has been reduced by five men during the last year, the work now falling upon each individual member of the staff is larger than formerly.

"The inspection work, which used to be carried on by the several mining inspectors in the Dawson mining district, prior to February 1 last, has been performed by the Government mining engineer, Mr. A. J. Beaudette, since then, and he has devoted most of his time to water right matters, either by reporting on the granting of pending applications or by settling difficulties on the creeks near Dawson regarding water. But in the rest of the Dawson mining district there has been no inspection work done since the new arrangement has been in operation.

"The sub-agencies where a mining recorder has been left are the following ones: Whitehorse, Kluane, Duncan and Clear. The Kluane district has been in existence since September 1 last only.

"The Whitehorse district seems to be stationary, and with the exceptions of the diggings on Livingstone, Cotton Eva and other creeks tributaries of the south fork of the Big Salmon River which are now attached to the Whitehorse district, there were no placer mining operations carried on during the last fiscal year.

"As regards the Kluane mining district it would appear from the returns received at this office covering the period extending to May 31 last, that a very large proportion of the placer mining claims which were staked and recorded in 1903 and 1904 has been abandoned, and that claims have been kept in good standing only on Burwash Creek, Arch Creek, Fourth of July Creek, Virgin Creek and Bullion Creek, where sufficient prospecting and development work has been done to warrant the mining recorder for that district in stating, in a report received some time ago, that the future of the camp is assured in that part of the country.

"The Duncan Creek district has given much encouragement to the miners interested in that part of the country, specially on Hight, Ledge, Edmonton and Cascade Creeks, and has attracted recently a good deal of interest during the last year.

"The Clear Creek mining district would appear to be on the decline, and very little interest seems to have been taken in any of the claims in that district during the last fiscal year.

"With respect to the matter of hydraulic mining leases, I beg to report that two yeases were issued during the last fiscal year, and two others were cancelled during the same period.

"The two leases which were issued are the following ones:—

"1. Lease No. 44, in favour of Grotshier and McBride, for an hydraulic mining location situated at the mouth of the Klondike River, on its left limit, and on the right limit thereof;

"2. Lease No. 47, issued in favour of William Charles Thompson, for an hydraulic mining location situated on Dublin Gulch, a tributary of Haggart Creek, in the Duncan mining district.

"The two hydraulic mining leases which have been cancelled during the last fiscal year are the following ones:—

"1. Lease No. 36, issued by the Department of the Interior on April 8, 1902, in favour of Thomas Howard, for a location situated on Indian River, which location was thrown open for occupation and entry by free miners on June 30 last;

"2. Lease No. 29, issued by the Department of the Interior on September 1, 1901, to the Alaska North-west Exploration Co., for a location situated on Ten-mile Creek, a tributary of the Sixty-mile River, which location was thrown open for entry and occupation by free miners on September 19 last."

Financial Statement, showing Receipts from July 1, 1904, to June 30, 1905.

Dawson—	
Free miners' certificates	\$25,344.00
Placer	65,572.98
Quartz	2,437.50
" Crown grants	893.55
Hydraulics	6,097.05
	\$100,345.08
Lower Dominion Creek	950.00
Upper Dominion Creek	1,610.00
Hunker Creek	1,719.50
Sulphur Creek	1,114.00
Grand Forks	2,902.65
Gold Run Creek	1,384.00
Selkirk Creek	207.50
Stewart River	2,017.00
Whitehorse	8,658.50
Hootalinqua	1,978.00
Forty-mile	1,199.00
Duncan	9,291.50
Clear Creek	2,990.00
Sixty-mile	3,033.50
Kluane	6,630.50
	\$146,030.73

Comparative Statement, Returns Gold Commissioner's Office.

	Year ending June 30, 1903.	Year ending June 30, 1904.	Year ending June 30, 1905.
Free miners' certificates	\$80,134.50	\$59,941.50	\$44,052.00
Placer grants	27,550.00	34,615.00	7,850.00
Renewals	78,135.00	55,675.00	48,800.00
Re-locations	28,765.00	17,480.00	11,340.00
Registered documents—placer.	13,460.25	15,717.75	9,849.00
Certificates of work—placer.	11,332.00	11,232.00	10,888.00
Lieu of assessment—placer.	14,200.00	4,500.00	.....
Abstracts	633.00	294.00	127.00

Water grants	632.50	980.00	864.50
Amended applications	60.00	15.00	15.00
Court fees	37.50	.....	.....
Quartz—			
Grants and records	5,250.00	1,360.00	1,190.00
Registered documents	1,553.85	623.30	566.50
Certificates of partnership	225.00	122.50	57.50
Certificates of work	2,615.00	1,780.00	1,070.00
Lieu of assessment	6,900.00	1,300.00	300.00
Crown grants	1,311.36	387.47	40.00
" " acreage . . . . .	.....	311.07	893.55
Abstracts . . . . .	.....	7.50	.....
Gusher royalty . . . . .	.....	139.75	65.65
Hydraulics	9,114.46	8,244.95	6,097.95
Inspection of work	217.00	32.50	27.00
Advance deposits	2,362.08	2,024.23	1,937.98
Gold royalty	1.14	.....	.....
Totals	\$289,525.14	\$216,833.52	\$146,030.73

Comparative Statement of Instruments Issued.

	1902-3	1903-4	1904-5
Free miners' certificates	7,711	7,078	5,069
Placer grants	1,893	3,429	795
Renewals	5,214	5,196	4,834
Re-locations	2,069	1,757	1,115
Registered documents, placer	5,814	4,803	3,921
Certificates of work, placer	5,666	5,947	5,368
Lieu of assessment, placer	71	24	....
Abstracts	84	49	19
Amended applications	12	3	13
Water grants	139	126	134
Quartz grants	1,035	261	232
Certificates of work, quartz	932	669	428
Certificates of partnership, quartz	90	46	23
Registered documents, quartz	680	137	191
Crown grants	21	24	16
Lieu of assessment, quartz	21	13	2
Quartz acreage . . . . .	.....	20	36
Quartz abstracts . . . . .	.....	3	....
Hydraulics	27	18	13
Inspection of work performed	34	6	2
Gusher royalty . . . . .	.....	7	....

REPORT OF DIRECTOR OF SURVEYS.

The report of the Director of Surveys shows that for about nine months of the fiscal year his staff consisted of three surveyors and three draughtsmen, and that March, 1905, it was reduced to one surveyor and one draughtsman. The surveys made included about 64 miles of base line on various creeks; the Dawson-Whitehorse road from Yukon crossing to Whitehorse, a distance of 148.6 miles; 40 "auction" claims, and an Indian reserve at Carcross.

REPORT OF CROWN TIMBER AND LAND AGENT.

The Crown Timber and Land Agent reported, in part, as follows:

"Only one timber berth of one square mile was disposed of during the past year, the revenue therefor being \$250, as against \$5,750 collected from this source during the year ended June 30, 1904.

"Royalty on timber has increased slightly; due to the fact that greater quantities of wood were cut on timber berths rather than to the increase of sales of lumber, 11,330 cords of wood having been sold from timber berths. This partially accounts for the reduction in revenue obtained from wood permits. Another cause for this reduction is found in the fact that over 5,000 tons of coal were consumed during the

year just finished, while less than 1,000 tons were consumed during the previous year. There are now only four or five steamers on the upper river run which utilise wood as their only fuel. The others combine coal and wood.

"I consider the reduction in seizures as an improvement in the actions of mill-men and wood-cutters generally. Less operations have been carried on in trespass during the year just ended than during any year since the opening of this office. This is due principally, I think, to the heavy penalty imposed on persons cutting logs on Dominion lands without authority. It is practically an impossibility for any one now to carry on operations with a view to disposing of their product in Dawson without being detected, and detection means financial loss to the operator.

"Royalty has been paid on 699 3-10 tons of coal. In addition to this 2,807 tons were mined which were not subject to royalty, the coal in question having been mined on coal lands purchased at a higher rate per acre, under regulations which made no provision for the payment of royalty, and there are 1,700 tons on which royalty is now due.

"In connection with the coal industry, I take great pleasure in quoting the following from Crown Timber Inspector Sugrue's report to me:—

"Coal at Tantalus is being worked by C. E. Miller. He has a contract with the B.Y.N. Co. for 3,000 tons, partly filled. There are employed at the mines an average of 14 men. The output is 35 cars per day, about 5 cars per man actually working drift. Tunnels—two have been run into the seam a distance of 450 ft. each, and cross-cuts opened for these. Coal is run out in cars on wooden railway and then elevated by means of hoist to screener. The seam dips at a sharp angle up stream and runs laterally at almost right angles to the river on the left bank. As yet no trace of corresponding seam has been discovered on the opposite side of the river. The coal is bituminous, intermingled with stringers of rock, and, unfortunately, very dirty. As the tunnels go back the coal becomes purer and less shattered. The screen works satisfactorily, but owing to the softness of the coal, the fall into the hopper refractures the larger lumps and causes much dust. The tests made by the steamers prior to the erection of screen were very unsatisfactory. Since the screening, results have not as yet been made public. In the event of the coal proving a success the wood-cutting on the river will be seriously affected. The company estimate that by use of coal their fuel bill will be cut in two."

