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CIRCULATION.

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PORCUPINE TO-DAY.

The astonishing recovery of Porcupine from the effects of the fire is stirring proof of the vigour and elasticity of our mining population. It is hard to conceive of any other class of people going so resolutely about the task of rehabilitation.

The public response to the request for assistance was prompt, and, in effect, adequate. There may have been incidental misunderstandings in the administration of relief, but there has certainly been no ground for grave criticism. The various committees gave their services voluntarily and without stint.

Particularly to be commended was the attitude of the Temiskaming and Northern Ontario Railway Commission. Disregarding everything but the relief of suffering and the immediate needs of the homeless, the commission worked valiantly. The value of its efforts may be best estimated when one attempts to picture what might have happened had there been no rail connection between Kelso and Porcupine Lake. It is not too much to say that the commission has brought credit to itself and to the nation. Whatever criticisms it may receive in the future, and no public corporation can hope to escape criticism, the historic incidents of the days that followed the fire will always stand out. Although much of the commission's property and supplies was destroyed, yet no thought was taken of this. The duty of the hour was faced.

As an example of what organization and well-applied wealth may do, we may cite the case of the Dome Mining Company, the chief loser in the disaster. Within an incredibly short time after the fire, a private car was hurried to the scene. Then, under the direction of Mr. Ambrose Monell, the whole situation was canvassed. After the first necessary steps towards ameliorating local hardships, the plan of campaign was outlined and actually begun. The decision was reached to erect a fire-proof group of buildings for residences, in a carefully chosen plot of ground. It was decided further to make all the plant buildings fire-proof throughout. Not a fortnight had elapsed when the company had 250 men again at work, with an ample commissariat organized. Feeding, sheltering, and directing this number of men is no mean accomplishment. The result, it is hoped, will be that a new mill will stand complete before winter has set in.

* * * * *

It were impossible to recite a tithe of the genuine acts of bravery that have been brought to our own notice. And it may be noted here that the real heroes are going quietly about their business, whilst several advertised individuals will scarcely receive a warm wel-

come in camp. Above all petty incidents, however, emerges the fact that the race has not degenerated. Men are still men.

* * * * *

Soon all physical traces of fire, save sundry square miles of scorched timber, will have been obliterated. Golden City, Pottsville, and South Porcupine will resume their normal aspects. Town lots are selling rapidly in the first and last named places, and the newly selected Timmins townsite is the scene of a real estate boom.

We believe that the new townsite will be laid out with due regard to sanitation. Unless, however, something is done very rapidly there will be a catastrophic outbreak of typhoid at Golden City and at South Porcupine. The state of affairs at the former settlement is exceedingly bad. There appears to be only indifference on the part of those officially responsible. Whereas the fire cost four-score lives, an epidemic of typhoid would take its toll of hundreds. Concerted effort on the part of the citizens themselves is now essential. With the aid of the Government, it is not too late to meet the situation. It will be shameful if the lesson learned in Cobalt be forgotten.

* * * * *

Rail connection has wrought vast change in Porcupine. Construction of plants is, of course, immeasurably facilitated. Living is made easier. The best of provender is obtainable. In fact, Porcupine is a full-bloom mining camp, with its hotels, restaurants, amusement halls, and most of the other perquisites that appertain to life under such conditions.

* * * * *

Not to be overlooked in any survey of Porcupine is the high standard of the men that are in charge of the mines. This is a direct inheritance from Cobalt. The "four-flusher," an unmitigated evil, became unpopular through Cobalt experience. He is not much in evidence in Porcupine. Cobalt has seen to that.

In the main, the sound engineers are successful in restraining their employers from early extravagance. It is gratifying to observe that the passion for mill-buildings and plant is being curbed. A wise balancing of mine and equipment will be thus attained.

* * * * *

Two favourite themes of discussion in Porcupine itself are the sins of the T. & N. O. Railway Commission and the vagaries of the Bewick-Moreing people.

As to the former, it is only necessary to state that the commission is fallible. It has, nevertheless, lived up to its promise. Its lines are fearfully and wonderfully congested with freight that cannot be handled by the consignees. Possibly 500 cars await unloading. We may add that but few strictures come from responsible sources. The incidental discomfort of sitting all night on a station platform is exasperating. But one can survive even that.

For the Bewick-Moreing concern we have little to say that is good. Their market manipulations have been cheap and undignified. Their mining methods and their mining men are of a high order of excellence. Why the firm cares to descend to the level of a broker's tout is hard to understand. They have sown the wind; of a surety they will reap the whirlwind.

At least 150 people arrive in Golden City daily. The influx is growing larger. Difficulties are arising in accommodating the newcomers. With a settlement and mine population that may now amount to six or seven thousand, and that is growing every hour, the railway and the hotels are being taxed heavily. It is to be hoped that both will be able to cope with the situation.

* * * * *

Considerable attention is being diverted to the Swastika region. The traffic at that getting-off place is large. Yet there is no station building at Swastika. This omission, for which there is no valid excuse, must be remedied at once.

* * * * *

To refer to the mines themselves, there is no particularly noticeable change. Three spectacular surface discoveries have been made. Actual mining progress is slow, and will be slow, until such time as the principal plants have been rebuilt. Considered generally, the number of *bona fide* mines will probably be larger than was thought a year ago, although substantial production of gold has been deferred.

In forecasting the future of Porcupine it must not be forgotten that the district as a whole must write off a large debt of expenditure. The railway from Kelso is a debit item, as are all outlays on prospecting, on fees, on roadbuilding, on mining, and on travelling expenses. If this chastening thought be kept in mind, it will temper the soulful enthusiasm of those who compare Porcupine with the Rand.

* * * * *

In a forthcoming special issue, to be published within a few weeks, the *Canadian Mining Journal* will report in detail the leading physical facts of the camp. The purpose of this editorial is entirely general.

GETTING DOWN TO CASES.

On another page will be found a letter from Mr. W. W. Cory, Deputy Minister of the Interior. In that letter reference is made to an editorial entitled "A Modern Instance," that appeared in our issue of June 15, 1911. Mr. Cory, we fear, has mistaken our point, and certainly has not attempted to meet our criticism.

To set forth the whole matter clearly, let us quote first from the editorial in question. Our own words were as follows:—

"Two men made application for a coal mining location in the west, covering 5,160 acres. All the requirements of the regulations were fulfilled as regards staking, making proper application, and making

“ the necessary deposits of \$5 each. The stakers had
 “ then thirty days from the date of staking wherein to
 “ put in their application. After that application had
 “ been considered favourably by the Department at
 “ Ottawa, a process covering two months, they were
 “ given another thirty days in which to make payment
 “ of the annual rental of \$1 per acre, a total of \$5,160.”

To these remarks, Mr. Cory takes exception thus:—
 “ I enclose herewith for your information a copy of
 “ the Coal Mining Regulations, which have been in force
 “ since the 25th day of May, 1910, from section 16, of
 “ which you will see that payment of the rental must
 “ be made to the Agent of Dominion Lands within thirty
 “ days from the date of the receipt of his application
 “ in the office of such agent.”

Section 16 reads as follows:—

“ If the application is granted, the locator shall be
 “ notified in writing, and he shall be given a period
 “ of thirty days from the date of the receipt of his
 “ application within which to pay to the Agent of
 “ Dominion Lands the full amount of the rental for the
 “ first year of the term of the lease, at the rate of one
 “ dollar (\$1) per acre, and upon the receipt of such
 “ rental the lease shall be issued and shall bear date
 “ from the day upon which the application was granted.
 “ If the rental is not paid within the time specified, the
 “ application shall absolutely lapse, and the rights ap-
 “ plied for shall become available for other disposition.”

The first clause of section 16 is the keynote of the matter. But before making further comment let us give the authentic history of the instance on which our former editorial was based.

Near Brule Lake, in the vicinity of the Yellowhead Pass, two coal claims were staked last spring. The stakers were Messrs. Scovil and Bartholomew. The annual rental for their leases was payable on May 3rd. Payment was not made. Information to this effect reached the ears of an investor who was anxious to secure the territory. The investor's representative called upon the Dominion Land Agent at Edmonton, and from that official obtained confirmation of the fact that the rental had not been paid. He therefore hurried to the ground, with the intention of staking. Arriving there on May 4 he found, in addition to the original stakings, stakings dated in April in the name of a third person, and more recent stakings dated May 4, one day after the date on which payment of rentals was obligatory. The latter stakings were in the names of Messrs. Scovil and Bartholomew, and, of course, were valid, despite the fact that they may have been made at any date before the old lease ran out.

We repeat, therefore, that this process of restaking might easily go on indefinitely. According to the regulations the applicant is allowed 30 days in which to file his application after staking. After the application is filed, it is often a matter of months before the department decides to grant the lease. The applicant then has another 30 days in which to make payment of the

rental of \$1 per acre. If he is not able to pay, he can immediately restake.

We believe that this is a fair and full statement of the case. We shall leave it to our readers to judge how far Mr. Cory's strictures are justified.

THE UNDEVELOPED IRON RESOURCES OF CANADA.

Despite political vagaries, it may be believed that Canada's iron and steel industries have passed through the dangers and diseases of infancy. Amongst the world's producers of pig iron Canada ranks eighth, exceeding Sweden by a relatively large amount. Whilst, however, the production of pig iron is about 700,000 tons, it is not pleasant to note that the domestic output of iron ore hardly exceeds 250,000 tons, or roughly, about one-sixth of the quantity required to account for the pig iron produced. This measure of dependence upon foreign sources of supply is humiliating. Assuredly, we are lacking in enterprise or in acumen, or in both, when our attempts to exploit our mineral possibilities are so feeble.

As pointed out by Mr. A. B. Willmott, in a paper read before the Canadian Mining Institute, no official estimate of available iron ore in Canada has ever been made. No doubt the making of such an estimate would be extremely difficult. Yet it should be done without delay. One estimate, made by a member of the United States Conservation Commission, places the figure at less than fifty million tons. This is supposed to cover known ore. It can be but a small fraction of ore that can be almost as readily won. At best, it is the roughest kind of guess, and is significant only in so far as it shows the small amount of prospecting and development done.

What Sweden has accomplished, with opportunities not to be compared with Canada's, is alluded to in Mr. Willmott's paper. No country deserves more credit than Sweden for making bricks without straw. In face of most discouraging conditions, that small country has built up an industry that is almost as large, and, presumably, is much healthier than is the industry that we have artificially nourished.

HUNTING FOR MINES.

The much-quoted statement of Mr. S. J. Jennings, vice-president of the United States Smelting Company, to the effect that during the year 1910 that corporation rejected 514 mining properties, calls for comment. The additional facts that preliminary examination alone was made in 124 cases, that further work was done on 46, and that only two properties finally met the requirements of the company, require elucidation.

It can readily be understood that a corporation as large and powerful as is the United States Smelting Company knows definitely what it wants. Many limit-

ing conditions can be set and, as a matter of fact, are set, by such a purchaser. The possible scale on which any given mine, prospects are very rarely touched, is already developed, and the future promise that it holds, are deciding factors. Neither raw outcrops, nor small mines are wanted. The relation of the mine to transportation, to smelters, and to markets is also a vital consideration.

In short, companies like the United States Smelting Company are interested only in large mineral deposits that are developed sufficiently and are so circumstanced as to warrant investment.

Hence, it is beside the point to accept Vice-President Jennings' announcement as meaning anything more than that his company purchased only two mines in more than 500 mines and prospects. Of that large number, doubtless many are saleable. That they were not wanted by the company in question need not imply that they are worthless.

THE REPORT OF THE COMMISSION OF CONSERVATION.

A voluminous report has just been issued by the Canadian Commission of Conservation. The volume contains 519 pages. It is divided into three sections, the respective captions being "Lands," "Fisheries and Game," and "Minerals." In the last-mentioned section is presented a summary of Dominion and Provincial mining laws. This is followed by chapters on conservation and on mine accidents, and by statistical tables.

The diagrams and maps that illustrate the chapters on mining are excellent. Statistics are digested much more readily when graphically represented.

Much information is compressed into the pages dealing with conservation. Controversial points, we more or less regret to say, are avoided. The following quotations, referring to the Sudbury district, show the tone of the report:—

"It is not believed that the waste in mining is very great."

"This loss of sulphur, copper, and nickel seems unavoidable at present."

This is certainly an improvement on the statements for which the commission was criticized.

The chapter upon mine accidents evidences much careful preparation. It is informing and copious. We would suggest that it would have been well to include in the text a discussion of the methods of collecting statistics in various countries.

The report as a whole is most creditable.

THE FARMER FOLLOWS.

The solid basis upon which is builded the growth of Northern Ontario is well seen when the agricultural possibilities of the country are noted. Many thousands of acres have been cleared in the region that lies between Cobalt and Englehart. The quiet migration of farmers to this section has passed almost unnoticed in the larger stream of mining population. But the farmer is there, and is there to stay.

From our own observation, and from the reports of those more competent to judge in matters agricultural, it is certain that the soil is remarkably rich. Without question, the farmer of the north will wax fat and lusty. Doubtless he will have several large mining communities to supply with the necessaries of life. He must not fail, in the hour of his prosperity, to acknowledge the debt he owes to his mining brother.

Nor is it inappropriate to remind the public and the powers that be of the fact that prospecting and mining open the way for the best and strongest settlement of the soil.

WOLFRAMITE IN NEW BRUNSWICK.

In the last number of *Economic Geology* there is a brief note by Dr. T. L. Walker, describing a recent discovery of wolframite in the centre of the province of New Brunswick.

For long it has been known that certain quartz veins near the confluence of the Miramichi River and Burnt Hill Brook contain molybdenite. Last year Dr. Walker examined the veins, and found that in almost every one wolframite occurs. More detailed examination has convinced Dr. Walker that these deposits may prove of commercial value.

CORRESPONDENCE

INVIDIOUS COMPARISONS.

Editor Canadian Mining Journal.

Sir,—The importance of the Porcupine district, like that of past gold discoveries in Ontario, is in danger of being too grossly exaggerated. While it has been stated by men who are qualified to judge that there are a number of properties in Porcupine likely to make producing mines, and while we know that several properties may already be called mines, yet it must not be overlooked that prospecting work in other sections of the field has

failed to reveal discoveries of importance, and, consequently, interest in some cases has been transferred to other places.

One effect of over-advertising has been to alienate the English press. In addition to this, the market manipulations of the Bewick-Moreing people have done much harm. The 44,000 of the Hollinger shares that were acquired by the Northern Ontario Exploration Company, also 30,000 shares of the same concern that were held by a brokerage house in London, have been sold

to New York and Toronto buyers. The fact that these shares were not purchased by English investors is sufficient cause for alarm.

It is true that the company made a profit of something like \$350,000 out of the Hollinger transaction. This may be considered good business. But it is to be regretted that the profits came out of the pockets of unfortunate stock gamblers, and not out of the Hollinger mine.

It is believed by many that at the present stage of development the Hollinger mine does not warrant the price paid for these shares, namely, \$10 to \$15. This bears out the opinions expressed by mining men during the Hollinger boom, to the effect that the shares reached a high point, not because the mine warranted it, but because of clever manipulation, supported by strong organization.

If Porcupine is to hold the interest of English and Continental investors, there will have to be more systematic and vigorous development work, with less daily press twaddle.

The attention attracted by Porcupine has certainly exceeded that roused by Cobalt, even in the latter's palmiest days. But it must be realized that gold has a fascination that no other mineral or metal possesses. It must not be overlooked that Cobalt stands in a totally different position than Porcupine. To be guilty of a few guesses, I would say that there is to be written off against the future production of Porcupine \$1,000,000 spent in the construction of the railroad; \$2,000,000 in freight and machinery; \$50,000 in engineers' fees; \$2,000,000 in the recording and performance of two years' assessment work on claims staked in the Porcupine mining division; \$175,000 in the incorporation of companies, etc.; roughly, about \$5,000,000, not including large sums of money spent in advertising the camp. While these guesses may be wide of the mark, the total is probably less than the truth. It is scarcely reasonable to expect that Porcupine will prove an exception to all other mining fields of the world. It is inevitable that it must go through the stage of paying for experience. It will have to pay heavily to work out the proper methods for its development, and for the treatment of its ores. Those who are acquainted with the history of some of the important mines in America, Australia, and South Africa, can form some idea of the large amount of money lost through the adoption of wrong methods. This must be expected in opening up any new mining field. Not until a camp has gone through several stages of development can these mistakes be rectified.

Recently there have appeared in the daily papers statements to the effect that Porcupine as a mining camp has usurped the position held by Cobalt; also that it will prove equal or even better than the Rand. Let us examine the matter. The position of Cobalt to-day is unique in mining experience. During the year 1910 it produced nearly 11 per cent. of the world's supply of silver, valued at \$15,375,000, and there is every indication that during the present year the output will exceed this by fully 20 per cent.

When Porcupine is producing an annual yield of gold equivalent in value to the silver produced by Cobalt each year, there will be some justice in the comparison.

For the benefit of the readers of this journal who are not familiar with the Rand, I will attempt here briefly to convey some idea of its vastness.

Johannesburg is situated 1,014 miles north of Cape Town, and has an altitude of about 5,500 feet above the sea, which assures a cool, pleasant, and healthy climate.

Extensive artificial afforestation has made Johannesburg and its surroundings a place of beauty.

In July, 1886, a man named Struben first discovered gold in an outcropping of quartz, which is now known as the main reef leader. A quantity of the ore was sent to Kimberley to be assayed. When the results were known Kimberley mining men, such as Wernher, Beit & Co., Cecil Rhodes, and others, became interested. There was not the usual blare of trumpets. The daily papers did not display half-page advertisements telling the public of the richness of the field. It was done in that quiet manner characteristic of the true mining man.

The Rand series was found to consist chiefly of conglomerate shales and quartzites, resting on granite, and extending east and west. What may be described as one of the Rand's unique features is the fact that gold associated with pyrite is found in paying quantities in a series of conglomerate beds, extending over a great length and to an unknown depth. The trend of the producing zone on the Rand is almost due east and west, extending in a basin-like form for a distance of 62 miles. Over this distance the producing mines are spread. At a place called Klerksdorp, a little over 100 miles in an easterly direction from Johannesburg, the same deposit was found by boring. The deposit is carrying high values in gold, extending for 20 miles, and will be the means of creating another Johannesburg.

There are 72 producing mines on the Rand, with 9,836 stamps dropping, crushing on an average 2,000,000 tons of ore each month, producing nearly \$13,000,000 worth of gold.

During the year 1910 the value of the gold output of the Witwatersrand amounted to \$147,378,777.60.

One mine on the Witwatersrand has produced 4,801,075 tons of ore, which yielded \$72,016,125, or an average of \$15 to the ton, and has given its shareholders a handsome profit of about \$33,000,000. A mine with a record behind it such as this is one of the glories of the mining industry. Fifteen mines on the Rand have individually contributed roughly \$250,000,000 worth of gold to the world's supply.

Dividends declared for the half-year ending June 30, 1911, by companies operating on the Rand amounted to \$20,424,085.

These figures are for the Witwatersrand only and do not include mines operating in outside districts in the Transvaal.

It is not my intention for a moment to belittle Porcupine. What I wish to show is that it is exceedingly foolish to institute comparisons between Porcupine and the Rand. Porcupine is more promising than any gold camp that Canada has ever developed. But I fail to see what earthly good can come of making insane comparisons where there is no room for comparison at all.

Temperate talk will do more for Porcupine than will all the shouting in the world.

Yours etc.,

GEORGE R. ROGERS.

Toronto, August 9, 1911.

A REMONSTRANCE.

Ottawa, 8th August, 1911.

Editor Canadian Mining Journal.

Sir,—My attention has been called to your editorial in the issue of "The Canadian Mining Journal" dated the 15th of June last, entitled "A Modern Instance," in which you point out that an applicant for a coal mining lease was given a period of three months from the date upon which his application was filed with-

in which to pay the rental for the first year; that being unable to raise the money he restaked the tract immediately after the expiry of the period given; and that he thus succeeded in postponing payment of the rental for another three months.

I enclose herewith for your information a copy of the Coal Mining Regulations, which have been in force since the 25th day of May, 1910, from section 16 of which you will see that payment of the rental must be made to the Agent of Dominion Lands within thirty days from the date of the receipt of his application in the office of such agent.

It seems manifestly unfair to criticize in so harsh a manner the regulations of this department without having some knowledge of their provisions.

Yours truly,

W. W. CORY,
Deputy Minister of the Interior.

Personal and General

Mr. W. K. McNeill, manager of the Canadian Laboratories, Ltd., has been placed in charge of the Ontario mineral exhibit at the Canadian National Exhibition. Mr. McNeill has just returned from Cobalt, Swastika, and Porcupine, in which places he made arrangements with the principal mines for suitable samples. The mineral exhibit promises this year to be much larger than ever. The directors of the Canadian National Exhibition recognize the importance of giving the mining industry the prominence that it deserves. Considerably larger space has, therefore, been assigned to the Bureau of Mines.

