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## THE YEAR 1908.

### A Review.

Looking over the mining history of the Dominion during 1908, there are more than a few notable events that have influenced the trend of investment and of energy.

We shall not be called to task for placing the activities of the Canadian Mining Institute first in order of importance. When the proposal to invite a large number of foreign mining engineers and technologists to Canada was first discussed, there were many difficulties in the way. The large expense incident to a tour that was to cover Canada from Sydney to Victoria seemed beyond the available means of the Institute. Other objections were urged. But the enthusiasm of the executive officers never wavered. The Federal and Provincial Governments were approached, and their aid was secured. The railways granted special rates. And so it came to pass that the Summer Excursion of the Canadian Mining Institute for 1908 will go down into history as an affair of international importance. Canada has never received such an absolutely effective advertisement of her mineral resources.

The Federal Department of Mines, under the careful hand of the Hon. Mr. Templeman, has played its part during the past year. Between it and the Canadian Mining Institute there is harmony. Both are factors in promoting the welfare and increasing the solidarity of the mining industry. The Department, which as a distinct administrative entity is scarcely two years old, is gaining in strength daily. The numerous strong requests that have been sent to Ottawa urging the retention of the Hon. Mr. Templeman as Minister of Mines are significant of a national interest in the work of the Department.

Recognition of the need of better facilities for technical education has been manifested east and west. In Nova Scotia a comprehensive system of instruction has been organized, and a well-equipped institution of technology is nearing completion at Halifax. This will put within the reach of the rising generation of the Maritime Provinces the opportunity of taking a larger part in the development of their own country. The mining departments of McGill and Queen's are overflowing with students, and the University of Toronto has entered upon the field with renewed vigor. In the west, British Columbia is hastening to provide the machinery for turning out her own mining men, and without doubt the new provincial universities of Saskatchewan and Alberta will include practical branches in their curricula. The prospects for

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secondary technical education in Canada are therefore brighter than ever before.

The mineral production of Nova Scotia for 1908 has exceeded that of 1907 by a good margin. The volume of the St. Lawrence coal trade was larger than ever before. The quarrel between those two great concerns, the Dominion Coal and the Dominion Steel, has had the effect of stimulating both to the keenest activity. The latter corporation has entered the foreign markets, and has captured Oriental contracts against British competition. The Nova Scotia Steel and Coal Company, despite the continued depression, has had a good year. So also have all of the smaller coal producers. The gold industry has lost no ground, but has, indeed, gained in several respects. In all branches of the mineral industry labor troubles have been practically absent.

New Brunswick possesses now the rudiments of a large iron industry. Development of the Bathurst iron ore deposits has been most encouraging. In coal mining there has been material progress, although on a very limited scale. However, New Brunswick's possibilities are being more thoroughly advertised. The Province requires a Department of Mines.

The asbestos production of Quebec is waxing steadily. As will be noticed in articles on another page, the productive area of the asbestos regions is extending, and new mills are being erected. The mining and milling of chrome ore, discouraged for a time by the inactivity of the iron industry in the United States is now showing signs of vigorous new life. The enormous hinterland of Northern and Western Quebec is still unexplored. It is possible that a change in administrative policy might have a beneficial effect upon this vast region.

The Province of Ontario has made undeniable advances in several directions. Cobalt has become a mining camp of solid reputation. The Montreal River districts, despite the pernicious activities of fakirs, have fulfilled their early promise, and now await sane development. This will come gradually, along with the subsidence of the stock boom. The production of silver in Ontario, which at present is practically confined to Cobalt, will exceed that of 1907 by nearly fifty per cent. in value, notwithstanding the serious drop in the price of silver. From the great copper-nickel field of the Sudbury region the usual production is expected. Here and at several other points in Ontario the mining of iron pyrites, which mineral is surely replacing Sicilian sulphur in the manufacture of pulp, has been carried on. Another subordinate mineral, talc, is being mined and milled on a much larger scale. The low demand for mica has reacted unfavorably upon its production in this Province. Perhaps the most significant development of the year is the completion of smelters for treating Cobalt ores. The establishments at Deloro and at Thorold have now been in full operation for some time. Ontario's total mineral production for 1908 will show a most gratifying increase.

The Albertan coal fields attracted much attention during the year. While new producers are constantly

entering the field, production has not been seriously augmented, although there has been a normal increase. Another year, however, will see many of these new producers attaining outputs up to the capacity of their plants. In other words, the coal industry of Alberta is yet in the early stages of construction. But the basis of a broad industry is being laid. The Provincial Government is thoroughly alive to the necessity of close inspection of collieries and to the need of departmental supervision.

Mining and its kindred industries are taking a new lease of life in British Columbia. Although last spring's abnormally low copper prices threatened the suspension of the larger producers in southeastern districts, outputs have been not only maintained, but increased. The Dominion Copper Company has fallen by the wayside, but not without hope of recovery. The Consolidated, the Granby, the B. C. Copper, the mines of Rossland, Nelson, and the Boundary, have more than held their own. As in the other provinces, there has been peace between employer and employed. The Fernie fire, a disaster of the first magnitude, caused but a small disturbance in the production of coal and coke. On another page the general progress of mining in British Columbia is well summed up. There are two incidents that must not be omitted here, however. These are the extension of the lead bounty, and the successful establishment of an electric reduction plant for the treatment of zinc ores at Nelson. Both of these events mean much to the miners of West and East Kootenay. In general, it may be said that, owing to carefully administered mining legislation, the constant support of local newspapers, and, by no means last, the character of the men most prominent in the management of the various enterprises, British Columbia's mining industry has been placed in such a condition that its continued growth is assured.

From the Yukon come reports of larger gold yields. These reports do not lack official confirmation. But details will not be published until early in February.

The field of mining in Canada is so tremendous that any editorial review must needs be superficial. But even a casual glance will detect the unmistakable signs of lusty youth in Canadian mining. Here it may be pointed out that there exists urgent need of co-operation between the Federal and the Provincial Governments in many matters pertaining to our industry. Uniformity in statistics and in mining regulations is a crying need. Co-operation in adopting measures for advancing various branches of mining is becoming more and more desirable. This may be illustrated by the effect of Ontario's drastic and praiseworthy treatment of wildeats. Since it is no longer possible for the spurious promoters to advertise in Ontario newspapers, he has turned attention to the newspapers of Montreal and other parts of Quebec. Again, the subject of prevention of mine accidents is one that all the Governments might well consider. In fact, there are many

directions in which co-operation of this kind is absolutely necessary.

Among the more important enterprises launched during the year are the Canada Iron Corporation, Limited, and the German Development Company, Limited. These two concerns are widely different in aims and scope. But both should have a large part to play in the development of our mineral resources.

We have alluded above to the good effects that are traceable to the trans-continental tour of the Canadian Mining Institute and its guests. One of these effects was the rectifying of much misinformation that was current on the other side of the Atlantic. It is not out of place here to make appreciative mention of the vigorous work of an occasional contributor to these pages, Mr. Alex. Gray, now of Montreal. Mr. Gray, as Canadian correspondent to several foreign technical papers, including the Mining Journal, of London, England, has accomplished a great deal towards correcting misconceptions and diffusing the truth concerning Canadian mining affairs.

In conclusion, we wish our readers a New Year happier and more prosperous, if possible, than the year that has passed. We are most thankful to know that this wish will include almost twice as many of our fellow-men as was the case one year ago.

#### THE GERMAN DEVELOPMENT COMPANY, LIMITED.

The investment of British and European capital in the mining industry of Canada has not always been attended with fortunate consequences. Needless profuse expenditure upon overground equipment, unnecessarily large staffs, lack of competent Canadian advisers, coupled with extravagant expectations, have usually had much to do with the failures. Moreover, it is true that in transit across the Atlantic a mining scheme loses nothing in size. In fact, we have known of Canadian properties that could not have been sold for \$10,000 in Toronto or Montreal forming the *raison d'être* of a £250,000 flotation in London. This kind of thing invites disaster.

Messrs. Frecheville and Marriott, in a paper entitled "A Visit to the Mineral Districts of Canada," speak most favorably of Canada as a field for mining enterprise. "Results in the past, it is true," these distinguished engineers conclude, "have not been uniformly encouraging, but this was probably more due to the methods adopted than to an absence of conditions for profitable working. . . English capitalists would, we believe, stand a much better chance of securing some of the good things . . . if, instead of waiting to have them brought over to London, they had an agent or representative resident in London." To this we may add that the representative chosen by foreign investors should be a mining engineer or mining geologist, preferably a Canadian or an acclimatized English-

man. We may remark that the process of acclimatization is rarely complete, although it is but simple justice to say that the Englishman who knows Canada and Canadians thoroughly is often the most competent man that can be secured.

With this introduction we wish to notice a publication that has a more than usual claim upon our attention.

The first annual report of the German Development Company, Limited, is a pamphlet of 82 pages. It is well illustrated with plans, maps and sections. It is admirably arranged, carefully edited, responsible and dignified in tone.

Scarcely two years ago it was announced that the German Development Company, whose chief stockholders are citizens of Berlin, Germany, had engaged Dr. A. E. Barlow to superintend the acquisition of mineral lands in Canada. Later, it was learned that Mr. D. B. Dowling was to undertake the duty of selecting suitable coal lands in the Rocky Mountains, and this year Mr. James McEvoy was selected to report upon the coal areas already acquired by the company.

It is to be noted that Mr. Martin Cohn, the managing director of the German Development Company, chose as the men who were to direct the activities of his company three Canadians, mining men of the highest standing. Dr. A. E. Barlow, whose name is well known on both sides of the Atlantic, did much brilliant work during his connection with the Geological Survey of Canada. His monograph on the Sudbury ore deposit is a classic. Mr. D. B. Dowling, like Dr. Barlow, a senior member of the staff of the Geological Survey, is a recognized authority upon the coal-measures of Western Canada. As a former member of the Survey staff and as geologist and chief engineer to the Crow's Nest Pass Coal Company Mr. James McEvoy had attained a sound reputation.

And the report before us is thoroughly in keeping with the standards to be expected from men of this class. A large folding map of the Dominion shows in red the situation of the coal lands owned and leased by the company in Alberta, and the silver areas staked in Ontario. The map also displays the main established and projected lines of railway communication.

The reports of Dr. Barlow on certain claims in the Montreal River Mining Division and upon others near Miller and Everett Lakes are followed by the reports of Messrs. Dowling and McEvoy upon the Kananaskis and Bighorn and Brazeau coal lands. Each of these reports will be given fuller attention in this and succeeding numbers of the Canadian Mining Journal. It is appropriate to allude here, however, to the businesslike, methodical, and satisfactory manner in which all of them have been prepared. There is no hyperbole. Each report is a careful, painstaking record of observed facts, and logical, professional deductions.

The probable cost of mining, labor, transportation, timber supplies and markets is fully set forth. The

results of the coal analyses conducted by Dr. Milton Hersey, of Montreal, are presented in such form as to afford a valuable comparison with other Canadian fuels. And it is pleasing to notice that there is a sharp line drawn between "samples" and "specimens." The point of view of each report is economic. None of the reports falls in any respect below the standard that obtains in the publications of the Geological Survey. The attention paid to commercial possibilities will, perhaps, prove suggestive to those of our official geologists who lean too strongly to the purely academic.

It is evident that the German Development Company is building the foundations of a strong enterprise safely and soundly.

### TO OUR READERS.

This number of the Canadian Mining Journal contains some first-hand information from several important mines. The historical sketch of the famous Crown Reserve, of Cobalt, Ontario, is the first authentic statement that has been issued concerning that mine. The summary of operations at the Trethewey mine is instructive. Ten months ago the Trethewey was looked upon as being in a more or less dubious position. Now it is strongly entrenched in the forefront of producers. For this both President A. M. Hay and Manager G. F. McNaughton deserve credit. And this can be given without casting aspersions upon anyone. The simplicity of the system of ore treatment at both the Crown Reserve and the Trethewey is to be commended.

The report of La Rose Consolidated contains much food for thought. The careful tabulation and differ-

entiation of costs is praiseworthy. It would be well if a larger number of mining companies could see the wisdom of this course.

The Hosmer collieries, owned by the Canadian Pacific Railway, are now producing coal and coke. This will mean a readjustment of the fuel traffic of British Columbia. The article by General Manager Stockett is most timely.

Space will not permit enumerating the other articles that appear. We must make mention, however, of Professor H. E. T. Haultain's keen analysis of the comparative value of the mill-test and the assay. Writing in non-technical language, Professor Haultain has succeeded in setting forth this practical subject in a way that will appeal to all readers.

For our forthcoming numbers we have a long list of timely articles and reports from the pens of Canadian workers. We begin the New Year with the firm belief that our columns will prove of greater value and of higher interest than ever before.

### THE TYRRELL PRIZE.

Twelve months ago it was announced in these columns that Mr. J. B. Tyrrell, of Toronto, had offered a prize of one hundred dollars for the best collection of specimens of Ontario minerals. Professor William Nicol, of the Kingston School of Mining, and Dr. T. L. Walker, of the University of Toronto, consented to act as judges. The time appointed for submitting collections expired last month. The collection of Mr. W. P. Battersby, of the School of Mining, Kingston, Ontario, was awarded the prize.

## SOUTHEASTERN BRITISH COLUMBIA.

### A Resume of the Mining Industry for the year 1908.

J. A. OHREN.

The year 1908 has passed to the annals of history, and when the final analysis is taken of the operations of the mining industry of British Columbia for the twelve months of the year, it will be found that, despite many drawbacks, the chief industry of this Western province has taken another step forward. The first day of January, 1908 dawned on the mining industry when general affairs were unsettled throughout the country. In Southeastern British Columbia the big copper producers of the Boundary were closed down; mining was quiet in the premier lode-gold camp, Rossland; and there were grave fears that the Le Roi Company would find it advisable to stop work at its big mine there. Business was inactive throughout the Slocan, and the probability of the Dominion lead bounty ceasing in June did not tend to encourage work on the low-grade silver-lead properties of that district. Rumor had it that the Sullivan mine, in East Kootenay, would close down any day, and the Queen mine was the only property making any headway in the Sheep Creek section. But, as a perusal of the following article will show, it was not long until sunlight

broke over this dreary aspect and things moved rapidly toward a better condition.

British Columbia is the principal mineral producing province of Canada, mining over thirty per cent. of the total mineral output of the Dominion, and mining is the cardinal industry of British Columbia, contributing forty per cent. of the production in a list enumerating mining, lumbering, agriculture, fisheries and manufacturing. During the past two years the mineral production of British Columbia has amounted to over \$51,000,000. The mining and smelting industry of this province is established on a firm and substantial basis—more particularly in the principal mining districts—but this substantial form of work is fast extending to the more meritorious of the smaller camps. There is an inclination toward consolidation of interests. This is more especially the case in the low-grade sections, where plenty of money, mining and smelting operations on a large scale, and economy throughout, are necessary. The big companies, like the Granby, B. C. Copper, Consolidated Mining and Smelting, and others, have adopted a far-sighted policy

to provide for the future, and have acquired valuable mines in the different mining districts. In this way these companies secure suitable ore for proper fluxing at the smelters, meanwhile developing properties that will very likely furnish the ore supply of the future.

#### The Mining Laws.

The mining laws of British Columbia have been, to some extent, compiled from mining laws in operation elsewhere, and so far they have been adequate to the demands made upon them. There are a few minor changes that will no doubt be made as soon as it is convenient to revise the Act. Among these changes is the suggestion of having the leases of mineral claims expire at 12 o'clock noon instead of at midnight. This would be a reasonable change, as under the present law great inconvenience is caused the mine owners. Claims are often re-staked in a wrong manner in the darkness, and the chances for evil practices are enlarged. An important decision in a contest over apex rights will soon be given by the Supreme Court of Canada in the case of Byron S. White Co. vs. the Star Mining and Milling Co., of Sandon. As this decision will be the first one of its kind rendered in this country, it is looked forward to with interest by mining men here. The case will have an important bearing on the future of lode mining in the Slovan.

#### Transportation.

Railway facilities in British Columbia are improving very much every year. The V. V. & E., which will give the copper ores of the Similkameen an outlet, will soon be built to Hedley. It is expected that the work will be advanced to Princeton by the end of May, 1909, and that trains will be running into Vancouver in a year. This line has already proved of much convenience to the mines of Yale District. The Canadian Pacific Railway is now building from Spence's Bridge to Midway, via Nicola and Penticton, affording railway facilities to a region rich in coal and metal mines. The Kettle Valley line is extending its road into Franklin camp, a copper district of promise. In the Crow's Nest District the improvements have been innumerable. On the first one hundred miles of the western end of the Grand Trunk Pacific one-third of the work has already been done. Railways are needed in the Windermere and Duncan River sections. The C. P. R. has a line surveyed from Golden to Fort Steele, which will give an outlet for the products of the Windermere mining division, but no definite move has been started toward construction. An electric line was proposed for the Duncan River Valley, but so far this enterprise has not matured.

#### Markets.

The markets for the mineral production of British Columbia are widening in an economical way as the consumption of these products in Canada increases. At the present time a great portion of these products is marketed abroad. Most of the gold is shipped to Washington Government assay offices, from whence it is sent to various parts of the United States for coinage. Much of the refined silver is disposed of in the Middle and Eastern States, although large consignments of the 999 fine silver made in British Columbia are shipped to the Orient, where it is made into money. To-day the refinery of the Consolidated Company at Trail is producing the silver used for coinage purposes at the Ottawa mint, and there is no doubt but that in a few years most of the gold and silver now mined here will be required at Ottawa for coins,

providing a more economical market than the foreign markets now afford. In fact, it is understood here that the entire gold output of British Columbia will be coined at Ottawa before another year has elapsed.

Copper matte and blister copper are sold in the United States. The lead pipe, bluestone, antimony, etc., produced here are to a great extent now disposed of in Canadian markets, which are yearly consuming greater quantities. Most of the zinc produced is shipped to Antwerp, small quantities going to the United States. The producers of lead and zinc in the United States are adverse to the admission of Canadian or Mexican lead or zinc to that country, and at this writing there is a strong sentiment against the reduction of the tariff barrier now existing.

#### Labor Conditions.

Labor conditions are, at present, very good in British Columbia. There is a plentiful class of labor for mining work requiring skill, and the supply is at present adequate to the demand. Of unskilled labor there is, perhaps, a small surplus. Miners here are now paid \$3.50 per day for eight hours' work, shovellers \$3, and common mine labor \$2.75. Machinists, etc., range from \$4 down. The scale in force is the normal scale adopted by the Arbitration Board at Nelson in the spring of 1907. There promised to be a little friction in the Boundary last spring, when the mines first started up, some of the miners wishing to go on strike for the abnormally high wage scale that prevailed prior to the general shutdown, but a majority of the men, satisfied to get back to work at the normal scale and recognizing that conditions did not warrant a higher wage, stayed at work, and the agitators had to reconcile themselves to the situation. There was some discontent shown at wages coming down in many of the Slovan sections, but this did not amount to anything. The B. C. Copper Co., when resuming work in the spring, found skilled miners of the better class scarce, many of these men having gone to the United States, but in due time they were able to fill their ranks.