"The Coal Creek Co. are also large operators. Their operations have been carried on on Coal Creek on coal lands purchased and leased by them.

"The sales of Dominion lands were very small, in fact, \$7,234.76 less than last year, and rentals have also decreased \$4,775.55. The cause of the reduction in rentals is the abandonment by lessees of portions of waterfront opposite Dawson, and also the purchase of lands for agricultural purposes which were previously leased."

COMPANY MEETINGS AND REPORTS.

IMPERIAL DEVELOPMENT SYNDICATE, LTD.

The sixth annual general meeting of the Imperial Development Syndicate, Ltd., was held at Nelson, B.C., on February 13, 1906. The directors' report, manager's report and financial statement were submitted and adopted.

The following directors were elected for the ensuing year: Messrs. Geo. Gillies, W. W. Beer, E. C. Arthur, Harry Bird, P. Lamont, Geo. Robertson, A. H. Gracey, A. L. McCulloch, J. Laing Stocks, A. H. Kelly.

Mr. A. H. Gracey was re-elected managing director, and Mr. F. W. Swannel, auditor.

At a subsequent meeting of 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.

Directors' Report.—The directors reported: During the past year no mining operations have been directly carried on by the syndicate. The calls made during the year have been used in making payments on the 32,000 shares of stock held by us in the Eva Group Mines, Ltd. Recently the possibility of making a sale of our holdings in that company (viz. 252,000 shares) has presented itself. Up to the present, however, we have nothing definite to report in this respect, although negotiations are still under way.

Financial statement and manager's report are herewith submitted.

Manager's Report.—The following is the report of the company's manager, Mr. A. H. Gracey:

As we have carried on no active mining operations during the past year I have nothing to report under that head. The Cholla group is in the same condition in which I reported it last year.

All our shareholders were mailed a copy of the last annual report of The Eva Gold Mines, Ltd., therefore the condition of the Eva mine and the work carried on by that company up to September, 1905, will be fully understood. It will be of interest, however, to summarise what has been done since our last annual meeting.

During 1905 and up to the end of January of this year, development to the extent of 1,200 ft. has been added to the previous work. During the same period (Jan. 1, 1905, to Jan. 31, 1906) 12,300 tons of ore were mined and milled, the largest portion of which was produced from development work.

The following summary will show the results:—

Bullion produced	\$45,084.66	Per ton...	\$3.66½
Concentrates (estimated)	7,150.00	Per ton....	0.58½
Total	\$52,234.66		\$4.25

The gross value of the ore has averaged about \$5 per ton.

The cost of this work including the development, mining, aerial tramming, milling, maintenance, management and general expense at Camborne, not including the 2 per cent mineral tax, was \$3.94 per ton.

The following figures, being a summary of the whole production since the mill was installed, will also be of interest.

Tons milled, 20,000. Bullion produced, \$94,108.27; concentrates (estimated) \$8,715; total, \$102,823.27, or an average of \$5.15 per ton.

Power drill equipment and larger milling capacity are now essential to reduce costs and place the property on a proper profit earning basis. It is estimated that costs can be thus reduced to \$2 or even less, per ton, which would leave a nice margin of profit on the grade of our ore bodies. Large quantities of this ore exist, as thoroughly proven by the past work.

Statements of accounts, as at December 31, 1905, were submitted, as under:—

Balance Sheet.—

Assets.	
Cholla group	\$29,433.19
Tools and supplies	118.76
Office furniture	213.25
Mining stock—(shares in Eva Gold Mines)	252,000.00
Bills receivable	500.00
Cash on hand	495.58
Shareholders' liability for calls	39,335.00
	<u>\$322,095.78</u>

Liabilities.	
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 issued with 50c. paid up)	16,000.00
Eva Gold Mines (liability for calls)	5,350.00
Profit and loss (as per account)	156,745.78
	<u>\$322,095.78</u>

Profit and Loss Account.—

	Dr.	Cr.
Office and general expenses	\$ 162.00	
Balance carried forward	156,745.78	
	<u>\$156,908.28</u>	
		Cr.
Balance brought forward		\$156,908.28

CONSOLIDATED MINING & SMELTING CO. OF CANADA, LTD.

Under date February 26, 1906, the directors of the Consolidated Mining & Smelting Co. of Canada, Ltd., made the following report to the shareholders:—

The St. Eugene, Centre Star, War Eagle, Trail Smelter and Rossland Power Co. having been consolidated, the directors beg to submit a brief report upon the operations of each of the properties, the financial standing of the new company, and its future prospects.

The new company was incorporated under the name "Canadian Consolidated Mines, Ltd.," but as the business of the new company will be largely smelting and refining, including a considerable amount of custom business, it was deemed advisable that this branch of the company business should be indicated in the name. Supplementary Letters Patent have therefore been obtained, changing the name of the company to "The Consolidated Mining and Smelting Co. of Canada, Ltd."

There will be some delay in the delivery of the engraved stock certificates, due to the necessity of complying with the requirements of the New York and Boston markets.

Financial Statement.—

Assets.	
Mines, plants, smelter, refinery, stocks of other companies, etc.	\$3,900,000.00
Cash in banks	325,315.19
Due account of ore shipments	153,628.01
Due from Government for bounties	17,450.35
Accounts receivable	100,274.02
Stores on hand	202,220.43
	<u>\$4,698,888.00</u>

Liabilities.	
Capital stock issued and fully paid up	\$4,698,888.00

(Authorised capital stock, \$5,500,000.00)

Note.—It was thought advisable to purchase the ore and products at the smelter and refinery, in process of treatment and in transit January 1, 1906, and an arrangement, most

advantageous to the company, has been concluded, by which all such ores and products (conservatively valued at \$908,460.07) will be acquired.

Managing Director's Report.—The managing director, Mr. W. H. Aldridge, reports as follows:—

I beg to submit the following report upon the properties comprising The Consolidated Mining and Smelting Co. of Canada, Ltd.

Centre Star.

Development.—In the Centre Star Co's report for the year 1904, the ore reserves were estimated at 50,000 tons. Development work was consequently pushed, the expenditure upon this account during the calendar year of 1905 being \$148,053.01, as compared to \$53,286.94 in the fiscal year ending September 30, 1904.

The ore being found on the 9th and 10th levels seems to justify the large expenditure for development work, and the sinking of the main shaft to the 11th level.

Shipments.—Since the report of 1904, 111,841 tons of ore have been shipped, having a gross value of \$11.28 per ton, or a total value of \$1,261,390.01. The net amount received by the company for this ore, after deducting all freight, smelter, refining and marketing charges, was \$503,476.31, or an average of \$5.39 per ton.

Ore Reserves.—The ore showing in the mine promises to yield over 100,000 tons ore of \$10 gross value, which does not include the ore being opened up on the 10th level. The mine is now shipping about 9,000 tons of ore monthly, averaging about \$10 per ton gross value.

Improvements.—Numerous surface improvements have been made and others are under contemplation. The sorting of the ore, or the picking out of the waste, has yielded better financial results.

Lawsuits.—Two lawsuits have been settled—one with the Miners' Union of Rossland, and the other with the Rossland-Kootenay Mining Co., Ltd. The settlement of these lawsuits places the company on friendly terms with its own employees and with the adjacent properties.

Explosion.—On December 16 there was an unfortunate explosion of powder in the thawing house, resulting in the death of John Ingram, who had been employed for some time in thawing and handling the powder. The explosion did considerable damage to the company's buildings and plants.

War Eagle.

Development.—In the War Eagle Co's report for the year ending December 31, 1904, the ore reserves are estimated at 23,000 tons. An unusual amount of development was performed, namely, \$128,046.10, which is \$77,059.91 more than was expended in the previous year.

Shipments.—Shipments during the year amounted to 60,860 tons, of a gross value of \$11.34 per ton, or \$690,269.21. The net amount received by the company for this ore, after the deduction of all freight, smelting, refining and marketing charges, was \$317,775.12, or an average of \$5.22 per ton.