Dr. W. Harvey Weed is in Porcupine.

Mr. Dwight E. Woodbridge was in Toronto on August 5.

Mr. W. F. Ferrier, Lumsden Building, Toronto, has returned to town.

Mr. R. B. Lamb has been retained as consulting engineer for the Pearl Lake Gold Mines Company.

Dr. James M. Bell, M.A., Ph.D., Harvard (formerly on the staff of the Canadian Geological Survey, and lately director of the Geological Survey of New Zealand), and Mr. Colin Fraser, B.Sc. (lately mining geologist on the staff of the Geological Survey of New Zealand), have opened an office as mining geologists at 621 Salisbury House, London-wall, E.C.

Dr. Malcolm Maclaren is making a geological examination of properties on the Porcupine Goldfield, Ontario.

Dr. James Douglas and Messrs. W. R. Ingalls, J. Parke Channing, J. R. Finlay, and John Hays Hammond have been appointed consulting engineers in the United States Bureau of Mines, and will be constituted a committee within the bureau to continue the development of rules and regulations for the promotion of safety in metal mining, upon which they have been engaged heretofore as a committee appointed by the American Mining Congress.

Mr. G. G. S. Lindsey gave a luncheon on Saturday, August 5, at the National Club, Toronto, in honour of Mr. Hugh Marriott and Mr. Louis Reyersbach. Amongst those present were Dr. W. G. Miller, Mr. Dwight Woodbridge, Mr. A. B. Willmott, Mr. W. E. H. Carter, Mr. R. B. Lamb, Mr. W. Stanley Leckie, Mr. Eugene Coste, and Mr. J. C. Murray.

Mr. A. J. McNab, of Trail, B.C., superintendent of the smelting works of the Consolidated Mining and

Smelting Company of Canada, Ltd., was in Nevada at the end of July.

Mr. Andrew Laidlaw, of Spokane, Washington, who is largely interested in coal properties in Alberta and British Columbia, recently went to Duluth, Minnesota, in connection with the prospective sale of valuable coal lands situated in the former province.

Mr. Thomas W. Lawson, of Boston, Mass., was a recent visitor to Portland, Seattle, Vancouver, and other Pacific coast cities. He returned east by the Canadian Pacific Railway, stopping en route at some of the favourite holiday resorts in the Rocky Mountains.

Mr. Donald G. Forbes, who some years ago was general manager of several companies working mines in the Lardeau district of British Columbia, recently returned to that province after an absence of about a year in England. He purposes shortly proceeding to Australia.

Dr. Alfred W. G. Wilson, of the Mines Branch of the Canadian Department of Mines, is in British Columbia obtaining information relative to the copper mining industry of that province, from which comes more than two-thirds of the copper production of the Dominion.

Mr. D. C. Livingston, son of the late Mr. Clermont Livingston (who organized, and until the time of his death was general manager of, the Tye Copper Co., Ltd., operating mines and a copper smeltery in British Columbia), has been appointed associate professor in the mining engineering department of the University of Idaho, Moscow, Idaho. Professor Livingston took his B.Sc. degree at McGill University in 1906, since which year he has been engaged in mining in Mexico, latterly with the Moctezuma Copper Co.

Mr. Alexander Grant has voluntarily retired from the management of the Marble Bay gold-copper mine, at Van Anda, Texada Island, B.C., after having been in charge there for between 11 and 12 years. During several recent months Mr. Grant had been under a surgeon's care, but, notwithstanding that he has been restored to good health, he has decided to relinquish the responsible duties inseparable from the active management of an operating mine. The Marble Bay mine was formerly owned by Mr. J. J. Palmer, of Toronto; it is now the property of the Tacoma Steel Co., of Tacoma, Puget Sound, Washington.

Circular from the U. S. Bureau of Mines

Compiled By John L. Cochrane.

Washington, D.C.—With the rapid development of mine rescue work in the United States in the last two years and the increasing use of the mine-breathing apparatus, there has come to the Federal Bureau of Mines a demand for information concerning this apparatus and how it should be properly used. In response the Bureau of Mines has issued Miners' Circular No. 4, on "The Use and Care of Mine-Rescue Breathing Apparatus," by James W. Paul, who has general charge of the rescue work. Mr. Paul makes the statement that the use of such apparatus for rescue work in mines is no longer an experiment, but has become an important factor in lessening loss of life and property from fires and explosions.

The circular describes the various types of apparatus used by the bureau and gives careful instruction as to

the care this apparatus should receive when not in use. Then the author passes upon the qualifications of rescue men at the mines. Mr. Paul says: "Mine men 22 to 45 years old, in good physical condition, who are temperate in their habits and naturally calm and deliberate, are best suited for mine rescue work. Before a man undergoes training in the use of breathing apparatus he should be examined by a physician to ascertain his physical condition, especially the action of his heart and lungs, and any defects of the nose or throat. Unless a man has a physician's certificate stating that his physical condition is good, he should not be permitted to take rescue training nor to attempt rescue work in a mine.

"A rescue party should have not less than five, and better not less than six members. Only such persons should be allowed to join the party as have already been trained in the use of the apparatus and are equipped with rescue apparatus in good order, and have agreed to follow the directions of the leader, who must have full charge. While working in unbreathable gases within a mine the men should keep close to one another and not separate under any condition.

"To be efficient and successful a party must take every precaution for its own safety. If one person in a party faints or receives an injury, he becomes a burden instead of a help, for the entire party must at once conduct him to the surface or to fresh air. One or two stretchers should always be at hand.

"A relief station or base of operations should be established at the end of the good air and a relief crew with knapsacks should be stationed there ready to put on their apparatus and start at a moment's notice. A patrol of all brattice and doors leading up to the relief station should be maintained to protect the relief crew from harm.

"At each large mine there should be at least four crews, two outside and two inside crews, each of six men, including a captain and a lieutenant, and these crews should have practice once a week.

"While working in dense smoke the members of a crew should hold a rope which leads to fresh air.

"In case of total failure of an apparatus to supply breathable air, the wearer of the apparatus can throw away all parts but the oxygen cylinder, and breathe from the cylinder through his mouth while endeavouring to reach fresh air with the rest of the crew.

"Apparatus for giving oxygen to one who has been overcome with gases is an essential part of the equipment of a rescue party.

"A telephone helmet is a convenience for shaft work, and its presence lends much confidence to a rescue party. Electric lamps, safety lamps, gas-analysis apparatus, thermometers, a pocket compass, and a map of the mine are necessary parts of the equipment.

"At each training station a record should be kept showing the work done by the men and the difficulties encountered. A record of each apparatus should be kept also. If an apparatus fails to give proper service it should be subjected to the regular tests unless some injury is seen by inspection.

The United States Bureau of Mines has established a regular course of training in the use of mine-rescue breathing apparatus. This training is designed to give miners or other persons connected with mining a know-

ledge of breathing apparatus in general, and a confident familiarity with those types of apparatus that are most apt to be used in this country.

"The purpose of the Bureau of Mines in establishing this system of training is to facilitate investigative work within mines in which disasters have occurred, and to make mine owners and miners acquainted with the value of breathing apparatus for rescue operations after mine disasters. It is hoped that, as a result of this work by the Federal Government in the near future, men familiar with such apparatus will be scattered throughout the coal-mining centres of the country, and be available on short notice to assist in rescue operations. After a disaster, valuable time is often lost in training men at the mine before rescue parties can be organized. Furthermore, a man can not work efficiently unless he has thorough confidence in the apparatus. To give a man this confidence, the course of training has been planned in such a way that he must do work in poisonous or unbreathable gases for periods of one and two hours at a time."

Porcupine Gold

Mr. Reginald E. Hore, in a paper published by the Canadian Mining Institute, discusses the modes of occurrence of gold in several of the Porcupine quartz bodies. In the Dome mine quartz, Mr. Hore found one grain of quartz, 0.5 by 0.8 mm. in section, completely enclosing three very small isolated grains of gold. One area of pyrite, 0.5 mm. by 1.0 mm., enclosed several irregular patches of gold, most of which were less than 0.1 mm. in diameter. Four of the gold grains were completely within the pyrite; but a much greater number were found to be partly enclosed by the pyrite and partly by quartz. Gold grains were found also in calcite, completely or partly enclosed; and in spaces between grains of coarsely and finely crystalline quartz.

In discussing the origin of these deposits, Mr. Hore favours the view that Porcupine ore bodies owe their origin to the same agencies that produced the gold-bearing quartz of California. Some gold, he believes, was deposited simultaneously with the original quartz of the veins. The pyrite, in part at least, appears to have been deposited from the same hot solution that carried the quartz and gold. Unlike the gold and quartz, the pyrite occurs scattered through the wall rocks. In fact, it is more abundant in the walls than in the veins. The relation of the carbonates to the quartz is not always clear. It is evident, Mr. Hore states, that the ferrodolomite of the wall rocks is older than the quartz.

Geologically, the Californian deposits referred to are the result of the intrusion of a quartz-mica-diorite into metamorphic slate. This metamorphic series consists of highly compressed and folded sediments. Among the igneous intrusives are augite-porphyrite, diabase, and serpentine.

The production of talc and soapstone in the United States reached 150,716 short tons in 1910. This is an increase of 16 per cent. in quantity. Of the eleven producing States, New York led, with 71,710 tons., 69 per cent. of the talc was ground, and 21 per cent. was made into slabs and manufactured. The New York product is nearly all ground.

List of Excursions of The International Geological Congress, to be held in Canada in the Summer of 1913

"A" Excursions.

A 1.—Excursion to Maritime Provinces.

At St. John and neighbourhood to visit Cambrian section, etc., one day and a half. Leaders, Drs. G. F. Matthews and W. Parks. Salisbury to Hillsboro and Hopewell, visiting Albert mines area, gypsum deposits, etc., one day. At Joggins section, examining cliff by walking and boats, one day. Passing the Bras d'Or Lakes, etc., by daylight. A day and a half at Sydney, visiting industrial plant, carboniferous section, etc. (A visit might be made to Louisburg by those desiring to do so.) Stop at Waverley gold mine; balance of day and next at Halifax. Leader, E. R. Faribault. By ferry to fish beds, etc., one day. By steamer to Perce and Grand Greve, etc., on Gaspé coast, visiting the very striking faulted sections of Silurian and Devonian exposed there, and return to Dalhousie, four days. Leader, Dr. Clarke. One day at Quebec seeing the city and the sections exposed in the neighbourhood.

Alternative Branch Excursion for Palaeontologists.

Omitting Sydney and Halifax; one extra day at Joggins section. To Antigonish by regular train and to Arisaig and return by carriage, giving two clear days at Arisaig, or on the return journey to Truro a day might be spent at the Riverdale locality. Leader, J. B. Tyrrell.

A 2.—Excursion to the Haliburton-Bancroft Area.

Leave Montreal. Leave Millbridge, drive to Ormsby Junction (or St. Ola.) This drive affords an excellent section across the Grenville series, one day. Leave Ormsby Junction (or St. Ola), arrive Bancroft. Go to camp at Bancroft and spend the remainder of the day in seeing the Crystalline Limestones, Nepheline-Syenites, Sodalite, and Fundamental Gneiss in this vicinity, one day. Leave Bancroft; drive to Mud Creek, about seven miles; take special train on Irondale, Bancroft & Ottawa Railway, stopping at a number of points of interest, and in the evening reach Gooderham. Camp at Gooderham, one day. At Gooderham visit Maxwell's Crossing and various other points, where the origin of the Amphibolites can be studied, and also visit the Nepheline-Syenite occurrences and the Gabbro, with its differentiation into Iron Ore, one day. Drive to Bancroft and then on to Bronson's Landing; the remainder of the day to be spent in further examination of the Geology in the vicinity of Bancroft, one day. Leave Bronson's Landing by canoe, paddling to Craigmont, making stops at two or three interesting points en route, at which occurrences of certain rare varieties of Nepheline-Syenite are to be seen, one day. At Craigmont study the Nepheline-Syenite and Corundum occurrences, one day. Leave Craigmont, arrive Barry's Bay, stopping en route to visit some points of interest, one day.

A 3.—Sudbury-Cobalt-Porcupine Excursion.

The first two days at Sudbury will be spent in an examination of the mines and geology of the nickel-copper bearing area. The third day an excursion will be made from Sudbury to Moose Mountain, where the iron mine will be visited. The fourth day will be spent on the general geology of the pre-Cambrian; prob-

ably a visit will be made to the classic Huronian area of Lake Huron. Leaders, T. L. Walker, Dr. Barlow, Dr. Coleman.

Three days will be devoted to the geology of Temagami, where good contacts of the Huronian and the Keewatin are to be seen, and where there is a characteristic outcrop of Keewatin jaspilite. At Cobalt, one day will be spent in visiting the mines and characteristic outcrops of the pre-Cambrian series, which are to be seen in striking exposures.

The members will leave Cobalt in the evening and about a day will be spent in the Porcupine gold camp. Those wishing to proceed to Montreal to take part in short excursions will take the main line of the Canadian Pacific Railway at North Bay. Leaders at Temagami, Cobalt, and Porcupine, Messrs. Miller, Knight, and Burrows.

A 4.—Niagara-Iroquois Beach Excursion.

One and a half days at Niagara Falls and Gorge Road. One day at Hamilton, Silurian on Mountain and at quarries, Iroquois Beach, in city, and Burlington Heights. Leaders, Messrs. Tyrrell, McNairn, Jennings, and Willmott.

A 5.—Asbestos Excursion.

Spend day at Thetford and take north bound train, arriving East Broughton. See East Broughton occurrences and mines, and Black Lake. Spend this day on Asbestos and next day on Chrome. Leader, Dr. Denis.

A 6.—Morin Anorthosite Excursion.

Examine the Anorthosite in the vicinity of St. Marguerite. Leave St. Marguerite, arrive St. Jerome. Examine the Anorthosite occurrences at St. Jerome. Leave St. Jerome, arrive New Glasgow, visit the occurrence of Foliated Anorthosite as well as the Dark Gabbro, Crystalline Limestone, and the Anorthosite which occur in this locality.

A 7.—Excursion to the Monteregian Hills.

Visit Mount Royal, studying the Nepheline-Syenite, and Essexite Intrusions, as well as the Dykes and the Contact Metamorphism of the Intruded Limestones. Visit the Breccias at Outremont. Visit St. Helen's Island, one day. Study of Mount Johnson. Arrive St. Gregoire, drive to Mount Johnson. Study there this remarkably interesting Intrusive rock, showing two varieties of Essexite passing over into Pulaskite, as described by Dr. Adams, one day. Leader, Dr. Adams.

A 8.—Apatite and Mica Region Around Ottawa.

Visit crystalline limestone and Potsdam escarpment at Lachute, one day. Visit Eozoon locality at Papineauville. Visit Graphite deposits at Lake Donaldson, seven miles from Buckingham, and Apatite deposits near Poupore, ten miles from Buckingham, one day. Gatineau Valley trip. Visit Nellis mica mines, south of Cantley, and other points of interest in the vicinity, also Blackburn mine, one day. Leader, Mr. LeRoy.

A 9.—Kingston Mineralogical Excursion.

Leave Kingston, visit Sydenham mica mine, Frontenac lead mine, Apatite deposits, one day. Leave Kingston, visit Verona, McDonald feldspar mine, Glen-

dower iron mine, Richardson feldspar mine, one day. Leaders, Dr. Miller, Prof. Nicol.

A 10.—Excursion to the Drift Deposits of the District about Ottawa and Montreal (Including a Visit to Rigaud Mountain).

At various points in Montreal, study the terraces which surround Mt. Royal. Visit the Mile End quarries and the brickyards at Maisonneuve. Here excellent sections may be seen of the Boucher Clay overlain by the Leda Clay and the Saxicava Sand, the latter formations holding an abundance of fossils, one day. Arrive Ste. Anne de Bellevue. Visit the occurrences in the vicinity, and arrive Rigaud Mt. Visit the Devil's Garden and study the drift phenomenon in this vicinity, one day. Arrive Green's Creek, collect concretions in the clay. Drive to marine terraces and sands on the Quebec side of Ottawa River.

A 11.—The Ordovician of the District about Ottawa and Montreal.

Visit morning at Cap St. Martin and Mile End, and afternoon at Grenville. Night at Hawkesbury, Chazy fossils, one day. Exposures of Chazy to the west. Drive to Caledonia Springs, one day. Ottawa, Queen's Park, Aylmer, Calciferous, Hull, Trenton, Rockcliffe, Chazy, one day. Leaders, Messrs. Sowter, Billings and Narrowsay.

A 12.—Palaeontological Excursion (Western Ontario.)

Brantford to fossil localities on the Onondaga and Oriskany, south of Waterford. Evening at Thedford, one day. Fossils near Thedford and possibly Kettle Point. Evening to Guelph, one day. Fossils at Guelph, Galt, Hespeler, etc., one day. Leader, Mr. Stauffer.

"B" Excursions.

B 1.—Niagara Falls. Dr. Coleman.

B 2.—Glacial and Interglacial, Don Valley, Glacial and Interglacial, and Iroquois Beach, East Toronto and Scarboro' Heights. Leaders, Dr. Coleman, Walker, and other local geologists.

B 3.—Hamilton excursion.

B 4.—Forks of Credit. Leader, Dr. Parks.

B 5.—Moraine north of Toronto. Leaders, Dr. Coleman, Taylor.

B 6.—Muskoka excursion.

B 7.—Oil Fields excursion. Leader, Dr. Parks.

B 8.—Palaeontological excursion to Streetsville. Leader, Dr. Parks.

B 9.—Clay works around Toronto, Don, Milton, etc.

NOTE.—These excursions are left to the Local Committee to complete, they being empowered to arrange further excursions, to be reported to the Executive Committee.

"C" Excursions.

C 1.—C. P. R. Main Line to Vancouver.

Toronto to Sudbury. Nickel copper mines, geological excursion. Sudbury to Port Arthur. Stop en route at Loon Lake. Port Arthur to Kenora. (a) Lake of the Woods excursion. (b) Rainy Lake excursion. (c) Port Arthur excursion, No. 2. Port Arthur to Medicine Hat. Gas wells, coal mines 7 to 10 miles west of Medicine Hat, and Medicine Hat to Banff, coal mines, Bankhead, Anthracite, Canmore. Geological excursion. Banff to Laggan. Excursion to Lake Louise and Victoria Glacier. Laggan to Field. Yoho Valley and Mt. Stephen excursions. Field to Glacier excursions. Glacier to Siccamous, or Kamloops, or Nicola. Arrive Vancouver. Fifteen days.

C 2.—Toronto to Vancouver (via Crow's Nest).

Toronto to Medicine Hat. Visit gas wells, coal mines. Medicine Hat to Lethbridge. Coal mines, Geological excursion. Lethbridge to Coleman, coal mines. Geological excursion. Coleman to Fernie, coal mines. Fernie to Hosmer. Geological excursion. Fernie to Nelson, Moyie mines, geology. Trip on Kootenay Lake, Sheep Creek camp. Geological excursion (alternative with Rossland). Nelson to Rossland, mines, smelter. Geological excursion. Trail to Grand Forks, smelter. Geological excursion. Grand Forks to Eholt mines, at Phoenix and Deadwood. Geological excursion. Grand Forks to Hedley. Nickel Plate mine. Geological excursion. Hedley to Princeton and Tulameen, coal mine. Geological excursion. Diamond fields. Tulameen to Nicola, coal mines. Geological excursion. Nicola to Vancouver. Sixteen days. Leaders, Messrs. Brock, Camsell, Dowling, and LeRoy.

Alternative Route.

Tulameen to Keremeos. Keremeos to Penticton. Penticton to Okanagan Landing. Okanagan Landing to Vancouver; or Tulameen-Vancouver.

C 3.—Toronto to Vancouver, via C. P. R., C. N. R., G. T. R. and C. P. R.

Toronto to Edmonton. Excursions en route, Lake Agassiz, Lake Winnipegosis. Edmonton to Yellowhead Pass. Edmonton to Banff excursions. Banff to Glacier excursion. Glacier to Vancouver, fifteen days. Leaders, Messrs. McEvoy, Tyrrell, Dowling, and Coleman.

C 4.—Toronto to Edmonton (via Great Lakes.)

Stopping at fossil localities in Manitoba, Red Deer, Kicking Horse, with sub-excursions from Edmonton to Lake Athabasca.

C 5.—Excursion Lakes Erie and Huron.

It is proposed to conduct this excursion by means of a chartered steamer. Toronto to St. Catharines, to proceed to Port Colborne. Niagara Falls, one day. Morning at Falls, to Port Colborne, fossils near Port Colborne, or alternative, afternoon on glacial work, one day. Leave Port Colborne to make Pelee Island some time the next night. Physiographic features of Lake Erie shore during the day. Rondeau Park. Night on boat at Pelee Island, one day. Glacial striae and quarries, Pelee Island. Proceed to Amherstburg, quarries and Livingstone cut. Wampole Island, one day. Indians at Wampole Island. Sarnia. Port Frank light. Thedford, Hamilton fossils and Kettle Point, one day. Goderich, salt, one day. Manitowaning. Fossil Hill. Niagara and Clinton fossils, one day. Fossils near Manitowaning. Little Current. Trenton fossils and palaeozoic contacts, one day. Little Current to Parry Sound, via islands, one day. Parry Sound, Grenville, one day. Parry Sound to Collingwood, one day. Utica fossils at Collingwood, one day. Fourteen days.