At the present time labor conditions here are all that could be asked for, and employer and employed are on the best of terms. This applies to both the coal and metal mines.

#### Geological Survey.

The work of the Canadian Geological Survey is very much appreciated in the mining districts here in which this worthy organization has been working. The work in Rossland, Phoenix, Greenwood, Hedley and the Slovan is proving invaluable to the mining interests of those districts. The work planned in the Tulameen section should disclose some interesting information. Franklin camp, on the north fork of the Kettle River, and the Ymir-Sheep Creek districts should prove worthy of notice by this department in the future.

#### The Boundary.

Some encouragement was lent the dark outlook at the beginning of the year by a slight rise in the price of silver and copper over the figures that prevailed during the last few months of 1907, and the work done by the Granby Consolidated M. S. & P. C. at its Phoenix mines. About one-half of the regular force was working, but the shipments were augmented week after week, so that in a very short time this company was breaking all former records of ore shipments from this district. No doubt, partly encouraged by the work of the Granby Co., the management of the B. C. Copper

Co. ordered work resumed at the Mother Lode and Oro Denoro mines, and ore shipments were begun in May. The smelter, after undergoing important improvements, was blown in, and the work has progressed satisfactorily up to the present day. The economical practice of mining and smelting in the Boundary, coupled with the heavy fixed charges of these big companies, made it a more profitable operation for the large copper producers to mine, smelt, and sell their products on a low market than to remain idle. This proving to be the case with the two principal mining concerns of the district, in June the Dominion Copper Co. resumed mining, and later on blew in the large furnaces at the Boundary Falls smelter. Increased shipments by the Consolidated M. & S. Co. of Canada from its Centre Star group at Rossland and heavy shipments from the Slocan-Kootenay made it necessary that the company have Snowshoe ore for fluxing purposes, and accordingly that mine was opened up in August, and shipments were begun to Trail smelter in September. Just now the surplus production of the Snowshoe is being sent to the Greenwood smelter of the B. C. Copper Co. The Consolidated Co. is actively executing development on its Phoenix Amalgamated holdings. This put all of the big Boundary producers on the active list during the year, where they have remained, with the exception of the Dominion Copper Company.

Southeastern British Columbia is dependent upon the Crow's Nest coal fields for its main supply of coke and coal, and in August a devastating forest fire sweeping over that section and doing \$200,000 damage to the coal and coke producing industry, for a time caused the Granby and Dominion Copper Companies to suffer a coke shortage. This shortage indirectly resulted in the Dominion Copper Co. ceasing operation, but the Granby Company easily weathered the situation by "banking" several furnaces at the smelter, and with the aid of its heavy emergency coke supply. The B. C. Copper Co. was not affected, as it received its supply of fuel from Coleman, Alberta. Most of the year a car shortage has been felt in the Crow's Nest coal mining district for the hauling of fuel, and at the time when the crops were moving East this situation was critical, but did not reach an acute stage. Even now, as the year draws to a close the car situation is not all that could be desired.

The Dominion Copper Co. did not make much headway during the year. While it was expected that the last partial reorganization of this company had placed it on a good financial basis, this has not proved to be the case. The company has been tottering along at a disadvantage financially, and the fuel shortage subsequent to the Fernie fire was sufficient to hurl its structure to the ground and carry its affairs into the courts. It has been asserted that this company has wasted money. Mining men here are slow to give this statement credence. It is a fact that considerable money has been spent in an effort to make the operations of the concern pay, but it takes a large sum of money and modern methods to make mining pay in the low-grade districts, and only those who know all the facts can tell where the faint line occurs that separates an unsuccessful, but proper, effort toward the economical from wasteful operation in this district.

The Granby Company during the past year has spent over \$200,000 in improvements and changes. This company has erected new buildings, bought a new and larger converter plant, blowing engines, compres-

sors, hoists, locomotives, and so forth. The B. C. Copper Co. has installed new ore-crushing, air-compressing and smelter machinery while at the Snowshoe-War Eagle holdings of the Consolidated many changes have been made in the power plant.

#### Rossland.

In the early part of the year, when those of a pessimistic mood were predicting a close-down for the Le Roi, Mr. W. A. Carlyle made a thorough examination of the mine, and mapped out a plan of work which has been followed during the year with good results. While shipments from the Le Roi this year will fall behind the tonnage sent out in 1907, the class of ore sent to the smelter has proved to be of a higher grade, the consequence of which has been a good profit on each month's operations, the climax of these earnings being reached in October, when the net profits on the company's operation for that month were in the neighborhood of \$50,000. Mining operations on the Consolidated claims, the Centre Star, War Eagle, Iron Mask, Idaho, Enterprise, etc., have given good results, and much progress was made during the year. The different lodes being mined and developed on these claims are resulting in all that could be desired, and the ore shipments from this group will exceed the output of the Centre Star group during last year by over 50,000 tons, and it is needless to say that the profits will be proportionally increased. The operations of the company in this camp have been resulting in a profit of over \$35,000 per month, it is stated; of course, the exact figures will not be known until the year's work has been wound up. Much new ore has been opened up in the Le Roi 2 ground and the company has paid six shillings in dividends this year, four shillings of which was paid from the net earnings of the mine during 1908, and it is almost safe to say the shareholders will receive another dividend from the earnings of the past year. This company, working on a small but economical scale, in a camp where mining is fraught with many difficulties, is an example of businesslike mining. It is true the ore they find in the Josie lode carries twice as much gold and copper as any found in the Le Roi or Centre Star, but the veins are narrow, and good management is necessary to make the company pay dividends.

Nearly every one of the small claims and prospects in the camp that have a mineralized ledge in sight has been leased and worked during the past year. The miners who were able to make this form of work pay, however, were few. The lessees of the Evening Star made several thousand dollars on their venture, and the men working the Bluebird made money; but it has been very much a matter of nip-and-tuck with the others, and a couple have quit work losers. The lessee in this camp has to put a good sum of money into the ground before he can obtain results, on account of the low grade of the ore. The White Bear, Jumbo, and other properties have not been operated this season, but the officers of both companies state that money will soon be available for work. The development of the Giant-California, behind which are Granby interests, has not given the results expected, the long cross-cut failing to strike the desired continuation of the known ore shoots. Diamond drilling is now being done in an effort to locate this ore.

#### Nelson District.

The extension of the Dominion lead bounty relieved the anxiety that was felt by the low-grade lead-silver

miners in the early part of the year, and as a result of this extension work has been begun on properties that would have remained idle for some time to come, and mining has been continued on mines that would otherwise have shut down. This bounty has been an important factor in the progress of mining in this district to the active stage that exists to-day.

The Silver King mine has been operated part of the year with good results on the upper levels, the unwatering of the lower portion of the mine is now going on, and the next twelve months will no doubt see some important developments at this property. In the Sheep Creek section the Queen and Nugget mines have come into prominence by their big earnings and gold bricks, and indications from the Ymir mine are more hopeful than they have been for years. The Arlington, Second Relief and other mines throughout this southern district are doing well, and new interest is shown by the owners of the smaller prospects.

Partly owing to litigation, the production of some of the Sandon mines has been restricted; but there is hope of this matter soon being settled, and with the strikes recently made on the Reco, Rambler-Cariboo, Eureka, and others, it is expected that Sandon will once more be as busy as in days gone by.

Over \$250,000 has been expended on the Blue Bell, and everything is now in line for profitable mining and milling of the immense quantities of low-grade lead-zinc ore on this group. The production of the White-water in zinc concentrate and ore has been steady, and the year's work will show good results. The output of the St. Eugene for the past twelve months will exceed the ore shipped in 1907 by about 2,000 tons. It is said that there is now a better lot of ore ready for stoping in the upper levels of the St. Eugene than there has been for years. The Sullivan mine and smelter shut down early in the year, due to financial difficulties and a change in the character of the ore, making it harder to treat. A movement is afoot to adjust Sullivan affairs. It is estimated there are 150,000 tons of ore blocked out in this mine.

### In Conclusion.

One need not be an expert in mining affairs to be able to discern the march forward that the mining industry in British Columbia has taken during the past year. The output of ore from the Boundary will exceed that of any previous year by over 270,000 tons; the Rossland output will exceed 1906 by 15,000, and 1907 by 10,000 tons, despite the falling off in Le Roi shipments, while Slovan-Kootenay shipments show a more healthy condition than last year, although the actual list shows a smaller tonnage treated, the shrinkage being caused by the shut-down of the Sullivan, La Plata, and other heavy producers of low-grade ore; but the advance among the smaller mines—the coming profit-payers of this district—is noticeably greater.

The prospects for the year now before the district are most propitious. The mines are prepared for a year of heavy production. The big political and financial questions that affect the country at large are settling nicely; Eastern capital is flowing easily westward, this being more noticeable than before the troublous times of a year or so ago, the actual effect being seen in the purchase by Eastern men of the Queen, on Sheep Creek, and the Iron Mask mine, at Kamloops. There is a tendency to give the miners their supplies at a more reasonable price than has prevailed in the last year or two. Labor also has been brought to see that inflated wages do not bring any great benefit, indirectly working a boomerang effect on themselves, and, best of all, the metal market is becoming firm and prices are rising to a normal figure based on a healthy demand. There has been a reconciliation. All have stopped a moment and looked back at their error, have recognized the worthlessness of frothy inflation, and are desirous of working forward during the year 1909 on a sound, wholesome basis. If this lesson is kept well in mind during the next twelve months, it is safe to predict that 1909 will be a more prosperous year by far than 1908, as the material is proved, and all that is necessary is the proper application of energy to make another pace forward.

## C. P. R. COLLIERIES IN THE WEST.

### The Bankhead and the Hosmer Collieries—A Review.

By General Manager Lewis Stockett.

The collieries of the **Bankhead Mines, Limited**, are situated on the main line of the Canadian Pacific Railway Co., at Bankhead, Alberta.

During the year 1908 the mine has been further developed by the driving of an incline on No. 6 seam to open an upper level. This incline, on a pitch of 32°, has been equipped with a cage and counter-balance, and operated by a pair of 10x12 hoists. From this incline, cross-cuts have been driven to the Nos. 5 and 4 seams. A slope has been sunk on the No. 4 seam, pitching 35°, on which the cars will be hoisted direct on the track, by a pair of 12x15 engines. To prevent the coal spilling off the cars on this pitch, covers will be placed on them, and automatically removed at the head and foot of the slope.

An additional unit of machinery has been put in the breaker, enabling a larger tonnage to be handled, and the coal more thoroughly prepared.

In the briquette plant, steam coils have been substituted for the melting of the coal tar pitch, instead of by direct fire.

The production of coal for the year 1908 will be about 250,000 tons, and of briquettes about 36,500 tons.

**The Hosmer Mines, Limited.**—This is a new colliery, located on the Crow's Nest Branch of the Canadian Pacific Railway, at Hosmer, B.C., and did not commence shipments until December 18th, 1908. The production of both coal and coke for the year 1908 consequently will be small. A detailed description of the plant is as follows:

The property consists of six sections of coal lands, and two sections of surface, on which the town of Hosmer, and improvements connected with the plant are located.

The seams, of which there are thirteen in number,

varying from 4' to 30', are being opened by a tunnel, driven at right angles to the measures, and starting at a point about 600' higher than the railroad track at Hosmer Station. Two tunnels are being driven parallel with one another, the larger tunnel consisting of three compartments, two of which will be used for haulage purposes, and the third as a travelling and pipe way, and the parallel tunnel, consisting of one compartment, will be used as a return air course, in connection with the ventilation of the mine. The tunnel is in at the present time 3,700', and has cut eight of the seams, and ultimately will have to be driven in 5,000 to cut the thirteen seams. These seams vary in dip from sixty-five degrees to thirty-five degrees. The tunnel was started in the Fernie shales underlying the coal measures, reaching them at a distance of 847', and the first seams cut are, therefore, the lower ones of the series. The coal is bituminous, decidedly rich in hydro-carbon, and, therefore, an excellent coking coal as well as a steam coal.

The ventilation of the mine will be produced by a 20' x 9' Walker Fan, running as an exhaust fan, but so fixed that, if necessary, it can be run as a blow fan. This fan will be driven by a pair of 30" x 16" engines, connected up to the fan by a rope drive, the steam for which is supplied by three 80 H.P. boilers. The fan is of steel and concrete construction, and the engine-house of brick. The other buildings at the mouth of the mine will be a concrete lamp house and time-keeper's office, locomotive house for the compressed air locomotives, and wash house, with baths and lockers for the use of the miners.

The coal will be lowered to the level of the tippie by a steam actuated, double track incline, each track being an independent incline. The mine cars, holding two tons of coal each, will be lowered in trips of twenty cars, and the empty cars hoisted in convenient numbers. The haulage engines are a pair of 28" x 48" first motion engines, with 8' drums, fitted with clutches and brakes, which, with the reversing gear and throttle, are all handled by steam, working through catract cylinders.

From the foot of the incline, the cars will be hauled to the tippie, by a compressed air locomotive, and dumped into the same over a cross-over dump, passing over shaking screens to remove the slack for the coke ovens, and over picking bands, for the purpose of removing the refuse from the larger size coal. Storage bins are provided to hold 2,600 tons of coal, 200 tons of rock, and 3,000 tons of slack for the coke ovens. The rock in the rock bin is drawn out into iron self-dumping cars, and hauled to the refuse dump by a compressed air locomotive. The coal in the coal bins is loaded into box cars by a box car loader, and the open cars from chutes. The slack from the slack bins is loaded into seven-ton larries, and hauled by a compressed air locomotive over the coke ovens.

There are 240 Bee Hive Coke ovens, twelve feet in diameter, and seven feet high, which will give an output of 300 tons per day. Belgian ovens, with by-product recovery, and distilling plant, are in contemplation for the next ovens required.

The power house building, of re-enforced concrete, with steel floor joists, and roof trusses, which roof trusses are covered with corrugated iron, contains two low pressure compressors, and two high pressure compressors, the former to furnish air at 100 lbs., for the rock drills, inside hoisting engines, and various other purposes around the plant; the latter to furnish

air at 1,000 lbs., for the five compressed air locomotives. The seventy-five K.W., alternating current generators, for the purpose of lighting the town and plant, are driven by two 125 H.P. engines. All of these engines are fitted with cut-off valves, the purpose being to carry steam, at 120 lbs. pressure, cut off early, and use the steam expansively. The exhaust steam from all of these engines is connected into two 20" pipe lines, one known as the atmosphere line, and the other as the heater line. By means of valves, the steam from any or all the engines can be turned into either of these lines. When turned into the heater line, the steam passes through a 1,500 H.P. Hoppe's Exhaust Steam Heater, heating the boiler feed water to 200° F. A ten-ton travelling crane has been installed for the convenient handling of the machinery.

A boiler house, also of re-enforced concrete, with steel trussed roof, covered with corrugated iron, and cement floor, contains four 250 H.P., Babcock & Wilcox boilers, with chain grate stokers, and appliances for the convenient handling of coal and ashes.

The town on the company's property at the present time consists of a general office, mess house, three officers residences, several foremen's houses, a large boarding house, and sixty miners houses, and hospital, all neatly painted and supplied with water and electric light. Quite a large and progressive town has been built across the railroad tracks, on property not owned by the company, and where are located the stores, hotels, etc., necessary for the maintenance of a miners camp.

The Elk River property is situated 45 miles north of Michel, B.C. During the past year continuous explanatory work and prospecting work has been done, with a view of opening up two or three large mines, when a branch of the Canadian Pacific Railway has been built from Michel to the property.

## MINING IN QUEBEC DURING 1908.

(Special Correspondence.)

Mining has been relatively quiet in this Province during the year with, nevertheless, a notable progress.

Asbestos mining and milling is still the leading industry, and quite an excitement has been prevailing in some districts which had not attracted much attention before, especially at East Broughton. Three mills have been in operation there, and two more are under construction, viz., one owned by the Frontenac Asbestos Company and the other one by the Boston Asbestos Company. This last one began to run in October with good results. The mill is well equipped and has been treating successfully some good fibrous material recently discovered.

Some prospecting has also been done in the district of Bolton, and we understand that mining operations and building of mills will soon begin there.

Besides there are several other companies in organization in different places of the asbestos district.

The mines at Thetford and Black Lake and Danville have been in operation as usual and now all use electricity as power.

The Black Lake mining and concentrating of chrome ore is going on as usual. Two mills representing 50 stamps have been in operation during the year.

Near Sherbrooke only one copper mine has been in operation at Capelton, and another one is being worked successfully in a neighboring locality. Several pros-

pects have been made in the same vicinity, in Ditton, and at Lake Megantic for gold, and very likely some development work will follow next summer.

In the Ottawa district, the mica industry has come to a standstill for some time on account of the general depression of business. The graphite mines at Buckingham show some activity and we expect to see the mills erected there to become producers of prepared graphite.

Near Calumet, a magnesite mine was open, which we expect will be soon developed. In the vicinity of

Montreal two very important Portland cement factories have started operations.

In the northern country, no important discovery has been made and prospectors are awaiting the building of a railroad for developing Chibogomo district. During the season two explorations were made by the department to the north; one to Chibogomo, which has confirmed the discoveries already made there, and the other one to the north of Outardes River, on the Labrador coast, to study the possibilities of that district.

## THE CROWN RESERVE MINING COMPANY, LIMITED.

About one year ago all that was evident of the Crown Reserve mine, apart from the enthusiasm of Mr. Samuel Cohen, was a body of water, twenty-three acres in extent, near the centre of which was a small island, where now stands the mine office. At that time the only tangible evidence of silver was a small diamond drill core.

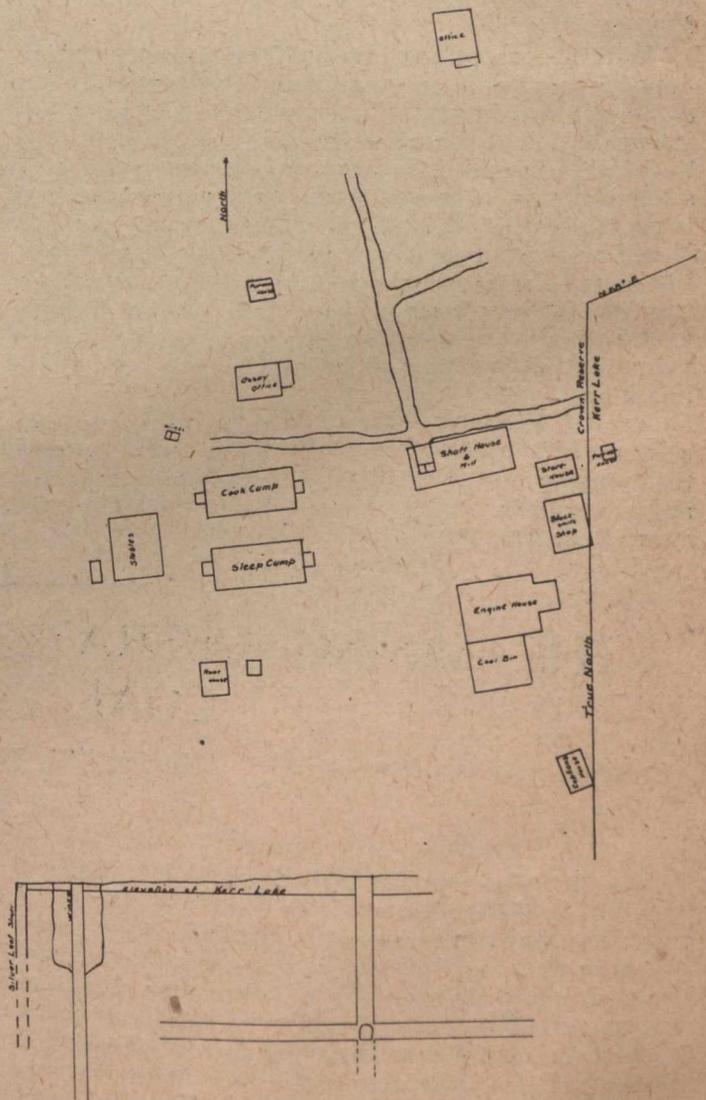
The work of lowering the lake was begun last October. By February 1st, 1908, the water level was lowered eight feet by means of the canal from Kerr Lake to Glen Lake. The change exposed a peninsula of land about three acres in extent. The peninsula could hardly be termed "terra firma." With the exception of the point, the exposed area was composed of marl, in some places fifteen feet deep, and not unlike quicksand. Contrary to expectations, the rock did not slope out gradually from the shore, but dropped abruptly, leaving a bank of marl.