Ore Reserves.—It is estimated that there are above the 8th level 45,000 tons of available ore, which will average about \$10 per ton gross value. The mine is now shipping about 5,000 tons per month, averaging about \$10 gross value.

It was found that the War Eagle vein had flattened below the 8th level, and that all work previously performed on the levels below this point, namely, the 8th, 9th, 10th and 11th levels, had been in the foot-wall.

New Ore.—Ore shoots below the 8th level have now been located by diamond drill holes, and within the last few days an ore body has been reached by rock cross-cuts driven from the 1,000-ft. and the 1,100-ft. or bottom levels of the War Eagle. This gives a considerable area to prospect between the bottom or 1,100-ft. level and the 800-ft. level. It will require some months to determine the extent and value of these ore shoots.

St. Eugene.

Development.—In the St. Eugene Co's report for the year ending September 30, 1904, it was estimated that the ore

in sight would yield 43,000 tons of concentrates. It was impossible to do much development work during the year because of the shortage of power. Since the installation of the three new boilers in August, and the new compressor, which is of a capacity of 3,100 cu. ft. of air per min., and of the 35 new machine drills, development work has been energetically carried on with satisfactory results.

Shipments.—Since the date of that report, there have been mined 151,373 tons of ore, which yielded 32,650 tons of concentrates and 1,734 tons of crude ore, or a total shipping product of 34,384 tons, containing 1,029,820 oz. of silver, and 40,462,141 lb. of lead. The total gross value of this production was \$1,820,011.53 or \$52.93 per ton. After deducting all freight, smelting, refining and marketing charges, the net amount received by the company, including the bounty, was \$1,232,893.40 or \$35.85 per ton.

Ore Reserves.—On January 1, it was estimated that the ore available in the mine amounted to 150,000 tons, which will produce about 33,000 tons of concentrates and picked shipping ore. About 15,000 tons of ore are being mined monthly, yielding about 2,700 tons per month of concentrates and crude ore, averaging \$60 per ton gross value.

New Ore.—A new ore shoot has been found in what will be known as the 1,300-ft level, which may yield a considerable tonnage. A winze driven from the 1,900-ft. level encountered what appeared to be a good body of ore, the extent of which cannot be determined for several months.

Fires.—There were two serious fires—one on September 22, which burned the upper terminal of the Moyie gravity tramway, the ore bin, snow shed, and blacksmith's shop. The second fire was on October 6, and destroyed the hoisting plant, shaft timbers to a depth of 60 ft., tunnel timbers for a distance of 100 ft., large framing shed, blacksmith's shop and ore bin. The last fire seriously interfered with the shipments and profits during the latter part of the year, and it was not until the first part of January that the concentrator resumed full operations.

Trail Smelter.

Smelter and Refinery Output, 1905.—The company's smelter, which comprises a complete, up-to-date lead and copper reduction works, and an electrolytic lead refinery, treated 240,000 tons of ore during 1905 and shipped:

1,359,911.068 oz. of silver.	\$	806,658.81	gross value.
82,644.311 oz. of gold		1,780,257.91	" "
4,571,764 lb. of copper.		563,249.87	" "
13,382,050 lb. of lead		397,580.70	" "

\$3,475,747.29

Refinery production from outside
bullion. 320,000.00

Total production, 1905 \$3,795,747.29. " "

Smelter and Refinery Output, January.—As an indication of the present volume of business of the company's smelter and refinery, it might be stated that during the month of January, 28,000 tons of ore mainly from its own mines, were treated and produced approximately the following:

Silver, 182,000 oz.	\$119,000	gross value.
Gold, 9,787 oz.	202,000	" "
Copper, 384,000 lb.	69,000	" "
Lead, 2,820,000 lb.	113,000	" "

\$503,000

or at the rate of \$6,000,000 gross per annum.

Destination of Product.—The above product was shipped in the form of fine silver bars to China and New York; gold bars to the United States assay office at Seattle; pig lead to Canada, China and Japan; copper sulphate to various wheat-growing districts in Canada, and the bulk of the gold and copper in copper matte to the American Smelting and Refining Co.

Rossland Power Co.

As the mill belonging to the Rossland Power Co. has not

been successfully operated, its scrap value was conservatively placed at \$60,000. This includes buildings, 86 acres of land, the water rights, four miles of large pipe line from Murphy Creek (used in supplying the smelting works with water), movable machinery and supplies.

Amalgamation.—Negotiations with Le Roi: Negotiations for the amalgamation of several of the Rossland properties were started by Messrs. T. G. Blackstock, G. S. Waterlow and A. J. McMillan more than two years ago. The new directors of the St. Eugene and Centre Star decided to bring the negotiations to a point where the Le Roi Co. could accept or decline a proposition involving the amalgamation of the Rossland properties with the St. Eugene Mining Co. and the Trail Smelter. Examinations of the properties were made by Professor R. W. Brock, of the Dominion Geological Survey; Mr. James Cronin, manager of the St. Eugene, Centre Star and War Eagle mines; Mr. R. H. Stewart, superintendent of the Centre Star and War Eagle mines; and Mr. J. M. Turnbull, mining engineer for the Canadian Pacific Railway Co. Mr. John H. Mackenzie, general manager of the Le Roi, was employed by that company to make examinations of all the properties, after which he strongly recommended amalgamation upon a basis which seemed equitable to all interests. In the meantime, agitation against amalgamation with the Canadian companies had been started in England, and, as a result, the amalgamation plan, as recommended by Mr. Mackenzie and the other experts, was defeated at the Le Roi Mining Co's general meeting last December.

Assets.—The St. Eugene, Centre Star, War Eagle, Trail Smelter and Rossland Power Co. have now been consolidated under the name of The Consolidated Mining & Smelting Co of Canada, Ltd., with a total capital of \$5,500,000 of which \$4,698,888 in stock have been issued, \$801,112 in stock remaining in the treasury. The Consolidated Co. started with a cash working capital of \$569,669.57 which is invested in ores and products in process of treatment and in transit. The company also has a liquid asset in the shape of fuel, fluxes and supplies valued at \$202,220.43.

Profits.—Deducting operating, development and construction expenses from the net receipts from ore shipments as above, the net profits of these properties during 1905, including the profits of the smelter, were over \$700,000, and it is expected that the company will do at least as well during the year 1906. Due to the consolidation of the properties and to the larger tonnages being handled, much lower grade ore can be profitably treated than formerly.

Future of Properties.—Development work in all mines during the past few months has been fairly satisfactory, and there is reason to expect a continuation of known ore shoots, as well the finding of new shoots.

The Consolidated Mining & Smelting Co. of Canada, Ltd., is not dependent upon any single mine, nor upon any single mining district; but its interests and business, besides being to an extent industrial, will also be so diversified as to minimize, so far as possible, the speculative element.

New Properties.—It is the intention of the company to watch developments throughout Canada, and to acquire new properties when favourably reported upon by reputable experts.

Management.—The improved condition of the properties is largely due to Mr. James Cronin, manager of all the mines; Mr. R. H. Stewart, superintendent of the Centre Star and War Eagle; and Mr. G. A. Clothier, of the St. Eugene.

Board of Directors.—The following comprise the directorate of the Consolidated Mining & Smelting Co., of Canada, Ltd.: Mr. W. D. Matthews, Toronto, Ont., president; Mr. George Sumner, Montreal, Que., vice-president; Mr. W. H. Aldridge, Trail, B.C., managing director; Messrs. E. B. Osler, H. S. Osler, and W. L. Matthews, all of Toronto, and Mr. Charles R. Hosmer, Montreal.

CANADIAN GOLD FIELDS SYNDICATE, LTD.

The annual general meeting of shareholders in the Canadian Gold Fields Syndicate, Ltd., was held in Montreal Quebec, on February 1, ulto. The reports of the directors

and managing director, respectively, were submitted and adopted. These were as follows:

Directors' Report.—Your directors have much pleasure in reporting that the St. Eugene Consolidated Mining Co., Ltd., paid three dividends of 2 per cent each during the year, out of which this company has been able to pay three dividends of 2 per cent each to its shareholders. A fourth dividend of 2 per cent was declared by the directors of the St. Eugene Mining Co. in December, payable on January 8, 1906, and your board declared a similar dividend payable on January 30, 1906. These amounts will be shown in the accounts for the current year. After payment of the dividend No. 7, the shareholders will have received in dividends a total amount of \$83,506.68.