C 6.—Cobalt-Sudbury Excursion as Before (to be repeated.)

C 7.—Alaska-Yukon Excursion.

This excursion would leave Vancouver after the three parties sent across the continent by different routes had all reached the coast.

The route would be from Vancouver to Skagway by steamer, Skagway to Whitehorse by rail, and Whitehorse to Dawson by river steamer. A short visit to the copper and iron deposits on Texada Island, and a trip up Portland Canal to Stewart. This canal or fiord cuts completely through the Coast Range and an opportunity would be afforded for studying the still unsettled question of fiord origin. The mineral de-

posits and glaciers of the Portland Canal District are also worth visiting.

From Skagway part of the Lewis River Valley is followed down to Whitehorse. The glacial features of the valley are very interesting.

The river trip from Whitehorse to Dawson down the great Yukon River offers many problems for discussion, among them those of peneplanation (the river passes through a typical one), the cause of the absence of glaciation north of the Rink Rapid, and the origin of the huge trough in which the river flows, often sunk for thousands of feet below the bordering uplands. Twenty-three days.

C 8.—Vancouver Island Excursion.

This excursion will occupy two or three days, and will include a visit to Victoria and an examination of the coal fields of Nanaimo.

Excursion to Fort McMurray or Athabasca Lake and Peace River.

The route of travel would be from Edmonton to Athabasca Landing. From Athabasca Landing down Athabasca River to Grand Rapids. From Grand Rapids to Fort McMurray. From Fort McMurray the excursionists, if deemed advisable, could be taken by steamer up down the Athabasca River to Athabasca Lake, and up Peace River to Vermilion Falls, also along Athabasca Lake and down Slave River to Slave River Rapids. (Thirteen days.) Economic interest in this trip centres largely in the area of Tar Sands along the Athabasca River. Sections of Cretaceous rocks, often continuous for miles, are exposed along the upper parts of both rivers, and flat-lying Devonian limestone in the lower parts.

OUR EUROPEAN LETTER

Spasmodic revival in Siberians — Rand settling down to an investment level — Giesecke mill — Life of the Rand — Report of Inspector of Scottish Mines — Overwinding appliances — Shaft-sinking by freezing.

(Exclusive correspondence to the CANADIAN MINING JOURNAL.)

London, July 30, 1911.

A spasmodic revival in Siberians emanating from Paris has been a feature of the half-year, but this movement has since subsided. Favourable developments have given a stimulus to the Barriers, otherwise base-metal stocks have been more or less neglected. Interest in Australians, too, has been practically dormant, apart from the Waihi collapse, and the same may be said of Mexican mining shares, though in the latter direction Paris has been a ready supporter.

Oil, as your correspondent has said, is equally idle, the public continuing apathetic and inside support being weak.

The gradual settling down of the Transvaal to a steady investment level is perhaps fully in accordance with the tremendous development that is taking place there. Reference has been made in these columns to the Giesecke mill which is doing such good work at the Geldenhuis Estate section of the Geldenhuis Deep. Experiments with the Bubola patent are also proceeding on the Stanhope area. This plant consists of a large tank, at the bottom of which the cyanide solution is let in by a pipe which is charged with positive electricity. A slight way up the tank is a grating, the use of which is to conduct the electricity over or through the entire mass of sands. At the top of the tank are two stirrers charged with negative electricity, and these work with a planetary motion. At the first test the boiler broke down before the experiment was completed, and work is delayed until the boiler is again passed for service by the Government Boiler Inspector. Triple tests were taken of the charge which averaged 3.5 dwts. (pennyweights) gold, and after a short period the residues were brought down to 0.6 dwt. Acceleration in recovery is one of the principal advantages claimed. The patent rights are owned by a small syndicate, and there have been dealings in the shares, which have a nominal value of \$5, at \$100 each. Some influential people have been purchasing shares between

\$50 and \$75. The results of the more extended experiments are being awaited with considerable interest. This is, of course, not the first time that electricity has been used in connection with cyanide, and on the Rand there have been applications of the principle several years ago.

Going back to the Giesecke mill it is stated by the manufacturers that the capital cost with a capacity equal to 50 to 60 stamps plus tube mills is about \$30,000. To this would have to be added cost of erection, motive power, etc. Roughly speaking, then, for \$50,000 a company would have a crushing plant, and to this would have to be added cost of cyanide equipment. C. O. Schmitt, in his paper on "Future Economies in Rand Reduction Plants," estimates the cost of additional reduction plants at \$1,000 per ton milled per day, including cyanide equipment. A plant capable of crushing and cyaniding 500 tons per day on the present style would therefore cost \$500,000. Rough figures like these—of course, cyanide plant cost must be added—give some indication of the value of the Giesecke mill and its possibilities, providing it is capable of doing what is claimed for it.

Dr. F. H. Hatch, speaking to the Institution of Civil Engineers in London on June 28th, detailed some calculations he had made to estimate the production of gold to be expected from the main reef series of the Rand, if worked down to a vertical depth of six thousand feet. He estimated that at the present time there remained \$5,230,000,000 of gold, which, on the basis of an average output of \$150,000,000 per annum, was equivalent to a life of 35 years — namely, down to a vertical depth of 6,000 feet. But if, at still greater depths, the banket should contain sufficient gold to yield a profit, after deducting the cost of working, they may rest assured that it would be worked. What, then, were the limiting factors? They were generally considered to be (1) the mechanical difficulty of raising the ore to the surface from such great depths, and (2) the effect of the temperature gradient.

With regard to the mechanical question, the electrical transmission of power applied to stage-winding had so modified the mining engineer's conception of the depth from which deep hoisting was practicable that it was now generally assumed that there were no mechanical difficulties that could not be overcome if

it paid to do so. For all practical purposes, the whole question turned solely on the gold content, and what that might be at a vertical depth of 7,000 or 8,000 feet no one could tell. This much, however, might be said: the geological structure of the country clearly indicated the continuance of the conglomerate or banket beds to still greater depths than even 7,000 or 8,000 feet before the bottom of the great synclinal basin of the Witwatersrand was reached; and beyond that point, the beds must still continue until they rose to form the southern lip of the basin known to exist beyond the Vaal River.

For some time past rumours have been reported here to be in circulation in Rand mining and engineering circles relative to defects which have developed in the battery of the City Deep. In this mill the ferro-concrete system was adopted, but the results cannot be claimed to be satisfactory, and the absence of elasticity is a great drawback. The ordinary type of mill, with wooden King posts, absorbs the impact of the heavy stamps upon the rock. The steel concrete King posts at the City Deep are reported to be giving considerable trouble. The whole plant has been reported upon by Mr. Templer, engineer of the Ferreira, and it is stated in circles usually well informed, that a considerable expenditure will have to be incurred in order to make the plant thoroughly serviceable. An amount of \$850,000 is spoken of, but, inasmuch as a 200-stamp mill — that is, the battery itself, and exclusive of tube mills and cyanide plant — could be erected for about \$425,000, it is presumed that this figure includes expenditure in providing additional stoping faces so that the 200 stamps can be properly supplied with ore.

Returning to home topics more particularly, there have been a great many discussions of the report for 1910 of the Inspector of Scottish Mines — more especially in connection with the winding accidents reported there. The number of shaft accidents seems to be on the increase, and the new Mines Bill takes cognizance of this fact by providing that a device shall be attached to each winding engine which shall prevent overwinding or overspeeding. Too often accidents, more or less serious, which may or may not have a fatal termination, are caused by a lapse on the part of the engineman. He may be seized with illness, he may forget to stop the engine at the proper moment, or he may start it running in the wrong direction with equally undesirable results.

Experience has clearly demonstrated the fact that some device must be provided, which will operate quickly and efficiently in an emergency. It must also be quite independent of the human factor, simple in construction, and mechanically perfect. Such an apparatus must, at the moment of need, shut off the steam and apply the brake without an undue strain on the engine. It must act promptly, and be free from complicated or delicate parts, which might fail when a strain is put upon them.

A controlling device which claims to fulfil these requirements has been placed upon the market by a Wigan iron company. It takes up a floor space of about 6 feet by 1 foot 6 inches, which permits of its being placed in any convenient location near the engine. Its employment renders unnecessary the use of detaching hooks, which have been found by mine managers to be unsatisfactory in the practical working of colliery winding gear. It will perform three distinct operations: (1) Prevent overspeeding of the en-

gine, (2) prevent overwinding, and (3) stop the engine if it is started working in the wrong direction. It can be adjusted to accomplish the two latter within about 2 feet of the regular working limit.

The principal part of the device consists of a substantial leading screw driven by a chain and sprockets from the main shaft of the winding engine. On this travels — one way or the other, according to the direction of the engine's rotation — a square block. Immediately above it is a notched bar controlled by a governor. It is kept raised above the block when the speed is normal, but lowered when the speed becomes excessive. When lowered the notched bar is carried along with the block and puts into action a trip attachment which turns off the steam at the main valve and applies the brake forthwith. At either end are notches cut successively lower, so that if the end of the wind be reached, even without the speed having exceeded the normal limit, the bar and trip action operate at once and prevent over-winding. In the same way a wrong start in either direction will be immediately checked and the cage stopped before damage is done. After the controller has acted it can be reset with a spanner. These controllers have been in use at important collieries in England and Wales for nearly two years.

The freezing process of shaft-sinking is comparatively new so far as this country is concerned, although a good deal of work has been done with it in Germany, that home of the scientific treatment of industrial methods. The object, of course, is to freeze wet ground so as to prevent or restrict the influx of water, to harden the ground so that much timbering becomes unnecessary, and to facilitate the erection of the lining. Some doubt has been expressed as to the depth to which freezing can be carried, because, as is well known, the melting point of ice falls as the pressure increases. J. Riemen has stated that at about 650 feet depth the ice becomes too plastic to withstand the pressure, but in a paper read before the North of England Institution of Mining and Mechanical Engineers, W. B. Wilson pointed out that at Easington in this country a depth of 615 feet had been attained without the ice showing any signs of plasticity, whilst at the Deutscher Kaiser Colliery in Germany a depth of no less than 1,366 had been frozen, and the ice was hard and brittle. The explanation which suggests itself is that a good deal depends upon the distance to which freezing is carried from the side of the shaft. The outer layers of ice will be exposed to the full earth pressure and may be plastic, but they will partly protect the inner ice at the shaft face, so that with a deeply frozen ground the face should be relieved of much of the pressure. In this connection it should be remembered that water expands on freezing, so that each outer layer of ice as it forms tends to hold the ground off from the inner frozen ground.

A NEW PROVINCIAL GOVERNMENT CHEMICAL LABORATORY IN MONTREAL.

With the object of encouraging and helping the development of the mineral resources of the Province of Quebec, the Honourable Mr. C. R. Devlin, Minister of Colonization, Mines and Fisheries, has concluded an arrangement with the corporation of the Polytechnic School of Laval University, whereby in future the chemical work of the Government will be done in the laboratories of this institution.

Prospectors and miners wishing to ascertain the value of ores and minerals can get assays, analyses and determinations of samples and specimens made at greatly reduced rates, and the well-equipped laboratories, as well as the staff of trained chemists, ensure prompt and reliable results.

Assays — for gold and silver — for copper — for iron, in specimens from the Province of Quebec, will be made for \$1 each. The tariff of analyses of other substances is equally low.

If the interested finder of a mineral wishes only for the determination of a specimen, a report, giving name of mineral, its composition and possible commercial value will be sent upon the receipt of a nominal fee of 25 cents.

Copies of the tariff of the analyses of the various substances, with instructions how to sample a mineral deposit in the field so as to obtain the most reliable results in the laboratory, can be obtained by applying to the Provincial Laboratory, Polytechnic School, 228 St. Denis Street, Montreal, or to the Superintendent of Mines, Parliament Buildings, Quebec.

Mining News from Quebec.

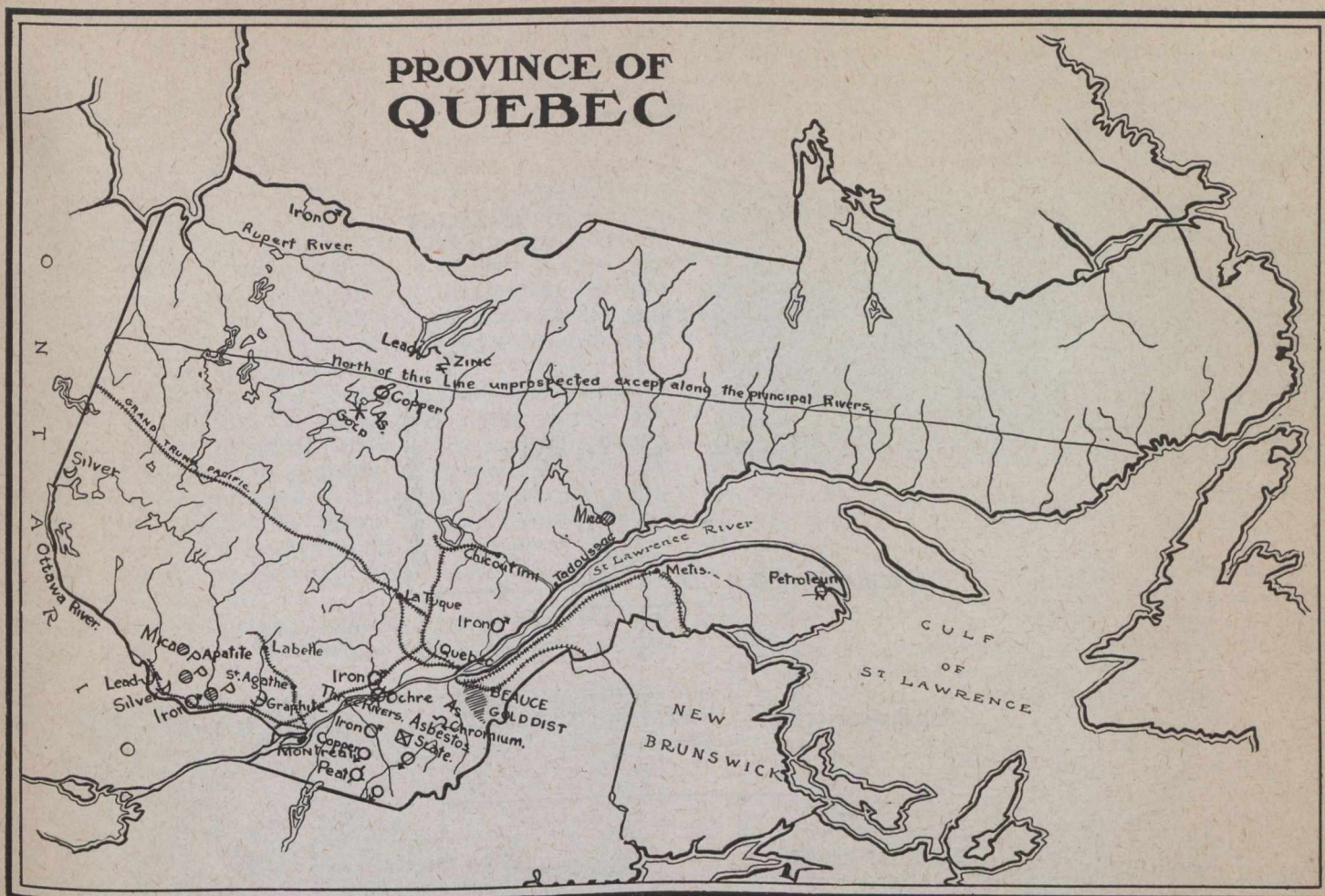
(Special Correspondence.)

In the Eastern Townships of Quebec an unprecedented activity in mining is now reported. On the historic Seigniory of Rigaud - Vaudreuil the Dominion Gold Fields, Ltd., has taken over mining rights. The photograph that accompanies this article shows that company's elevator and stacker, the first of its kind in Canada. The complete plant is now in operation. Mr. J. R. Duckett, Beauceville, is the managing director.

At Weedon, about 30 miles north of Sherbrooke, on the Quebec Central Railway, the East Canada Smelting Company is working the MacDonald mine. This new field is similar to the well known Eustis deposits which have been worked for a long time by the General Chemical Company. The deposits of iron pyrites, with which is associated copper pyrites, are in a belt that extends through Weedon and Stratford townships. Mr. Leland D. Adam is superintendent of the MacDonald mine.



Elevator and Stacker, Dominion Gold Fields, Ltd.



Mr. B. J. Bennett has been appointed manager of the new asbestos company that has recently acquired the old Ward-Ross mine at Thetford. The price paid was \$710,000. A mill is under construction and the mine is being equipped.

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The Quebec Mines Branch, of which Mr. Theo. Denis is superintendent, has been most active this year. Dr. J. A. Bancroft, a shining light in the younger firmament of geologists, is striving with the geological problems of the Kewagama and Keekeek Lake re-

gions. Professor Dulieux is investigating the deposits of titaniferous iron ores in the lower St. Lawrence region of the province. He has already finished the examination of the St. Urbain deposits, which were worked 40 years ago. At present Professor Dulieux is working over Seven Islands, 300 miles below Quebec, where exist large bodies of titanium-bearing iron ores.

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The Quebec Provincial Laboratory has been transferred to the Polytechnic School, Montreal.

A CANADIAN TALC MILL

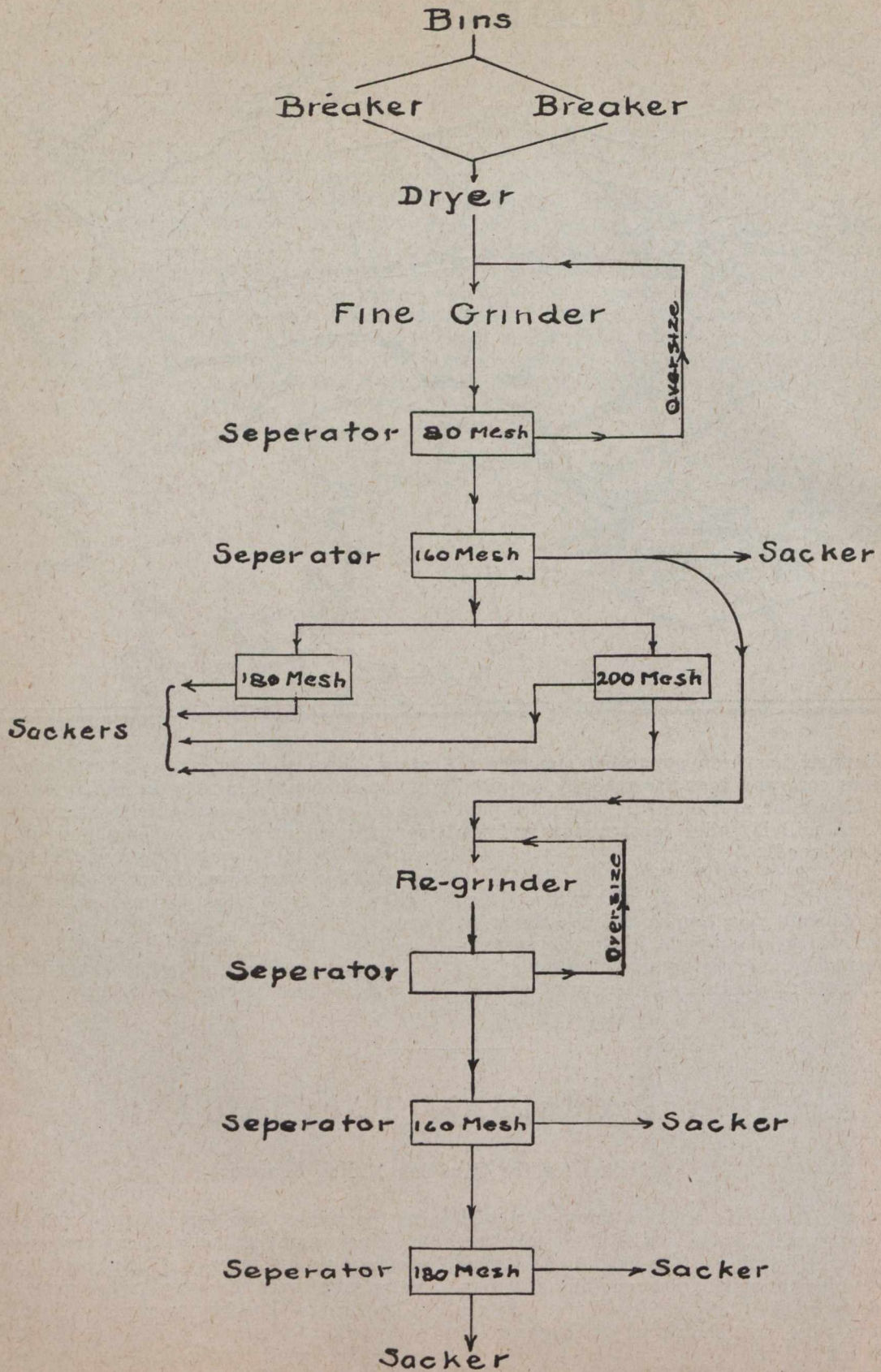
(Written for the Canadian Mining Journal.)