With a dozen men and no plant, Mr. Cohen commenced to dispose of the marl. He first allowed it to freeze, and then worked off fifteen-foot slices. Thus an open trench was formed, three sides of which were frozen marl and the fourth the shore of the lake. The trench was deepened until bedrock was reached and the vein exposed. A little tar-papered shack, in which the men slept, was the only building then on the property.

Money was now an absolute necessity. The vein as exposed on the surface was only six inches wide, and showed richly for but a length of ten feet. It was determined to take out enough ore to provide the small amount of machinery necessary for further work. Mr. Cohen, therefore, gouged out from the surface 6½ tons of ore and shipped it by express to the American Smelting & Refining Company. The ore, consisting practically of silver and calcite, was cupelled. The gross value of the silver extracted was \$13,000. With the returns from this first shipment a 30-h.p. boiler and a small hoist were purchased. An open cut, 30 feet long, was now started. The next carload of ore extracted was probably the richest shipment of silver ore ever shipped. It averaged 9,000 ounces to the ton, and there were over five tons of nuggets bagged from the car.

The open cut was continued until a depth of 50 feet was reached. At the same time Mr. Cohen commenced sinking the main shaft at a point 200 feet east of the open cut, where a small outcrop of rock occurred above the level of the lake. After sinking to a depth of 100 feet, a cross-cut was driven north to catch the main vein. This was encountered 25 feet from the shaft. Up to this time about \$350,000 worth of ore had been

taken from the open cut. Open cast work was then discontinued, but a winze was sunk from the open cut to develop the vein. The winze is now down 135 feet in rich ore.



PLAN & PROFILE  
THE CROWN RESERVE MINE  
Scale 1" = 100'

As the accompanying plan shows, the vein has been drifted on from the new shaft about 100 feet to the east line of the property, and west to within 30 feet of the open cut. Assuming the vein to be continuous

through this 30 feet, a continuous ore shoot 300 feet in length is indicated. In width the vein measures from 6 inches to 33 inches. An average of 12 inches may be considered as under the actual truth. As stated above, the first car shipped averaged 9,000 ounces. This, of course, was exceptionally rich. The high-grade average now is about 5,000 ounces. There is also a mineralized zone extending four feet on either side of the vein. After the high-grade ore is picked out of the muck, the half-inch screenings from the whole face of the drift, seven feet wide, averages 250 ounces to the ton.

But it gives one a startling conception of the richness of Crown Reserve to be informed that at one time responsible visitors could see a vein 33 inches wide which averaged 10,000 ounces to the ton. One piece of ore weighing 435 pounds was sold to the Geological Survey at Ottawa. The Survey willingly paid for this specimen at the rate of \$5 per pound. Last summer, when the European guests of the Canadian Mining Institution visited the Crown Reserve, there was a pile of high-grade ore in the little ore-house measuring 8 feet by 10 feet by 10 feet. This was valued at \$200,000.

With the exception of the ore from the open cut, all ore shipped has been won from development. The stopes are still intact. The cross-cut to the north has intersected eight silver-bearing veins, ranging from  $\frac{1}{2}$  to 3 inches in width, and showing in some cases high silver contents. Cross-cutting is in progress eastward to cut the 7-inch vein of the Kerr Lake property, which, it will be remembered, was discovered by Mr. Cohen. The Kerr Lake people are drifting on this vein not far from the Crown Reserve line. The Crown Reserve cross-cut will run down the lake, and, at 500-foot intervals, other cross-cuts will be continued to the shore line for air.

Around the main shaft is a substantial concrete collar, which comes above high water mark. All of the buildings also, including the shaft-house, ore-house, and power-house, in which there is any machinery, are on solid concrete foundations to bedrock.

The bunk-house and dining-room accommodate 100 men. The shaft-house is 10 feet high. The power-house is equipped with one 100 h.p. boiler, one 30 h.p. boiler, a six-drill Sullivan compressor, a dynamo, hoist, pumps, etc. There are also blacksmith and machine shops. In the latter is a machine lathe. The assaying and drafting building and the ore-house, which is practically a little mill, must also be mentioned. In this ore-house all of the high-grade ore is put through a small Moussette mill, which extracts the nuggets. The nuggets are melted into bars in an oil furnace. The pulp from the Moussette mill is high-grade ore. It contains about 4,000 ounces of silver to the ton. Everything except the high-grade ore is put through an Austin gyratory crusher, which crushes the material to pass a two-inch ring. The crushed material then passes to a trommel, which separates the  $\frac{1}{2}$ -inch stuff containing 250 ounces per ton. From the trommel the 1-inch and 2-inch goes over a picking belt, when the high-grade ore is picked out by hand. By this simple process practically all of the valuable ore is saved. Only the silver that is tied up in the country rock is lost.

An extraction of 95 per cent. of the total silver that goes into the ore-house is counted upon. When the dump is of sufficient size to warrant the installation of a mill, either the ore-house can be more completely equipped or the dump can be sold to one of the custom mills. At present the simple operations outlined above are found to be cheap and effective.

In conclusion, in February, 1908, the first shipment of  $6\frac{1}{2}$  tons was made. In April regular shipments were begun. Including the ore on hand in December, 1908, there has been shipped a total of 540 tons. Of this 140 tons were screenings averaging 250 ounces to the ton, and the balance, 400 tons, was high-grade ore. Thus the value of ore shipped during little more than nine months of initial development is about \$850,000. Until August all of the work was done by hand. Since then only three machine drills have been running.

This is indeed a record as interesting as it is remarkable.

## THE MINING OPERATIONS OF THE DOMINION COAL COMPANY.

### Article IV. THE HUB SEAM.

By F. W. Gray.

The Hub Seam is the highest seam that has been preserved in the land area of the Glace Bay Basin. A glance at a map of the Basin will illustrate the thought that gave the seam its unusual and appropriate name. The visible crop circumscribes a limited area of a semi-circular shape measuring roughly one mile between the intersections of the seam with the face of the cliff at the shore, and a little over half a mile at the extreme radius inland, taking Table Head as a centre point. The shaft of the Hub Colliery forms therefore the approximate centre of a series of concentric arcs described by the outcrops of the coal seams, and the general appearance of the geological map suggests a wheel with its central "hub."

In Mr. Hugh Fletcher's table of equivalency the Hub is regarded as the equivalent of the Barasois in the Lingan Tract, and it is not present in the Morien

Basin. According to this table there are two seams above the Barasois, one of which, known as the Carr Seam, is 6 ft. 5 ins. in thickness and is situated 190 feet above the Barasois. These seams may be represented in the submarine portion of the Glace Bay Basin, and there is a possibility that at some remote future date the equivalent of the Carr Seam may be reached from the submarine workings of the Hub Seam by means of an inclined cross-measure drift. Only a very narrow strip of this seam can, however, have been preserved at a sufficient depth below the sea floor to enable it to be worked, and the fact of its possible existence is mentioned merely as interesting, but not as a serious factor.

The average thickness of the Hub Seam is 9 ft. 6 ins. It is characterized by a more or less undulating pavement, and local variations in the character of the seam have been met with. It yields an excellent house or

steam coal, with a lustrous appearance and a decidedly cubical fracture. It is to be regretted that Nature has not left us a greater area of such a valuable coal seam as the Hub. This is a comparative statement, having in mind the much greater areas in the lower and less profitable seams. Dr. Edwin Gilpin estimated a total accessible area in the Hub Seam equal to a yield of 35,000,000 tons, but there is every reason to believe that undersea workings can be prosecuted at a much greater distance from the shore-line than the limit used by Dr. Gilpin in his calculations.

Considering the seams as a whole the amount of coal which at a future date may be won from the submarine areas of the Glace Bay Basin will depend to a large extent on the extent of the dislocation which attends the seaward course of the Bridgeport or East Bay Anticline, and the extent of the submarine denudation along the crest of the fold. This as yet is a matter of conjecture and hypothesis only, but there are

from what has been found to occur in the land area, the miner of the future may come across local troubles and variations in the character of the coal seams. Writing in 1872, Dr. Edwin Gilpin made the following statement: "The former extent of this coalfield to the eastward is now a question beyond the reach of solution, and the conviction is forced upon the mind of even the most casual observer that it is but a remnant of the measures deposited at the coal-producing period of the carboniferous era; that the rim only is left of an immense district, now lost under the Atlantic."

As one would expect from its exposed position, the Hub Seam was one of the first to be worked in the Glace Bay Basin. Much of the early history of the coal trade of Cape Breton centres around that portion of the shores of Little Glace Bay which is included between the crops of the Hub Seam. Not far from the Hub Colliery is Burnt Head, the scene of exciting passages in the long-contested struggle between the French and the English

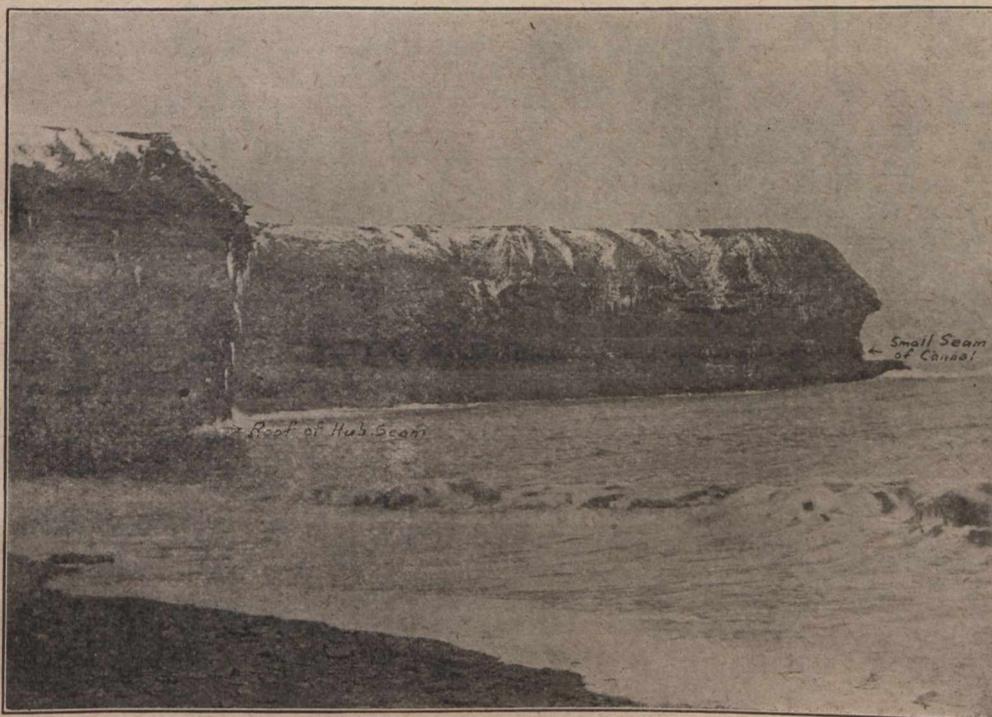


TABLE HEAD—LITTLE GLACE BAY.

On the left hand of the view the roof of the Hub Seam dips under the water. A small seam of cannel coal can be seen along the side of the headland. The photograph was taken four hours before high water.

indications which favour the theory that the continuity of the lower seams is not altogether interrupted by the anticline in the whole of the accessible submarine area. So far as the Hub Seam is concerned, however, its submarine outcrop lies at least three miles inside the anticlinal line.

On the southern boundary of the basin the coal seams crop out with great regularity from Glace Bay to Cape Percy, where they pass into the ocean. The projection of the line of outcrop of the Lorway Seam as shown on the Geological Survey corresponds with the seam that shows itself in Flint Island—an outlier of Cape Percy, separated by a distance of two and a half miles. A line drawn on approximately the full dip of the seams through Flint Island will pass the axis of the Basin at a point seven miles to sea off the shores of Table Head. One might assume, therefore, that no marked interruption in the continuity or dip of the seams occurs within the accessible area of the coalfield; although, reasoning

for the possession of Canada. During the English occupation from 1745 to 1749 the garrison at Louisburg was supplied with coal taken from the entrance to the Little Bras d'Or and the vicinity of Burnt Head. Being apprehensive of attacks from Indians, who were friendly to the French, the English erected a blockhouse on Burnt Head. Remains of the ditch are still visible, although the actual site has long since been swallowed by the sea. Mr. Richard Brown quotes from a history written in 1760 by M. Pinchon, the Secretary of the French Governor of Louisburg, as follows: "The English had a coal pit at Burnt Head defended by a fort of considerable strength, where with fifty men they successfully repulsed the attacks of the savages and kept possession of the fort." Mr. Brown adds that the pit took fire in 1752, when the fort also was entirely consumed. Traces of this fire may still be seen along the crop of the seam for a distance of nearly one mile. The surrounding measures, mostly soft shales, have been baked by the

heat to every gradation of colour, and a very pretty gravel may be quarried out of the cliff. Pebbles are to be found on the beach, so rounded by the sea's action as to show the different laminations passing from green to red in all its variations. In the cliff itself are to be found perfectly preserved fossil impressions, while at other points the cliff has been fused into a mass resembling a furnace slag-dump.

The Hub Colliery has seen numerous vicissitudes in its life of fifty years. After the cancellation of the monopoly of the General Mining Association, Mr. Archbold mined the Hub Seam by means of shore levels from 1858 to 1861. In the latter year the Glace Bay Mining Company acquired the mining rights from Mr. Archbold and sunk two shafts, 130 feet deep, down to the Hub

acquired the property they pumped out the workings, and between 1895 and 1899 they extracted about 350,000 tons. In 1899 the mine was again abandoned, and was once more pumped out in 1903, when the curtailment of the company's output by the Dominion No. 1 fire made it necessary to open up some additional supply. The mine was largely extended and the deeps were driven a long distance into the submarine field, when operations were again interrupted by a disastrous fire which occurred on the 14th of December, 1906. It was found necessary to flood the mine, and hoisting operations did not recommence until November, 1907.

Old residents invariably refer to the Hub Colliery as the "Roost." In the early days of mining there, a long ridge of sandstone ran out into the sea near Burnt



Crop of Hub Seam in base of cliff near Table Head. Portion in shadow on left hand is where sea was first admitted into workings after the fire. The cavity is now silted up

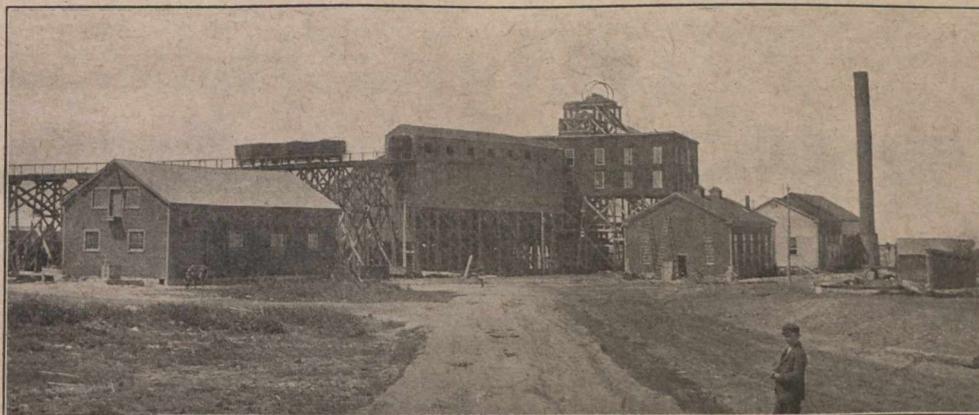
Seam. One of the shafts was used for hoisting coal, and is still used for that purpose by the present owners. The other shaft was used for ventilating purposes, and was originally intended for a water shaft also, but was never so used, as the workings were drained by an adit driven out to the shore. Practically the whole of the land area was extracted, and in many places the measures were cracked up to the surface, admitting the outer air. The Glace Bay Mining Company erected a surface equipment and constructed a railway one mile in length to Glace Bay Harbour, which they enlarged and used as a shipping port, as described previously. They continued to work the Hub Seam until they had opened up the Harbour Seam at the Stirling shafts in 1876, after which they abandoned the Hub Mine and allowed it to fill with water. When the Dominion Coal Company

Head, and was a favorite resting place for the common cormorant or Shag. It was generally known as the Shag Roost. One of the shore levels worked by Mr. Archbold commenced on the Shag Roost, and in course of time the mine came to be known by the shortened appellation of "the Roost."