In the month of July last (1905) a proposition was made to amalgamate the St. Eugene, Centre Star, War Eagle and Le Roi mines and the Trail smelter. Your directors personally were of the opinion that the interests of the St. Eugene shareholders would be best conserved by remaining out of the amalgamation, but as the holders of the majority of the shares of that company were of a contrary opinion, and had the voting power to carry it through, it was felt that all that could be done was to negotiate for the best terms possible. Your board appointed a committee to meet with the representatives of the majority as well as of the other interested parties. The committee had several meetings, and went fully into the reports as to valuations of the different properties as prepared by experts, and also had the benefit of a personal interview with Mr. Jas. Cronin as well as numerous communications with the managing director of your company, and finally when the Le Roi shareholders decided not to enter the consolidation, the terms upon which the St. Eugene should enter were fixed at two shares of the Canadian Consolidated Mining Co., Ltd., for each three shares of St. Eugene. These terms were more favourable than those first proposed and in our opinion are fair towards all interested. Your directors are of opinion that the earnings of the Canadian Consolidated Mines, Ltd., will conduce to more regularity and uniformity in the payment of dividends.

Managing Director's Report.—The mining outlook for 1906 is much better than it was at the beginning of 1905, the average prices of metals now being considerably higher than they were at the beginning of last year. The price of silver in January, 1905, was 58 cents per oz., of copper about 15 cents per lb. and of lead about £12 per ton. The bounty on lead given by the Dominion Government brought the lead value up to a little over £15 per ton. Silver is now worth 65 cents per oz., copper 18½ cents per lb. and lead about £17 per ton. The Dominion Government no longer has to pay the bounty on lead, although liable to do so until June 30, 1908, should the price of lead again fall below £15.6s. per ton. The increased price of metals is all clear profit to the producer. Production, stimulated by higher prices, is steadily increasing in British Columbia. In 1905, that Province produced \$2,050,000 worth of silver, \$5,450,000 worth of copper and \$3,370,000 worth of lead, a very marked increase over the production of 1904. It will thus be seen that the high prices of these three metals is of vast importance to the mining industry; the result of these favourable conditions means a still further increase in production and the investment of considerable capital in new mining ventures, because of the increased profits.

The year 1906, should be a favourable time for either working or selling the various properties in which this company is interested.

It is satisfactory to note that the St. Eugene group at Moyie, B.C., in which the Canadian Gold Fields Syndicate is so largely interested, still remains the banner mine of British Columbia. Negotiations are progressing for the consolidation of the St. Eugene and Centre Star mines with the Trail smelter and Rossland Power Co., on terms that in my opinion, will result in substantial benefit to the Canadian Gold Fields Syndicate. The new company will be called the Canadian Consolidated Mines, Ltd., and the Canadian Gold Fields Syndicate will transfer its present holdings in St. Eugene shares into shares of the new company.

The buildings and machinery on the company's Rossland property, the Sunset No. 2 group, have been kept in good order and repair. Two offers to lease the Sunset group were received during the year, but the parties could not show sufficient financial backing, and it was not deemed advisable to entrust the property to parties not in a position to work it properly.

Negotiations are in progress for the sale of the True Blue group, in which this company owns the controlling interest.

I respectfully suggest and recommend that it would be advisable to consolidate the shares of this company into shares having a greater par value, so as to permit of the stock being listed on the various stock exchanges, and would advise that this question be referred to a committee of the directors to get full information and report on the best plan to adopt.

Balance Sheet, December 31, 1905.—

Assets.	
Sunset and Alabama mines—	
Cost of mines and surface rights	\$120,790.50
Expenditure on development, etc.	227,597.11
Machinery and buildings	13,287.71
Furniture and fixtures	963.67
	\$362,638.99
Jennie Mine—	
Cost of mine	12,000.00
Cost of survey, taxes, etc	259.76
	12,259.76
Goldhunter Mine.—Cost.	
	35,125.00
St. Eugene Consolidated Mining Co.—	
640,000 shares, fully paid up, \$1 each.	640,000.00
Placed in Balance Sheet, at cost of Lake Shore properties to Canadian Gold Fields Syndicate, subject to revision according to market value	145,448.23
True Blue Copper Mines, Ltd.—	
390,000 fully paid up shares, 10 cents each	39,000.00
Cost to Canadian Gold Fields Syndicate, subject to revision according to market value	6,249.98
Commonwealth Mines, Ltd.—	
400,000 fully paid up shares, \$1 each.	400,000.00
Cost to Canadian Gold Fields Syndicate, subject to revision according to market value	9,374.99
Eldon Mineral claim.—Cost	154.80
Bills Receivable.—On hand	1,197.17
Cash.—On deposit B. B. N. A.	1,967.49
Petty cash on hand.	12.78
	1,980.27
Due by shareholders	2,400.00
True Blue Mines, Ltd., Loan Account.	39.75
Commonwealth Mines, Ltd., Loan Ac. t.	39.00
Profit and Loss. At debit	23,092.06
	\$600,000.00
Liabilities.	
Capital Account (Stock)—	
6,000,000 shares subscribed at 10 cents per share	\$600,000.00
\$600,000.00	
<i>Cash Statement.</i> —	
Receipts.	
St. Eugene Con. Mining Co., dividends Nos. 4, 5, and 6, of 2% each on 640,000 shares	\$ 38,400.00
Bills receivable on account	102.83
Interest on bills receivable	189.49
	\$ 38,692.32
On deposit in Bank of B. N. A., January 1, 1905.	2,907.73
	\$41,600.05

Disbursements.

Office Expenses in Montreal.—	
Printing, stationery, rent, safety box, etc	\$147.47
Secretary-treasurer's salary	400.00
Secretary-treasurer, preparing and paying dividends.	300.00
Guarantee bond, secretary-treasurer.	37.50
Auditors' fees	25.00
	909.97
Directors' fees and travelling expenses.	1,102.95
Discount on dividend cheques.	89.55
Managing director, salary and expenses, Rosslund	1,250.00
Petty cash	80.00
Insurance on machinery, plant and buildings at Rosslund, two years	250.00
Government Dues and Taxes—	
Sunset property	\$ 42.34
Jennie mine	9.00
	51.34
Loans True Blue Mines Ltd..	\$ 39.75
Commonwealth Mines, Ltd..	39.00
	78.75
Dividends Nos. 4, 5 and 6 of 2% each.	35,820.00
	39,632.56
On deposit in Bank of B. N. A., December 31, 1905	1,967.49
	\$41,600.05

The following were elected directors for the ensuing year: J. W. Graham, J. G. Hodgson and G. Sumner, of Montreal, Quebec; Alex. Pridham, Grenville, Quebec; T. G. Blackstock and W. H. Brouse, of Toronto, Ontario; R. K. Hope, Hamilton, Ontario; Thos. Wilson, Clarence, Ontario, and J. C. Drewry, Rosslund, B.C.

The officers of the syndicate are: George Sumner, president; Alex. Pridham, vice-president; J. C. Drewry, managing director, and John Hyde, secretary-treasurer.

RICHARD III. MINING CO., LTD.

The third annual general meeting of shareholders in the Richard III. Mining Co., Ltd., was held at Duncan's Vancouver Island, on March 9, inst. This company owns the Richard III. mine, at Mt. Sicker, V. I. The following is the report of the directors:

"Your directors have to report that the mine has been unworked during the year, following the policy recommended at the last annual meeting that we should await developments on the Tyee Copper Co's claims, whose ground adjoins us on the West. Although the Tyee Co. has been steadily approaching our line, it is still in the neighbourhood of 100 ft. from our boundary. During the next few months it should be proved at what point of our ground the lode enters. As soon as this is determined we hope to make financial arrangements which will enable us to continue work on the mine. The work that is proposed would be to run a drift from a point in the shaft to encounter the lode and if the same maintains its present character profits should be immediately forthcoming.

"It will be noted from the balance sheet that we still have 79,285 shares unsold, which shares can be sold for development when a favourable market can be obtained. The mortgage of \$1,500 with accrued interest will be due on 18th inst. and at the meeting you will be asked to deal with this question.

"It is with pleasure we refer to the very favourable conditions occurring at the Tyee Mine 1,000-ft. level and in view of such favourable conditions we have no hesitation in assuring the shareholders that in our opinion a great future is

yet in store for our property. During the past year the directors had submitted to them a tentative offer, through Mr. Clermont Livingston, to bond the property, which offer in the interest of the shareholders, was declined.

"Since pumping was discontinued at the mine the company has incurred no liabilities beyond a small sum necessary to maintain the buildings, neither have any salaries been paid. Under these conditions the directors feel it is in the interest of the shareholders to await a favourable time before resuming operations."

BLACK MACKAY MINING CO.