Three years ago there was no such thing as a talc-grinding mill in Canada. Shipments of crude talc were made from Madoc, Ontario, to the extent of between 1,000 and 1,500 tons annually. The grinding and marketing were done in the State of New York. As the profits on mining were low, the greater profit accrued to the New York mill owners.

Early in the year 1908, Mr. G. H. Gillespie, a Scotch mining engineer, took in hand the enterprise of equipping a suitable mill for grinding the Madoc talc. It took many months of trial and disappointment to hit upon the proper machinery. The question of grading

for the market also gave trouble from the first. Both machinery and grading problems were solved, or, rather, are in constant process of solution. The main drawbacks were overcome early in the game.

The original building selected for the mill was an old, extremely substantial, warehouse, situated a few feet from the Grand Trunk Railway, and almost opposite the station. Alterations were effected and grinding machinery installed. Needless to say, the market had already been as closely investigated as circumstances would permit, and it was known that a foothold could be secured.



In the two photographs that accompany this article, it will be noticed that the mill consists of one large main section, on lower ground, facing the track. The loading chute can be seen plainly. This building is the original warehouse. The large addition behind and all the smaller accretions represent the growth in three years. The mill has grown with the business.

At first the total capacity of the plant was about five tons of ground talc per day. The capacity now reaches 40 tons per diem. Even this will have to be enlarged.

In grading, the finished products cover a very wide range, all the way from material that soothes the irate infant to stuff that goes into the coarsest roofing. And this is the secret of commercial success—a system of grading that eliminates waste.

The amount of hard missionary work that was necessary to break into the market was a very painful surprise to those interested. Once, however, the Madoc talc became known, the obstacles of competition were not found to be insuperable. At present Canada sends talc of various grades to Great Britain, Europe, United States, and even farther afield. In three years the largest talc-grinding industry in the world has grown up almost unsuspected.

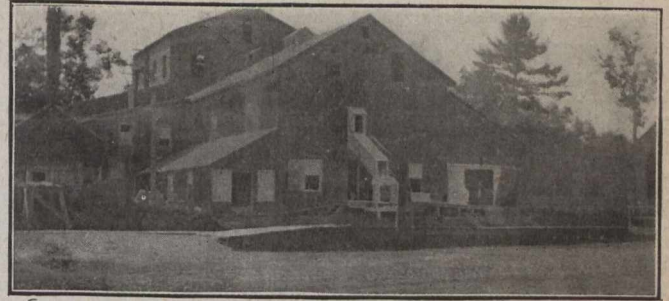
A rough flow-sheet, suggestive rather than exact, is given herewith. The massive talc is brought through



successive stages of comminution until the finest possible mesh is reached. Observe, when next the barber decorates your face with talcum powder, the fineness of the subdivided material. The chance is fair that the comforting stuff was once handled as ore at Madoc.

Virtue is its own reward. The conscientious reader

of the *Canadian Mining Journal* will find in that invaluable paper, in the November 1st, 1907, issue, an article describing the Henderson talc mine—the mine from which comes all the ore supplies for Mr. Gillespie's mill. The mine is under the supervision of Mr. Stephen Wellington, a mining man who has contributed not a little to the development of mining in Eastern Ontario.



Mr. Wellington possesses the mining sense. He knows every outcrop of anything for miles around the country in which he operates.

From the aforementioned back number of the *Journal*, the following descriptive sentences may be quoted:—

“The shaft is 105 feet deep. It bottoms in clean granular massive talc. Neither hanging nor foot wall is visible to the deep, where the shaft is 25 feet wide by 30 feet on the strike. . . . The shaft, or pit, as it is more properly called, now opens about 40 feet by 35 feet at the mouth, and narrows down irregularly to the bottom measurements mentioned before. . . . The maximum width of the vein is about 36 feet. This measurement is obtainable near the surface, where, in the pit, the walls are visible. The strike is north, 40 degrees west. The talc vein cuts across a tilted deposit of dolomitic limestone. The dip is 80 degrees south.”

The above paragraph was written before the milling enterprise had been attempted. Since then a new, excellently-timbered, shaft has been sunk, and some hundreds of feet of underground work have been done. The amount of talc in sight is enormous. The principal difficulty in estimating it is in keeping within reasonable bounds. Hence the Madoc mill is in the enviable position of having an assured supply for an indefinite period.

A large and cheap supply of ore is not the only advantage that Madoc offers. Cheap hydro-electric power is used at the mill. This implies cleanliness and economy.

THE UNDEVELOPED IRON RESOURCES OF CANADA

By A. B. WILLMOTT, Toronto, Ont.

Abstract of paper read at the Annual Meeting of the Canadian Mining Institute, Quebec, 1911.

We may now fairly assume that the iron and steel industry is firmly established in this country. Although the steel companies are quite willing that the bounties should be continued, it is evident from their prosperity that this continuation is not necessary. We may also affirm that the system of giving direct grants to encourage the establishment of basic industries in our

country has been fully justified. These bounties have been paid for a term of several years, decreasing in amount each year, and finally terminating on December 31st last. Table 1 shows that the production of pig iron has steadily increased both in tonnage and value.

TABLE 1.

ANNUAL PRODUCTION OF PIG IRON BY PROVINCES,
1887-1909.

Year	Nova Scotia.		Ontario.	
	Tons.	Value \$	Tons	Value \$
1887	19,320	\$ 250,000	.....	.....
1892	40,049	583,556	.....	.....
1897	22,500	230,000	26,115	\$ 291,466
1902	237,244	2,477,767	112,688	1,584,273
1907	366,456	4,211,913	275,459	4,581,309
1908	352,642	3,554,540	271,484	4,385,271
1909	345,380	3,453,800	407,012	6,002,441
	Quebec.		Total.	
1887	5,507	116,192	24,827	366,192
1892	2,394	53,865	42,443	673,421
1897	9,392	217,235	58,007	738,701
1902	7,970	181,501	357,902	4,243,541
1907	10,047	232,004	651,962	9,125,226
1908	6,709	171,383	630,835	8,111,194
1909	4,770	125,623	757,162	9,581,864

From Table 2 it further appears that there has been an equally encouraging increase in the production of steel.

TABLE 2.

ANNUAL PRODUCTION OF STEEL INGOTS AND CASTINGS
1897-1909.

Calendar Year	Short Tons.
1897	20,608
1902	203,881
1907	706,982
1908	588,763
1909	754,719

It must further be noted that we have made some small exports of both pig iron and steel.

To those who have not considered the subject it will perhaps be a matter of some surprise to note that Canada now ranks eighth among the nations of the world in her production of iron and steel. We have still a long distance to go, however, before overtaking the seventh country on the list, namely Belgium, as shown in Table 3 below.

TABLE 3.

PRODUCTION OF PIG IRON IN THE PRINCIPAL COUNTRIES
OF THE WORLD.

	1908	1909
United States	16,191,907	26,209,677
Germany	11,805,321	12,625,575
United Kingdom	9,202,280	9,819,469
France	3,400,771	3,544,638
Russia	2,800,653	2,871,332
Austria-Hungary	1,518,549	.....
Belgium	1,270,050	1,632,350
Canada	572,290	686,893
Sweden	567,821	443,000
Spain	403,554	.....
Italy	112,924	207,800
China	66,409	74,000
Japan	45,396	.....
Australasia	30,393	.....

Notwithstanding this gratifying increase in our production of iron and steel we are still very far from meeting our own requirements. Our imports of manufactured iron and steel goods are still enormous, as shown in Table 4.

TABLE 4.

	1908	1909
Imports of iron and steel subject to duty	\$51,485,456	\$33,083,397
Imports of iron and steel free of duty	10,334,242	7,310,034
Total imports	\$61,819,698	\$40,393,431

Many of these articles are highly manufactured and we can hardly expect that their production should be undertaken in Canada. The weight of these iron and steel manufactures is largely unknown. Included, however, in the figures presented in Table 4 are a large number of partially manufactured products which could be well made in Canada and of which the tonnage is known. These are given in detail in Table 5.

TABLE 5.

IMPORTS OF SOME IRON AND STEEL PRODUCTS OF WHICH
THE QUANTITIES ARE AVAILABLE.

Material	12 months	12 months
	ending Mch, 1908	ending Mch, 1909
	Short tons	Short tons
Pig iron	212,290	58,591
Ferro-products and chrome steel	17,661	13,206
Ingots, blooms, billets, puddled bars, &c.	21,222	8,887
Scrap and scrap steel	69,213	26,212
Plates and sheets	126,172	101,317
Bars, rods, hoops, bands, &c.	98,631	69,818
Structural iron and steel	373,871	162,735
Rails and connections	52,706	32,543
Pipes and fittings	25,090	18,309
Nails and spikes	2,741	1,432
Wire	57,046	39,452
Forgings, castings, and manufactures	22,357	13,092
Total	1,079,000	545,594

Although a study of Tables 1, 2, and 3 shows that the production of iron and steel is firmly established, it must be admitted that there are some discouraging features in the situation. Of the total quantity of ore required for Canadian furnaces in 1909, only 17 per cent. was of Canadian origin. All the furnaces in Ontario and Quebec are dependent on imported coal or coke, and two of them are using imported limestone. As Ontario and Quebec are devoid of coal, the importation of fuel must be continued until such time as the further development of the electric process of smelting will enable us to substitute water power for a portion of this fuel. These facts are unpleasant; but they should be faced and a serious attempt made to develop our own resources.

A study of the last available statistics shows that iron ore was produced in 1909 in only two of our provinces, as shown in Table 6.

TABLE 6.

PRODUCTION OF IRON ORE BY PROVINCES, 1908-9.

Provinces	1908		1909	
	tons	value	tons	value
Nova Scotia	11,802	\$ 17,620	.....	.....
Quebec	10,103	22,094	4,150	5,508
Ontario	216,177	528,475	263,893	653,808
Total	238,082	568,189	268,043	659,316

In 1910 conditions were somewhat improved by a small production in both New Brunswick and Nova Scotia. Our steel industries in Nova Scotia utilize nearly altogether iron ore from Newfoundland. In

the past a considerable tonnage of ore has been raised from Nova Scotian properties; but the cheapness of the Newfoundland ores has virtually excluded the Nova Scotian ore from the market.

In Ontario and Quebec our furnaces have been supplied in part from Ontario ore and to a small extent from Quebec ores; but much more largely by American ore from the Lake Superior region. This has been due in part to the cheapness with which American ores could be secured, since they are not subject to an import tax. It should further be noted that American ore-producers are willing to take contracts for the requirements of the furnaces and to deliver ores of the standard agreed on. So far there have been practically no producers of Canadian ore and those who were offering to deliver ores were undertaking the business in a most half-hearted way. Few of them were able to accept any considerable contract and from the smallness of their operations furnace men were afraid to entrust them with contracts. Moreover, the ore produced was apt to vary very much in grade and was frequently not of an attractive character.

Some of the iron and steel companies have been very active in looking for Canadian ores and have spent large sums in the search. It must be confessed that so far the results have been rather disappointing. Other companies have done little in this respect, probably for the reason that their capital was required in connection with their iron and steel plants. Practically no money is being spent in Ontario by independent ore companies, a fact, no doubt, partially attributable to the smallness of the market. While there was a duty of 40 cents a ton on Canadian ore entering the American market a producer of Canadian ore had very few furnaces with which he might market the ore. Owing to the different grades required by the different furnaces, and geographical conditions, it often happened that only one furnace was available. It is not surprising that miners have hesitated to embark in the production of iron ore with such a small market open to them. With the reduction of the American duty to 15 cents a ton this cause is partially removed.

In a number of the provinces there are no smelters, and iron ore unless within reasonable distance of a furnace is of no value. This observation particularly applies to British Columbia, where a number of promising deposits are known, but where there is no incentive to development because of the lack of a market. This is also true, though to a much lesser extent, of the prairie provinces.

British Columbia.

Throughout the coast region of this province numerous deposits of magnetite are found which are high in iron and low in phosphorus. These deposits occur at the contact of igneous intrusives with some sedimentary rock, usually limestone. These deposits are very irregular in their outcrops and one cannot predict anything definite as to the size and shape of the ore bodies. They belong to deposits of the pegmatite type and presumably have a greater extension in depth than they have in either breadth or length. Usually a series of outcrops is found along the line of contact varying from a few square feet in area up to deposits one hundred and fifty feet wide and several hundred feet in length. Little is known as to their depth, though several deposits have been opened by tunnels to a depth of one hundred feet. At the Paxton mine, on Texada Island, the ore is exposed by a tun-

nel for a width of seventy-five feet, at a depth of about five hundred feet from its highest outcropping on a hill above.

Most of these deposits carry a little sulphur in the form of pyrite or chalcopyrite. In many cases deposits of this type have sufficient copper value to make them attractive from this standpoint and they are operated as copper properties. With the increase in copper there is usually a decrease in iron contents. There are many deposits throughout the coast region too low in both copper and iron to be worked for either.

A long list of these properties is described in the various reports of the Minister of Mines for British Columbia; particularly in that for 1902. Lindeman describes a number of the more important ones. Among these may be mentioned the deposits on the Gordon River, Texada Island, Campbell, and Nimpkish Lake.

The average of all analyses on one of these groups of claims made by the writer yielded iron 56.135 per cent., sulphur 1.34 per cent., phosphorus .101 per cent. On another property the analyses averaged 60.98 per cent. in iron, 1.8 per cent. in sulphur, and .015 per cent. in phosphorus. The average of all analyses in three other private reports on different properties was as follows: iron 62.82 per cent., sulphur 1.54 per cent., phosphorus .028 per cent.; iron 68.79 per cent., sulphur .35 per cent., phosphorus .056 per cent.; iron 61.47 per cent., sulphur .67 per cent., phosphorus .021 per cent. The average of these different properties will probably fairly represent this class of ore. The average is iron 58.04 per cent., sulphur 1.14 per cent., phosphorus .044 per cent.

It is estimated by Hayes that these deposits contain at least thirty million tons of ore of present commercial grade and probably a considerably larger amount of low grade and deep ore not now available. My own opinion is that considering the frequency with which this type of deposit has been found in the small area of the province which has been prospected that the total tonnage ultimately available will be much larger than this estimate. Practically only portions of Vancouver and Texada Islands are included in this estimate. Similar deposits are known in the Queen Charlotte Islands and on the Chilcat River, in the extreme northern part of the province. The main land is also likely to show numerous deposits of this class.

Clay ironstones are known to occur in the Queen Charlotte Islands and on Vancouver Island in connection with the coal deposits; but at present are of no commercial value. Possibly they may be of some use in forming a desirable mixture when the smelting of the magnetite is undertaken. At several points deposits of bog iron ore are known and although very great claims have been made as to the value of these deposits I think they may be considered useless at the present time. Some bodies of hematite are reported on Vancouver Island and on the main land near Bute Inlet, but little is known of them. In south-eastern Kootenay, at Kitchener and Bull River, deposits of hematite have been partially explored.

The lack of smelters in British Columbia and the Pacific coast of the United States has been a serious drawback to the development of the British Columbian ores. Without a market the mine owner was not warranted in spending money on the development of his property. Per contra, iron men have hesitated to establish furnaces until a sufficient quantity of iron ore was assured them. The coming summer will probably see an end

of this condition of affairs, as two companies are now proposing to establish iron furnaces in the province.

Prairie Provinces.

Throughout Manitoba, Alberta and Saskatchewan almost no iron ore of commercial value is at present known. Naturally in the prairie parts rocky exposures are few and moreover the conditions for the formation of iron ore deposits are absent. In the Pre-Cambrian area, which touches the north-western corners of Manitoba and Saskatchewan, iron deposits of the Lake Superior type will probably be found.

On the outer edge of the Rockies there are numerous occurrences of reddish shales of Triassic age, which in places carry considerable iron. Possibly some of these may yet prove of value as a source of iron ore.

Alberta, particularly on its west boundary, is very rich in coal of good coking quality. There is a large and ever increasing demand for pig iron in the three provinces for local foundry purposes. Such pig at present commands a very high price, due to the high freight charges on pig iron from the east. There does not, however, seem to be any available source of iron ore within these provinces; but the hematite deposits of south-eastern British Columbia, if properly developed, may yield sufficient ore for a furnace situated in the Crow's Nest Pass.

The iron ores already known, and which may be found, in north-eastern Manitoba and Saskatchewan are too far from a source of coke. With the development of the electro-thermic process for smelting iron ore these may, perhaps, become of value.

The Territories.

In the Yukon Territory occurrences of magnetite similar to those occurring in the coast region of British Columbia are known. Cairnes describes the Mack claim on the Hutshi River as "A small hill of almost solid iron ore about two hundred feet long." The Gilltana Lake claim consists of magnetite, with more or less chalcopyrite, as is so often found with these contact deposits.

On the head waters of the Wind, Bonnet Plume and Snake Rivers, tributaries of the Peel, Camsell describes large quantities of float consisting of banded jasper, with hematite or magnetite. On the Rackla, a tributary of the Yukon, Keele finds similar float in large quantities. Apparently around the head waters of these streams there is a large area carrying banded jaspers similar to the Lake Superior type. The iron ore is of course of no commercial value at present and consequently no exploration has been undertaken.

Several occurrences of magnetite and hematite are reported on the islands of the archipelago in the district of Franklin.

In the district of MacKenzie specular hematite is reported to be found in the vicinity of Great Slave Lake. In the territory of Keewatin, magnetite, apparently of the Lake Superior type, is found near Knee Lake. On Berrens River, a magnetite of similar character is reported by Low. There are probably very numerous occurrences of the Lake Superior type stretching far to the north-west through the province of Keewatin. Close examination has not yet been made of this large area.

On Sutton Mill Lake, an expansion of Trout River, south of Hudson Bay, there is an exposure of the Animikie rocks similar in character to those at the west end of Lake Superior. Dowling reports the occurrence of jaspilite interbanded with hematite and magnetite, as in the region around Port Arthur. The deposit observed

by him occurs in narrow beds, the iron running from 68 per cent. down to 28 per cent. It would seem probable that careful examination of these areas might lead to the discovery of iron ore of commercial value. The district is seventy miles from Hudson Bay.

In the territory of Ungava, banded jaspers are known in considerable quantities, and commercial ore may yet be found. Leith, Low, and Mickle, together with others, have visited and described these rocks. The Nastapoka group consists of chemical and mechanical sediments closely related in appearance to the Animikie rocks of the Lake Superior basin. Interbedded with the shales and sandstones of this group are beds of jaspilite forty to one hundred feet in thickness. In these beds are occasional concentrations somewhat richer in iron ore. In the natural exposures few cases are found where less than half of the beds are rock and even of the balance there is considerable silica mixed with the iron ore. There are two types of occurrence, one of siliceous hematite or magnetite ore, and the other manganiferous carbonate ore. In both cases the local enrichment does not extend more than a few hundred feet in length or on the dip of the beds. The similarity of geological occurrence and of the enclosing rocks on the Nastapoka Islands and in the Mesabi district of Minnesota is striking. Whether commercial ore bodies will yet be discovered in the former can only be told by extensive exploration.

One hundred and twenty-five miles south of Ungava Bay, in the valley of the Koksoak, there is an occurrence of rocks apparently of Animikie age. For seventeen miles these rocks are exposed along the river valley from Shale Falls to the mouth of Swampy-Bay River. Low describes the ore-bearing portion of these rocks as alternating bands of magnetite and jasper in close proximity to cherty limestone. Analyses of the ore run from 31 per cent. to 54 per cent. in metallic iron. On the natural exposures from which these samples were taken the ore is hardly of high enough grade to be of commercial value. Such as it is Low states that "The ore in sight must be reckoned by hundreds of millions of tons."

On the Ashuanipi branch of the Hamilton River, three hundred miles due north of the Seven Islands, on the north shore of the St. Lawrence, there is an occurrence of similar rocks. Through faulting four different belts of these rocks are exposed. The ore formation consists of banded magnetite or hematite, with jasper and cherty limestone. Assays of natural outcrops showed iron varying from 30 per cent. to 40 per cent. Low states that "The deposits are widespread and that the ore will be found in practically inexhaustible quantity." The striking similarity of these last occurrences to several of the iron ranges of the Lake Superior district must be noted. Whether natural concentration of these ores has taken place can be proved by careful exploration. The large area over which the occurrences are found renders it probable that in some cases concentration will have occurred.

On the Stillwater River, in Ungava, Low reports a large area of iron-bearing ore in gneiss. Beds of impure iron ore are also reported from the shore of Hudson Strait.