The fire of December 14th, 1906, is a matter of history and may be referred to more fully. The fire appears to have commenced in a pumphouse in the pit bottom in the afternoon of the 14th of December, and its origin has never been definitely ascertained. The smoke followed the return air up the hoisting shaft and rendered it difficult to use the shaft or approach the seat of the fire. It was decided to reverse the fan to clear the smoke and get access to the flames. This operation took a long time, owing to the fact that all

the underground connections and doors were frozen by the intake air. All attempts to extinguish the fire failed. The heat was communicated to the fan, which failed about 9 o'clock in the evening. All the men were withdrawn, and it was decided to seal the hoisting shaft. While the work was in progress, however, the air suddenly reversed itself and a gush of flame came up the hoisting shaft, set fire to the bankhead and practically

in. A shaft was then sunk from the surface to the bottom of the coal seam down the face of the cliff. This work was commenced on the 29th of December and continued without intermission, with four shifts per day, until the 9th of January, on which date the pavement was reached. A level was driven to a point below the sea-level at high tide, and a communication was made with the sea, which resulted in letting into the mine a

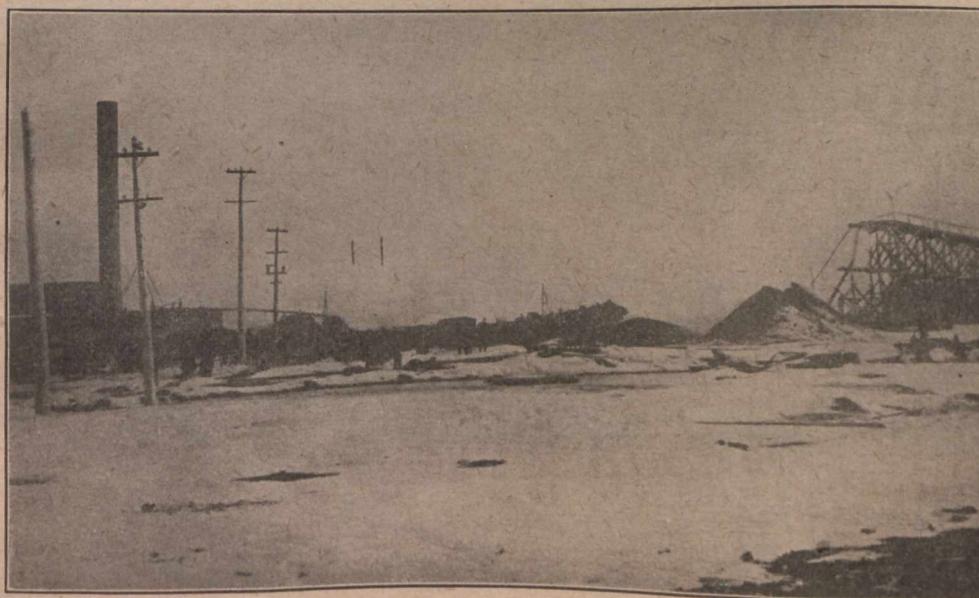


The Hub Colliery (Dominion No. 7) before the fire of December 14, 1906.

the whole of the surface erections were destroyed in half an hour. Finally it was decided to flood the mine, and all the available surface streams were turned into the shaft. On the 16th an old level at the shore, close by the adit previously referred to, was opened up, and the water of the Atlantic at high tide flowed into the mine. The volume of water flowing in was too small, however, to effectively and quickly flood the mine, as the seat of the fire was at the shaft bottom, and the whole of the deep workings required to be flooded before the water would come in contact with the fire. The inflow of

great volume of water. On the 28th of January the water had risen to sea-level and covered the seat of the fire. The hoisting shaft was unsealed on the 2nd of February, and the opening into the ocean was closed by a concrete dam. Pumping commenced on the 14th of February, and continued until the 1st of November, when the face of the deeps was reported dry. The regular hoisting of coal began in December, 1907, about a year from the date of the fire.

The work of unwatering the mine was greatly hindered by the corrosive nature of the mine water. The



The Hub Colliery after the fire of December 14, 1906.

water was also considerably hindered by the silting up of the opening every tide by gravel washed in from the sea. It was found impossible to clear away the gravel because of the enormous amount of carbon dioxide gas that the opening emitted. In addition to this the opening was situated under a dangerous overhang of cliff weighted by icicles which made the place unsafe to work

upper part of the workings was filled with slack, which in the old days was an unsaleable bye-product and was left in the mine. As the water drained out of these old workings and percolated through the slack it acquired a particularly virulent character and worked havoc with the pumps and necessitated constant repairs. Another peculiar feature of the unwatering operations was

a frozen saline deposit which had formed to a considerable thickness along the rim of the water as it receded. This substance resembled a coarse sea-salt, and it was found to have absorbed appreciable quantities of carbonic oxide gas, which diffused into the atmosphere as the deposit was disturbed by the shovel in the work of clearing. The workmen suffered a little from headache and the nausea that is associated with carbonic oxide poisoning.

Since the fire the Hub Colliery has been entirely remodelled both above and below ground, and it is practically a new mine. At the present time the output is

B. & W. boilers, rated at 500 h.p., and room has been left for an additional battery when it is required. A small brick extension on the back of the house contains the feed water pumps and a Webster feed water heater. In this extension is also housed the fire-pump, which is a Knowles duplex pump 14 in. by 7¼ in. by 12 in. The fire discharge lines consist of a 6-inch main with 4-inch and 2½-inch connections. Hydrants are placed in the bankhead, the rescreening house, and at numerous points around the colliery. The circulating water and the water reserve for fire protection purposes is contained in a circular reservoir holding 400,000 gallons, situated imme-



No. 7 HEADFRAME.

800 tons per day, but in the summer of 1909 it is expected to reach 1,200 tons daily.

The surface power plant is not a large one, as a large part of the motive power used at this colliery is obtained from the Central Electric Plant.

Before the fire the mine had 828 h.p., of Babcock & Wilcox boilers, housed in a wooden building. This was completely destroyed by the fire. The boilers were repaired, not being greatly damaged by the fire, and a new frame building was erected, 60 ft. long by 40 ft. wide.

A new brick boilerhouse, 65 ft. 8 in. by 51 ft. 8 in., with cast steel roof trusses and corrugated iron roof, has been erected since the fire. It contains two batteries of

diately at the back of the boilerhouse. The new steel stack of the boilers recently installed is 7 ft. 9 in. diameter inside the shell, 100 ft. high, cast-iron base plate, lined with 4-inch fire brick for 35 ft. from the base and with red brick for the remainder of the distance, secured with two sets of guys.

The coal-hoisting engine is a horizontal, double engine, built by the Jenckes Company, cylinders 24 in. by 42 in., with Corliss valve-gear. The drum is 8 ft. diameter by 6 ft. on the face. The hoisting rope is 1¾ in diameter, passing over 12 ft. pulleys. This engine went through the fire, but was successfully repaired.

The man-hoisting engine is a new one, replacing the

one in use before the fire, which had outlived its usefulness. It was built by Matheson, New Glasgow. It has cylinders 18 in. by 36 in., slide valves, drum 6 ft. 8 in. diameter by 12 ft. 6 in. The rope is  $1\frac{1}{4}$  in. diameter.

There are two Norwalk air compressors with a capacity of 2,000 cubic ft. each. Before the fire they had single steam cylinders, but they are now tandem-compound, air cylinders 19 and 30 by 30 in. stroke, steam cylinders 20 and 34 by 30 in. stroke.

The bankhead is an entirely new structure. It is built of hard pine on concrete pedestals, and is 105 ft. long by 31 ft. 6 in. wide. The head-frame is built of 10 in. by 12 in. hard pine posts, with backstays 12 inches square. The height of the centre of the pulleys is 75 ft. This head-frame, in common with those of No. 10 Colliery and the International Water Shaft, has a simple device for hoisting the winding pulleys into position. The framework is carried up 17 ft. above the centre line of pulleys, and is fitted on either side of the framework with projecting  $1\frac{1}{2}$ -inch eyebolts to which the tackle can be attached. By this provision the pulleys are easily hoisted and swung into position, and an operation which is often a cause of annoyance is thereby simplified.

The coal is hoisted on the ordinary dumping cage, which discharges into a weigh-tank. The latter empties itself onto feeder belts, which travel at the rate of 13 ft. per minute, and empty their contents onto a triple battery of shaking screens operated by eccentrics from shafting. From the screens the coal passes on to two picking belts, 40 ft. long and 5 ft. wide, which feed a loading belt 35 ft. long and 35 ft. 6 in. wide. The arrangements are such that any coal for the boilers can be dropped out of the weigh-tanks into tubs and run along a special trestle to the boiler room. The whole of the bankhead machinery is operated by electric power. Each side of the screening machinery is driven by a separate motor of 15 h.p. The loading belt is driven by a  $7\frac{1}{2}$  h.p. motor. All the machinery is operated by separate friction clutches.

The screening arrangements are practically a duplicate of those at the Reserved Colliery, and were built by Plowright Bros., of Chesterfield, England. The machinery had been installed shortly before the fire, and after the fire it was found to be badly twisted. It was repaired by the Brown Machine Co., and put into the new bankhead.

Other surface erections belonging to the colliery are the Wash House, Warehouse, Lamphouse, Firemen's Hall, Forge and Carpenter Shop.

The mine is ventilated by a Capell fan, 11 ft. dia, meter, by 8 ft. 6 in., running at 220 revolutions, with a capacity of 200,000 c. ft. per min., at 2 ins. W. G. The fan is enclosed in a steel and concrete casing, and is driven by a 12 in. by 15 in. Robb engine. The air shaft is circular, 9 ft. 6 in. diameter. It is 130 feet deep, the same depth as the coal shaft. A large amount of work has been done underground since the fire in building permanent brick and concrete stoppings, and improving the air courses.

The coal shaft is divided into three compartments, two for coal hoisting and one for the man's cage. It is 11 ft. 4 in. by 20 ft. 8 in. over all. A new concrete lining has been placed around the mouth, extending down the shaft for a distance of 24 feet from the surface. The coal compartments are 6 ft. 6 in. by 10 ft., and the man cage compartment is 5 ft. 2 in. by 10 ft. The after-effects of the fire necessitated repair work in the bottom. Large concrete piers and wood packs made out

of old railway ties have been placed around the shaft bottom, and the roof has been completely boarded over.

A new electrical haulage system has been put down underground since the fire. The hoist is driven by a 200 h.p. Westinghouse variable-speed induction motor, 550 volts, 288 revolutions. The engine itself was built by Matheson, of New Glasgow. It is fitted with a Hill type friction clutch. The driving sheave, or "bull-wheel," is 6 ft. 6 in. diameter. The engine house is brick-lined, with concrete floor and foundations, and the roof is supported by 24-inch I beams, with about 20 ft. span. The mine cars used are of two tons capacity. The track gauge is 2 ft. 2 in. The haulage rope at present used is 12,500 feet in length, of  $1\frac{1}{8}$ -inch wire rope.

Approximately below the shore-line underground is an electrically driven pump made by Hathorn Davey, of Leeds, Eng. It is a three-throw reciprocating pump, 10-inch plungers, 24 in. stroke, with a capacity of 500 gallons per minute at 175 feet head. It is driven by a 75 h.p. Westinghouse motor, constant-speed, running at 480 revolutions per minute. The pump is housed in a brick-walled chamber, with concrete floor, and roofed with steel I beams.

Further down the deeps is a McDougall turbine pump, built in Canada. It has a 5 in. discharge, three-stage impellers, and has a capacity of 550 gallons per minute against a head of 310 feet. It is driven at 1,420 revolutions per minute by a 100 h.p. Westinghouse constant-speed induction motor.

The transmission cable for the pumps passes down a borehole 163 feet deep, situated not far from the shore. The cable used is lead-covered with paper insulation. The conductors are three in number, No. 4-0. A  $\frac{3}{4}$ -inch wire rope is attached to the surface and passed down the borehole, to which the cable is attached by lashings every two feet. At the foot of the borehole the main transmission is divided, one lead going to each of the two pumps described. In the mine the cables are laid in the side of the travelling deep in wooden boxes along the pavement. The discharge of the two pumps is made through a common borehole at a point near the transmission borehole. The discharge hole is lined with 8-inch wrought iron casing, cemented in, and finished with a cast iron section at the foot of the hole. The cable borehole is also lined with 6-inch wrot. iron casing.

The transmission cable for the haulage plant is conveyed in a similar manner down a borehole near the colliery office.

The coal is undercut with the ordinary "puncher" machine, for which compressed air is used. A few small pumps are also driven by air.

Every precaution has been taken underground to protect the workings against fire. Every engine-house and pumphouse has a small chemical fire-extinguisher, and, as in the other collieries, the air lines are so arranged that they can be connected with the pump discharge at short notice. The pit bottom is plentifully supplied with extinguishers and stand-pipes.

Nothing but safety lamps are used in the mine. At the present time lamps of the Marsaut type are in use, but they are very shortly to be replaced by the A. & B. type, which is in use in the other mines. The mine is naturally a safe one, being more or less damp, and gas is not present in any large quantities.

Under normal output the mine will employ between 300 and 400 men. The horses number around thirty.

In the colliery yard is situated also the Rescreening Plant for the Central Banking Station. This erection

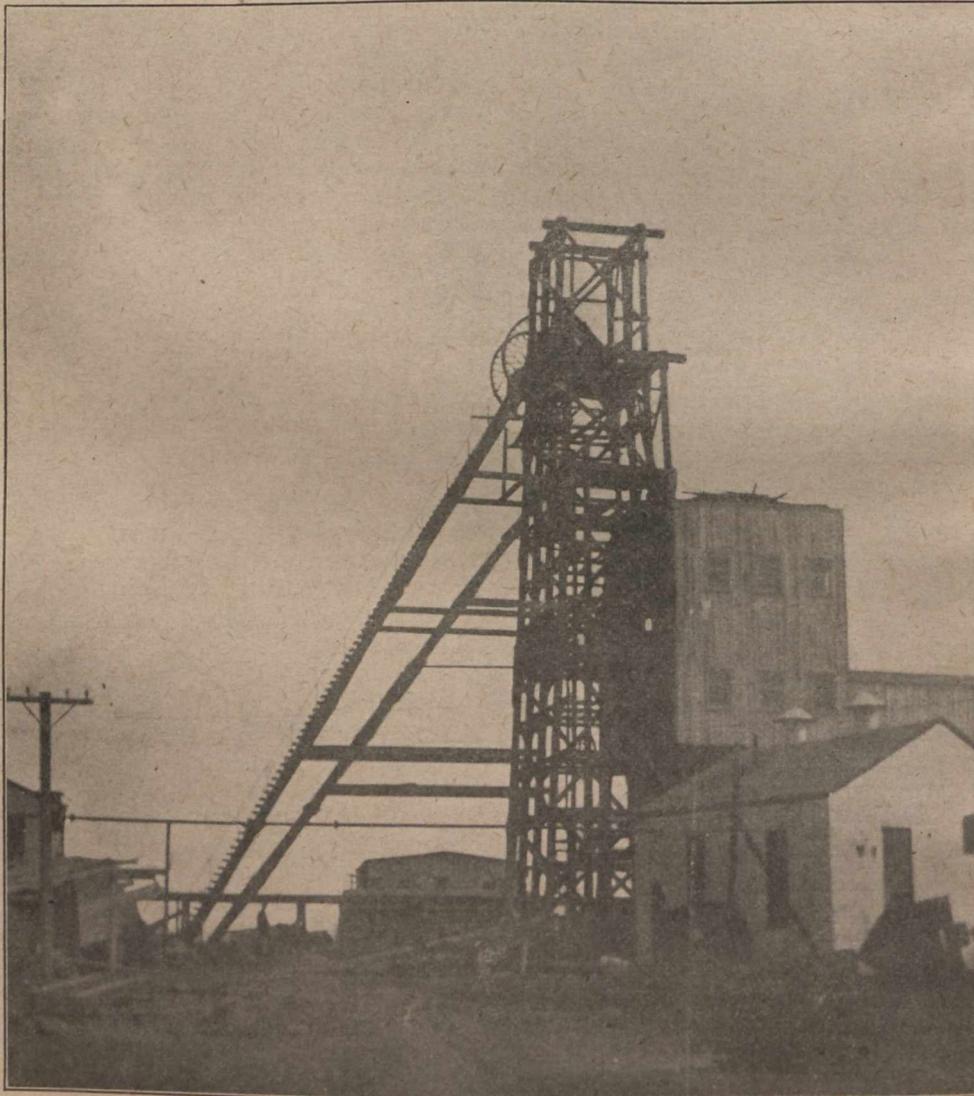
is 81 ft. long and 39 ft. high to the centre of the haulage pulley. The coal is filled at the Banking Station into cars and hoisted up a long inclined trestle to the screens where the slack is taken out. The haulage is effected by a Matheson engine 18 in. by 36 in., housed in a wooden building.

The work of rebuilding the Hub Colliery after the fire gave opportunity to the officials of the Dominion Coal Company for some very prompt and effective construction work. The photographs accompanying will give some idea of the completeness of the destruction and of the rapidity with which the reconstruction work went forward. The Rescreening Plant, for example, was com-

on the iron ores and the status of the iron and steel industry of Canada.

Mr. Kraynik took part in the excursion of the foreign engineer and metallurgists arranged by the Canadian Mining Institute through Canada in August and September last. His lecture was the more interesting as generally little is known across the water regarding the iron resources and the condition of the iron and steel industry in this country, and this interest was clearly evidenced by the discussion on the subject afterwards. Mr. Kraynik's paper dealt with the

(1) General condition of the iron industry in regard to the iron ores mined in Canada, the iron ores of



RESCREENING PLANT AT DOMINION No. 7. 1132

mended and finished between the 6th of April and the 6th of May, months in which construction work is not favoured by the weather in Cape Breton. The head-frame and bankhead were also reconstructed within the space of three months.

#### LECTURE ON CANADIAN MINING INDUSTRY AT DUESSELDORF, GERMANY.

Before a large gathering of representative mining, iron, and steel men, at Duesseldorf, Rhenish Prussia, on the 6th December last, Mr. Ernest Kraynik, M.E., metallurgist, of Berlin, delivered an interesting lecture

Nova Scotia (Annapolis, Londonderry, and Newfoundland).

(2) Iron and steel metallurgy in the Dominion Iron and Steel Works, Nova Scotia Steel Co., and Londonderry Iron Works.

(3) Iron ores in Quebec and New Brunswick (Bathurst), works at Drummondville, Radnor, etc.

(4) Iron ore resources in Ontario, Animikie in comparison with Mesabi formation, the Helen mines, Moose Mountain and Atikokan iron ranges.

(5) The works at Midland, Port Arthur, Sault Ste. Marie, Hamilton, and Deseronto.

(6) The feature of electric smelting in Canada, the

Grondal process, the electric furnace at Welland and Niagara Falls.

(7) The mining industry and its future in British Columbia and Vancouver.

**GYPSUM.**

Opportunities for developing large gypsum properties are not lacking in Canada. Gypsum, as a mine

product, will stand only a limited cost of transportation. Most of the New Brunswick and Nova Scotia quarries are on or close to tide water. Hence cost of handling is reduced to a minimum. If, however, the gypsum were reduced to the plaster of commerce and the arts at or near the quarry, the range of the market would be extended very considerably. The necessary plant is cheap. Installation of this sort would increase the value of the quarry immediately.

**LA ROSE MINES, LIMITED.**

Editor's Note.—In response to our request for information, the management of La Rose Mines, Limited, readily furnished the Canadian Mining Journal with the following statement and resume:

**La Rose Consolidated Mines Company.**

Production six months ending Nov. 30th, 1908.

	Tons.	Ounces.	Gr. value.	Net value
				f.o.b. Cobalt.
Shipments. . . . .	2,780	1,418,485	\$718,543	\$628,357
On hand Nov 30. . . . .	99	72,978	35,613	\$31,340
Production. . . . .	2,879	1,491,463	\$754,156	\$659,697
<b>Operating Expense</b> , including			Per oz. silver.	Per ton.
Development and all charges except new construction. . . . .		\$106,063	7.11c	\$36.84
<b>Marketing Expenses</b> , including Smelter deductions, treatment, and freight. . . . .		\$94,459	6.33c	\$32.81
<b>Total Expense</b> . . . . .		\$200,522	13.44c	\$69.65
Operating Profit, 6 mos. . . . .		\$533,634		
Construction Account . . . . .		\$7,148		

The completion of the first six months work on the property of the La Rose Consolidated Mines Co., shows the following work accomplished up to November 30th:

Drifting. . . . .	1,957 feet.
Cross-cutting. . . . .	555 feet.
Raising and sinking . . . . .	216 feet.
Trenching. . . . .	8,181 feet.
Open cutting . . . . .	99 Cubic yds.
Stoping . . . . .	2,861 Cubic yds.