The following is a recent report on the property of the Black Mackay Mining Co., of Nelson, B.C., by Mr. J. T. Laidlaw, M.E.:

"This property consists of two full claims at Moyie, East Kootenay, B.C. They extend west from the St. Eugene Mining Co.'s property, under Moyie Lake, and join the Aurora property on the west side. These claims, staked recently under a permit from the Government, allowing time to make discovery, were considered valuable property eight years ago, but owing to the difficulty of obtaining title, have lain open till staked by your company.

"The St. Eugene mine is the largest silver-lead property in Canada, producing since 1900 some \$3,500,000. This ore was obtained from two parallel veins, striking nearly east and west, and which have proved continuous from the top of the mountain to the edge of the lake. On the west side of the lake is the Aurora property, on which a large amount of work has been done, a series of tunnels and surface cuts exposing a vein for over 1,500 ft., from which two cars of ore have recently been shipped. This vein strikes nearly east and west, dips to the south and has the same characteristics as the St. Eugene vein. From surveys made by myself, I am satisfied that the St. Eugene and Aurora mines are on the same vein and that the vein will be found to continue under the lake. From the soundings taken, the greatest depth of water obtained was 140 ft. The general average of the soundings gave 76 ft.

"The best way of opening up the property would be by shafts, sunk on each side of the lake. On the east side I would recommend a two-compartment shaft, to be followed later by a three-compartment shaft (working) on the west side. By sinking the shaft on the St. Eugene side to 400 ft., no difficulty should be experienced in drifting under the lake. This would give about 125 ft. of backs, figuring the average depth of the lake at 76 ft. and allowing sufficient ground between the lake and stopes for safety.

"The estimated cost of sinking a shaft 5 by 9 in the clear and plant would be as follows:—

Sinking shaft 400 ft., at \$40.	\$16,000
Cross-cutting and drifting 1,000 ft. at \$12.	12,000
Plant, consisting of compressor, boilers, hoists and pumps	10,000
Buildings, including shaft-house, blacksmith shop, trestles, etc.	1,700
	\$39,700

"In my opinion there is an excellent chance of finding ore when the vein is tapped, and the close proximity of the railway to the proposed shaft-house site should allow of ore being placed on the cars at a very small expense. Should the ore require concentration, as does the St. Eugene ore, an excellent mill site could be obtained on the west side of the lake."

In New Zealand Sunday labour is strictly forbidden by the Mining Act (1898) in both mines and mills. Crushing operations are suspended at 12 p.m. on Saturday night and resumed again at 12 o'clock Sunday night. At Christmas a full fortnight's holiday is given to all miners and mill men; this is also a compulsory section of the Mining Act.

COMPANY CABLES AND NOTES.

CABLES.

British Columbia.

Cariboo Consolidated.—Early in March the London office of this company, which is operating a deep drift mine on Lightning Creek, Cariboo, received from the mine manager a cable as follows: Main tunnel completed on Wednesday last.

Le Roi.—February: Shipments amount to 7,500 tons, containing 2,721 oz. gold, 4,700 oz. silver, 190,691 lb. copper. Estimated profit on this ore, after deducting cost of mining, smelting, realisation and depreciation, \$24,000. Expenditure on development work during the month, \$9,500.

Le Roi.—March: Have struck pay ore on the west side of the Josie dyke, 800-ft. level; average assay of ore is \$14 for 20 ft. Extent at present unknown; development proceeding.

Tyce.—February: Smelter ran 13 days and smelted Tyce ore, 2,224 tons; custom ore, 292 tons, total, 2,516 tons. Matte produced from same 240 tons. Gross value of contents (copper, silver and gold), after deducting costs of refining and purchase of custom ore, \$34,402.

U. S. A.

Alaska Mexican.—February, 30½ days, 120 stamps, 19,572 tons: Estimated realisable value of bullion, \$21,691. Saved 325 tons sulphurets; estimated realisable value, \$17,381. Working expenses, \$36,315. Were compelled to crush a quantity of ore below the average.

Alaska Treadwell.—February: 30½ days, 240 stamps, 34,832 tons; estimated realisable value of bullion, \$39,935. Saved 600 tons sulphurets, estimated realisable value, \$30,348. Working expenses, \$46,215.

Alaska United.—February: Ready Bullion claim, 29½ days, 120 stamps, 20,000 tons, estimated realisable value of bullion, \$26,130. Saved 201 tons sulphurets; estimated realisable value, \$10,721. Working expenses, \$26,944.

NOTES.

The Southern Cross Copper Mine Co., Ltd., has been incorporated with an authorised capital of £150,000 to acquire the Ballarat, Southern Cross, Included Fraction, Constance Fraction, Dora and Northern Star mineral claims, all situated at Uchucklesit Harbour, west coast of Vancouver Island.

The Williams Creek Dredging, Transportation and Agency Co., Ltd., has been incorporated with an authorised capital of £150,000, to acquire the assets of The Cariboo Gold Fields, Ltd., which for years has been operating a placer gold property situated along the bed of Williams Creek, near Barkerville, Cariboo.

The Canada Mine and Smelter Supply Co., Ltd., has been incorporated with an authorised capital of \$150,000, to acquire and control the patent rights in Canada of the Smith-Willey concentrator, the Smith granulator, the magneto-static ore separator, the zinc-lead separator, and other improved mining machinery.

Ore crushing has been commenced at the Canadian Metal Co's zinc smelter at Frank, South-west Alberta. A considerable quantity of zinc concentrates and crude ore is on hand and preparations are being made to shortly start smelting on a commercial scale. For the time being British Columbia will supply practically all the ore and concentrates these works will smelt.

The Tyce Copper Co., Ltd., has sent out the following report of the March returns from its smelter at Ladysmith, Vancouver Island: Smelter ran 13 days and treated 2,153 tons of ore, giving a return, after deduction of freight and refining charges, of \$37,965.

The accounts for 1905 of the Alaska Mexican Gold Mining Co. show a net operating profit of \$238,620; to which must be added profit on sale of Tacoma Smelting Co. stock, \$111,726 and \$238,613 brought forward from 1904. Dividends amounting to 53 per cent, or \$477,000 have been paid, leaving \$111,995 to be carried forward.

The accounts for 1905 of the Alaska United Gold Mining Co. show an operating profit of \$75,990, to which must be added profit on sale of Tacoma Smelting Co. stock—\$222,106

—and \$248,174 brought forward from 1904, together \$546,270. A dividend of 10 per cent has been paid, and there has been written off for depreciation of plant \$81,454, leaving \$374,717 to be carried forward.

The Rosella Mining Co. of Victoria has already sent men up to Cassiar to prepare for the work of taking in and installing plant, etc. The manager, J. W. Haskins, is expected to follow with more men about May 1.

The Berry Creek Mining Co., Ltd., has commenced preparations for the season's work on its hydraulic gold placer property on Thibert Creek, Cassiar, with six men in charge of the foreman. More men will go up in May, and as soon as practicable after their arrival at Thibert Creek hydraulic operations will be pushed and will be continued so long as sufficient water shall be available.

The gold recovered at the 10-stamp mill of the Eva Gold Mines, Ltd., at Camborne, Fish River camp, in February is stated to have been of the value of \$4,300. A larger return would have been made but damage to the water flume necessitated a temporary shut down of the mill and a consequent reduction of the tonnage of ore put through the mill during the month.

By an order made by the Hon. Mr. Justice Duff, dated February 19, on the petition of Henry Giegerich, of Sandon, B.C., it was ordered that the Last Chance Mining Co., Ltd., be wound up under the provisions of the "Winding Up Act," and Amending Acts, and that Louis Pratt, of Sandon, B.C., mine manager, be appointed provisional liquidator of the said company without security.

Notice has been gazetted that the registered office of the St. Eugene Mountain Mines, Ltd. (name changed from Yankee Girl Mining Co., Ltd.), has been removed from Kaslo, B.C., to Moyie, B.C.

The directors of the Black-Mackay Mining Co., Ltd., of Nelson, recently incorporated with a nominal capital of \$1,000,000, are John Morton, of Ferguson, Lardeau, and F. M. Black, E. A. Crease, Duncan McArthur and Chas. A. Mackay, all of Nelson, B.C. One third of the capital stock has been set aside for treasury purposes.

The Eureka Copper Mines, Ltd., of Nelson, B.C., has been incorporated with an authorised capital of \$250,000 in 1,000,000 shares at 25 cents each, of which 700,000 shares have been placed in the treasury and the remainder pooled for two years. The provisional directors are: J. J. Malone, J. A. Kirkpatrick, J. L. Porter, L. K. Larsen, and J. C. Bunyan. The company has been organised to acquire the Eureka group of seven mineral claims and fractions situated near Nelson.