Ontario.

The iron ores of Ontario have been the subject of numerous papers and for that reason only a brief summary will be given here. From the standpoint of the present demand for iron ore the deposits of Ontario are the most important in the Dominion and consequently are not receiving the space in this paper which their commercial importance would warrant. A consideration

of the more remote portions of the Dominion has, however, taken so much time that I shall content myself here by referring the interested readers to other papers. In the eleventh volume of the journal of this institute, I published a paper on the iron ores of Ontario, which summarized fairly well the known occurrences of iron ore in Ontario. To those seeking more detailed information I would refer to the index to the reports of the Bureau of Mines of Ontario, 1891-1907.

Iron ores of the magmatic type are represented in Ontario by deposits at Nemogosenda, on the Canadian Pacific Railway; at Bushnell, on the Temiskaming and Northern Ontario Railway; at Gooderham, on the Irondale, Bancroft and Ottawa Railway, and elsewhere. All of these ores are magnetite and most of them are contaminated with more or less titanium and frequently with sulphur. That at Nemogosenda has been worked this year, and some others have been worked in the past. The pyrrhotite of Sudbury, which carries the Ontario nickel, belongs to this type.

The Pegmatite type is represented by such properties as the Belmont, in Central Ontario. This is a magnetite, low in phosphorus, high in iron and with some sulphur. A number of deposits of a similar type are known through Eastern Ontario.

The Vein type is represented by a number of small and unimportant deposits occurring in the quartzites of the lower Huronian, north of the Georgian Bay. Deposits of this kind are known in Aberdeen Township, near Algoma Mills, and in the vicinity of Killarney.

The Carbonate type is represented by the siderite of Devonian age occurring on the Opazitika, in Northern Ontario. Deposits of siderite of Keewatin age are found at the Helen Mine, Josephine Mine, Magpie Mine, in the Michipicoten district, and at Steep Rock Lake, in the Rainy River district. These siderites run around 35 per cent. in iron, are very low in phosphorus, and with some sulphur. They exist in considerable amounts and on roasting would yield a fairly good ore.

The most important ores of Ontario belong to the Lake Superior bedded type. They are restricted almost entirely to beds of Keewatin age and occur at scores of places throughout the province from the Manitoba boundary to the Ottawa River. The different ranges have been described by Miller, Coleman and Willmott, Coleman, Miller, Leith, Smith, Bell, Silver, Coleman, Coleman and Moore, MacKenzie, Moore, Allen. The formation consists of chert or jasper interbanded with hematite, magnetite, siderite, or pyrite. These beds are usually standing vertical and their total length within the province must amount to several hundred miles. The similarity between these ranges and the Vermilion iron range of Minnesota is very close. Natural concentrations are to be looked for in these iron formations, and the ore, if found, will likely be deep. Comparatively little exploration has yet taken place on these Ontario ranges. It is probably safe to assert that there has been more exploration on the twenty-three miles of the Vermilion iron range than on the several hundred miles in Ontario.

There are four producing mines in Ontario located on this class of deposit, namely: the Helen, Magpie, Atikokan, and Moose Mountain mines. At least three other properties have been drilled, with satisfactory results, but have not yet been opened up.

The Limonite type is represented by a number of bog iron deposits in the older parts of the province, which have been slightly exploited in years gone by. Some de-

posits of this character in the Metagami Valley are the subject of a paper before the institute this year.

The Metamorphic type is represented by many of the magnetite deposits along the Kingston and Pembroke Railway, which have been described by Ingall. Other deposits of this character have been worked along the lines of the Central Ontario Railway and the Irondale, Bancroft and Ottawa Railway.

Quebec.

Iron ores of the Magmatic type are of frequent occurrence throughout the province of Quebec. Deposits at Bay St. Paul, Seven Island, St. Jerome, St. Lin, Lake Kenogami, and on the Chaudière are described by Ellis. Many of these deposits are of large size and some of them are high in iron, all of them carry titanium and many of them in large amounts.

Deposits of the Beach Sand type are also of frequent occurrence in the province. They are particularly abundant along the shores of the St. Lawrence, where they occur in beds from six inches to two feet in thickness. Among the more important are those at Moisee, Mingan, Bersimis, Tadousac, which are described by Ellis.

Bog ore deposits are widely scattered throughout the province, and have been mined in small quantities for many years. In the district of Three Rivers small furnaces have been at work for a long time using the local ore supplies. Bog ores have been mined in Drummond and Vaudreuil Counties.

Ores of the Lake Superior bedded type do not seem to have been recognized to any large extent. Their occurrence has been noted on Lake Opazitika, on the boundary between Ontario and Quebec, and also near Lake Megantic, in the south-eastern corner of the province. As there are numerous areas of the Keewatin rocks throughout Quebec (usually mapped as Huronian in the Geological Survey reports) there is every reason to think that with proper prospecting many occurrences of this type will be found.

Ore of the Pegmatite type is found at a number of places, particularly in the counties of Pontiac and Ottawa. The Ironside Mine and the Bristol Mine have both produced a small amount of magnetic ore. Throughout the Eastern Townships a number of magnetite deposits are known in the townships of Brome, Sutton, St. Armand, and near Sherbrooke. These probably belong to the Metamorphic type.

A number of deposits of chromite are known in the Eastern Townships and some production takes place annually. They have been described by Cirkel.

New Brunswick.

During 1910, iron mining in New Brunswick has taken on a new lease of life. This is due to the discovery and exploitation of some large deposits of iron ore near Bathurst by the Canadian Iron Corporation. These ores were described by Hardman before the institute two years ago. There are three separate areas, one of them two thousand one hundred and forty feet long proved to a depth of five hundred feet by drilling. Mr. Hardman estimated that half of these beds would average 53 per cent. iron and not over 15 per cent. silica; phosphorus would be high, possibly .75 per cent. The second area after hand sorting was expected to yield a product 58 per cent. in iron, 10 per cent. silica, 0.88 per cent. phosphorus, and 0.055 per cent. sulphur. During the past year the property has been opened and machinery installed for the production of one thousand tons

of crushed ore per day. A railway has been built and a dock completed at Newcastle, New Brunswick. Seven thousand tons of ore were shipped before the close of navigation. This ore belongs to the Lake Superior bedded type and seems closely related in origin to the deposits at Moose Mountain and Atikokan, Ontario.

Years ago some iron ore was mined in the county of Carleton and smelted locally. The ore is a hematite, occurring in numerous veins, one to sixteen feet in width. The ore was very low in iron and high in sulphur and phosphorus, and the enterprise failed. Some small deposits of hematite are known in St. John County and some magnetite deposits in St. John and Carleton Counties. These latter deposits have been described by Bailey. Bog ore is of frequent occurrence throughout the province, but is not at present utilized.

Nova Scotia.

Years ago Nova Scotia produced considerable iron ore; but the output diminished until it reached the vanishing point. Last year, however, witnessed a moderate revival of shipments. This decrease has been due to the ease and cheapness with which our eastern steel plants can procure suitable ore from Newfoundland.

The iron ores of Nova Scotia have been the subject of an exhaustive monograph by Woodman, published by the Mines Branch of the Department of Mines at Ottawa. According to Woodman, the Nictaux-Torbrook Basin is the most important and promising field in the province. The ores are Clinton hematites, and bedded magnetites metamorphosed from it. The ores occur in two zones striking north-east. On the north one are two ore bodies, the Leckie and the Shell, of economic value. The ores run 44 per cent. to 49 per cent. iron, 15 per cent. to 17 per cent. insoluble, .7 per cent. to .9 per cent. phosphorus, and sulphur nearly .01 per cent. The ore is used largely at Londonderry for mixing with local limonite and carbonate. The Clementsport district is regarded as a promising field for exploration. In Antigonish County are other Clinton hematites, which may be of value.

Along the Cobequid Hills, in Cumberland and Colchester Counties, there are many isolated localities, in the Devonian, where siderite and ankerite occur. In places these have altered to oxides at the surface, but rapidly changed into the unaltered carbonate in depth. Acadia Mines has been intermittently active for years as a mining and smelting centre. The ore is very low in phosphorus and sulphur and exceedingly low in iron.

Summary.

No estimates of the amount of available iron ore in Canada have been made by any of the various Governmental officials. In a report by Hayes on the Conservation of Natural Resources in the United States, an estimate is made of the iron ores in the countries adjoining the United States. The estimate is there made of available ore as follows: British Columbia, thirty million tons; Ontario, nine million tons; Nova Scotia, four million tons; total, forty-three million tons. This I would consider a sufficiently high figure for ore already known. At the same time the possibilities and indeed probabilities are so great that a much larger tonnage must be considered as likely to be found. The Lake Superior type of bedded deposit is known to occur in the extreme north-west of our country in the Yukon Territory and in the south-east in New Brunswick, a dis-

stance of twenty-eight hundred miles. At numerous points between these extremes, Keewatin rocks of the great Archæan shield are known to occur, and in nearly every case where these have been carefully searched the iron formation has been found. In far from all of these occurrences will the iron formation be productive of commercial ore, but we have every reason to expect that with careful and detailed exploration many of them will. It is true that large areas at present are so far from transportation that they cannot be considered as possible sources of iron ore for years to come.

On either side of the shores of Hudson Bay the Archæan rocks are found much as they border both sides of Lake Superior. Already, with a most limited amount of exploration, we know that rocks of Keewatin and Huronian age are found bordering the shores of this inland sea and that these series of rocks carry the iron formations just as they do around the basin of Lake Superior. Sixty years ago the production of iron ore on Lake Superior in the quantity in which it is produced to-day would have been looked on as an utter impossibility. It was urged that the district was so remote from supplies of coal that the ore even if found could not be profitably smelted. With the tremendous cheapening of transportation this has proved to be a false prophecy, and it is quite possible that water carriage from Hudson Bay may yet solve the transportation problem for that great region. It should further be remembered that Hudson Bay itself is navigable for quite as long a period each year as Lake Superior.

In considering the possibilities of our great northern areas it would be well, also, to bear in mind what has been accomplished in Sweden during the last few years. Some of the largest deposits of iron ore in the world are now being mined in that country within the Arctic Circle. Geologically these ores occur in the Pre-Cambrian rocks found to such a large extent in our own country. The exact equivalent in type of ore deposits is at present not known here; but it is quite within the bounds of possibility that such may yet be found.

The Clinton ore deposits, which yield such a large portion of iron ores of the United States, occur but to a limited extent in Canada, and cannot be looked on as probable large producers. In Newfoundland, however, two of our eastern steel companies have very large iron ore reserves in beds of this type.

Editor's Note:—In the original paper reference numbers are affixed to each author mentioned. These are omitted in the above abstract.

MINING RIGHTS IN QUEBEC SEIGNIORIES.

The last title to a Quebec seigniori was issued in 1762, under the French regime. All mining rights on all except a few seigniories were reserved to the Crown. After the British occupation in 1763, the townships were granted or sold with reservation of mineral rights. Thus, on concessions of lands made before 1763, the Crown still possesses the mining rights; whilst on land patented between 1763 and 1880 the mining rights belong to the surface owners, except for gold and silver, which were always specifically reserved.

The provision as to seigniories affects 11½ million acres, and hence is of some importance.

SOME COAL MINING DATA

Excerpts from the Provincial Mineralogist's B.C. review of "Coal Mining in the Province."

The following table shows, for the past four years, the output and the *per capita* production of the various districts:—

Year and District.	Gross tons mined.	Total No. of employees at colliery.	Tons of coal No. of men mined per		
			Tons of coal mined per employee.	No. of men employed underground.	underg'd employee.
1907—					
East Kootenay District	876,731	2,290	383	1,527	574
Coast District	1,342,877	3,769	356	2,862	469
Whole Province	2,219,608	6,059	366	4,389	506
1908—					
East Kootenay District	883,205	2,524	350	1,746	506
Coast District	1,226,182	3,549	345	2,686	456
Whole Province	2,109,387	6,073	347	4,432	476
1909—					
East Kootenay District	923,865	2,427	380	1,737	532
Coast District	1,476,735	3,991	370	2,976	496
Whole Province	2,400,600	6,418	374	4,713	509
1910—					
East Kootenay District	1,365,119	3,111	439	2,374	575
Coast District	1,774,116	4,647	382	3,529	502
Whole Province	3,139,235	7,758	404	5,903	532

"It will be seen from the above that the production 'per employee' has materially increased, particularly in the last year. This increased effectiveness of the labour employed is largely due to better methods, better equipment, and greater volume of output.

"During the year 1910 there were 404 tons (2,240 lbs.) of coal mined per employee, or 532 tons for each underground employee. According to the 'Report of the Inspector of Coal Mines for the State of Washington,' it appears that in the mines in that State there was mined in 1909 3,205,900 long tons (2,240 lbs.) of coal (3,590,639 tons of 2,000 lbs.), with a *per capita* production of employee equal to 560 long tons per annum; while in 1910 each employee represented 590 long tons production, or an output of 3,553,200 tons (2,240 lbs.). From this it appears that the effectiveness of the employee is greater in Washington than in British Columbia—whether due to the nature and occurrence of the coal seams, equipment, or other causes is not known.

"It is, however, to be noted that this increased *per capita* production has been obtained at a greater list of accidents than in British Columbia mines, as in Washington there was 92,548 tons (2,000 lbs.), or 82,632 tons of 2,240 lbs., while in British Columbia there was mined some 112,116 tons (2,240 lbs.) for each life lost."

The next table gives analyses of accidents in British Columbia coal mines in 1910:—

	No. of accidents per 1,000 men employed.				Tons of coal mined per accident.			
	Fatal.	Serious.	Slight.	Total.	Fatal.	Serious.	Slight.	Total.
East Kootenay District	5.46	15.75	5.78	27.00	80,301	27,860	75,840	16,251
Coast District	2.36	9.89	10.32	22.59	161,283	38,568	36,961	16,896
Total Province	3.61	12.24	8.51	24.36	112,116	33,044	47,564	16,610

"The gross output of coal for the year was 3,139,235 tons (2,240 lbs.), which represents an increase over that of the year 1908 of about 48.8 per cent., and over that of 1909—formerly the 'banner year'—of about 30.7 per cent.

"Of this gross tonnage of coal mined, 2,800,046 tons was used as coal, while 339,189 tons was utilized in making coke, of which there was produced 218,029 long tons.

The total value of the product of the collieries of the Province for 1910 was \$11,108,335, an increase over the highest previous record—that of 1909—of \$2,533,451, or nearly 130 per cent.

"As in former years, the greater proportion of this product was made by three larger companies—the Crow's Nest Pass Coal Co., with two collieries in East Kootenay, and the Western Fuel Co., of Nanaimo, and the Canadian Collieries (Dunsmuir), Ltd. (formerly the Wellington Colliery Co.), both operating on Vancouver island.

"In addition to these larger shippers, appreciable shipments were made by the Hosmer Mines, Ltd., and the Corbin Coal and Coke Co., in East Kootenay, by the Nicola Valley Coal and Coke Co., the Diamond Vale Collieries, and the Coal Hill Syndicate, all of Nicola valley; and by the Pacific Coast Coal Mines, Ltd., and the Vancouver and Nanaimo Coal Mining Co., both operating on Vancouver island, near Nanaimo.

"During the year 1910 about 51.3 per cent. of the coal, sold as such, produced by the collieries of the Province, was consumed in British Columbia; about 46.2 per cent. was exported to the United States, including Alaska; and 2.5 per cent. was exported to other countries, chiefly to Mexico. Of the coke sold, about 96 per cent. was consumed in British Columbia, and the re-

mainder was exported to the United States." (Note by Ed.—In 1908, 19 per cent., and in 1909, 19 per cent. of the output of coke was exported to the United States.)

The distribution of this output of coal and coke is shown in the next table, which is followed by another showing the number of employees at the coal mines and coke ovens.

COAL AND COKE PRODUCED, EXPORTED, ETC.

Sales and Output for 1910. (Tons of 2,240 lbs.)	Coal		Coke	
	Tons.	Tons.	Tons.	Tons.
Sold for consumption in Canada	1,238,439	.....	213,274	.....
Sold for export to United States	1,114,809	.....	8,730	.....
Sold for export to other countries	60,290	.....	.....	.....
Total sales .....	.....	2,413,538	.....	222,004
Used in making coke	339,189	.....	.....	.....
Used under colliery boilers, etc.	206,871	.....	79	.....
Lost in washing	146,277	.....	.....	.....
Total for colliery use .....	.....	692,337	.....	79
Stock on hand first of year	36,290	.....	17,109	.....
Stock on hand last of year	69,650	.....	13,055	.....
Difference added to stock during year .....	.....	33,360	.....	*4,054
Output of collieries for year .....	.....	3,139,235	.....	218,029
By-products—Clay—4,535 tons. *Taken from.				

NUMBER OF HANDS EMPLOYED.

Character of Labour.	Underground.	Above ground.	Totals.
	No. employed.	No. employed.	No. employed.
Supervision and clerical assistance	133	97	230
Whites—Miners	3,003	..	3,003
Miners' helpers	619	..	619
Labourers	1,085	481	1,566
Mechanics and skilled labour	798	626	1,424
Boys	143	63	206
Japanese	24	25	49
Chinese	95	548	643
Indians	3	15	18
Totals	5,903	1,855	7,758

The Porcupine Gold Area

(Extracts from report by A. G. Burrows, Ontario Bureau of Mines.)

Character of the Gold-Bearing Deposits.

The occurrence of gold at Porcupine is associated with the quartz solutions which circulated through the fissures in the Keewatin and Huronian series. The irregular fissuring has produced a great variety of quartz structures, varying from the tabular, though often irregular or lenticular, vein which may be traced several hundred feet, to mere veinlets, often only a fraction of an inch in width and a few feet in length, which ramify through a rock that has been subjected to small irregular fissuring. This latter variety is well illustrated in the fissuring of ankerite bands, so characteristic of many of the gold deposits of Porcupine. Irregular and lenticular bodies of quartz often occur

which may have a width of ten or twenty feet, but which die away in a distance of fifty feet. Again there are dome-like masses of quartz which are elliptical or oval in surface outline, but whose underground extension has not been examined closely. In some parts at least these masses can be seen in contact with underlying rocks at a low angle, which would suggest that they are broad lenticular masses which have filled lateral fissures in the country rock. The most conspicuous dome masses are those of the Dome property where the two largest are about 125 feet by 100 feet. A fissure may be vertical and regular at some points. At others it may incline at a lower angle to the hori-

zontal or take on a more or less lenticular form.

The relationship of the strike of the veins to that of the enclosing rock is often difficult to determine, since generally along the veins there has been shearing of the country rock which may conform to the general direction of the strike of the veins. However, by determining numerous strikes in the schist away from the veins, it is seen that the majority of them are inclined to the direction of strike of the enclosing rocks. In dip the veins vary from vertical to nearly horizontal. In No. 1 shaft of the Hollinger the vein is practically vertical, while a series of narrow quartz veins, 6 to 18 inches wide on the Lindburg claim, have a dip at the surface of only 20 degrees. The prevailing dip of the schist in the Poreupine area is to the north at a high angle, and frequently the veins dip distinctly to the south across the cleavage of the schist. While it is apparent that most of the deformation of the country antedates the vein formation, nevertheless there is a decided tendency in many cases for the fissuring to be influenced by the direction of schistosity, which is also a direction of weakness; hence we find veins having a more or less lenticular structure the strike of which closely corresponds to that of the country rock.

Distribution of Veins.

While gold-bearing veins occur over a wide area and are often isolated, it is seen, from a number of those already discovered, that they occur in groups along certain lines. For instance, in Tisdale Township there are at least three distinct areas where the fissuring has been most pronounced. One such area extends from the southeast end of Miller Lake, on lot 11 in the first concession, in a northeasterly direction for three miles, and includes such veins as the Miller-Middleton, Hollinger, McIntyre, and Connell or Rea, and in addition many others with visible gold. The average strike of the veins here is northeast-southwest. Another series, including the Davidson, Crown-Chartered, Armstrong-McGibbon, and Bannerman (in Whitney), occurs in the northeast part of the township in the fifth concession. The general direction of the veins is east and west. Again in the southeast part of the township is a group including the Foster, Dome, and Dome Extension, with general strike somewhat south of west. Similar groupings could be mentioned in other parts of the area.

In these disturbed zones the country rock is generally schistose in character. At the Dome mine the disturbed area has a width of about 600 feet, in which there are numerous narrow quartz veins in addition to large irregular quartz masses.

Well defined, disturbed zones occur in the fifth concession of Tisdale. In this locality the main rock is a light greenish, fine-grained, rather massive greenstone. This greenish rock is itself not much fissured, but here and there through it are bands of rusty-weathering carbonate, which is generally schistose, striking east and west. I think that much of the carbonate associated with this greenstone is of secondary origin. It is possible that the shattering and fissuring of the greenstone in an east and west direction may have caused a deposition of migrating carbonate solutions, partly filling fissures and partly replacing the greenstone. These carbonate bands were later fissured, and gold-bearing quartz solutions deposited in them. The fissuring of the carbonate is generally irregular, and hence we find veins with steep or low dip striking with the schist and across it. This irregular series of veins

is seen at the Crown-Chartered and Armstrong-McGibbon properties. Where the veins are small, it becomes necessary to mine both the carbonate and the intersecting quartz veins. Gold often occurs in the carbonate near the contact with the quartz veins, as well as in the quartz.