The properties worked have been the La Rose, Princess, and the Violet; no work has been done on the Eplett, Fisher or Silver Hill claims.

On the main La Rose vein, much of the development has been done on the lower intermediate, between the first and second levels. The results have been much better than expected, and make one of the largest additions to the ore reserves since the property was taken over.

The first and second north winzes are 350 feet apart. Drifts were started from both winzes and there remains less than 100 feet to make connection.

All this drifting has been in good ore. One face is now in 3,000 ounce ore, the other in 2,000 ounce ore, and we are practically assured of a continuous ore

body 510 feet long on this level on the north side of the main shaft.

This is particularly gratifying as the showing on this level both in width and values is considerably better than it was on the first level above.

This lower intermediate level will be made the main drive for the exploration of the La Rose Extension claim though it will require 250 feet of drifting to reach the line.

At the north end of the first level the vein had split up into stringers; in the face of the level below, however, which is now a little farther north than the face of the first level, there is a solid nickel and cobalt vein 18 inches wide. This makes the outlook for the north half of the property exceedingly bright.

**No. 3 Vein.**—This vein crosses the main vein, and is opened up by a drift from the first level of the mine.

The stops above this level have shown the ore shoot to be more extensive than the outcrop indicated, and have yielded a good tonnage of first-class ore, which runs uniformly better than 3,000 ounces per ton.

A drift 60 feet from surface, starting from No. 3 raise, is being run east toward the big open cut; the ore is from 2½" to 4" wide, the last samples assaying from 4,900 to 6,700 ounces per ton.

No. 3 shaft sunk at the west end of the big open cut on the hill is 300 feet east of the No. 3 raise referred to above, and on the same vein.

The open cut is 42 feet deep. When it was found that the good ore continued strong in the bottom of this cut, it was decided to sink No. 3 shaft at least to the 100 foot level.

It is now down 65 feet, where the vein is two to three inches wide assaying 5,348 ounces per ton.

An important development has been recently made in the O'Brien No. 2 shaft, which is 200 feet from the south-east corner of the La Rose.

On the 160-ft. level, they have found a new vein 3" to 6" wide carrying much native silver in the calcite. This has been drifted onto within 5 feet of the La Rose line, so it is almost assured that this ore shoot will continue into our property.

It runs parallel to No. 3 vein, about 100 feet to the north. The important point about this is, that the ore occurs in the Keewatin, and at a point 100 feet deeper than our lowest workings on No. 3 vein. This would indicate that the stronger No. 3 vein will continue to be productive to at least the same depth. The recent development on both veins make this south-eastern corner of the property one of great promise.

**McDonald Vein.**—Some stoping has been done on this vein from the tunnel which penetrates the bluff 10 feet above the swamp level.

The ore in the top of the main stope was cut off by a flat fault, but a short cross-cut above the fault, picked up the vein again, where it proved better than it was below, assaying from 3,000 to 6,000 ounces.

In order to develop the McDonald vein at greater depth, a cross-cut was run from the first level of the main mine; this cut the vein 110 feet west of the mouth of the tunnel in the hill, and it has been drifted on for 90 feet. The vein is good, there being two stringers aggregating 3", the ore averaging between 2,000 and 3,000 ounces.

This work proves the vein 65 feet deeper than the hill tunnel, and will doubtless result in largely increased ore reserves on this vein.

**No. 10 Vein.**—When the new company began operations nothing had been done on this vein, although rich ore was in evidence on the outcrop. The estimates made at that time allowed a block 20 ft. x 30 ft. deep with a value of less than \$50,000.

A tunnel was driven into the hill, which cuts this vein 80 feet below the outcrop, and from the point of intersection a drift was run 80 feet on the vein to the Ferland-Chambers line.

The vein is good the whole distance, assaying better than 3,000 ounces over a width of three inches. Besides the high grade ore the country rock is good, the screenings from the broken ore running several hundred ounces per ton.

Up to November 30th this vein has produced \$41,854 worth of ore, and a block of ground 80 ft long x 80 ft. high has been opened up, compared with the estimated block 20 ft. x 30 ft. In addition to this, is the ore body below the tunnel, whose depth is as yet unknown.

**Development Work.**—Extensive exploration work is in progress throughout the mine. A cross-cut is being run lengthwise of the hill on the level of the swamp to cut several cross veins; a parallel cross-cut has been started from the first level of the mine and will run lengthwise of the swamp between the hill and the main vein; and another cross-cut starting at the south end of the mine runs toward the office to develop several veins outcropping near the south line.

About 250 men are employed, double the number at work last June.

New ore houses with shaking tables have been built at the McDonald tunnel, No. 10 tunnel, and at No. 3 shaft; also a new storage ore house on the railroad siding near the main shaft.

**Princess.**—Next to the La Rose proper, the Princess is the most promising holding of the Consolidated, lying, as it does, between the McKinley-Darragh and the Silver Queen, with veins from both sides running toward it.

During the last four months some 300 feet of drifting and cross-cutting has been done from the 50 foot level of the shaft.

Three veins have been developed, all of which carry high grade ore.

No stoping has been done, but over \$10,000 worth of ore has resulted from the development work.

The results have been so encouraging that a new 40 foot head frame, with ore house and picking tables, has been put up, and the shaft is now being sunk to the 100 foot level.

The Right of Way Co. owns a strip 99 feet wide between the Princess and the Silver Queen; on this they put down a shaft and cross-cut to the Silver Queen vein, on which they are now drifting toward the Princess line.

The vein carries six inches of good ore, and as their work is now close to our lines, it is almost certain that this vein will prove of considerable value in Princess ground.

**University.**—A small force has been employed on this property, taking out cobalt ore from an open cut, and in sinking a shaft on No. 4 vein.

The shaft is now down 50 feet, on a small vein 1" to 3" running about 3,000 ounces per ton.

A new headgear and ore house is being erected and the vein will be opened up for stoping.

**On the Violet** some trenching has been done, resulting in the finding of two veins carrying silver values, and I have great hopes of this ground when systematic mining operations are begun.

La Rose Mines, Limited,

R. B. WATSON,

General Manager.

## The Mill-Test for Gold versus The Assay.—A Comparison in the Methods for Non-Technical Men.

H. E. Haultain.

**"TWO AND A HALF TONS OF ORE FROM THE DUMP WERE PUT THROUGH THE MILL, AND YIELDED \$27.50 WORTH OF GOLD."** From a report.

The term mill-test is a time-honored phrase, and is associated in the minds of most miners with honesty and square dealing. It represents something tangible and reliable, something you can feel and see; whereas the assay has something of the hocus pocus about it; it savors of the ways of the alchemist and the mystery-man. The mill-test deals with a comparatively large amount, a ton or two, that you can appreciate in an ordinary everyday way, and it gives you the real stuff that is in the ore that you can handle and weigh on everyday scales. The assay deals with a spoonful, and

gives you a result that can hardly be seen without a glass and which weighs no more than so much dust on commercial scales.

Are two such methods that are so far apart in appearance near each other in results, and which is the more reliable?

In any test there are three sources of error: First, errors due to the limitations of the method and the appliances. Second, errors due to the carelessness or lack of skill of the man in charge. Third, errors due to intentional falsification by the man in charge or by others having access to the test.

In essential principles the mill-test and the assay test for gold in ore are remarkably similar. In each case the ore is first crushed to a fine sand. In the mill

the gold is separated from the sand by alloying the gold with mercury; in the assay by alloying it with molten lead. The gold is separated from the mercury by boiling off the mercury; from the lead by burning off the lead. In the mill the gold is alloyed with the mercury by flowing the crushed sand and water over copper plates coated with mercury. In the assay the sand and gold and suitable fluxes are all fused together with finely divided lead in a small crucible. With the best possible conditions and the most skilled attention the mill will catch only a part of the gold, this part being often less than 50 per cent. of the total gold contents and seldom more than 80 per cent. With ordinary care the crucible will catch practically all the gold; that is, more than 99 per cent. In the mill the mercury-coated plates must of necessity be used over again for different tests. It is impossible in ordinary work to remove all the amalgam (mercury and gold alloy) from these plates; the amount remaining on the plates depends on the skill and care of the manipulator. It is quite possible for some of the gold left on the plates from a preceding test to come off with the next test. The accuracy of the recovery of the gold from the plates depends on the skill and care of the man in charge. In the assay, clean crucibles are used, and the method is such that none of the gold remains behind. In the mill the ore is crushed in mortar box, in which are placed round steel dies. In and about these dies and in and about the corners and rough edges of the mortar box are crevices that will hold much gold. The very greatest care is needed before and after a test to clean out this box, and this cleaning out is a troublesome affair, and even under the best conditions cannot be thoroughly done. In the assay the ore is crushed by appliances specially designed to admit of perfect and easy cleaning, and the final crushing to sand is done on a perfectly smooth iron plate. From all this it will be evident that as far as the actual recovery of the gold is concerned the assay method is very much more accurate than the mill method. In general, if the mill-test is conducted under the best conditions with disinterested care, the result will show a value to the ore below the true value, but it is a very easy matter even when great care is exercised for the gold from one test to affect appreciably the results of succeeding test, especially if the succeeding test be on a low-grade ore. But the usefulness of the resulting gold in each case depends upon the accuracy of the weighing both of the ore treated and of the resulting gold. In the results, but the assayer has for his everyday use ball-mill-test ordinary balances will show fairly accurate ones that enable him to weigh a spoonful of ore with a smaller percentage of error than the mill scales weigh a ton, and he has still finer balances that will weigh his pin's-head of gold more accurately than the millman weighs his small brick. It is simply a question of apparatus, just as the mechanic with his hand micrometer will measure his lathe work to a thousandth part of an inch, while the mason will measure his wall only to the nearest inch. There is no question whatever that as far as the rock actually treated is concerned, the assay is very much more accurate than the mill-test. At first sight, however, the mill-test seems to have a very great advantage in that it handles a large quantity of ore, a ton or more, while the assay treats only an ounce, a small teaspoonful.

This is more a matter of appearances than anything else. The ton and the spoonful are each samples; the ton is only a very small amount compared with the

mine. The ton can be as misleading as the ounce. It is all a matter of sampling. And there is the crux of the whole matter; it is all a matter of sampling; and sampling is an art that has been reduced to a science.

In taking a sample there are two separate and distinct steps. The first is the taking of the sample from the mine, either from the solid unbroken ore or from the dump. This should invariably be of several pounds weight, and may run up into the tons. The second step is the drawing from this large sample of a small one which will accurately represent it. The two steps call for entirely different methods. The first one is by selection, and calls for trained experience, coupled with disinterestedness. This disinterestedness is essential. A foreman cannot sample his own mine, and for the same reason that a doctor will not operate on his own child. The second step is mainly a mechanical one, though it may be done largely by hand. It consists of crushing and mixing and "quartering," repeated until both the size of the largest particle and the size of the remaining sample have been very much reduced.

Everyday experience shows that with proper methods and proper care an ounce will accurately represent a carload.

All the ore sold to smelters (excepting the very richest) is sampled by sampling down the carload to a few ounces, of which less than an ounce may be taken for assay. It is a very common thing for shareholders or directors to ask for a "smelter test," thinking that they get an actual large-size test of their ore. In no case do they get it. Their ore is mixed with other ores long before it is smelted; what they get is a sampling and an assay.

There is, however, this much to be said in favor of the mill-test. Men inexperienced in sampling and honestly trying to learn the value of their prospect will probably get nearer the truth if they take a sample weighing a ton than if they take only a few pounds. But it must be remembered that if the sampler is the owner, or a foreman, it is (psychologically) a difficult thing for him to sample fairly if his mine or his vein is spotty, as most gold veins are, and it will be just as natural for him to get an excess of the better spots into his ton as into his few pounds.

If now, on the other hand, there is anything to be gained by high returns, the larger sample lends itself to salting at every turn. It must be handled by several men; it cannot be kept under constant supervision; it cannot be enclosed in puncture-proof cases. When it comes to the mill-test, if this is carried on in the ordinary mill to which the workmen and others have access, "salting" is the simplest matter. A handful of rich ore, even a spit of tobacco juice containing gold dust, will do the work.

Taken all round, the assay is much more reliable than the mill-test, but without proper sampling neither of them is of any value as a guide.

The art and science of sampling, and more particularly the sampling of ore in place, has been very much developed in the last ten years, and it has now taken its place in most mines of importance as a part of the regular routine work. All ore faces exposed in shafts, raises, drifts, and stopes are regularly sampled every few feet. If this is of value and importance in a regularly running mine, of how much greater importance is it in a new prospect, and if it can be done with sufficient accuracy to enable a man to control his monthly output by using it as a guide, assuredly it is suffi-

ciently accurate to be of prime importance in a partly explored ore body calling for capital. The ridiculing and belittling of the value and accuracy of proper sampling is the regular work of the wildest promoter. It is a part of his stock-in-trade, on a par with the oft-repeated fiction of "increase in value with depth." To all men interested in mining ventures I say that all exposed faces of ore can be accurately sampled by a trained man without the taking of very large samples. I say further that a few pounds of properly taken samples will give much more reliable information concerning the true value of an ore body than several tons taken at random; and further, that the reducing of a ton sample of gold ore to a few pounds in weight by proper methods and the examining of this small sample in a laboratory will give much more information and more reliable information than a mill-test of the whole ton of ore.

Whence comes, then, this veneration for the mill-test? This is not hard to find. Its value developed in the days when there was no cyaniding or chlorination or smelting, when there was nothing but amalgamation, and what the mill failed to recover was no better than valueless. The question was not "how much gold is there in it," but "how much will the mill save." But

in these days, with advanced methods some means can always be devised for the recovery of most of the gold, and the right question is "how much gold is there in the ore?" and this the ordinary assay determines more accurately than any other method.

In the August 15th, 1908, issue of this magazine I said: "There is not a property in the Larder Lake District upon which sufficient work has been done to justify the presence of a mill, not even of the small three-stamp, so-called, prospecting mill."

These mills were put up for one of two reasons, either to test the ore bodies or else to sell stock. Thirty years ago it might have been justifiable to put up a very small mill to test an ore body, but nowadays the trained mining engineer will get more accurate results than the mill, and at a small fraction of the cost. A fee of \$1,000 and the costs of sampling and assaying will give better information than \$20,000 spent on a mill. But—and here I speak quite seriously—the engineer's results cannot be controlled by the promoter, and naturally, if the purpose is to sell stock, a mill-test on more or less selected ore will be much more efficient for newspaper talk than the cold-blooded facts of the engineer.

## EARLY DAYS IN COBALT.

BY W. G. TRETHERWEY.

It was during the winter and spring of 1904 when my friend, Dr. Milton Hersey, of Montreal, brought to my attention the fact that silver had been found up in the wilds of Nipissing, west of Lake Temiskaming.

Dr. Hersey's observations were that the samples were wonderful, but native silver had, as a rule, proved freakish and unreliable, but that, however, the discovery was worth investigating.

My mind was made up to visit this new country as soon as navigation was open on the Ottawa River and on Temiskaming Lake. On parting with Dr. Hersey I told him that I would inform him of the results of my visit and give him what advice I could as to the prospects in the new country.

To better investigate the finds in the north I decided to settle my family in Toronto for a time. From Toronto I could equip myself with full information as to the mining laws of Ontario, etc. At the Parliament Buildings I was shown every courtesy, and met there some of the men who have made Ontario's Bureau of Mines a credit to the Dominion.

Having ascertained that the ice was clear, I gathered my camp outfit and left Toronto for the north on the 16th day of May, none too late, as patches of snow and ice lay all about after Temiskaming was reached. In those, what appear now, distant days we had to travel to North Bay by G. T. R., thence to Mattawa by the C. R. R. main line, and to Temiskaming by short line, and by boat to Haileybury, then a hamlet of a few houses, a store, a postoffice, and one hotel.

Since that memorable trip it has often occurred to the writer that fortune was certainly on his trail. After leaving Toronto no familiar face appeared. At North Bay the day of my arrival had seen an important event—the sitting of court—and all hotels were filled, and not a bed was to be had. After considerable prospecting, however, I found a man who offered to furnish

a place to sleep, and to this day I think it was the apartment of his daughters. It has often occurred to me that I owed this man substantial thanks, for it was this night's rest that fitted me for what was ahead. Next morning, bright and early, I took train for Mattawa, and thence the short line to Temiskaming Landing, where the boat was waiting to convey the many passengers north, some to the new silver fields (for a few had scented fortune afar off), but more to the backwoods settlements beyond New Liskeard.

In all my tramps abroad it has been my practice to carry a good pair of field glasses. These I was using liberally, examining the shores of the Upper Ottawa, trying to read the different formations, when a bronzed and rugged pioneer with interested and penetrating look upon his face, stepped forward and said: "Are you a mining man?"

I replied that although I was not an expert or engineer, I had mined and prospected to a considerable extent, and that I had heard wonderful stories of a country ahead. He looked hard at me for some moments, and seemed to be trying to read my thoughts. Then suddenly appearing satisfied with his scrutiny, he said, pulling and tugging at something, jagged and irregular, in a lumberman's woollen sock, which had been fished up from the depths of his overcoat pocket, "What do you think of that? What is it?"

The magnificent specimen of silver now held up before my eyes spoke more forcibly than any words could do that I was indeed on "treasure's trail." In it I recognized a piece of almost pure native silver larger than I had ever seen before, as a sample, and it told a story of hidden wealth far beyond anything I had pictured.

This man's name was McKinley, one of the original discoverers of the now famous McKinley-Darragh mine. He assured the writer that he found that piece

lying loose in the gravel by the shore of a small lake; that he and his partner had staked the ground, and hoped to find more.

My desire was to see the place where this specimen came from, and I pressed my new-found friend to show me, which he kindly agreed to do. That night, the 18th of May, we landed after dark at Haileybury, and in spite of the electric lights of the town not being in commission, I managed to find a place to sleep, thanks partly to Mr. McKinley. The following morning being fine, we, as the saying is, "hiked it" over perhaps the roughest trail to what was to be the new silver camp, at that time known as Long Lake (now changed to Cobalt).

Mr. McKinley first took the writer to his claim, and there I had my first experience in washing silver nuggets from the gravel and dirt of the Cobalt Lake shore.

Mr. McKinley did not seem to realize that beneath the debris somewhere there must be a vein hidden, and I suggested to him to start a cross-trench from the water's edge toward the hill, and thus, if possible, cross-cut the vein. This was done, and the vein found from which these rich specimens had come.

From this property we went to see the "Little Silver" vein, as it was called, and there I saw more silver than I had ever dreamed of. From here we visited Cobalt Hill, and the now splendid La Rose mine, which at that time, was a mere discovery, and what a western man would term a prospect.

After ascertaining that no properties were for sale in the new camp, I made up my mind to pitch my tent at Long Lake and prospect. It had rained heavily on the 20th, and it was the evening of the 21st before my camp was put in order, on the ground where now stands the Right of Way shaft-house.