The formation of the Phoenix Amalgamated Copper Mines, Ltd., with a nominal capital of \$5,000,000 in 500,000 shares at \$10 each, to acquire a group of eight mineral claims situated near Phoenix, Boundary district, has been announced. It is stated that only two-fifths of the stock will be available for treasury purposes. The group consists of the War Eagle, Bald Eagle, Lulu, Red Rock, Missing Link No. 2, Pinhook, World's Fair, and Dandy, comprising in all about 150 acres. Some of these claims have had a comparatively large amount of development work done on them but none have shipped ore in considerable quantity.

The Dominion Copper Co., Ltd., of New York, operating mines and a smelter in the Boundary district of British Columbia, has secured an amendment to its original memorandum of association authorising a reduction in number of shares and an increase in their par value. The capitalisation as amended is 500,000 shares at \$10 each in lieu of 5,000,000 shares at \$1.

The case of Lasell vs. Thistle Co. and Hannah has been decided by the Supreme Court of Canada in favour of the defendants. This was a Cariboo mining company case, which was tried before Mr. Justice Martin last July, when judgment was given against the defendant Hannah, the court holding that he should transfer to the plaintiff 12,500 shares in the Thistle Co. or pay him \$12,500. An appeal was taken by Hannah in November to the Full Court, which set aside the judgment of the trial judge. The case was then appealed to the Supreme Court at Ottawa by Lasell. The judgment of

the Full Court has been sustained by the Supreme Court. It was held that there was no *bona fide* contract and that therefore there was nothing binding upon the defendant.

LE ROI NO. 2

According to the statement published in the last issue to hand of the London *Financial Times*, the following is the Le Roi No. 2 mine manager's report for the month of February: Output—Seventy-two cars of ore were shipped, making an approximate total of 2,160 tons. Development—500-ft. level: H. west—72.8 ft. were driven here, and the ore though for the most part low grade, has been continuous. In many places it has lain very flat, and the average width was therefore hard to determine, but it probably averaged not less than 3 ft. in width. The average of all samples taken was 0.25 oz. in gold, and 0.5 per cent copper. H. east—We drove 121.9 ft. here in excellent ore, the average width being some 2 ft. For the first 25 ft. we were in dyke matter, but even here we had no difficulty in following the ore. The average of all assays taken during February was: Gold, 2.29 oz. per ton; copper, 4 per cent. The average gold does not include one exceptionally high figure. At the end of the month we reached what we considered the black dyke, which crosses stope 20, not very far from its east end. In the 700-ft. level, stope 11, the raise mentioned in the January report, has been completed a distance of 31 ft. having been made. This was in ore. Ore has been hoisted from the following working places: No. 9 stope, 22 cars; stope 20, 1,105 cars; stope 28, 481 cars; stope 11, 795 cars; H. west, 417 cars; H. east, 509 cars; total 3,389 cars.

General remarks on the above stopes: Stope 9, 500—This is the streak of ore met with in a diamond drill hole some three floors below the 300-ft. level above No. 9 stope. It appears to be a solitary bunch and we have never located it east and west. We have therefore started to stope what is showing, with fairly promising results. The ore is very scattered. Stopes 20 and 28 show little change from January. Stope 11, 700 was very good in the back during February, but seems somewhat poorer westward.

CERTIFICATES OF INCORPORATION.

- Eureka Mines, Ltd.*, with a capital of \$250,000, divided into 1,000,000 shares of 25 cents each.
- Southern Cross Copper Mine Co., Ltd.*, with a capital of £150,000, divided into 150,000 shares of £1 each.
- Williams Creek Dredging, Transportation and Agency Co., Ltd.*, with a capital of £150,000, divided into 30,000 "A" shares of £1 each and 480,000 "B" shares of five shillings each.
- Prince Henry Mining Co., Ltd.*, with a capital of \$500,000, divided into 500,000 shares of \$1 each.
- Canada Gold Hydraulic and Dredging Co., Ltd.*, with a capital of \$250,000, divided into 250,000 shares of \$1 each.
- Canadian Mine and Smelter Supply Co., Ltd.*, with a capital of \$150,000, divided into 15,000 shares of \$10 each.

REGISTRATION OF EXTRA-PROVINCIAL COMPANIES.

- New Felcet Portland Mine, Ltd.*—Head office in England. Capital, £10,000, divided into 10,000 shares of £1 each. Head office in British Columbia at Rossland. Attorney, C. R. Hamilton, Bank of Montreal Chambers, Rossland.
- Ylleva Mining, Milling and Development Co.*—Head office at Seattle, Wash., U. S. A. Capital \$5,000,000, divided into 5,000,000 shares of \$1 each. Head office in British Columbia at Vancouver. Attorney, (not empowered to issue and transfer stock) A. B. Irwin, Vancouver, B.C.

TRADE CATALOGUES, ETC.

The Canadian Westinghouse Co., of Hamilton, Ontario, has issued an illustrated folder on Westinghouse fan motors,

showing alternating and direct-current fans of various styles; also a booklet describing and illustrating ceiling and floor column fans, for cooling and ventilating places of business and entertainment during the summer months.

The Sawyer-Man incandescence lamps sold by the Westinghouse Electric and Manufacturing Co., of Pittsburg, Pa., are described in detail and illustrated in a booklet lately received. The thirty cuts exhibit lamps in varied style and covering a wide range of serviceableness in electric lighting.

W. F. Stanley & Co., of London, W.C., England, the largest manufacturers of surveying and drawing instruments in the world, have published a pamphlet describing Stanley's Patent "Invar" and nickel steel standards, which have the advantage over other standards of a three-fold use, viz., (1) an inside standard gauge, (2) an outside standard gauge, and (3) a standard scale gauge. These three are usually made as separate standards. They are all certified by the National Physical Laboratory, and are reliable for the standardising and testing of measures, and are also most important for use in high-class engineering works.

The Westinghouse Electric & Manufacturing Co., of Pittsburg, Pa., has printed Circular No. 1102, which deals with the Westinghouse direct current multiple arc lamp for 110 and 220 volts; and No. 11-3 on small power motors. These contain much useful information.

A new catalogue on "Aerial Tramways" and a pamphlet on "A New Design of Aerial Tramways," have been issued by the Vulcan Iron Works, San Francisco. The latter embraces an illustrated description of a new tramway recently erected by the Vulcan Iron Works for the American Magnesite Co., at Red Mountain, California. The former is very well illustrated and contains much interesting information relating to the following Vulcan tramways: The standard, double rope, friction grip, single rope, double carrier, single carrier and surface planes.

MACHINERY AND CONSTRUCTION NOTES.

The West Kootenay Power & Light Co. recently purchased a 4 by 6 and 6 by 8 centrifugal pump for its Bonnington Falls plant on Kootenay River, near Nelson, B.C., from the Canada Foundry Co.

The Alaska-Treadwell Gold Mining Co. of Treadwell, Alaska, has ordered a 20 by 16-in. double drum, direct acting, hoisting engine from a firm manufacturing mining machinery in the United States.

The Canadian Westinghouse Co. has sold to the Dominion Copper Co., Ltd., two 100-h.p. CCL motors, 2,000 volts. Another order lately received from the Boundary district was for one of these motors for operating a centrifugal pump to supply the town of Grand Forks with water.

The Canadian Forty-mile Gold Dredging Co., at Dawson, Yukon Territory, the headquarters of which are at Toronto, Ontario, has ordered a special gold dredge equipped complete with 5 1-3 cu ft buckets. The contract covers the entire machinery equipment complete, ready for operation, including electric-light plant, two 100-h.p. boilers, engines, pumps, etc. The hull of this dredge is being constructed in the yards of the Pacific Coast Lumber Co., at Vancouver, B. C. It will be 106 ft. long and 36 ft. wide, and will have a scow behind with sluice boxes, which will bring the total length to nearly 250 ft. The dredge, by the time it shall be completed, will have cost about \$500,000. It is to be taken to Whitehorse in "knock-down" condition and after having been put together there, will be towed down the Yukon River to its destination.

The Canadian Smelting Works, of Trail, B.C., is installing three oil-insulated, water cooled Westinghouse transformers, each having a capacity of 1,250 kw.; also one Waldwin Westinghouse electric locomotive, class 4-2-S-C, 500 volts.

The Canadian Westinghouse Co., of Hamilton, Ontario, has closed a contract with the Canadian Rand Drill Co. for one 207-h.p. type CCL induction motor, 3-phase, 2,000 volts, 7,200 alternations, to be used in connection with the new air compressor the latter company is supplying to the British Columbia Copper Co at Greenwood, Boundary district.

The owners of the Centre Star mine at Rossland, B.C., have purchased from the Canadian Westinghouse Co. a 650-h.p. type CCL induction motor, 180 r.p.m., 2,000 volts, 3-phase, 7,200 alternations, including switchboard and lighting arresters. The motor is to be used for operating a Rand air compressor at the mine.