Distribution of the Gold.

While the quartz is considered to carry the gold, it was noted at many properties that the metal occurs in greatest quantity along certain lines which give a streaky character to the ore. On the surface these streaks are rusty, due to the oxidation of pyrites, while at depth they are dark gray or greenish in colour.

Thin sections of quartz from the main Hollinger vein show grains of quartz with irregular outline, which often contain liquid and gas inclusions. There has also been much secondary pressure, indicated by strain shadows or wavy extinction, and along lines of slip or fracture planes there has been much crushing of the quartz to finer grains. In these crushed areas are secondary minerals like calcite, sericite, etc., while iron pyrites is also present in cubical form and has evidently crystallized, subsequent to the crushing.

Some thin sections from the Rea mine main vein also show much secondary crushing along lines. Calcite and sericite are present in the crushed quartz generally in linear arrangement, and in addition there are several rough crystal outlines of free gold which were formed subsequent to the crushing.

These fine dark streaks may have resulted from a solidification and shrinkage of the quartz forming filmy cracks, which may have become slip or crushing planes along which the richer gold-bearing solutions were deposited at a later period.

These minute dark streaks in the quartz are frequently slickensided, and this character may often be seen in hand specimens, as from the Rea or Vipond mines.

It should be noted that where cracks or fracture planes have been produced in a quartz vein and subsequently filled by minerals from solution, secondary quartz can be distinguished with difficulty, if at all, from the original quartz. Hence it is not always possible to say whether visible gold in such a vein occurs in the original or in secondary quartz.

Carbonates of lime, magnesia, and iron occur with the quartz in practically all the veins in the area. This material may have been absorbed from the wall rock, which is frequently dolomite or rock impregnated with dolomite or calcite. Fragments of country rock are often included in the veins. Veinlets of clear calcite occasionally cut the quartz veins.

The distribution of the gold is generally irregular, occurring along one or both walls, while other portions of the veins may be very low grade. Most spectacular showings occur on many properties, but these are limited to portions of the veins. Considering the irregular character of certain veins and the quantity of country rock which will need to be mined, the ore must be considered low grade.

Iron pyrites occurs in massive and crystallized forms, somewhat sparingly in most of the veins. Cubes of pyrites are frequently abundant in the enclosing rocks, especially where sericite or dolomite schist occur. A sample of cube pyrites was separated from the schist, obtained from a shaft of a principal property, and an assay gave a gold content of \$10.40 per ton.

Copper pyrites, galena, zincblende, and pyrrhotite are found in some veins in very minor quantity. Sulphide of silver, argentite, occurs in association with the gold on the Powell property in Deloro township.

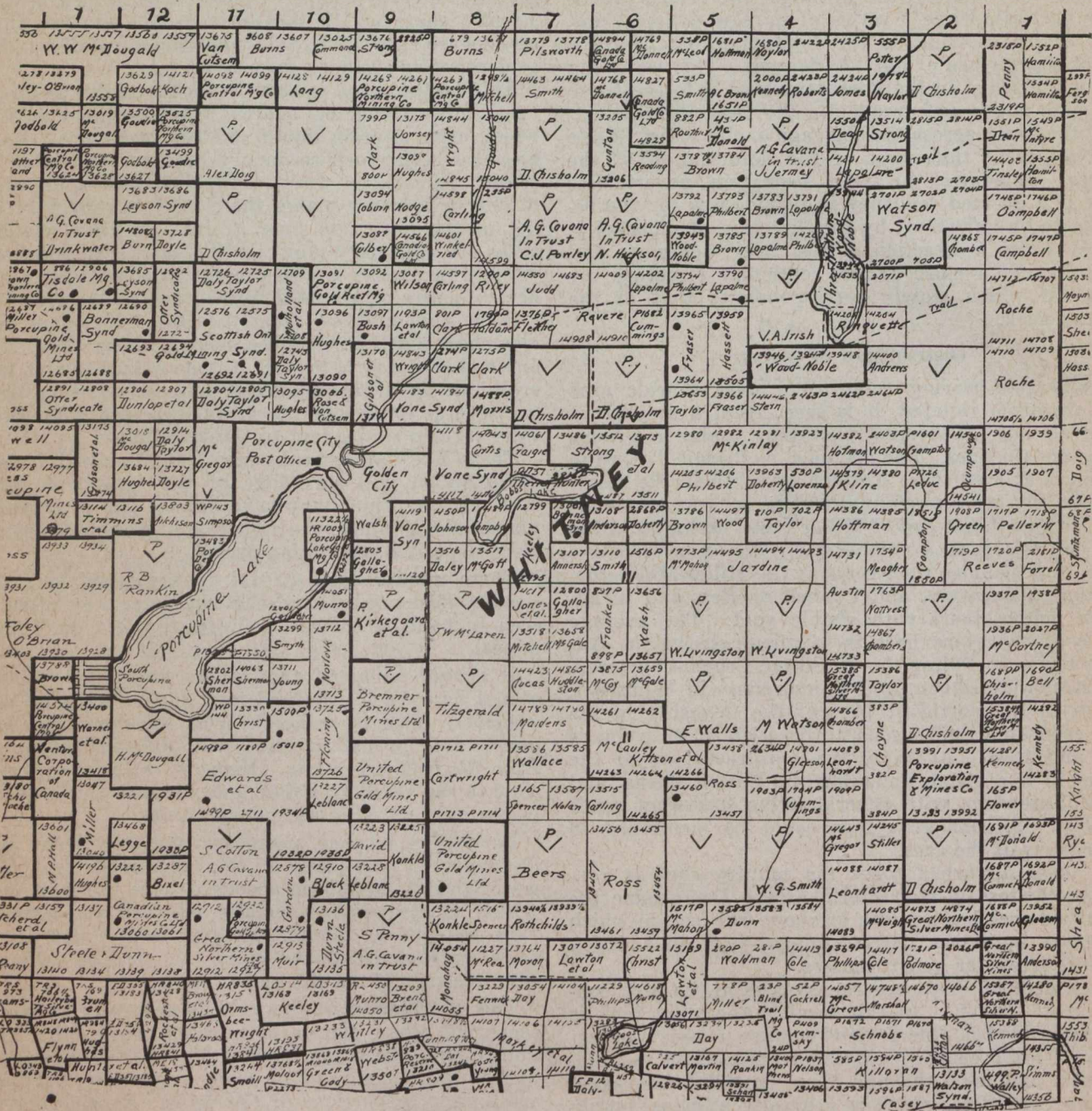
It will be seen from an examination of the ore from most of the properties that it is largely free milling, while the concentrates should be amenable to cyanide treatment.

Little is said in this report as to actual values of properties, since their sampling is the prerogative of

many claims, some of which discoveries are of recent date. A part of the coming summer will be devoted to an examination of these properties.

The Dome Mine.

This property, comprising six claims, is situated in the first concession of Tisdale, and includes parts of lots four and five. The main workings are on the northwest forty two acres of lot four. In an area, which is roughly 600 feet wide north and south, and 800 feet



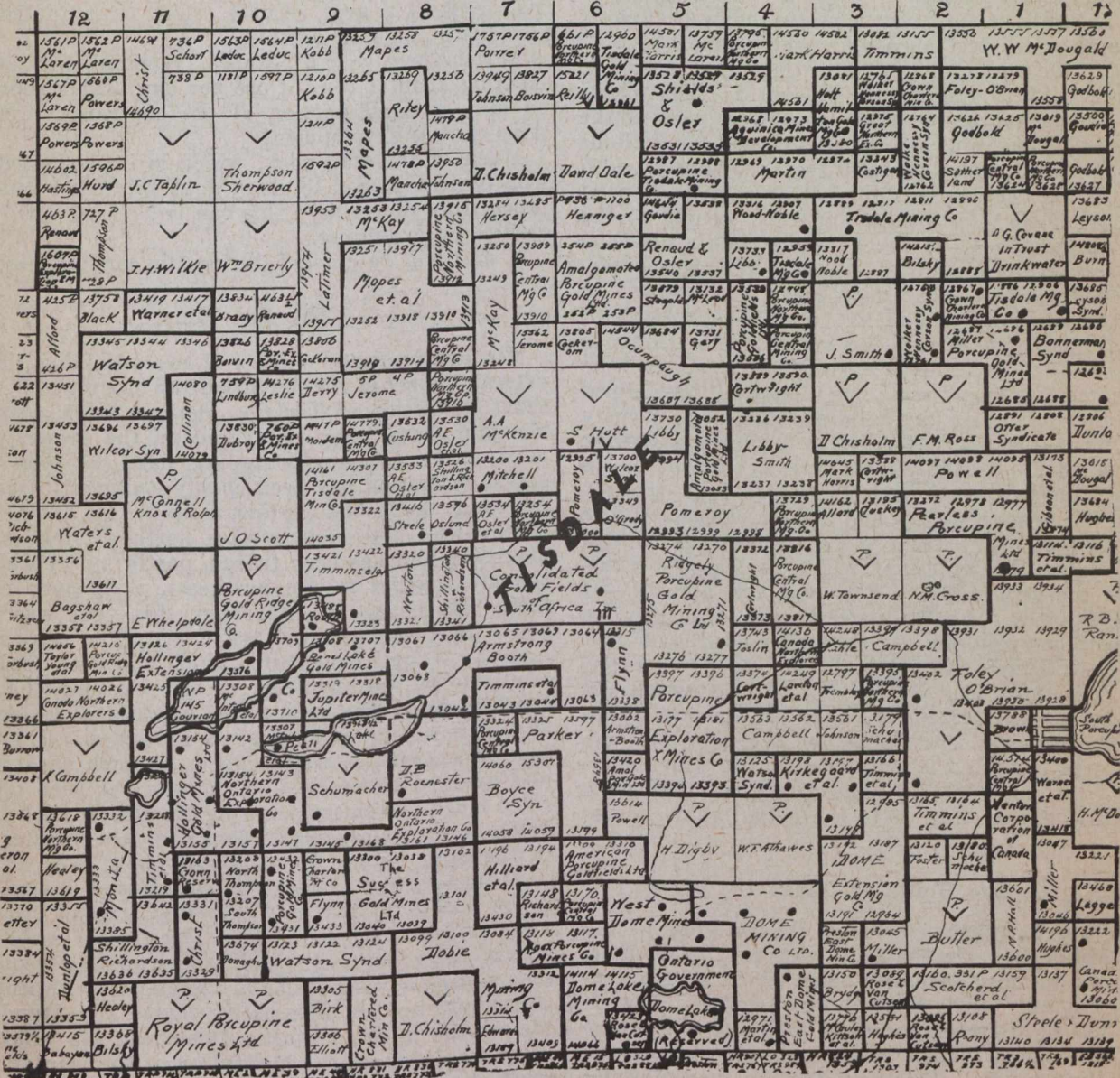
their owners. Many samples were taken for assay, rather for the determination of the distribution of the gold, which was found to be irregular and to be associated with the secondary fracturing of the quartz (and schist) in many cases. The determination of the value of properties is a matter requiring considerable development accompanied by extended sampling and mill tests.

In the following is a brief description of a few of the working properties. Gold has been discovered on

long east and west, there are frequent occurrences of quartz in irregular masses and narrow quartz veins, in some of which there is visible gold. Toward the east end of the workings there are large dome-like masses of quartz in contact with Huronian conglomerate and slate-like greywacke, while to the west the quartz occurs chiefly as narrow veinlets associated with Kee-watin schist which is impregnated with carbonate. The country rock in the proximity of the veins contains considerable crystallized iron pyrites.

The surface of this deposit was sampled during the summer of 1910, while a part of it was tested by underground workings, consisting of five shafts, one raise, and about 1,000 feet of drifting and cross-cutting at the 40-foot level. In addition, seven diamond drill holes averaging 400 feet tested the property at various points. During the latter part of the summer a 1,500-pound Nissen stamp was used for sampling purposes. As the result of this prospecting the company decided to equip the property with a modern 40-

bins. Chalmers and Williams' 1,250-pound gravity stamps will be used with straight-back rapid-discharge type mortars, screen 18-mesh or coarser. The foundations will be reinforced concrete. Outside amalgamation will be adopted. Superimposed Dorr drag classifiers will be installed over tube mills of the El Oro type, which will be followed by a second set of amalgamating plates. Hydraulic cone classifiers will discharge back to tube mills and overflow to Dorr thickeners. Agitation will be accomplished in a ser-



stamp mill and cyanide plant, to treat the mass as a low grade ore body, mining both schist and quartz.

A main 8 foot x 18 foot shaft will be sunk to the north of the present No. 2 prospecting shaft. Both the mine and the mill will be operated by electric power, for which purpose about 1,000 horse power will be required. Ten air drills will be used for breaking down the ore.

The mill treatment of the ore will be as follows:

Preliminary crushing will be done in two stages, using No. 7 1/2 and No. 5 Kennedy gyratory crushers. Belt conveyors will carry the ore to the stamp feed

ies of continuous Pachucas. Combined thickeners and press tanks will feed to Merrill slime presses, which will discharge through automatic tailing samplers.

The gold will be precipitated by the Merrill zinc-dust process. The zinc-dust will be fed by a short conveyor belt, operated by means of floats and counter-weights, at a rate proportional to the volume of solution pumped from the tank. The zinc-dust will be discharged into a mixing cone and the emulsion agitated by a jet of air. A small stream of barren solution will provide a constant overflow which will carry the emulsion down a pipe to the suction of the

pump. The solution will be pumped to triangular precipitating presses, precipitation taking place entirely during the passage of the solution through the pump, pump-column, and presses. The precipitates will be acid-treated, fluxed and smelted.*

West Dome Mines.

This property, commonly known as the Foster, is directly southwest of the Dome in lots five and six. There are several veins on this property, some of which occur near the Dome boundary. These are narrow, averaging possibly two feet in width, and consist of ankerite and quartz. One shaft has been sunk to a depth of 25 feet on a vein which dips about 75 degrees to the north. The greatest attention, however, has been paid to the deposit known as the "Curts vein," which is situated in the southwest part of the property. This vein has been stripped at various points, over a distance of 1,200 feet, showing a width of about three feet up to twenty-two feet. The deposit has well-defined schist walls, and dips steeply to the north. In proximity to the vein the country rock is rusty weathering, but away from the vein is a greenish Keewatin schist. The main mass of the lode is a lime-magnesia-iron carbonate, the composition of which is given earlier in the report. This mass is variously called ankerite or ferruginous carbonate. In fresh material the carbonate has a gray to light bluish colour, but on the surface is much stained to a rusty brown, which has resulted partially from the oxidation of iron pyrites but chiefly from ferrous carbonate. In parts of this carbonate rock there has been fracturing and filling with quartz and a later carbonate. The quartz veinlets vary from mere threads up to two feet in width, the widest of which are mostly transverse to the strike of the lode and end abruptly at the schist walls. Unequal weathering of carbonate and quartz has resulted in a striking ribbed structure. Native gold occurs in patches in the quartz and also in the carbonate near the quartz, indicating an enrichment of the carbonate from the quartz veins. When the property was visited on February 21st the development consisted of only two shafts, which were down 32 feet and 45 feet respectively, so that little was known at that time as to the actual value of the deposit.

The Hollinger Mines

The property consists of four claims lying to the east of Miller Lake in the southwest part of Tisdale. There are a number of quartz veins which have a general northeast and southwest strike. Development has been largely confined to the southeasterly vein of the series, which is generally known as the main Hollinger vein. This vein has the characteristic lenticular structure, which is frequently seen in this area, widening in places to 15 feet and again narrowing to a few feet. Two vertical shafts No. 1 and No. 3, 625 feet apart, have been sunk 100 feet. Of these No. 1 is a 14 x 6½ foot 3-compartment shaft, and has been used as the main working shaft. No. 2 shaft, which is midway between the others, was discontinued at 60 feet. No. 1 and No. 3 have been connected at the 100-foot level by a drift along the vein. On February 19th this drift had been extended 300 feet northeast of No. 1 shaft, and at a point 120 feet from No. 1 shaft a 6 x 9-foot winze had been sunk 114 feet.

*Can. Mining Journal, Vol. XXXII., No. 4, p. 126.

The vein, as exposed at the surface, at the bottom of No. 1 shaft and at the bottom of the winze, is nearly vertical. A cross-cut had also been run from a point 110 feet south of No. 1 shaft 100 feet to the southwest towards the second vein of the series.

The gold in the ore occurs chiefly along dark seams in the quartz in which there is iron pyrites. These seams are well distributed in much of the quartz in this vein. Copper pyrites, zincblende, and galena occur in minor quantity. Other minerals in the vein are calcite, dolomite, sericite, and chlorite. Fragments of wall rock are frequently included in the vein. The wall rock is a grey sericite schist impregnated with carbonate and iron pyrites.

For the past year a 2-stamp Tremaine mill has been treating about 4 tons of ore per day, which represented only a small portion of the ore raised from the mine during development.

Much of the wall rock, which is impregnated with iron pyrites, is said to carry gold values for some distance from the veins. This can be treated with better results by cyaniding.

A mill will be erected during the coming year.

The Rea Mine.

The Rea property consists of two adjoining 160-acre veteran claims in the north half of lots 6 and 7 in the third concession of Tisdale. Several veins, with visible gold, have been discovered on the property, but most of them, beyond stripping, have not been developed. Attention has been chiefly confined to the vein known as the Connell, which is on the lot line between the claims. This vein strikes north 47 degrees east magnetic, and has been traced, partly by trenching in the low ground to the northeast, a distance of 300 feet. When seen in February this vein was being tested by two shafts 150 feet apart. The more northerly, No. 1, or "Kingsmill," shaft had been sunk vertically to 85 feet, while at 75 feet cross-cuts had just been started. The vein where exposed at a depth of 30 feet has a dip of 85 degrees northwest. The hanging wall, which is well defined, is much slickensided and grooved vertically. The quartz has been subjected to much movement, showing frequently slickensides along dark seams, which occur for the greater part in the direction of the vein and show over a width of about two feet. Numerous stringers of quartz, from a few inches to two feet in width, extend from the main vein into the foot wall. The greater enrichment occurs along the north wall, where gold is frequently seen along the dark seams in association with iron and copper pyrites. A little native copper was found near the surface in No. 2 shaft. This shaft, the "Eakins," was being sunk on the inclination of the vein and had reached a depth of 25 feet.

Preston East Dome Mines.

On the Preston claim, H. R. 826, in Deloro township, adjoining Tisdale, the rock associated with the gold veins is a quartz-porphry, which in part has been fractured and filled with narrow quartz veins, some of which will average from 5 inches to 15 inches in width. These narrow veins cut across the general strike of the formation in a north and south direction. In places the porphyry has been sheared and fractured, showing dark seams along which gold sometimes occurs. When seen in November, 1910, the property had not been developed beyond some stripping and a

few shallow pits. During the winter a compressor plant and 2 Nissen stamps were taken in to test the property.

Armstrong-McGibbon.

On the Armstrong-McGibbon claim, the northwest quarter of the south half of lot 1 in the fifth concession of Tisdale, there is a band of impure carbonate rock with an east and west strike, which towards the west is exposed for a width of 50 feet. This rock has been considerably fractured in an irregular manner, and quartz veins occur at many points. These veins, towards the west part of the band, have a dip to the south at about 35 degrees, whereas the schistose carbonate rock dips to the north. Gold has been found in very coarse and spectacular form at several places in the quartz, and the best values are obtained along the line of quartz and schist, especially where slips occur. On the west part of this band of fractured rock a 7 x 9-foot shaft had been sunk 65 feet, encountering narrow veins of quartz dipping to the south, in all totaling about six feet. Six hundred feet to the east a second shaft had been sunk 30 feet. Here the quartz veins have a decided dip to the north.

The property was equipped with a 30 h.p. boiler and a 6 x 8-foot hoist, and drilling was being done by hand.

Scottish Ontario.

On the Scottish Ontario property in northwest Whitney there are several veins exposed on the surface with approximately east and west strike.

An 8½ x 5-foot shaft had been sunk 100 feet and at 90 feet cross-cuts had been started north and south. The north cut had been extended 80 feet, while at 50 feet it cut a mass of quartz on which drifting had just begun. The rock in the cross-cut is Keewatin greenstone, a soft decomposed basalt at the breast and a hard quartz diorite at 30 feet from the shaft. This hard rock was also exposed in the shaft at 40 feet. The cross-cut was to be continued northward to cut two well-defined veins which were exposed on the surface for over 400 feet.

A 24 h.p. boiler is used to run the hoist, and drilling is done by hand.

Powell Claims.