On the 22nd my efforts were in a southerly direction, but I met with stakes and lines on every hand, and I came back to camp determined to try in a new direction on the morrow. This, the 23rd of May, 1904, was an eventful day for me. During all the forenoon and well into the afternoon the day was taken up in working towards the southwest along the chain of small lakes toward and round Pickerel Lake. The formation here I did not fancy, and at 2 p.m. I returned to camp weary and hungry. My man at camp understood the art of cooking bacon and eggs, and after a good lunch and a rest, it being now 4 p.m., I decided to finish the day searching for the silver trail in a quite opposite direction—northwest—a direction I had been assured was out of the mineralized zone. From my camp I headed straight across ridges, over bluffs, and through thick brush and swamp until I came over the bluff west of where the old Trethewey plant now stands. Perhaps it was intuition, or perhaps it was the mere fancy that I had gone far enough to get beyond the zone of stakes and lines of other claims, but here I stopped to examine the rock, in which I recognized the same characteristics I had observed near the veins already discovered in the camp. And I said, mentally, "This is good-looking formation," and at once I decided to follow it along the ridge south. As examination proceeded along the bluff it was evident that other fortune-hunters had been there, but I detected, as I thought, a want of experience by reason of the green moss having been disturbed, and an absence of the evidence of digging in the crevices and cracks, where the silver is usually found. As the bluff was traversed I noticed an almost natural opening or pathway over one portion of the bluff, which at this point jutted out into a swamp.

The other prospectors had evidently taken this easier way. The point, from the swamp side, was covered with fallen trees, underneath which there was room for one to pass round the point of the bluff by wading in the water. The writer was after silver, and a little water or brush had no terrors for him, and beneath these windfalls he was determined to examine. And there beneath this Nature's covering was Nature's prizes. The thing that men work and sweat and hope for—silver in abundance!

It was now 5 p.m., and I was in an unknown forest at least a mile from camp, without any tool but a prospector's pick; and I realized that camp must be reached and an axe brought back for the proper staking of the new find. In the meantime another prospector might come and make the discovery of the presence of silver, in which case the discovery might be lost, as the first discovery post would probably hold the ground. Therefore, I lost no time in returning to camp, and as there was a company of other prospectors sitting round my fire having tea, it was best that I should act rationally and take refreshments as if a mine did not exist for me. All the time I was planning how I might move off with my axe without arousing suspicion that something was doing. After tea I said to my man, in the hearing of all, "I am going over here to cut a particular tree down that I saw, and will return shortly." I passed from camp as if I were on the most trivial errand; but when out of sight the high places were only touched, and in a few minutes I was there to see if someone had discovered my prize. All was well, and no time was lost in erecting a stake on the vein and inscribing date and name thereon. Also a witness tree was treated likewise, after which I had a little time to breathe and look around. It was becoming dark now, and a move for camp was made, which this time was more southerly, further along the bluff. Now, fully imbued with the idea that mineral might be found anywhere, my scrutiny was close as I passed along, and, sure enough, at about 200 feet distance from the first find, which is now the Trethewey mine, the first vein on the Coniagas was discovered. I did not secure a sample from the last find that evening, as it was almost dark, but I left for camp with the absolute confidence that it was there, from the indications I had seen.

I had heard stories about a syndicate that owned all the ground round for miles, and that night I was turning it over in my mind and wondering if it were true, and if my finds would, after all, be taken away. I carefully consulted the Mines Act, and from it decided that I would get the ground, providing the Mines Department lived up to the law. Prof. W. G. Miller (now Dr. Miller) had arrived in the country a few days previous to my discovery, and was camped on the La Rose property at this time. There I repaired, and I anxiously asked him if it was the intention of the Department to enforce the Act, and on receiving an affirmative reply, I told him of my discovery, and the following morning we repaired to the spot, the Professor's assistant, Mr. C. Knight, accompanying us. Dr. Miller was almost a total stranger to me at this time, and from the amused twinkle in his eye when I told him of my hidden millions (before he had seen for himself), it was evident that he had been filled up with prospectors' yarns before. On arriving on the ground, however, his manner became serious, and it was evident he was pleased at the new finds.

Mr. Alex. Longwell, prospecting for Mr. R. W. Leonard, was at my camp and sharing my awning for

dining-room at this time. I asked him to help me measure off the Coniagas—known as J. B. 6 lot—and Trethewey—J. B. 7. For this he and Mr. Leonard became part owners in the former claim. After all staking had been completed I returned to Toronto to have the titles properly attended to. This took considerable time, and it was about the middle of July before the writer received permission from the Department to go on and prospect the Trethewey property.

Things were indeed crude and slow in those early days of Cobalt's development. To get in powder we had to almost beg the officers of the transportation company to carry us small shipments. And \$32 was paid for one box of giant powder at Haileybury. From there in, the road was so bad that it cost a dollar a box to get it to the mines. Our teamster usually loaded up with liquid combustibles, so, he said, if the powder went up going over the jolts, neither he nor his team would know when it happened. Those were the good old days—the summer of 1904—when we were not bothered with specimen hunters, and we were busy digging out the beautiful metal. On Sundays we were rarely disturbed at our bathing in front of the town of Cobalt, for ladies were seldom seen in those parts. Such a thing as stock selling and mining the public, a widely practised art now, was not dreamed of. We were happy; but when returning to civilization with pockets stuffed with nuggets and stories of the great wealth of that land, our experienced mining friends would look with a sort of pity, as if to imply, "I wonder how long before the dream will end?" or "He is not long to remain with us. Mimico will be his portion soon."

This apathy and extreme inattention to Cobalt's importance got a sudden jolt when news came from New York that cheques ranging up to tidy fortunes were being paid for single cars of ore.

The crowd has now gone just as batty in the opposite direction. From a people that nothing could move in 1904, we now have what the world seldom sees—a mad, clamoring crowd buying everything in the form of a Cobalt stock, the end of which spells disaster for many.

The writer had the honor of grading, at his own expense, for the first switch and siding at Cobalt on the T. & N. O. R., and landed the first car of machinery—a boiler, a hoist, and an electric light plant.

I could go on enumerating incidents of Cobalt's early days, but I feel, Mr. Editor, that a good earnest apology is more in order for the space already occupied by this rambling reminiscence. A lesson Cobalt has taught me is that poverty and riches bring out human nature either in its beauty or in its most contemptible form; by them you will know your true friends.

W. G. TRETHEWEY.

### TRETHEWEY MINE.

The Editor, Canadian Mining Journal,  
Confederation Life Building, Toronto.

Dear Sir,—In response to your request, I have much pleasure in giving you a synopsis of the operations conducted at the Trethewey Mine up to the present date.

The property is situated on Sassaginaga Lake, just outside the town limits of Cobalt, and lies between the Coniagas Mine on the south, and the Temiskaming & Hudson Bay Mine on the north, and marches with one of the locations of the Nipissing Mining Company on the east.

The development work to date has been principally conducted at the south-east end of the property, close to the Coniagas and Nipissing boundary lines.

There are three working shafts on the property, measuring in all over 400 ft., with upraises of over 100 ft.

No. 1 and No. 2 Shafts, approximately 650 ft. apart, are connected by a drift on vein "F" at the first or fifty-foot level.

No. 2 and No. 3 Shafts, a distance of about 110 ft. apart, are connected at the second level, which is 140 ft. below the collar of No. 2 Shaft. No. 3 Shaft has been sunk to a depth of about 200 ft., where a third level is being run east to the Nipissing boundary and west towards No. 2 shaft. The total amount of drifting and cross-cutting in these workings is about 4,000 ft.

Several thousand feet of surface work has been done, consisting of trenching and "open cutting," and several prospecting shafts have been sunk on veins and fissures occurring towards the north end of the property. Owing to the geological conditions there existing, these operations have failed to disclose any ore bodies of economic value, it having been recently proved that the veins at the north end (with one exception, namely the discovery vein on the Temiskaming & Hudson Bay location) do not carry values until considerable depth is reached. This has been recently demonstrated by a tunnel which was run from the workings of the Temiskaming & Hudson Bay property at their 100 ft. level, towards and across the Trethewey north line, where an important body of rich silver ore was encountered at that depth.

Prospecting operations by the diamond drill were also conducted during the past year, the result of which was to locate some valuable veins at depth, and by means of which important geological information was gained.

The system of treating ores for shipment obtaining at the mine is now confined to crushing and hand sorting, followed by partial concentration in a double compartment Hartz jig, to which is being added a belt conveyor and coarse concentrating table to handle the hutch product from the jig. The present operation is so satisfactory that only very low grade ore is being sent to the dump for future treatment. By this means the grade of ore formerly shipped as screenings (running from 100 to 200 oz. per ton and carrying about 70 per cent. of country rock, on which in some instances a heavy penalty was exacted by the smelters) is made to produce a high-grade product, running from 1,500 to 2,000 oz. per ton, thus saving a very heavy expenditure for freight and treatment charges on the bulk of the ore formerly shipped.

As the development work proceeds, the production of ore is increasing, and during the past few months the output represents a net return of over 25 per cent. on the capital of the company, notwithstanding the present low price of silver.

The new ground recently developed by the lower workings is producing ore of high grade equal to the best in the history of the mine, and the large reserves of ore being opened up warrant the belief that the mine has a very promising future before it.

Yours faithfully,  
ALEX. M. HAY.

### THE RETIRING TREASURER OF THE CANADIAN MINING INSTITUTE.

After holding the office of Treasurer of the Canadian Mining Institute for ten consecutive years, Mr. J. Stevenson Brown has tendered his resignation. In the early days of the Institute the work of the treasurer-

ship was comparatively light. During the last few years, and especially during the year that has just closed, the enormously increased membership has entailed a correspondingly greater bulk of work upon the treasurer. In addition to collecting and handling the annual fees of each member and controlling the disbursements of the Institute, the disposal of large governmental appropriations has fallen upon his shoulders.

whose chief object and aims were centred in fostering and developing the mineral resources of the Dominion.

"At that time there was, comparatively speaking, but a handful of members, led by that enthusiast of sacred memory, the late B. T. A. Bell, the founder and organizer of the Canadian Mining Institute, and its indefatigable secretary. And surrounded by such men as were attracted to the Institute, mainly through his



MR. J. STEVERSON BROWN, RETIRING TREASURER OF THE CANADIAN MINING INSTITUTE.

Hence it is evident that the position is at present no sinecure.

The following extracts from a recent letter of Mr. Brown's are most pertinent and interesting. We can hardly do better than quote Mr. Brown's own words:—

"I joined the Institute at its inception in 1898, associating myself with a number of men, who recognized that there was a great field for an organization

wonderful personality, it is not surprising that the organization has made a steady march in the direction of progress and that the influence of this man's work should be stamped on almost every page of the Institute's history.

"Working hand in hand with the late Mr. Bell, and closely identified with the early history of the Institute, were John E. Hardman, George E. Drummond, A. W.

Stevenson, George R. Smith, Charles Fergie, Major R. G. Leckie, John B. Hobson, besides several others who have passed beyond the great divide, such as the late lamented Dr. Geo. M. Dawson, James F. Lewis, Roderick Robertson and John Blue. These men were all zealous and enthusiastic workers in the affairs of the Institute in its early days—men of character and ability, indeed I may say of authority, in their respective fields of work.

“At the end of the first year there was a membership of upwards of 150. It was then, on the resignation of Mr. A. W. Stevenson, who was the first Treasurer of the Institute, and at the solicitation of such men as I have mentioned, that I became a candidate for the office so made vacant, and was elected by acclamation.

“Year by year the Institute has continued to grow, until now there are close upon 700 names on the membership roll, not including student members.

“Lack of time prevents me going more into detail. Were it not for that, I could say a good deal about the

difficulties we had to contend with at the start. Bell, of course, was the leading spirit, and his wishes generally carried, often for the reason that he had at command such a flow of language and such an array of proof based on authorities that he could quote by the yard and pour forth in such a whirlwind of enthusiasm that few could face. And be it said to his credit, his plans and convictions were usually right.”

Since those early days, upon which Mr. Brown touches so vividly, the Institute has had the full benefit of his continuous services, and his ripening experience. He has now, forced by the demands of his private affairs, decided to resign the office that he has filled honorably and well for ten years. This will not, we hope, mean that Mr. Brown is to sever altogether his connection with the Canadian Mining Institute. We shall still expect to see his cheerful countenance, hear his tales of the heroic days, and listen to his inimitable renderings of Dr. Drummond's poems.

## THE AGAUNICO MINES DEVELOPMENT CO.

We have been requested by Mr. E. L. Fralick, mining engineer to the Cobalt Lake Mining Company, Limited, to give publicity to the following correspondence.

The Agaunico Mines Development Company is incorporated under the laws of Arizona, with a capital of \$500,000. The mine on which this capitalization is based is situated on the shore of Lake Temiskaming. It has produced no silver. It has produced a few tons of high-grade cobalt ore, for which there is a very limited market.

This property was one of the first exploited in the district. The original owners were prominent and capable mining men. The property was thoroughly prospected.

The prospectus is a phosphorescent mass of falsehoods. One S. W. Gilbert describes the property as “a reservoir of solid silver.” Mr. Gilbert needs classification by President Roosevelt. Other equally absurd features distinguish this precious prospectus.

When the property was first acquired, and before the prospectus was issued, Mr. E. L. Fralick states that he consented to advise the company as to selection and installation of machinery. He stipulated expressly that his responsibility ended there.

When the prospectus appeared Mr. Fralick immediately protested against the use of his name. The following letters speak for themselves. Mr. Fralick has put the matter in the hands of his attorney:—

E. I. Rosenfeld, Esq.,  
Tacoma Bldg., Chicago, Ill.

Nov. 25, 1908.

Dear Sir,—Enclosed please find copy of letter to Mr. E. J. Bestick, which explains itself.

Yesterday I received a copy of the prospectus of the Agaunico Mines Development Company, in which I am mentioned among the officers as consulting engineer. When I consented to advise regarding the plant and equipment, it was agreed and understood with both yourself and Mr. Martin, that my services ended there. It was explicitly stated by yourself and Mr. Martin that my services were not desired as consulting engi-

neer, but merely to advise regarding the plant. It was definitely agreed and understood that there my responsibility ceased, and that I had nothing whatsoever to do with the mine or the planning of the work.

To-day I am informed that my name is being used on the letter-heads of the Agaunico Mines Development Company. This is also entirely unwarranted and unauthorized by me. I have merely acted in the capacity of consulting master mechanic, something entirely different from that of consulting engineer.

I gave no permission for the use of any letter of mine in the prospectus. A letter which I wrote has been slightly changed and letters tacked on to the end of my name, which are not the proper designation of my degree.

I therefore insist that my name must be eliminated from any prospectus, letter-head or other literature emanating from your office, or in any way connected with the Agaunico Mines Development Company.

I shall await the receipt of satisfactory assurance that this will be done by return mail. I am,

Yours truly,

(Sgd.) E. L. FRALICK.

(Note.—The following is an answer from Mr. Fralick to an enquiry concerning the Agaunico).

Nov. 25, 1908.

Mr. E. J. Bestick,  
Detroit, Mich.

Dear Sir,—Your letter of the 12th, asking my opinion as to the prospects of the Agaunico Mines Development Company, received. It is not usual for me to comply with such requests, except in the form of a report after due examination. The use of my name, however, by the Agaunico Mines Development Company necessitates this departure.

From my own personal knowledge, I know absolutely nothing of the underground workings of the mine. I have, however, frequently heard competent and reliable men familiar with the mine state that there was in sight there a larger body of high-grade cobalt ore than in any other property in the district.

I am familiar with the work done there in the last couple of weeks. It appears to have been prosecuted in a vigorous and competent manner. Further than this, I know absolutely nothing of the prospects of the Agaunico Deveolpment Company.

Yesterday I received a copy of the prospectus of this company, and noted that I am put odw on its list of officers as consulting engineer. I am not now and never have been the consulting engineer of the Agaunico Mines Development Company. The use of my name is is entirely unwarranted, and I am taking the necessary steps to have it stopped.

Nov. 30th, 1908.

Mr. E. L. Fralick,  
c/o Cobalt Lake Mining Company,  
Cobalt, Ont.

Dear Sir,—I am in due receipt of your letter of the 25th inst., and have delayed a few days in answering, as I did not wish to be hasty.

I am frank to say that I have never in my thirty years' business experience been subjected to such unqualified impertinence. Your statements are absolutely without warrant. There is only one of them that is right, and that is that you are not connected with the Agaunico Mines Development Company, and that is right because from the time your letter was received it is needless to say that the Agaunico Mines Development Company would not permit you to be.

I made a definite and unqualified arrangement with you to act as consulting engineer, in the presence of Mr. Martin, the president of the Agaunico Mines Development Company, and you have been rendering some services, but none commensurate with what I supposed your abilities were, or what you were paid to do.

Mr. Whitson assures me, without qualification, that the letter he asked you to write was for the purpose of being embodied in the prospectus, and I know Mr. Whitson well enough to know that he does not make any statements which are not true. Unfortunately, on such matter as we have your name it cannot be taken off, excepting to erase same on such matter as is sent out from our office. This we will take great pleasure in doing. As a matter of fact, you owe both Mr. Martin and myself an apology.

I am sending a copy of this letter to Mr. Bestick for his better information.

Referring to the criticism about the letters "E. M." after your name, beg to say that you yourself told me that you were a mining engineer and a university graduate with that degree. I supposed you were telling the truth.

Yours very truly,  
E. I. ROSENFELD,  
President.

P.S.—You will please turn over either to Mr. Rochester or Mr. Martin any such correspondence as you may receive with reference to the Agaunico Mines Development Company.

Haileybury, Ont., Dec. 2nd, 1908.

Mr. E. L. Fralick,  
Cobalt, Ont.

Dear Sir,—I am in receipt of your letter of Nov. 26th, with a copy of one to Mr. E. J. Bestick, Detroit, Minn., and Mr. E. I. Rosenfeld, Chicago, Ill.

Your request that your resignation be accepted, to take effect at once, will be cheerfully granted on one condition, that you retract the last paragraph of your letter to Mr. Bestick, and acknowledge to him that you were retained by the Agaunico Mines Development Company as consulting engineer, to select and see to the proper installing of their machinery, and to direct their underground work, but was at no time to be asked to say where this work might be done.

These are absolutely the duties you undertook to perform, and was paid for, and we had the same right to use your name as we have that of any laborer on our pay roll. Your claim to have been hired to act in the capacity of consulting master mechanic is entirely erroneous, and I doubt very much your right to that title.

I am making this condition with prejudice, and hope you will accept it, before may become necessary to repeat it.

Yours truly,  
(Sgd.) D. K. MARTIN,  
President.

### THE CHROME IRON MINES.

(Special Correspondence.)