A contract for an aerial tramway about 6,000 ft. in length, for the Mother Lode group, in the Salmo section of the Nelson mining division, has been let to the Kootenay Engineering Works, of Nelson, B.C.

Among the orders for Farrel-Bacon crushers built by the Jenckes Machine Co., Ltd., of Sherbrooke, Quebec, during March was one of 24 by 13 size which was shipped to the Coast Quarries, Ltd., Vancouver, B.C., and which was sold through the Vancouver office of the Jenckes Machine Co. The Canadian Pacific Railway Co. made a record run on the shipment of this crusher, taking the car from Sherbrooke to Vancouver in 15 days.

The 250-h.p. electric hoist which was built for the Granby Co.'s mines at Phoenix, B.C. by the Jenckes Machine Co., Ltd., of Sherbrooke, Quebec, was recently shipped. The fact that this hoist was built by a Canadian firm is noteworthy, as heretofore electric hoists of large size have been regularly imported from the United States. The hoist has two conical drums, each 81½ ft. diameter at large end, 5 ft. diameter at small end, and 51½ ft. long, both drums being capable of independent operation through the medium of powerful friction chutches. The capacity of the hoist is a load of 10,000 lb. on either drum at 500 ft. per minute, and the shipping weight was about 50,000 lb.

The Yukon Consolidated Goldfields Co., Ltd., has contracted with the Canadian Westinghouse Co. for the following electrical apparatus to be used in connection with gold dredging in Yukon Territory: Three 100-h.p., 3-phase, 60 cycles, 400 volts, type F motors; three 15-h.p., 3-phase, 60 cycles, 400 volts, type F motors; three 50-h.p., 850 r.p.m., 3-phase, 60 cycles, 400 volt, constant speed induction motors; three 30-h.p. motors, three 20-h.p., 1,120 r.p.m. motors, three 15-h.p., 850 r.p.m. motors, three 7½-h.p., 1,700 r.p.m. motors; nine 75-kw., oil insulated, self-cooling transformers; two 625-kw., 3-phase, 60 cycles, 2,200 volts, 415 r.p.m., alternating current generators, and two 17-kw., type S exciters for same; one 4-panel switchboard for controlling above; four 250-kw., oil insulated, oil cooled transformers, and four 200-kw. transformers, same type.

COAL NOTES.

The output of coal at the Crow's Nest Pass Coal Co.'s collieries, South-east Kootenay, during March was the largest yet reached in any one month in the history of production by this company, having been 4,970 tons in excess of that of last January which month's output was the highest to that date. The production at the company's several collieries was as follows:

Coal Creek Colliery	43,701 tons.
Michel Colliery	29,667 "
Carbonado Colliery	7,904 "
Total	81,272 "

The production of coke in March amounted to 25,452 tons, which though not a record was a satisfactory output.

At Lethbridge, South western Alberta the men employed in the coal mines of the Alberta Railway and Irrigation Co. and the Gold Coal Mines, have gone out on strike. More than 500 of the coal mines' employees joined the union formed here in February. They are reported to have made demands upon the company to the following effect: Provision for the hearing of grievances by company's officials and pit committee and, in case of non-agreement, men to be at liberty to stop work if they so desire; access to the mines be given pit committee for purposes of investigation; company to deliver all material to nearest cross-cut to working face, to secure each miner a minimum wage of \$3 per shift, to deliver screened coal to workmen at \$2.50 per ton, to fully

recognise the union, to retain from wages due employees amounts of orders payable to union officers; contract coal to be weighed before being screened; day's work underground to be eight hours, outside labour ten hours; miner's wages \$3, or in wet places and at rock work \$3.50; hoisting engineers \$4. The companies declined to accede to these proposals, claiming that their adoption would involve the operation of the mines at a loss. The men thereupon ceased work.

The *Frank Paper* states that the International Coal & Coke Co., which commenced to open up its coal measures at Coleman, South-west Alberta, late in 1903, is now mining about 1,350 tons of coal per diem. Of this quantity about 200 tons is made into coke and the remainder sold as coal. There is a good demand for the coke made and all of the beehive ovens, 104 in number, are kept in operation. The company's March output of coal was expected to exceed by more than 10,000 tons that of any previous month.

Frank B. Smith, inspector of coal mines for Alberta, reports that there are now in this Province 125 coal mines subject to Government inspection as compared with only 30 in existence four years ago. Although the output of the mines has increased rapidly the market for the coal has so extended that while this year's production will probably exceed 1,000,000 tons it is not expected there will be any difficulty experienced in disposing of this larger output.

Mr. G. G. S. Lindsey, general manager of the Crow's Nest Pass Co., is reported to have announced that the company's Carbonado mines will be closed and the men will be given employment at Michel.

YUKON NEWS.

Information received from Eastern Canada is to the effect that Yukon Government officials have been freely and unfavourably criticised for having entered into a contract with Charles M. Hatfield of Los Angeles, California, described as "the famous rainmaker," to make rain in the Klondike during the ensuing mining season. The territorial controller now acting commissioner in the temporary absence of Hon. W. W. B. Melnes, commissioner of Yukon Territory—who had learned of Hatfield's rain making work in California, has been prominent in bringing about an arrangement for similar work to be done in the Klondike, where, last season, the production of gold was comparatively small owing to the shortage of water, the rainfall having been unusually light. The contract calls for Hatfield's working for four months, virtually all the open season, beginning May 1, by which date he must be on the ground with an assistant and the rainmaking apparatus. Hatfield undertakes to keep up a sufficient supply of water to admit of the operation throughout the summer of the hydraulic and other gold placer mines. Should he do this to the satisfaction of a board of seven men, three of whom are to be chosen by the Government, three by Hatfield, and the seventh by the other six, he is to receive \$10,000. Half of this sum is to be paid by the Government and the other half by ten of the largest mining operators in the Yukon. Should he fail to satisfy this board he will receive only his cost of transportation with cost of shipping his apparatus. No specific quantity of water in inches is stipulated for, the contract simply providing that he "shall increase the rainfall and renew it from time to time for four months, as may be named by the board, and sufficient to insure, so far as ample rain can do, a successful and prosperous summer for the placer mining industry of the Dawson district."

A pumping system is to be installed on Duncan Creek, where there is known to be rich gravel but pumps are necessary to control the water. The Government mining engineer has selected two Cameron pumps, one a No. 10 vertical plunger sinking pump and the other a horizontal, light service pump 12 by 10 by 18. The pumps will reach Dawson shortly after the opening of navigation and will be hurried thence to Duncan Creek as quickly as possible.

MINING MEN AND MATTERS.

Mr. Barclay Bonthrone of Vancouver, B.C., has returned to that city from a visit to Mexico.

An assayer's certificate has been granted to Mr. David Sloan of Three Forks, Slocan district.

Mr. Thos. Starbird, manager of the Ptarmigan mine, near Wilmer, East Kootenay, has returned from a visit to the East.

Mr. George W. Kessler, formerly superintendent of the Britannia mine, Howe Sound, B.C., is now in Los Angeles, California.

Mr. Thos. Kiddie has resigned as general manager for the Britannia Smelting Co. and is taking a much-needed rest at Victoria, B.C.

Mr. A. J. McMillan, managing director of the Le Roi Mining Co., has returned to Rossland, B.C., after an absence in England of about eight months.

Mr. F. H. Brackett, manager of the Willow Creek Mining Co., Atlin, has returned to that camp after wintering outside and is now preparing for the ensuing season's work.

Mr. Lucien S. Robe, for several years mining engineer with the N. A. T. & T. Co., in the Canadian Yukon, has left Dawson for Tanana, where he will practise his profession.

Mr. Ernest Waterman, of Princeton, Similkameen, B.C., manager of the Vermillion Forks Mining & Development Co., Ltd., has returned from a winter vacation spent in California.

Mr. F. W. Rolt, formerly of Rossland, is now residing at Nelson, in which city has been established the head office in British Columbia of the Canadian Metal Co., of which he is a director.

Mr. R. B. Lamb, of Hedley, Similkameen, B.C., manager of the Daly Reduction Co., operating a 40-stamp mill at Hedley, left last month for Denver, Colorado, en route to New York, on a business trip.

Mr. George Alexander, manager of the Kootenay Ore Reduction Co., with sampling works at Kaslo, B.C., has gone to England and Belgium in connection with the shipment of ores to those countries for treatment there.