The claims of the Powell group are in the northeast part of Deloro township. A band of rusty weathering carbonate with much serpentine occurs on M. E. 22, M. E. 21, and adjoining claims. This band has a strike somewhat south of west, varies in width from 35 feet up to 75 feet and dips to the north at about 60 de-

grees. In parts of this band there are veinlets of quartz and dolomite in which visible gold has been found. The veinlets of quartz have a general strike of northeast and southwest. In one part argentite occurs in association with the gold.

Two 50-foot shafts one-half mile apart have been sunk in the hanging wall of the carbonate band at points where the rock is much intersected by quartz veins.

Vipond.

This property is the principal claim of the Porcupine Gold Mines Company.

There are several narrow quartz-ankerite veins having a general northeast and southwest strike. When visited in February last the main development had been confined to No. 3 vein, which had been traced for several hundred feet on the surface. A 4½ x 9-foot 2-compartment shaft had been sunk to the south of the vein a depth of 100 feet, and a cross-cut of 42 feet made to the vein. Drifting had been started in both directions along the vein, which at this depth showed a width of 18 inches to 2 feet, dipping to the southeast at about 83 degrees. The vein consists largely of quartz, but in addition there is considerable carbonate, some in the form of clear calcite.

On No. 3 vein a shaft had been sunk 50 feet, but at 23 feet the vein dipped out of the shaft and no cross-cut to it had been made.

One Nissen stamp was in operation and a small amount of bullion had been produced.

Foley-O'Brien.

This property is situated half a mile west of the south end of Porcupine Lake, where, on a ridge of Huronian rock which outcrops through the drift, the main workings are located to the north of the main road.

No. 1 shaft has been sunk 70 feet. The surface was not exposed, but it was stated that this shaft had been sunk on a quartz outcropping. As seen underground, the quartz appears to occur as a lens, but more development is necessary before the character of the ore body can be determined.

At the 37-foot level the quartz mass is about 26 x 35 feet in horizontal dimensions, while it shows in the shaft for 20 feet deeper, and from a lower cross-cutting appeared to be dipping to the east.

A second shaft had been started to the south of No. 1 shaft on high ground, since the first shaft was located close to a creek and much water was encountered.

A 4-drill compressor plant had been installed and 3 drills were in operation.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

The inundation of Port Hood Colliery.

Later information does not throw much light on the cause of the flooding of Port Hood Colliery, but it is now clear that the inrush could not have been predicted, and that, under the circumstances, and with the pumping equipment available, it was quite impossible to do any more than was done to save the mine. Some very uncalled for and injudicious attacks have been made on the management, and innuendoes have not been few that the mine was lost through improper working.

The water broke in at a point where the vertical cover mea-

sured 941 feet, in a portion of the workings where no faults had ever been encountered and no signs of water had ever been noticed. When first the water made its appearance it was the merest trickle, but it was regarded seriously because hitherto the mine had been quite dry in this section. The inflow is calculated to have been about 300 gallons per minute, and the low level pump could only handle 54 gallons per minute at the best. It was speedily drowned. Two attempts were made to put in dams, but before they could be completed the water overflowed them. Had there been time to have finished the dams it is extremely doubtful if they could have

been made effective, because of the enormous pressure of the rising water and the broken nature of the roof. The inundation was so utterly unexpected that no proper dam material was at hand, but even had material been ready, it is more than doubtful if it would have availed anything.

The depth of water at a point vertically overlying the place where the water broke in is only 17 feet, and the sea-bottom is bare at low-tide. It is, in fact, just at the end of the shipping pier.

The whole affair is inexplicable, but so far as can be learned no blame can be laid upon the management, except it be that they failed to anticipate the unexpected.

The Port Hood incident makes it evident that in submarine mining nothing should be taken for granted. All possible information should be collected as to the depth and the nature of the cover, and the position and size of any faults or crevices in the strata. The depth of the sand should be tested by drills, and the soundings should be accurate and so arranged to show, if possible, the presence of any hollows or pits in the sea-floor.

No rules can be laid down for pillar-drawing, or the system of working to be pursued in submarine territory, because the local conditions must rule, and local experience must guide the operations. It is obvious, however, that pillar-drawing should be undertaken with great judgment, and that every possible means should be adopted to prevent any decided break in the sea-floor. Such precautions will be especially necessary in the case of submarine territories where more than one seam is being extracted, and where barrier pillars may be superimposed. It may be possible to use with advantage the system of packing the waste by "flushing" with sand, which system has been largely used in Germany and is being now used in the United States.

A reasonable precaution in all submarine mining would be to have in readiness suitable material for building dams quickly. In some places it may be advisable to put in permanent dams, so arranged as to swing or slide into position when required. Ample pumping capacity should, of course, be provided.

So far as is now known, the submarine areas around Sydney and Glace Bay are of a very different character to those of Inverness County. In the Sydney coalfield the sea-bottom slopes very slowly from the shore, and the submersion of much of the coast is evidently the result of slow erosion extending over an incalculable period. There are practically no faults or dislocations in this field, and both the measures and the coal seams maintain a surprising regularity and sameness. The conditions for submarine mining are very favourable, and given only reasonable precautions there is absolutely no reason to anticipate any such occurrence in the Sydney coalfield as has unfortunately befallen Port Hood Colliery. That reasonable precautions are being taken is more than assured, and it may be confidently stated that the people in charge of the mining operations in the Sydney coalfield are fully alive to all the possibilities of submarine coal-mining.

Dominion Coal Outputs.

The outputs for July total approximately 369,000 tons, or 600 tons more than the largest monthly output yet obtained from the Dominion Coal Company's mines. The largest previous monthly production was 368,400 tons, in July, 1908. The figures for July this year are, however, really better than would appear, because in July, 1908, the month had 26 working days, and in the same month this year there were only 25. The average daily output in July of this year was 14,710 tons, comparing with 14,170 tons in July, 1908. The steadiness of the outputs has been noteworthy.

No. 9 Colliery (Harbour Seam) put out 39,920 tons, beating its own record of 38,655 tons in October, 1906. All the Lingan collieries exceeded their best previous performances, con-

tributing 52,000 tons, or one-seventh of the entire monthly tonnage.

No. 14 Colliery is now almost up to its full production, and when the permanent hoisting engine is installed, the equipment of this mine will be complete. It is practically settled that the hoist will be an electrically operated one, and if this intention is carried out, No. 14 will be a colliery without boilers, and consequently without smoke.

In very many respects the new collieries at Lingan will be in advance of the older collieries on the Glace Bay side, but in no respect will the improvement be more marked than in the housing accommodation, and the general surroundings of the colliery houses. It is not so generally realized as it might be how great an influence on the steadiness and morale of a mining population is brought about by decent housing and pleasing natural surroundings. The new houses being built for the colliery workers have rear kitchens and front verandahs, and care has been taken in clearing the woods to leave as many of the hardwood trees as possible. It is pleasing to note how many of the residents have cultivated kitchen gardens, and to observe flowers and creepers around the house fronts.

The improvement in the Springhill output continues, and from 1,000 to 1,400 tons a day are now being mined. The July output was about 27,000 tons.

ONTARIO.

Cobalt and Gowganda.

While the tonnage shipments from the Cobalt camp for the first six months of this year are almost 3,000 tons less than for the first six months of 1910 the value of the ore sent out is almost two million dollars higher. The figures for the first quarter of the year are official, those for the second quarter are based on the tonnage shipped, the same ratio of silver ounces per ton being allowed as in the first quarter. As concentration has increased during this period and the shipment of low grade ore decreased, the estimate should be exceeded. The official return for the first quarter of the year was:

First Quarter.	
Ore	\$3,358,273
Bullion	350,271
	\$3,708,544
Second Quarter.	
Ore	\$3,883,460
Bullion	330,329
	\$4,263,789
First six months of 1911	\$7,972,333
First six months of 1910	6,103,372
	\$1,868,961

The La Rose Consolidated is now for the first time since the property was taken over, working the Violet mine, near Cross Lake. The old shaft, sunk five years ago by the original owners, has been pumped out and work may be resumed from it. Under the old owners this property yielded two cars of ore. It is in the diabase formation, which has not been very profitable digging for mine operators.

Having secured some fresh capital, the Rochester Mining Company has let a contract to the Lumsden Mining Company to open up its property from the 200-foot level of the contractor's shaft. At this depth the Lumsden opened up a vein carrying much smaltite and some native silver, and it is proposed to follow this and other veins over the boundary of the property on to the Rochester, which has been idle for some time. It is interesting to geologists to notice that, like the Temiskaming, the Lumsden has found the diabase under the Keewatin, and, like them too, find that the values do not persist

in it. The probability of this development was discussed by Mr. Cyril Knight in a paper he read before the Cobalt branch of the Canadian Mining Institute some months ago. He then predicted that after about 600 feet of diabase had been penetrated the Keewatin would be encountered again, and with it galley five—Mining journal 8 point a chance of getting more silver values. It remains to be seen if any of the South Coleman operators will have the courage of their convictions and expend money in sinking and diamond drilling for the Keewatin underneath.

Captain A. A. Hassan has returned to the Cobalt field and reports that he has a considerable sum of money to continue development at the Cobalt Station Grounds. Contracts may be let either to the Cobalt Lake Mining Company or the City of Cobalt to continue their drifts into the Station Grounds property and so develop it.

It is again reported, with some colour of probability, that the T. & N. O. Commission is going to build an electric line into Elk Lake and Gowganda. It is likely that the line, if it is built at all, will be constructed on the same terms as the Hollinger extension from South Porcupine, namely, that the money for the scheme is to be provided by a private company, that will receive back its money in a percentage of the traffic returns. It is said power is to be developed at Englehart.

At Elk Lake some bags of ore have been discovered, stolen, it is said, from the Lucky Godfrey shipment more than a year ago. Some 25 bags have been discovered, and it is said that the constable who has made the find it hot on the trail of more. Among well posted mining men it has always been doubted if the loss through the highgrading operations was quite as high as the company imagined, though it has always been conceded that some high grade ore had been taken and rock substituted in its place.

The Crown Reserve has completed its contract with the Prussian Government. The million ounces were contained in seven cars of high grade ore, the last of which left Cobalt the end of last month.

The standing of the Temiskaming Mining Company on July 1st, according to its own statement, was:

Cash in banks	\$247,902.38
Owing from smelters	42,659.00
Ore in hand	35,944.85
Accounts receivable and stock in hand	25,119.86
Unearned insurance	3,138.05
	<hr/>
	\$354,764.14
Account and taxes payable	44,812.41
	<hr/>
	\$309,951.73

The Philadelphia Syndicate which purchased the Cobalt Central mine, is now attempting to induce old stockholders in the Cobalt Central to put up more money to further develop the property at Diabase Mountain. The committee representing the Philadelphia Syndicate consists of Alfred S. Elliott, William J. Haines, and Spencer W. Wright, with head office at 1011 Chestnut Street, Philadelphia.

During the first six months of 1911 the Crown Reserve mined ore to the amount of \$795,829, while the mining profits amounted to \$654,287. The cost of mining was 11.467 cents per ounce, a third of a cent lower than the cost for last year. During the six months \$53,644 was paid out in dividends, leaving a cash surplus of \$45,582.

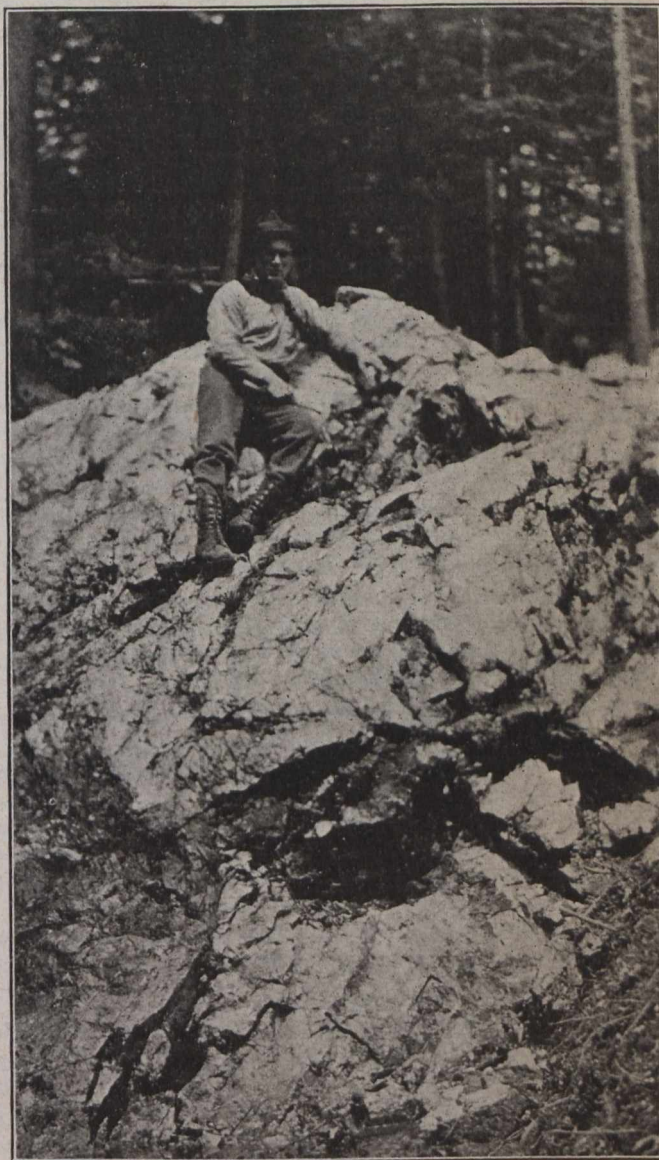
Arbitration is still in progress in relation to the strip of land expropriated from the Cobalt Lake Mining Company by the T. & N. O. Railway. Two sittings have now been held, and the third will be opened shortly in Toronto.

The Coniagas paid another 6 per cent. regular and 3 per cent. extra dividend on August 1st, which meant a disbursement of \$360,000. The company has to date paid 62 per cent.,

or \$2,480,000. With ore reserves of 16,000,000 ounces almost untouched, the Coniagas holds a very strong position in the Cobalt camp.

Porcupine and Swastika.

The general work of reconstruction after the fire has hardly commenced at the mines affected with the one exception of the Dome. They were not in a sufficiently forward position to have any extensive plant, and since the fire wiped everything out there has been considerable deliberation before ordering fresh plants. Much good work has been accomplished fixing up the mine roads, clearing and preparing for the erection of



Quartz Outcrop on Martin Group.

the plants. The Dome, having plans fully matured, commenced with the utmost speed to replace what it had lost. It employed every man it could find to build a spur out from the main line to the mine, so that the new and very heavy machinery could be unloaded right at the foundations of the plant. It secured a second-hand plant exactly similar to the one burnt, so it will be able to place it on the old foundations. It is very desirous of immediately proceeding with underground work so as to open up other levels.

It is now known exactly where the spur line to the Hollinger will go. By extending the line somewhat it has been possible to avoid a very heavy rock cut, and the line should be running into the Hollinger by the first of October. Now that the T.

& N. O. Commission has definitely picked the spot for the station at the Timmins townsite, the lots should be on the market in a few days. So heavy has been the demand that it has been decided to auction them on the understanding that every lot will be furnished with water and drainage by the vendors.

The Jupiter mine has continued to be the scene of good discoveries. On what may possibly be another vein running parallel to the first at the hundred foot level, another extremely rich lens of ore has been struck about 40 feet from the former. So rich is the ore that after it had been picked over several times it still yielded minute nuggets and fine gold on panning.

There is now a very bad congestion of traffic on all the sidings in Porcupine or on the Porcupine branch. It is estimated that 380 cars are lying between North Bay and Porcupine waiting to go in and the merchants at the gold camp have not been able to unload the freight as fast as they hoped. There was a dearth of teams and the road between the railroad and South Porcupine was long delayed. It is claimed that to-day there are a million and a half feet of lumber required in Porcupine, and only 350,000 feet have so far reached the gold camp. The same conditions prevailed at Cobalt after the fire, and only time can remedy the state of affairs.

The Brydge McAulay claims in Bristol township have been sold to B. E. Cartwright, of Toronto, president of the Temiskaming mine at Cobalt, for half a million dollars. The first payment is small and the installments are spread over two years. The vein is of quartz and ankerite and free gold can be discovered in the quartz all across the vein, and it is fully twenty feet wide on the average. An action for an interest has been started, but it is not expected to form any impediment to the deal.

The British Canadian Power Company has finished its surveys at Waiwaitan Falls on the Matagami River, and 25 men are now employed laying out camps for the 250 men who are to be employed at the work of erecting a dam and putting in machinery for a plant to supply 800 horse power. The water power consists of a series of falls about 18 miles from Porcupine.

Work recommenced on the Hughes property has already brought results. Two new veins running parallel to the first find have been opened up and traced for a distance of 200 feet.

Mr. Walker Ross, who has been put in charge of the Standard Mines, where everything was lost in the fire, will not bring in a fresh plant till he has done a very considerable amount of diamond drilling and prospecting. It is said the Imperial Porcupine will soon start up again after its complete demolition by the flames.

After duly considering the claims of the prospectors for extension of time in which to do assessment work, the Government has decided to grant a general extension of 60 days, with power to Mr. Bruce, the local Recorder, to still further extend the time limit in any cases he thinks particularly hard. It was at first proposed to make a year's extension, but this was opposed as likely to foster the speculative spirit in the camp.

Under Mr. Rickart, the new manager of the Foley-O'Brian, work has been resumed and new camps are being built. The Foley-O'Brian was fortunate enough to save its plant, and the principal loss it sustained was loss of time owing to the impossibility of housing the men. Work has also been resumed on the Vipond and the ten stamp mill which was to have been installed this fall will probably now be brought in as soon as it can be supplied and hauled over the road.

It is now anticipated that the Swastika plant will be set up and in running order by the end of August. The new plant consists of an eight drill compressor, two 125 horse power boilers, and a complete equipment. It will now be possible to continue development on a much larger scale, former opera-

tions being very largely curtailed by the small and antiquated plant.

An excellent discovery has been made on the claims of the Pike Lake Mining Company at Swastika. There had previously been discovered a wide vein of quartz and ankerite, and in it a very little fine gold. Recent developments have opened up a rich section in this vein. Another good discovery has been made on the Hurd claims on the north side of the track. The property is now known as the Lucky Cross Mines of Swastika.

The Porcupine Canada Gold Mines, Limited, has purchased, through Baron von Polenz, the Joslyn, the Canadian Northern Explorers, and the Kahle claims in Tisdale township. The people interested are mainly Germans and Englishmen.

Captain A. S. T. Stevens, who has resigned from the management of the City of Cobalt mine at Cobalt, was given a very handsome present by the men when he left the company. The contract made with the Northern Customs plant to mill City of Cobalt ore has expired and has not been renewed, the Customs company desiring to turn its attention to Cobalt Townsite ore in preference.

BRITISH COLUMBIA.

At the time of writing (August 1) the outlook for a resumption of work at the coal mines of the Crow's Nest district is not thought to be encouraging, except that information has been received of the intention of the Corbin Coal and Coke Company to reopen its mine at once. This company, however, is differently situated to others in the district, in that it has an immense body of coal which can be mined—practically quarried—from the surface, and this will give a large tonnage over a long period. A press despatch from Fernie contains the information that the Crow's Nest Pass Coal Company's employees near there, numbering more than one thousand men, have decided not to support resuming work under the conditions proposed by the Board of Conciliation as contained in the majority report made to the Minister of Labour. Meanwhile the exigencies of the situation are being in part met by a reduction of railway freight rates on coal from the United States and the announcement that a rebate of the customs duty will be made on coal shipped from the States to the parts of Western Canada most affected by failure of their ordinary sources of coal supply.

East Kootenay.—The Sullivan mine continues to be one of the chief sources of lead ore supply for the Consolidated M. & S. Company's smeltery at Trail. The output for the seven expired months of this year has totalled between 9,000 and 10,000 tons. The St. Eugene, for many years the largest and most productive lead mine in Canada, has shipped about 3,800 tons of lead-silver concentrate during the same period, this being the product of between 20,000 and 25,000 tons of crude ore mined and put through the concentrating mill. Several other properties in Fort Steele mining division are being worked, but as yet their production is insignificant. Placer mining is being carried on in several parts of the district—on Wild Horse, Perry, and other known gold-bearing creeks.