Owing to the constantly increasing demand for Canadian chrome iron for the last two years or so operations were carried on more with a view to developing thoroughly the known resources than to prospect or search for new deposits. The principal, and to-day the only company working in the district, is the Black Lake Chrome Asbestos Co. This company has done more for the development of the chrome industry than any other, and it may here be said that the success of the competition of the Canadian article with foreign ores, especially with those from New Caledonia, is solely due to the untiring and energetic efforts of this concern. The presence of silica in chromic iron beyond a four per cent. limit excluded the Canadian ore for a number of years from its application to furnace linings; but to-day ores containing eight and ten per cent. are successfully used for that purpose. This change has greatly stimulated the demand for Canadian ore, so much so, that for the last two years the requirements on the part of United States manufacturers could not be fulfilled. The Black Lake Chrome Asbestos Co. owns most of the productive chrome properties in the Eastern Townships of Quebec, and produces at present almost the whole Canadian output. Two pits are in operation: No. 1 is located not far from the railroad track, about two miles from Black Lake, and consists of an inclined (65°) shaft 400 feet deep. This shaft is in solid crude ore, and it is reported that it delivers mostly all crude high grade ore. The company has spared no money or means to find out the extent of the deposit, both as to depth and lateral extension, by diamond drilling. The mill is located close to the track of the Quebec Central Railway, and consists of 30 stamps, jaw crushers, and 5 Wilfley tables.

The other mine, known as the "Montreal Mine," is located on lot 26, range 11, Coleraine, at a distance of 7½ miles from Chrome Siding, to the east of the railway. It was taken over by the Black Lake Chrome and Asbestos Co. in 1906, and since that time development work has been pushed to an extent that leaves no

doubt as to the very large quantities of chrome ore available at this mine. The mill consists of 15 stamps, jaw crushers, and three Wilfley tables. The production of chromite for 1907 had a value of \$72,901, whereas the value of 1901 reached the sum of only \$25,444.

#### Asbestos Mines.

The asbestos mines in the Eastern Townships of Quebec constitute one of the successful industries of the Dominion. While in the year 1904 altogether ten mills, with a total milling capacity of 3,500 tons per day were in operation, last year (1908) there were 13 mines and mills with a total capacity of 6,000 tons working, and there are in addition at the present time under construction four more mills with a total milling capacity of 1,500 tons. The great advance in the development of this industry may be seen from the following figures:—

	Production.	Value.
1904. . . . .	35,479	\$1,199,919
1907. . . . .	61,985	2,483,211

In other words, in three years the production increased 75 per cent. and the value of this production over 100 per cent. This great increase is principally due to the great demand for the last number of years from the United States and Europe, and in consequence thereof the old establishments increased largely their mill capacity, and new mines sprang up.

Of special interest in the asbestos industry is the activity which is being displayed at present in the Broughton district. The first mill, that of the Broughton Asbestos Co., was built in 1903. In 1904 the Quebec Asbestos Company followed, and in 1908 the mills of the Eastern Townships Asbestos Company and the Boston Asbestos Company were built, while the big 500 ton mill of the Frontenac is still under construction. It has been shown through recent investigations by Mr. Fritz Cirkel, M.E., of Montreal, that the Broughton asbestos range commences in the third range, and is to be found on every lot numbered 13 of the different ranges of Broughton township, extending right into and through the township of Thetford, and joining the famous rich asbestos-kill at Thetford village. Commencing with the easterly discoveries, the Cliche asbestos outcrops on lot 13, range 111, we have altogether 13 locations, and working mines, and it is probable that this number may be increased through new discoveries in the near future.

While it must be admitted that for the last six months the asbestos market was very sluggish as a direct result of the financial depression of a year ago, there is now a decided improvement and it is confidently expected that the next year will bring a further favorable change in the situation. It is acknowledged that Canada supplies 90 per cent. of the world's production of asbestos; new discoveries in foreign countries are being made every year, but so far they have failed to enter into serious competition with the Canadian article. The future outlook of the asbestos industry is very encouraging indeed and prompted by the constantly growing number of commercial uses, the industry keeps steady pace with the demands made upon it.

#### THE WORK OF THE KINGSTON SCHOOL OF MINING.

Since its inception in 1893 the work of this school has been of unusually direct benefit to our mining and

metallurgical industries. The short courses for prospectors inaugurated the first session did much to stimulate interest in minerals and their discovery. There followed immediately the summer mining classes, afterwards taken up and extended by the Ontario Bureau of Mines. In 1894 the first mining laboratory erected in Canada was built at the School of Mining, and it immediately became useful to the mining industry. Ores from all parts of Canada were treated for value and process, and this work has become of such importance that the laboratory is now kept open all the year round. When corundum was discovered in Ontario, Professor Miller, then of the School of Mining, was given the task of prospecting the field to ascertain its extent and value. Twenty tons of the ore were treated in the mining laboratory, and a method of concentration worked out. The quality of the corundum was examined, and a method for analysis of corundum and ore was found. The industry, which was later established at Craigmont, Ont., was based largely upon this work. A later example of the value of the mining laboratory to Ontario is seen in the extensive use made of its staff and equipment by Cobalt mine owners. We must add to this that the first Canadian process for refining Cobalt ores was there worked out by Professor S. F. Kirkpatrick. This process is now in operation at Deloro.

This modest wooden building is at present a most interesting scene of activity. Large lots of ore, from one to twenty tons, are there being treated for value and process, and such is the demand for space that the necessity for a larger building is evident.

The chemistry building is also perilously overcrowded. Originally built for 150 students, there must now be provided within its walls class-rooms and laboratory places for 450.

The spirit that pervades this institution is that of intelligent practical service. Its work has in the past been carried on under the disadvantages of inadequate income, and very modest buildings, quite too small in some cases for the needs. To meet the first want the Board of Governors have started a campaign for an endowment of \$200,000. The director of the school, Dr. Goodwin, has been carrying this on for a few months, and we commend it to all our readers who care to invest in a carefully managed institution. It has been said of it in the Ontario Legislature, on the occasion of votes of money for its assistance, that "no institution gives to the province better return for the expenditure of public money." We understand that the School of Mining will appeal to the Ontario Government for the wherewithal to erect the much-needed buildings for mining, metallurgy, and chemistry. Considering the public services rendered by the school, we have no hesitation in sustaining the appeal.

In order to correct a mistake often made in regard to the School of Mining, we note that its charter makes it an independent institution, its corporation consisting of all who subscribe to its funds. The management of the school is completely in the hands of this corporation, which meets annually and elects a Board of Governors.

We append the following tables of attendance taken from the Report of the Dean and Director:—

The statistics for the fifteenth session of the School of Mining make clear that the growth of the school is strong and steady. The numbers are as follows:—

BY COURSES.		1907-7.	1907-8.
Course A (Mining)	.....	96	106
" B (Chemistry and Mineralogy)	..	2	5
" C (Mineralogy and Geology)	..	4	9
" D (Chemical Engineering)	....	2	7
" E (Civil Engineering)	.....	53	64
" F (Mechanical Engineering)	..	17	17
" G (Electrical Engineering)	....	41	59
" H (Sanitary Science)	.....	4	5
" J (Power Development)	.....	0	2
" Special	.....	0	5
		219	279
In other courses	.....	203	252
Total	.....	422	531

BY YEARS.		1906-7.	1907-8.
First Year	.....	95	118
Second Year	.....	47	65
Third Year	.....	38	56
Fourth Year	.....	39	40
Total	.....	219	279

BY PROVINCES.	
Ontario	..... 223
Quebec	..... 10
Manitoba	..... 4
Saskatchewan	..... 1
Alberta	..... 8
British Columbia	..... 13
Yukon	..... 1
Nova Scotia	..... 4
New Brunswick	..... 4
England	..... 1
New York	..... 3
Columbia, S.A.	..... 3
Idaho	..... 1
Vermont	..... 1
New Hampshire	..... 1
North Dakota	..... 1
Bermuda	..... 1
Total	..... 279

## SPECIAL CORRESPONDENCE

### NOVA SCOTIA.

**Port Hood.**—(Note.—The following is a series of extracts from a letter written for the information of the Canadian Mining Journal.)

**The Port Hood Richmond Railway Coal Company, Limited.**

#### 1908 Review.

In going over the plant in connection with the work done for 1908, it strikes one that a very interesting position of affairs is evident here, and while, of course, we have not reached the output anticipated and hoped for last season, due to many facts which, of course, were unforeseen, such as explosion, labor strike, safety lamp installation, shortage of water, and also our inability to get a sufficient number of men, still the condition of the plant and the work generally for the year taken in comparison with the work accomplished at other collieries must be satisfactory, for example, when we commenced the 1908 operations:—

Mine development was practically worked out, and commencing with the close of navigation, the development of the mine for an output of 800 tons per day was proceeded with, and when navigation opened the mine was developed in such a manner that an output of the above amount could have been maintained, and although the output has not reached to the above amount per day, the development of the mine has been maintained, and at the close of 1908 the mine will be in such a state of development as to maintain the output for practically the season of 1909 with very little additional development.

The slope, for the whole distance of 2,800 feet, has been widened, silled and sleepered, and is now in a most excellent condition.

The bankhead has been strengthened and improved in such a manner as to-day to be in a better condition than at any time since this company took hold of it, and all the machinery has been maintained in as good, if not in a better condition than one year ago. In addition, a new picking belt, to enable us to handle 1,000 tons per day, instead of 400 tons per day, has been installed.

One hundred new pit boxes have been added to the stock, while the old pit boxes have been maintained in a good state of repair.

Twenty-seven new and improved wharf cars have been added, in addition to our stock of 1907.

Two new additional pumps, two additional boilers, together with an additional smoke stack, one new wharf engine, giving us three times the capacity of that which we had in 1907, a new conveyor belt for slack coal, by which means all the coal used in the boilers is conveyed direct from the coal pockets to the boiler-house, thereby doing away with a horse and two men, a new engine for the conveyor plant at the boiler-house, one new engine and a conveyor belt, 36 inches, giving double the capacity of the belt we had in 1907, has been added to the wharf plat, also one large boiler capable of handling all the machinery necessary at the pier has been established. The pier itself has been strengthened and put in a better condition than at any time since it was built, and our storage capacity at the pier increased from 900 to 2,400 tons, enabling us to load and handle steamers from 1,000 to 2,000 tons capacity in from four to seven hours. In addition to the above, there is to-day on the plant ample equipment, so far as we can see, to handle next year's business without any additions whatever of a large or costly nature, and altogether the plant is in a most excellent condition, and fully equipped to handle and develop an output of 1,000 tons per day, and also every bit of the plant from top to bottom has been maintained in a very much improved condition over its previous history, and in addition we have greatly increased the reservoir water supply and laid a pipe line to the pier, a distance of over 3,000 feet, for water supply there.

Monthly costs may now be said to be a fixed maximum basis on the output which we are now receiving, giving us ample scope for reducing, and the reduction of the monthly cost is purely a matter of increased output. Now that the mine is just about entering on the stage of pillar work and having reached a stage where the great trouble and annoyances and increased costs arising from shortages in equipment, lack of facilities, etc., have been overcome, the prospects of 1909 over 1908 in these respects are vastly different and much brighter.

The volume of the output for 1909 is a question of men, not a question of the development of the mine or the facility of handling, and if we secure sufficient men, or if the absence of men we can install mine machines, as discussed with the direct-

ors, the volume of output can be placed at whatever may be desired. In going over the statement, it must be borne in mind that the company have placed all of the improvements outlined above, maintained its property, developed its mine and put it in the state which we are now in, absolutely out of the earnings of the company, and we have not increased the indebtedness one cent for 1908, and practically every item mentioned above is fully paid for; only in the case of the boiler and wharf engine are any installments whatever still due.

During 1908 our market has been practically confined to a few places over Nova Scotia, New Brunswick, Prince Edward Island and Quebec, and to all places shipped we have received, with very few exceptions, a good report of our coal. We have not been able during 1908 to reach some of the markets which we had hoped to reach during the early part of the season, on account of shortage of output, but when the last of December of 1908 arrives, providing weather conditions will permit and navigation remains open, we will not have one pound of coal practically left on the plant. All of our output over and above our own boiler consumption will have been marketed.

Outlook for 1909.—In respect to the raising of the volume, the condition of the property and our ability to handle an increased output is very much brighter than 1908. The question of market, however, gives a more interesting feature than that of 1908 inasmuch as the coal prospects generally are not as bright as last year, and in addition we must anticipate and plan for a considerably increased output.

It may be said, in addition, that the property has been raised from one considered of little or no value to one now looked upon as one of the best coal propositions in Nova Scotia. To-day we find a ready market for all of our coal, whereas in 1907 a market was difficult to obtain, although the demand for coal was very strong, and now, with a weak market generally, we find our coal taking one of the first places on the market for quality, which makes the prospect for 1909 bright indeed in comparison to past years.

**Glance Bay.—Naked Lights vs. Safety Lamps.**—In considering the Port Hood explosion at the beginning of 1908, a Cape Breton jury gave as its verdict an opinion that ten men lost their lives "through the explosion of an explosive mixture." This was not a very illuminating verdict, but the jury had appreciated one thing which it is taking a great many mine explosions to teach us, namely, that if the factors which go to cause an explosion had not been present there would have been no explosion.

What are the factors that lead to mine explosions? There is no mystery about it, as some sapient individuals would have us believe there is. We think in every instance the factors may be resolved into two, and two only—the presence of fire in some form with the simultaneous presence of an inflammable substance, or an explosive mixture, this being generally one or all of three things, viz., marsh gas, coal dust, or some form of blasting powder. Fire is introduced into a mine for two purposes only, first as an illuminant, and secondly as a means to ignite powder. True, electric sparks may arise from electric machinery or transmission underground, but this can be confined to one spot, and with proper fittings it can be practically done away with. The blasting side of the question does not enter into present considerations, except that many persons think that the use of the "squib" in gaseous mines should be discontinued in favor of electric firing.

There are three ways to light a mine, naked lights, safety lamps, and electric light. The latter illuminant can be used in the pit bottom and along the main approaches, but its extension into the working places is a problem as yet not satisfactorily solved. We have left for consideration, therefore, naked lights and safety lamps.

The modern safety lamp gives a good clear light, and the first objection to safety lamps, that they gave a light too dim

to be used satisfactorily, cannot now be advanced. The often-repeated statement that safety lamps increase the danger from falls of roof and side because of the limited range of their illuminating power has never been proved, and never can be. Miners' nystagmus was once laid at the door of safety lamps, but it is now known to result from straining of the elevator muscles of the eye, caused chiefly by handpick underholing in thin seams. The magnetic-lock electrically-ignited type of safety lamp with underground relighters disposes of the objection that men have to lose time when their lamps go out. Such time-worn objections as that safety lamps decrease the miner's earning power have been too frequently exploded to need further demolition. The real sum of all the objections to safety lamps is that they cost money, and that is all there is about it. Those, however, who object on these grounds are as the man who will not insure against fire, who one day rues his omission. In this case, however, not only is money at stake, but human lives.

The foolishness of naked lights in coal mines, to our mind, needs no emphasis. A coal mine is a place where inflammable material is dug out, and the surroundings of the men who work underground are such things as coal, wood, an inflammable dust capable of detonation, explosive gases, brattice cloth, and tub-grease. The ordinary citizen would not explore the recesses of his attic with a naked light. He is not so foolish as to put naked flame into contact with inflammable material, which is what is done every time a naked light goes down into a coal mine.

The second volume of the British Royal Commission on Mines states that from 1896 to 1905 there were 183 mine explosions in the United Kingdom, of which 119 were caused by naked lights, 12 by matches, and 17 by open or defective safety lamps; or altogether 148 explosions out of 183 occurred from some form of naked light, being 80 per cent. of all explosions. The explosions that occurred about a year ago in such disquieting numbers, accompanied by such dreadful loss of life, all occurred in open-light mines. The recent disaster at Marianna took place in a developing mine, which was to be a model of every principle of safety, and its officials appear to have been sincerely anxious to design a safe mine. Yet disaster came. The Engineering and Mining Journal says: "The mine was known to be gaseous, and safety lamps were supposed to be employed exclusively in it; but—carelessness again—there were some naked lamps." If anything is worse than naked lights from a point of safety it is perhaps mixed lights. The Port Hood explosion, to which we referred above, although trivial compared with the wholesale destruction caused by the explosions in the United States, is nevertheless a case in point, for it was doubtless caused by the contact of a naked light with marsh gas, probably aggravated by coal dust and loose powder. The Hamstead fire in England was directly caused by the criminally careless use of candles underground.

Naked lights are responsible not only for the majority of mine explosions, but also for most mine fires. Any person who is acquainted with the habits that are associated with the use of naked lights in a coal mine will accept this statement. Where naked lights are used they are generally provided by the miners themselves, and smoking is a usual practice in an open-light mine, with the lax discipline that accompanies the two things. The use of safety lamps is always attended by stricter supervision and more consistent discipline than is to be found in naked light collieries.

For the foregoing reasons, and at the risk of being considered extreme, we take the view that the use of naked lights should be prohibited in all coal mines that employ over thirty men at one time, and they should, of course, be forbidden in even these if any signs of gas are present. The French Government recently prohibited the use of naked light in all and every mine of the French dominions. An extensive development of

coal mining awaits us in Canada, particularly in the prairie country. It is very probable that here the work of mining will be easy and conditions of comparative safety may exist. Under these circumstances the use of naked lights may grow, as they have done in the United States, until we are awakened by something resembling the recent epidemic of disaster there. Nowhere in the world has coal mining been so easy as in the United States, and miners there have gone along from small things to the present day of huge mines and large outputs, until recent events have awakened the country to a belated consciousness that they are decades behind European practice in everything but the accumulation of dividends. We have no fear that such a state of affairs as exists in American mines will ever become the rule in Canada, but if due regard is had to safety in the day of small things, it will have become a habit in the day of larger things that is coming.

We, therefore, repeat the opinion that naked lights should be forbidden, and that nothing but properly approved and tested types of safety lamps be used in every coal mine in the Dominion, with the possible exception of very small mines employing only a limited number of men.

### ONTARIO.

**Cobalt.**—Regulations in force at Cobalt Lake mine:—

#### Notice.

The quantity of explosives brought into the thawing-house shall not at any time exceed the requirements of the mine for a period of twenty-four hours, except where such requirements would be less than 100 pounds.—Mines Act, Sec. 164, Sub-Sec. 4.

The powder boxes shall be opened not closer than at least 100 feet distant from the thawing-house, and all sawdust carefully removed from the cartridges before they are taken to the thawing-house.—Mines Act, Sec. 64, Sub-Sec. 8.

The powderman shall keep the thawing-house and magazine clean and especially see to it that the floors are free from any sawdust in which the dynamite has been packed.

He shall see that the cans are at all times full of thawed dynamite.

He shall change the water sufficiently frequently for this purpose, using no water warmer than that in which a hand can be immersed without scalding.

He shall at least once a week thoroughly cleanse the cans with warm water and washing soda.

No machine man or other person shall approach or enter the thawing-house with a candle or other naked light, but in all cases is to use a lantern.—Mines Act, Sec. 164, Sub-Sec. 6.

Any machine man taking powder from the cans for firing

shall replace the amount taken with unthawed sticks from the racks so that the cans may at all times be kept full.

In preparing the charge, the fuse must on no account be threaded through the cartridge, but it must on all occasions be inserted in the end, and the wrapper securely tied with twine which is always provided for that purpose.

A charge which has missed fire shall not be withdrawn, but shall be blasted, and in case the missed hole has not been blasted at the end of a shift, that fact shall be reported by the foreman of shift boss to the mine captain or shift boss in charge of the next relay of miners before work is commenced by them.—Mines Act, Sec. 164, Sub-Sec. 10.