Messrs. Sigmund Rothschild, Jr., Otto R. Brener (manager), Chas. Mass (accountant), and J. Moore Elmer (consulting engineer) of one of the mining companies operating in the Yukon, went north at the close of March, expecting to reach Dawson early in April.

Mr. Frank S. Wood, a director of the company owning the Argenta mines, situated on Hamill Creek, which flows into Lardeau River, a few miles north of Argenta, at the head of Kootenay Lake, lately visited the company's property, afterwards returning to Boston, Massachusetts.

Mr. Geo. H. Robinson of Salt Lake City, Utah, who is president of the Britannia Copper Syndicate and the Britannia Smelting Co., Ltd., both operating in British Columbia, recently visited the Britannia mine, at Howe Sound, B.C., and the smelting works at Crofton, Vancouver Island, B.C.

Mr. Pierre Maris, who was for some time in charge of the Cork mine, owned by a French company known locally as the Silver Star Mining Co., and situated on the south fork of Kaslo Creek, is reported to have lately been engaged in organising in France a company to operate extensively in coal mining.

Mr. J. W. Astley, late general superintendent for the Le Roi Mining Co., Rossland, writing to a Rossland friend from Bournemouth, England, where he now resides, stated that he had quite recovered from the illness that necessitated his leaving the Kootenay and is once again in the enjoyment of excellent health.

Mr. J. J. Fleutot, who in the spring of 1903 succeeded in organising in France the West Canadian Collieries, Ltd., the owning coal mines at Grassy Mountain, Lille, Belle-

vue, Blairmore and Byron Creek, all in the Blairmore-Frank district, Southwest Alberta, has returned from France, whence he went last autumn.

Mr. W. Hudson, superintendent of the Second Relief mine at Erie, in the Nelson mining division, recently visited Nelson to have removed from his right hand a piece of steel that years ago became imbedded in it as the result of an accident. The necessary operation was successfully performed by a surgeon of that city.

Mr. A. C. Garde, formerly resident manager of the Payne Consolidated Mining Co., operating the Payne mine and concentrator in the Slocan district of British Columbia, has taken charge of development work at the mine, situated near the head of Kootenay Lake, B. C., of the Argenta Mines, Ltd., of Boston, Mass.

Mr. T. H. Rea, manager of the Betts and Hesperus mine, near Grand Forks, Boundary district, is visiting Chicago, Illinois, the headquarters city of the company owning that mine. It is probable that on his return another contract for diamond drilling in the mine will be let, the 850 ft. drilled having given encouraging results.

Mr. W. E. Zwicky, of Kaslo, B.C., manager of the Rambler-Cariboo Mines, Ltd., which company is nearing the completion of a deep-level tunnel about 4,500 ft. in length at its mine near Kaslo, lately paid a visit to the Sullivan Group Co.'s smelter at Marysville, East Kootenay, where the Huntington-Heberlein process has been in use for months.

Mr. D. B. Brown, of New York, president of the Brown-Alaska Mining Co., and the Alaska Smelting & Refining Co., recently met Mr. J. L. Parker, mine manager, and Mr. Paul Johnson, smelter manager, in Seattle, Washington, and afterwards spent a few days at Victoria. Messrs. Johnson and Parker came down from Southeast Alaska to meet Mr. Brown.

Mr. R. C. Miller, mining recorder at Whitehorse, Yukon Territory, is reported to have been appointed assistant gold commissioner for that district with headquarters at Whitehorse. Mr. Percy Reid is stated to have received the appointment of recorder at Conrad, Windy Arm, and Mr. J. Holliday is mentioned as the probable appointee as recorder for Klunene.

Mr. F. L. Underwood, of New York, president of the British Columbia Copper Co., accompanied by Mr. W. H. Thomas, consulting engineer, recently paid his periodical visit to the company's mines and smelter in the Boundary district of British Columbia. He was attended on his tour of inspection by the company's resident engineer, Mr. Fred-eric Keffler, and manager, Mr. J. E. McAllister.

At Union Bay, Vancouver Island, Mr. Geo. McLaughlin, general foreman of the Wellington Colliery Co.'s mechanical department at Union Bay, a short time before his departure for Scotland, was presented by a complimentary address and a gold locket by employees who had served under him and by other local residents. A handsome silver tea service was presented to Mrs. McLaughlin on the same occasion.

Messrs. Geo. H. Collins and W. T. Hunter of Greenwood, for themselves and others associated with them in this enterprise, have bonded the Washington and Idaho claims, situated near Beaverdell on the west fork of Kettle River. These were owned by the Boundary and Beaverdell Mining Co., which several years ago sunk a 110-ft. shaft on the property on which occur two strong leads stated to be 8 to 10 ft. wide with ore ranging up to \$60 a ton, the values being chiefly in silver.

Lord Ernest Hamilton, chairman of the directorate of the Le Roi No. 2, Ltd., and a director of the Hall Mining & Smelting Co., Ltd., the former owning and working the well known Le Roi No. 2 mine, near Nelson, and the lead smelting works in that town, was a recent visitor from England to British Columbia. Besides looking over the properties at Rossland and Nelson, respectively, of the companies mentioned, he visited the Boundary, where he saw the Emma mine, in which the Hall Mining & Smelting Co. has a one-

fourth interest, and the Granby Co's big smelter at Grand Forks. On his trip to the Boundary he was accompanied by Mr. Paul S. Couldrey, manager of the Le Roi No. 2, Ltd., and Mr. J. J. Campbell, business manager of the Hall Mining & Smelting Co. Lord Hamilton started on his homeward trip on March 2, intending to return to England, via Montreal.

BRITANNIA OFFICIALS.

Mr. Geo. H. Robinson, managing director of the Britannia Copper Syndicate, Ltd., and the Britannia Smelting Co., Ltd., has issued the following circular: "I beg to advise you that Mr. Thomas Kiddie has retired from the management of the Britannia Smelting Co., Ltd. Mr. H. C. Bellinger, consulting engineer for the company, has assumed the duties of general manager, and will reside at Crofton, B.C. Mr. C. M. Dull has been appointed general auditor of all the allied interests on the west coast under my control, and will have general charge of the business of the Britannia Smelting Co., Ltd., Crofton, B.C., the Britannia Copper Syndicate, Ltd., Britannia Beach, B.C., and the Mount Andrew mines, Prince of Wales Island, Southern Alaska, and will reside at Crofton, B.C. Mr. C. B. Holmes has assumed the duties of general accountant of the Britannia Smelting Co., Ltd., with headquarters at Crofton, B.C. Mr. Samuel McMurren has assumed the duties heretofore performed by Mr. Dull for the Britannia Copper Syndicate, Ltd. Mr. J. W. Lee will continue as secretary and general accountant of the Britannia Copper Syndicate, Ltd. These changes took effect March 15, 1906."

KETCHIKAN, SOUTH-EAST ALASKA.

During three months, December-February, the Alaska Smelting & Refining Co's smelting works at Hadley, Prince of Wales Island, smelted rather more than 14,000 tons of ore from which about 800 tons of copper matte was obtained. The furnace was blown in on December 5 and during a 24-day run smelted about 8,000 tons of ore and produced 490 tons of matte. The second run was in January when during 14 days nearly 4,000 tons of ore were smelted and 270 tons of matte produced. The third run covered eight days during the first half of February when 2,360 tons of ore were smelted and 145 tons of matte was the result. The ore smelted was from the Brown-Alaska Co's Mamie mine and the Hadley Consolidated Copper Co's Stevenstown mine, both on Prince of Wales Island, with silicious copper ore from the Britannia mine, Howe Sound, B.C., as a flux for the local ores which contain a large percentage of iron but insufficient silica for smelting to best advantage. The smelter at Hadley was designed and erected by Paul Johnson, F.M.I., who is the company's smelter manager and metallurgist.

The Victoria, Australia, correspondent to the *Mining Journal* of London, England, writes that publication: Dredging for gold among the old diggings of this State is an industry of very important dimensions. The coming winter season will see a large number of additions to the dredging fleet. In three years the production of gold from this source has been nearly doubled. Yet it is only five or six years since we experienced a disastrous boom in dredging companies. Now the merest tyro can see that the failures were due to the way these concerns were pushed on the market without due regard to proper equipments, suited to the ground it was proposed to deal with. On the same areas, where such failures occurred as led to their abandonment, good work is now being performed by more effective plants.

An ingenious device for treating mill residues has been invented by Mr. George Ridgeway, chief engineer of the Great Boulder, Western Australia. The machine, which was really an atmospheric filter, is to be known as Ridgeway's continuous slimes process, and is now doing good work on the Great Boulder. The inventor claims that the machine now in use at the Boulder can treat 50 tons per day, and will secure better extraction than an ordinary filter press.

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