In blasting a miss-fire the tamping must not be removed by blowpipe or otherwise closer than six inches of the powder or of the cap which has missed fire.

The machine man shall also notify his partner on opposite shift of any miss-fire before work is resumed.

The employees who have occasion to raise the mine doors shall put up the guardrails or close the gates, as the case may be.—Mines Act, Sec. 164, Sub-Sec. 19.

Workmen may not be lowered or hoisted in shafts, in buckets, skips, or tubs.—Mines Act, Sec. 164, Sub-Sec. 23.

All workmen shall be at the mouth of each shaft at the beginning of every shift promptly as the whistle blows.

At the end of each shift or half-shift five minutes and no more before the whistle blows will be allowed workmen coming from the working face, except on Saturdays, when, except in case of firing, workmen shall remain on duty until relieved by the night shift.

Machine men must in no event use any gelignite that is not thoroughly thawed, and the holes shall be charged and fired as speedily as possible before it has time to freeze.

Any employee who absents himself from work without permission from the office or from the foreman will be discharged.

The machine man shall notify the hoist man at least two hours before he will be ready to fire, and the hoist man shall see that a sufficient quantity of powder is thawed by that time.

Unused sticks of powder or portions of sticks must not be left in the shaft-house or hoist-house, but must be taken back to the thawing-house.

Muckers must look for unused powder in the muck and give same to the foreman or shift boss, who shall put it in a place of safety.

**Ardoch.**—Work has been in active operation since September 14th, under the management of Mr. Geo. R. Rogers. A sample of fifty-five tons of ore has been mined from nine different veins on the property, including the 100-foot level, and run through the company's ten-stamp mill. The values recovered were satisfactory.

## GENERAL MINING NEWS.

### NOVA SCOTIA.

**Halifax.**—Sensational reports, that lack confirmation, are being circulated concerning the discovery under romantic circumstances of rich silver veins. Credence cannot be given this story until full details have been secured.

Dr. Hugo Von Hagen, who is the originator of two bogus coal companies, one supposed to be operating on a large scale at Maccan, and one in New Brunswick, has chosen a name for the latter company that conflicts with an honest operating company. Von Hagen's Maccan property produces, we are informed, about 20 tons of coal per day. In spite of this his company has been paying dividends since August. He is pure fakir.

The output of the Dominion Coal Company for 1908 exceed 3,519,000 tons. This is an increase over 1907. The other coal mines of Nova Scotia will show good increases.

### ONTARIO.

**Miller Lake.**—Native silver has been found on the White claim of Miller Lake Syndicate.

**Cobalt.**—H. P. Davis has organized a syndicate to work the Flynn property on Cross Lake, upon which native silver has recently been found.

The Cobalt Lake Mining Company has on hand, sacked and ready for shipment, three carloads of cobalt ore, two carloads of niccolite ore, and one carload of fair grade silver ore in the ore-house ready for cobbing.

The frame of the O'Brien concentrator will soon be erected.

The Coniagas mill has 20 stamps dropping.

Returns have been received from the two cars of ore shipped a fortnight ago by the Buffalo Company to the Copper Cliff smelter. One of the cars contained concentrates from the com-

pany's own mills, and ran over a thousand ounces to the ton. The car of ore netted 5,000 ounces to the ton, representing a value of \$70,000. This is one of the most remunerative shipments made out of the camp in some time.

A ton of rich ore is being bagged daily from a six-inch vein of smaltite, niccolite and discrasite on the 75-foot level of No. 3 shaft of the Right of Way mine. Silver leaf in places nearly a quarter of an inch thick is also found in this vein also. Another vein three inches in width has been located on these workings, and also shows high-grade ore. A cross-cut will soon be started north in the direction of the Princess vein, which also heads towards the Right of Way.

Work is being prosecuted at the University mine, and by spring regular shipments will doubtless be resumed. A dozen men are now at work on this property, and the shaft on No. 4 vein is now down about fifty feet. It will be continued to a depth of one hundred or one hundred and fifty feet before drifting will be done. This is a narrow vein, having a surface width of between one and two inches, but the ore shows up all the way down. This vein is so promising that Mr. Watson is having a new ore house erected and a good-sized head frame built. With depth the vein may be expected to widen.

The Crown Reserve has contracted with the Denver Smelter to supply 100 tons of ore a month for January and February. This will yield the company about \$200,000.

#### BRITISH COLUMBIA.

**Kaslo.**—After an expenditure of about \$250,000 on the Bluebell property, under the supervision of Mr. S. S. Fowler, is working successfully. The zinc concentrating plant is running. Since July lead concentrates to the amount of 2,000 tons have been shipped to the Trail smelter. Zinc concentrates will now be turned out regularly. French capital is behind the Bluebell.

**Nelson, Dec. 19.**—During the past week the most striking feature in mining circles in south-eastern British Columbia was the semi-official announcement by the Canada Zinc Company, Limited, of the successful operation of their electrical reduction plant at this city, with many interesting details.

The 14th gold brick turned out by the Kootenay Bell mine in the Sheep Creek section since last June, was brought here during the week. The brick weighed 84 ounces and was valued at \$1,500.

A shipment of 313 tons of ore was sent from the Silver King mine at Nelson to the Trail smelter during the week.

The total shipments from the district to date now exceed 1,825,000 tons.

**Phoenix.**—H. Gardner, of London, England, one of the largest shareholders in the Granby Company, was a visitor recently, being shown through the mines by Manager A. B. W. Hodges.

Mr. Gardner is in charge of the London office of the American Metal Company, which handles a large amount of Granby copper, Jacob Langeloth being president of both it and the company.

## MINING NEWS OF THE WORLD.

#### FRANCE.

The co-operative colliery, "Mine aux Mineurs," near St. Etienne, which has been worked for some years by the syndicate of miners of the Loire district, has gone into liquidation, no funds being available to meet liabilities or pay current wages.

#### RUSSIA.

On January 1st the term for duty-free entry of machinery for the gold mines expired. The mining interests are anxious for a prolongation of the term, but it is considered probable that a duty will be imposed.

A great deal of foreign capital is being invested in mining in Siberia. In the Ushka-Menogov districts English interests representing a capital of £1,000,000 have acquired extensive gold properties, and the English Yenissei Copper Co. is conducting operations on a large scale. The question of the influx of foreign capital into the Urals is exciting considerable discussion in the Russian press.

#### GERMANY.

At the general meeting of the Verein für die Bergbauliche Interessen, at Dortmund, it was decided to abandon the projected jubilee festivities owing to the Rodbach colliery disaster, and to devote 100,000 marks to a fund for relieving distress due to mining accidents, and a further sum of 400,000 marks to place on a proper footing the existing fund for granting pensions to technical officials in mines and their widows and orphans.

The Mansfeld Copper Co. will shut down work at the Martin shaft, Kreisfeld, as the rich vein of ore that has been worked for 70 years has become exhausted.

#### CHINA.

There is considerable activity in connection with the opening of coal mines in Southern China, especially in the Fa Yuen dis-

trict, not far from Canton. It is believed that there are great mineral resources in Kwang Fung Province, and strong appeals are being made to the authorities for permission to develop them. The Government of Kwangsi has appointed a special commissioner to visit the United States and study American mining methods.

#### SOUTH AFRICA.

During the last eighteen months or so the tendency to erect more tube mills and put in heavier stamps at the Rand mines has become more marked. At the beginning of 1908 there were 72 tube mills at work, and the stamp duty was 5.8 tons per day. Over 100 tube mills are now running, and the stamp duty in September was 6.4 tons. Some of the heaviest stamps are: Cinderella Deep, Jupiter, and Knight Central, 1,700 lbs. each; Simmer Deep, 1,670 lbs.; Bantjes Consolidated, Geduld Proprietary, and Vogelstruis Cons. Deep, 1,650 lbs each. The installation of even heavier stamps is contemplated.

The South African Option Syndicate has located four new diamond areas in the Bembesi district of an aggregate extent of 13 square miles.

#### UNITED STATES.

Asbestos has been found on the property of the Union Copper Mining and Development Co., in Northern Wyoming, 28 miles west of Sheridan. It is of a good quality, shading from grey to white, and similar to that found in the copper mines of Nevada and Arizona.

The Secretary of the Interior has withdrawn from entry, selection, and location all public lands in Wyoming, Idaho, and Utah believed to contain phosphate rock, pending action by Congress. The list of lands withdrawn was furnished by the Geological Survey as the result of preliminary examination of the field.

The International Smelting and Refining Co., capitalized at \$50,000,000, has been incorporated in New Jersey by Messrs. Frederic Hoff, Richard C. Hunt, and Nelson W. Runnion, of New York, in opposition to the American Smelting and Refining Co.

The actual manufacture of steel at Gary, Ind., was begun on December 21st, when blast furnace No. 12 was blown in. It is estimated that when the mills are in full operation 25,000 men will be employed.

Prof. Wm. Griffiths, a mining expert, of Scranton, Pa., estimates that at the present rate of consumption the coal supply of the Pennsylvania coal fields will be exhausted in 84 years.

**MEXICO.**

The Guanajuata-Jalisco Development Co., organized in New York by Mr. Dwight Furness, with \$4,000,000 capital, has undertaken the development of six groups of mines in Guanajuata and Jalisco covering nearly 1,000 acres. Plants costing \$350,000 have already been installed.

The 300-tons copper-matting plant of the Rio Tinto Company, Chihuahua, has been started, and will handle custom ores of Northern Mexico.

Arrangements have been made for the resumption of work at the iron smelting and machine works, Durango, American capital having been invested.

**COMPANY NOTES.**

**GRANBY CONSOLIDATED.**

The Granby Consolidated Mining, Smelting and Power Co.'s dividend of \$2 per share, payable Dec. 15, will bring the aggregate dividends to \$3,510,000 since the first return to shareholders was made in December, 1902, two years after the organization of the company.

At a meeting of the bondholders of the Dominion Copper Co., on Nov. 30, the National Trust Co. made a report, in which the assets of the company were enumerated. The receiver's statement of liabilities showed that in addition to the bonded indebtedness of \$800,000 and accrued interest there are outstanding claims against the company amounting to about \$75,000, inclusive of the payrolls for the miners for August and September, which aggregated \$20,000.

Pending the sale, the receiver has been authorized by the

court to borrow \$20,000, for the purpose of defraying the expenses of the receivership. The principal item is the cost of power and labor in keeping the mines pumped out and for watchmen at the smelter and other properties of the company. The receiver estimates that his expenses will aggregate \$4,000 per month.

There will be a meeting of directors of the Dominion Iron and Steel Company in Montreal on December 29.

The Nova Scotia Steel Co. has declared a quarterly dividend of 2 per cent. on the preferred stock, payable January 15.

The statement was made at the special meeting of the Dominion Copper Company that the Granby Consolidated had recently made a bid of \$300,000 for the entire holdings of the corporation of the Dominion Copper Co., including its furnaces and smelting outfit.

**STATISTICS AND RETURNS.**

**COBALT ORE SHIPMENTS.**

Following are the weekly shipments from Cobalt camp, and those from Jan. 1 to date:—

	Week end.	
	Dec. 12.	Since Jan. 1.
	Ore in lbs.	Ore in lbs.
Crown Reserve .....	57,000	1,123,688
Chambers-Ferland. ....	60,000	503,890
Drummond. ....	40,000	1,331,520
La Rose .....	151,100	8,793,470
McKinley-Darragh. ....	41,340	3,322,810
Nipissing. ....	202,562	8,790,502
O'Brien. ....	127,837	6,782,718
Right of Way .....	185,480	1,486,250
Silver Queen .....	127,000	1,826,390
Silver Cliff .....	120,000	318,100
Temiskaming. ....	60,000	1,234,980
Trethewey. ....	65,000	400,670
T. & H. B. ....	120,000	2,433,660

The total shipments for the week were 1,357,319 pounds, or 678 tons.

**COBALT ORE SHIPMENTS.**

Following are the weekly shipments from Cobalt camp, and those from Jan. 1 to date:—

	Week end.	
	Dec. 12.	Since Jan. 1.
	Ore in lbs.	Ore in lbs.
Buffalo. ....	54,980	1,071,930
Coniagas. ....	.....	2,320,288

Cobalt Lake .....	.....	404,623
Crown Reserve .....	120,000	1,243,688
Cobalt Central .....	.....	527,935
Chambers-Ferland. ....	.....	503,890
City of Cobalt .....	60,000	1,513,140
Drummond. ....	.....	1,331,520
Foster. ....	.....	437,300
Kerr Lake .....	.....	1,152,794
King Edward. ....	.....	127,240
La Rose .....	195,000	8,988,470
McKinley-Darragh. ....	115,800	3,438,610
Nipissing. ....	130,760	3,921,262
Nova Scotia .....	.....	487,675
Little Nipissing .....	.....	40,110
Nancy Helen .....	.....	408,977
Peterson Lake .....	.....	41,237
O'Brien. ....	.....	6,782,718
Right of Way .....	62,100	1,548,350
Provincial. ....	.....	143,210
Silver Leaf .....	.....	372,900
Silver Queen .....	67,000	1,903,390
Silver Cliff .....	44,000	362,100
Temiskaming .....	60,000	1,294,980
Trethewey. ....	131,000	531,670
T. & H. B. ....	.....	2,433,660
Watts. ....	.....	561,680

The total shipments for the week were 1,040,640 pounds, or 520 tons. Total shipments from Jan. 1 to date are 45,585,030 pounds, or 22,792 tons. The total shipments for the year 1907 were 28,081,010 pounds, or 14,040 tons.

**B. C. ORE SHIPMENTS.**

The following are the ore shipments for the week ending Dec. 19 and year to date in tons:—

<b>Boundary Shipments.</b>		
Total . . . . .	34,758	1,406,199
<b>Rossland Shipments.</b>		
Total . . . . .	5,440	287,489
<b>Slocan-Kootenay Shipments.</b>		
Total . . . . .	3,561	131,895
The total shipments for the past week, 43,759 tons, and for the year to date, 1,825,673 tons.		
<b>Granby Smelter Receipts.</b>		
Grand Forks, B.C.		
Granby . . . . .	20,536	1,006,659
<b>B. C. Copper Co.'c Receipts.</b>		
Greenwood, B.C.		
Total . . . . .	11,805	343,372
<b>Consolidated Co.'s Receipts.</b>		
Trail, B.C.		
Total . . . . .	7,366	319,942
<b>Le Roi Smelter Receipts.</b>		
Northport, Wash.		
Total . . . . .	1,273	83,710

The total receipts at the various smelters for the past week were 40,980 tons and for the year to date 1,781,285 tons.

The output of the Crow's Nest Pass collieries for the week ending on December 11th was 18,214 tons, a daily average of 3,035 tons; week ending December 13, 1907, 24,536 tons, a daily average of 4,089 tons.

**B. C. COPPER COMPANY.**

The following sets forth the output, costs and net earnings of the B. C. Copper Company for the six months ending November 30th, 1908:—

1908.	Lbs. Fine Copper produced from B.C. Ores.	Net Profits.*
June . . . . .	891,032	.097c \$25,850
July . . . . .	1,038,944	.0812 49,934
August . . . . .	1,069,367	.0815 59,634
September . . . . .	829,282	.1057 23,933
October . . . . .	760,811	.1074 20,349
November . . . . .	958,438	47,000

5,547,874 lbs.

Profits from other sources . . . . . 5,900

\$232,609

\*Cost production per lb. laid down in New York—Average cost per lb. for 5 months .0932c. This average cost per lb. will be somewhat reduced by lower cost in November details not having been received.

As the billing prices of copper were below the prices at which settlements will be made, the net profits for the six months will be somewhat greater than here shown:—

Value at Time of Shipment.

Shipped.	Copper Value.	Silver Value.	Gold Value.	Total Value.	Percentage of Gold and Silver Value.
June . . . . .	\$88,339	\$3,813	\$27,986	\$120,156	26 per cent.
July . . . . .	135,899	5,592	46,398	187,859	28 per cent.
August . . . . .	173,153	6,878	62,237	242,278	29 per cent.
September . . . . .	115,609	4,274	39,823	159,706	28 per cent.
October . . . . .	98,328	3,745	37,635	139,718	30 per cent.
November . . . . .	134,535	4,871	48,972	188,378	29 per cent.

The company ceased operations at its mines and smelting plant November 26th, 1907, and resumed on June 1st, 1908.

The following are the figures of German consumption of foreign copper for the months of January and October, 1908:—

Imports of copper . . . . .	135,347 tons.
Exports of copper . . . . .	7,342 tons.

Consumption of copper . . . . . 128,005 tons.

as compared with consumption during the same period in 1907 of 96,395 tons. Of this quantity 124,408 tons were imported from the United States.—Reported by L. Vogelstein & Co., New York.

**DECREASED PRODUCTION IN 1907.**

The total production of gold and silver in the United States in 1907, according to figures published by the United States Geological Survey as the result of conference and adjustment between that bureau and the Bureau of the Mint, was valued at \$127,735,400.

The total production of gold for the year was 4,374,827 fine ounces, valued at \$90,435,700—a decrease, when compared with the production in 1906, of 190,506 fine ounces, worth \$3,939,100.

The production of silver in 1907 amounted to 56,514,700 fine ounces, with a commercial value of \$37,299,700. As compared with the production of 1906 this is a decrease in quantity of 3,200 fine ounces and in value of \$956,700.

**SILVER PRICES.**

	New York. cents.	London. pence.
December 9 . . . . .	49	22 5-8
December 10 . . . . .	49 1-4	22 3-4
December 11 . . . . .	48 5-8	22 7-16
December 12 . . . . .	48 3-4	22 1-2
December 14 . . . . .	48 3-4	22 1-2
December 15 . . . . .	48 3-4	22 1-2
December 16 . . . . .	48 3-4	22 5-16
December 17 . . . . .	48 3-8	22 5-16
December 18 . . . . .	48 1-4	22 1-4
December 19 . . . . .	48 1-2	22 3-8
December 21 . . . . .	48 5-8	22 7-16
December 22 . . . . .	48 1-2	22 3-8
December 23 . . . . .	48 3-8	22 1-2
December 24 . . . . .	49 3-8	22 3-4

**MARKET REPORTS.**

December 23:

Connellsville coke, f.o.b., ovens:—  
Furnace coke, prompt, \$1.80 to \$1.90.  
Foundry coke, prompt, \$2.15.

**Metals.**

December 23:

Tin, Straits, 29.25 cents.  
Copper, prime Lake, 14.37½ cents to 14.50.  
Lake arsenical brands, 14.37½ cents to 14.50.  
Electrolytic copper, 14.12½ cents.  
Copper wire, 15.75 cents.  
Lead, 4.20 cents.  
Spelter, 5.12½ cents.  
Sheet zinc, 7.50 cents.  
Antimony, Cookson's, 8.12½ cents.  
Aluminium, 24 cents.  
Nickel, 40 to 47 cents.  
Platinum, \$22.50 to \$23.50 per ounce.  
Bismuth, \$1.75 per pound.  
Quicksilver, \$45.00 per 75 lb. flask.