Slocan.—The Canadian Pacific Railway Company having let a contract for the construction of a spur line, to be about four miles in length, from its Slocan railway at Three Forks to near Bear Lake, chiefly to provide railway transportation for the Rambler-Cariboo and Lucky Jim mines, an aerial tramway is to be erected from the former mine to the site to which its concentrating mill is to be removed. The distance from mine to railway will be approximately two miles. The mill site will probably be near the railway, so as to admit of economic shipment of concentrates from the mill to the smeltery. Financial arrangements have been made for the improvements decided upon. Much ore of good grade has been opened on five levels, namely on the 700, 800, 900, 1050, and 1250-foot levels, and the main adit is being extended on the 1400-foot

level to cut the downward extension of the three oreshoots opened in the higher levels. Several years ago this main adit was driven 4500 feet with the object of draining the old workings of the mine and doing away with pumping and hoisting. Since then connection has been made with the old shaft at the 800-foot level and other levels below that have been opened. Now there is a comparatively large tonnage of ore available for extraction, but since the forest fires of last summer destroyed the railway for several miles, it has not been practicable to ship a large quantity of ore. The construction of the C. P. R. spur line will do away with this disability. Shipments of ore from this mine during an earlier four-year period totalled 14,500 tons, having average metal contents as follows: Silver, 127 ounces per ton; lead, 37 per cent.; zinc, 14 per cent. Average metal contents were rather lower last year, but as some shoots of high-grade ore have since been opened, good returns are looked for. Last winter, when snow was on the ground and hauling was good, shipments of ore were at the rate of about 200 tons per month. Preparations for shipping ore from the Lucky Jim mine, which in past years has been the largest shipper of zinc ore in Canada, are being made, so as to be in a position to regularly maintain a fairly large output after the railway spur shall be completed to within a short distance of the mine. The Lucky Jim also has large reserves of ore, and the mine has been developed to an extent that will admit of its production being an important one.

Nelson.—Lode-gold mining in Sheep Creek camp is on a gradually increasing scale. Mill plant and machinery is being installed at the Mother Lode mine; the Nugget is being closely examined by representatives of United States capitalists who have this property under bond; the Queen is being opened to a deeper level; and the Kootenay Belle is also shaping well for future production. Several other properties are being developed, some of them with good prospects of becoming producers. Lead ore has lately been found in the vicinity of Sheep Creek camp, and some prospectors are now giving attention to this mineral. The Emerald lead mine, near Salmo, in this district, has shipped much lead ore in recent years, and has heretofore been the only lead mine in the Nelson mining division. Mining in Erie and Ymir camps is still in progress, but without much ore production just now. Near the town of Nelson the chief producer is the Granite-Poorman property, on which a 20-stamp mill is kept running.

Boundary.—The smelting works of the Granby and British Columbia Copper Companies have been kept in operation, supplies of coke having been obtained from Pennsylvania during the last three months. There is not much being done in the way of producing ore in this district other than the operations of the two companies just mentioned. The Greenwood-Phoenix Tramway Company is persisting in its work of driving a long tunnel from Boundary Creek near Greenwood into the mountain in the direction of Phoenix, but so far no orebody of commercial importance has been encountered. Good results are expected ere long, though.

Portland Canal.—The most important mining operations in progress in this district are those of the Granby Company in the vicinity of Goose Bay, Observatory Inlet, the latter being an arm of Portland canal. The company has about 80 miners at work developing the Hidden Creek copper mine, and a number of mechanics and other employees making surface improvements. The mine is stated to be developing satisfactorily, giving promise of proving a large copper mine. It is unlikely, though, that much ore will be shipped to smelters this year, the company's present policy being to further develop a large tonnage and to otherwise prepare for putting in its own smelting works at such a place as shall be found most advantageous.

In Portland Canal camp proper the Portland Canal Mining Company and the Red Cliff Company are operating energetically.

The former company has added more machinery and plant to the equipment of its concentrating mill, which was running to full capacity by the end of July. The mine is in excellent condition for regularly maintaining a sufficient supply of ore to keep the mill fully supplied, and development work is being kept well ahead. The Red Cliff Company has been awaiting the completion of the 12 miles of railway that will provide transportation facilities for shipment of ore to Stewart, where it will be loaded on steamers for conveyance thence to the Tye Copper Company's smeltery at Ladysmith, Vancouver Island. It is stated to be the intention of the management to ship 100 tons of ore per day. Ore is being opened on three levels in the mine. Water power has been substituted for steam to drive the compressor. A gravity tramway down to the shipping bunkers is about completed, and other preparations for sending ore out are also reported to be well forward.

Skeena.—This district is receiving much attention this year, particularly the part of it with Hazelton as its centre. The development of a number of promising silver-lead properties is being proceeded with, there now being a prospect of transportation difficulties being much lessened by the progress made with construction of the Grand Trunk Pacific Railway. Much district is contained in the reports of Mr. W. W. Leach, printed in the "Summary Report" of the Geological Survey of Canada for 1909 and 1910, respectively. Mr. Jas. McEvoy is opening coal measures in the northern part of Skeena district for a syndicate in which Toronto capitalists are largely interested. It is expected that this property will be visited late in August by Mr. G. G. S. Lindsey, and Messrs. Louis Reyersbach and Hugh F. Marriott, of the Central Mining and Investment Corporation, London, these gentlemen being scheduled to make a trip to western mining districts shortly.

Other Coast Districts.—Metalliferous mining on Queen Charlotte Islands seems to be quite unimportant at present. Several years ago many glowing statements were published concerning the big ore deposits reported to have been opened on Moresby Island of this group, but little or nothing is heard of them these days. Prospecting for coal is being carried on in parts of Graham Island, but the gross exaggerations of company promoters, as advertised in some of the provincial newspapers have made many people suspicious of the bona fides of the companies spending so much money in flamboyant advertising. One of the worst offenders in this direction is the "trustee" of the British Pacific Coal Company, which is alleged, among other things, to control "practically the only body of anthracite coal land in Western Canada."

Much activity prevails on one or two of the creeks in Atlin camp, where returns from placer mining were larger in 1910 than in either of the two immediately preceding years. Information concerning gold-quartz mining in Atlin district is given in the report of Mr. D. D. Cairnes, printed in the "Summary Report" for 1910 of the Geological Survey of Canada, including the fullest particulars yet published relative to the pockets of rich gold-tellurium ore found at the Engineer mine, Taku arm.

Vancouver and Texada Islands.—Coal mining on Vancouver Island is on a larger scale this year than in any previous year in the history of this industry, so that last year's record output of more than 1,600,000 long tons of coal is likely to be exceeded this year. There is no metal mining of consequence being done, save that it is reported a large deposit of iron ore, in the vicinity of upper Quinsam and Buttle Lakes is being opened, with promise of results of commercial importance. The mining of gold-copper ore in the vicinity of Van Anda, Texada Island, is being continued, though recent production has been largely restricted to the Marble Bay mine.

GENERAL MINING NEWS.

NOVA SCOTIA.

Glace Bay.—A new record for coal production was hung up at the collieries of the Dominion Coal Company last month. The output reached the splendid figures of approximately 369,000 tons. This is the largest output in any one month at these collieries. The best previous month was July, 1908, when 368,324 tons were produced. That month, however, contained 26 working days, while there were only 25 in the month just closed, which, therefore, in addition furnished a record for the best daily average production all around.

Other features of the output figures for the month are that the men at No. 9 made a new record for that time, getting out 39,920 tons—the best previous month's work at No. 9 resulting in an output of 38,600 tons in October, 1906—and the rapid growth in the output figures for the new collieries in the Waterford district. As will be seen by the figures given below, these new collieries produced about one-seventh of the company's total.

The approximate outputs by the collieries in detail were as follows:

No. 1	50,940
No. 2	68,320
No. 3	16,240
No. 4	36,590
No. 5	29,570
No. 6	22,750
No. 7	17,770
No. 8	17,970
No. 9	39,920
No. 10	15,680
No. 12	25,290
No. 14	21,820
No. 15	3,820
No. 16	1,180
No. 20 (Birch Grove)	1,130

Total 368,990

ONTARIO.

Ottawa, July 31.—Hon. Mackenzie King to-night made the following announcement:

"With a view to relieving the situation as it has developed in the Canadian West in consequence of the prolonged cessation of operations at the coal mines in southern British Columbia and Alberta, an order in council was passed by the Government to-day providing that on and after August 7th the duties on coal will be removed on the southern frontier, west of Sault Ste. Marie for consumption in British Columbia east of the 122nd meridian of longitude, and in the Provinces of Alberta, Saskatchewan, and Manitoba."

The action taken by the Government is based on representations which have been made by the Premiers of Alberta and Saskatchewan, by boards of trade and the authorities of the mining localities in provinces concerned to the effect that a serious shortage of coal in eastern British Columbia and in the Provinces of Alberta and Saskatchewan and Manitoba is likely to result from the prolonged cessation of work in the various coal mines, and that such shortage will be liable to be the occasion of widespread privation and possible disaster among the inhabitants of the provinces referred to. In these circumstances and having in mind the situation as it developed in the

Canadian West at the time of the threatened fuel famine four years ago, it has seemed right and conducive to the public good that exceptional steps should be taken to assist in bringing about an avoidance of dangers which might arise from a fuel famine.

It is stated in the order in council that the proposed remission of duties shall take effect on and after August 7th next, and shall continue so long as in the opinion of the governor in council the mines may, through lack of operation, fail to secure sufficient coal to meet present requirements and for a period of two weeks after the passing of an order revoking the order which authorizes the remission of duties. From this it will be apparent that if the authorities between now and the close of the present week affect a settlement and work is to be resumed on Monday next, no remission of duties will take place. On the other hand, if work should not be resumed on Monday next, then practically all coal brought into the Provinces of Manitoba, Alberta, Saskatchewan, and British Columbia will come in free of duty for such time as the work may not have been resumed at the mines and for a period of two weeks thereafter.

Poreupine, Ont.—Railway sidings are practically completed into the Dome mill site, over which new machinery will be taken as the beginning of another forty stamp mill and cyanide plant.

Railway building is being pushed in Tisdale, and within 30 days mines will be able to get sidings for the shipment of provisions and building material. The Government waggon road from South Poreupine to Pearl Lake is about completed.

A twelve-drill compressor plant has been ordered for the Pearl Lake gold mines.

Cobalt.—The Violet property, adjoining the Colonial, near Cross Lake, owned by the La Rose Consolidated, is again being worked, after a suspension of nearly five years.

BRITISH COLUMBIA.

Fernie.—The executive of District No. 18 of the United Mine Workers of America has acted wisely in deciding to submit the question of the acceptance of Dr. Gordon's award as chairman of the Board of Conciliation, which recently inquired into the differences between the miners and mine owners of the Crow's Nest Pass and Southern Alberta, to a vote of the men. By so doing they relieve themselves of any implication of prolonging the dispute for personal ends of any kind which might be levelled at them by persons not conversant with the situation. As a result of the executive's action the decision is left with those who are vitally and directly interested. The result of the vote will be awaited with the greatest interest.

YUKON.

Dawson, August 2.—The largest concern ever organized for Yukon, excepting Yukon Gold of Guggenheims, is now the eight millions company reported from London by cable as having been formed by the South African Gold Field Companies' capital on advance of John Hays Hammond. It is believed here that the concern takes extensive holdings on the Dominion Quartz and other creeks organized during the last two years by Arthur N. Treadgold, in his giant fight against Yukon Gold. It is also reported that the company absorbs Northern Light Power & Coal Company, which invested three million dollars some years ago installing electric power. Treadgold has already acquired vast holdings of the Canadian Klondike Mining Company, including the Boyle concession and dredges.

COMPANY NOTES

ONTARIO PORCUPINE GOLDFIELDS DEVELOPMENT.

Property Unharmed by the Recent Forest Fires.

The statutory meeting of the shareholders of the Ontario Porcupine Goldfields Development Company, Limited, was held at the registered office of the company, 20 Cophall Avenue, London, E.C., July 24, Mr. Cyril Wanklyn (the chairman of the company) presiding.

The secretary (Mr. F. C. Heley, F.C.I.S.) having read the notice convening the meeting.

The chairman said: Gentlemen, Forest fires, as you know, are of frequent occurrence in Canada, but they do not generally mean much loss of life. Two years ago in Porcupine the loss of life from a forest fire would have been very small indeed—in fact, it is quite possible that there might have been no loss of life at all. But since the summer of 1909 growing and flourishing townships have sprung up, a railway has been brought on to the field, and settlers of every class have crowded in. In these two years the population of the district has probably increased more than a hundred fold, and Porcupine, which a short time ago was a simple desert, is now the centre of a very flourishing and important community. Happily the loss of life is by no means so great as was at one time feared would be the case; but a sacrifice of life among men who are practically pioneers in a new region is always sad, and I feel sure that to those who have suffered, or who may be suffering to-day, the sympathy of all present here to-day will be cordially extended. Both in loss of life and in loss of property this company escaped almost as by a miracle. We had news of forest fires in the district towards the end of June, but the principal fire which caused all the mischief in this case seems to have started on 7th July in the southwest. It swept across the east side of the Porcupine field, in a line from southwest to northeast, and practically wiped out all it met. It descended in its course on our Camp No. 4, on the Dome mines, and on the townships around Porcupine Lake. Our other camps were in very serious danger at one time, but in the end they, with the Hollinger and the Rae mines, escaped unhurt. Above all, not one single member of the company's staff was hurt. Our principal danger was at No. 4 camp, as I said just now, but here everything was saved by the prompt action of our foreman. What occurred is described in a letter dated 10th July, from which I will read you an extract. The extract is to the following effect: "The fire swept over our No. 4 camp, and would have resulted in the complete loss of all our camp equipment had it not been for the foresight of the foreman in charge, who, realizing the danger, struck all the tents and buried the whole of our outfit in trenches. When the fire had passed, it was difficult to see where the site of the camp had been." The very latest news, later than that letter, is contained in a cablegram dated 18th July, which is as follows: "Railway opened 1st July; not damaged fire; official statement, dead under 70, our camps not damaged; no loss of life our staff; fire facilitate prospecting very much." Altogether we may congratulate ourselves upon a most fortunate escape, and I think that more than a word of thanks is due to the staff and management on the spot for the prompt measures which they took at the time to minimize what might have been a very terrible catastrophe.

With these few words on the recent fire, I pass to the immediate affairs of the company. The company proceeded to allotment on 26th April, and since then the entire purchase consideration, whether in cash or shares, has been paid. Moreover, the fifty mining claims in Porcupine, which we were formed to explore, have been registered in the company's name. I hope that this distinct statement will put an end to suggestions to the contrary which have been made, and to the effect that there has even been any difficulty about our titles.

No difficulty of any sort ever existed, and the claims are now not only our own, but are registered in our own name. In addition to the mining claims, we also took over some machinery, plant and buildings, to the value of £10,000 or thereabouts. The machinery includes boilers and a winding and compressor plant, and is practically new. As regards working capital, the prospectus stated that the issue would provide approximately £89,000. As a matter of fact, after payment of the vendors, we were left with £90,000, and of this sum £80,000 is still available for working capital and for the general purposes of the company. We were formed then to acquire and explore 50 mining claims in Porcupine. The area of these 50 claims is about 2,000 acres, and they are not in one block, but are dotted about the field. Yet there was nothing whatever haphazard in the selection of these claims; in fact they were pegged out by Messrs. Timmins and their friends in the early days of the field. At that time competition for claims was not so strenuous or severe as it became later on, and it was only natural that these gentlemen, who were not in any way hampered in their selection, should have chosen positions which, as it seemed to them, would repay subsequent investigation. The expression "early days of the field" in the case of Porcupine means about two years ago. Little, in fact, was known of this district till towards the end of 1909; we have, therefore, behind us the advantage of all the knowledge of people who were among those who led the way into this new district. Our 50 claims occupy no fewer than 14 different points on the main portion of the Porcupine field. This fact increases our chance of finding a successful mine, but it also involves a more extended and perhaps more expensive search than would be the case if our claims were all concentrated at one point. There is a distance of seven miles between our extreme north and our extreme south claims; there is a similar distance between our extreme east and our extreme west claims. We shall in our researches be attacking the field simultaneously at several different points. This advantage, in my opinion, far outweighs anything that might be gained by the concentration of our leases in one spot.

For carrying on the work we have established four mining camps at four principal points. Two of these are important head camps, the other two are small subsidiary camps formed for prospecting purposes only. It was on one of the latter—the No. 4 camp—that the fire descended the other day. Other small prospecting camps will be formed at likely points as time goes on. At these camps we have recently been employing from 100 to 150 men. From them as a centre, exploration of the surrounding plains will be vigorously carried out. To assist towards this end we have offered a stimulus, or what I hope will be a stimulus, to our working miners; we have promised a reward of \$250 for the discovery of any quartz vein of sufficient value to be opened up. This, I think, will encourage our men to do their best, and in any event it will be particularly useful on outlying claims where supervision might be rather difficult. In the work that lies before us the first essential is a thorough search for surface indications on all our leases. I do not say that here or there we may not sink trial shafts; I do not say that here or there we may not drive on any vein channel that seems important. We have already, in fact, done both of these things on a small scale; but the first essential is a thorough search for surface indications. On this account the character of the surface covering of all our leases is very important. Now our leases are largely covered with trees and with a growth which is called muskeg. This muskeg is a thick mass on a sediment of fallen leaves and other forest matter. All this has to be cleared away before the real character of the surface can be ascertained. Moreover, until April

in the present year, another obstacle in our way was snow. In March the trees were actually standing in from 4 feet to 6 feet of snow. You must not on this account suppose that the field is unworkable in the winter months; indeed, judged by parallels of latitude, Porcupine is some 3 degrees nearer the equator than London itself. But certain factors which make for mildness in our insular climate are entirely absent at Porcupine. In England, when snow falls, it seldom lies for any length of time, but Porcupine is part of a large continent, and when snow falls there, there it may stay for many weeks. This matter, of course, only affects the question of surface examination. In all other respects work underground or overground can be carried on without let or hindrance throughout the year. But our surface examination must clearly be prosecuted with thoroughness in the coming months. Some promising places must be opened up which in the subsequent winter months can be developed underground. Wherever outcrop indications are favourable there must be trenching and costeaning, and if there are no outcrop indications costeaning must be done at all likely spots. Later on, small trial shafts may be sunk and the veins themselves explored. But a systematic and thorough surface examination is the first essential. It should be all the more systematic because the field is a virgin field, and it should be all the more thorough because purely surface work is limited to the open months of the year.

To assist us in all this work we are having a geological survey made of all our leases. This survey is being carried out by Dr. Malcolm Maclaren, who has already been engaged upon it for some time. Dr. Maclaren is a leading expert on the question of the geological distribution of gold, and many who are interested in good mining know of Dr. Maclaren's work in other connections and in other countries. All speak of his ability and of the value of his experience in the highest terms. I myself have seen the results of his work elsewhere, and I shall look forward to reading his report on our Porcupine claims with the utmost interest. I feel sure that in this report we shall have a document of the greatest possible value to guide us in the work we have now in hand. The branch line from the railway at Kelso is now working as far as Porcupine. The station is near our No. 4 camp, and the line will be continued four miles further west to the Hollinger mine. We shall then have direct railway communication with our No. 1 camp, and the journey from Montreal, which until recently occupied three or four days, will now be accomplished in about 24 hours. In conclusion, I may mention that both Mr. Moreing and Mr. Loring are now on the spot. Mr. Moreing is the head of the firm that is managing our affairs in Canada, and is well known to you all. Mr. Loring is a partner in that firm, and I think he is also their chief mining engineer, and his advice, I think, is second to none in the profession. His acquaintance with the Porcupine field dates from the autumn of 1909. These two gentlemen left London a fortnight ago, and they will have arrived just after the recent great fire. They are both of them directors of this company, and their visit will be most timely. If anything could be considered as wanting to the management on the spot at such a moment, the presence of Mr. Moreing and Mr. Loring will amply supply that want. We have, gentlemen, entered upon a field of great perhaps of unique—possibilities. Everything that can be done is being done to further the company's interests and to push on with the company's work. It is early days yet to talk of actual and definite specific performance; much work has still to be done—work that will take considerable time. I am therefore only able to speak of mere preliminaries to-day and nothing more. There is, however, one impression which I hope I shall leave behind me, and that is the feeling that we are doing everything in our power to make this undertaking a success. There is no resolution to submit to you, gentlemen, to-day. Our business was simply to place before you the statutory report, but my friend, Mr. Richards, who was absent in Canada on

the business of the company for some weeks early in the year, I think, would like to make a few remarks with reference to the company and its work. (Applause.)

Mr. David Richards: Gentlemen, I am not anxious to make a few remarks, but having only just returned from Canada after an absence of from four to five months, and being particularly identified with this company from its inception, it is very interesting to me to be present at the first general meeting of the company. It may be within the knowledge of many of you that Mr. Moreing and I went to Canada in January last in connection with the negotiations which eventually resulted in our acquiring this property. When Mr. Moreing and I completed those negotiations and entered into the necessary contracts, Mr. Moreing abandoned me cruelly—he left me in Canada and came back—(laughter)—as it was very necessary that he should be here in London in connection with the organization of the company. Having acquired a property in those rigorous northern latitudes, the first thing to do was to prepare to go on with the work.

Consequently, I remained in Canada, opened our business in Montreal, and immediately ordered the whole of the necessary outfit, machinery, compressor plant, etc., to which Mr. Wanklyn has just referred, and all the necessary stores to supply the wants of from 60 to 90 men on the field. This was most necessary, because it is only during the winter that transport can be effected in these wilds. As an example of that, I might mention that during the winter, when the ice is good, we send goods to the camp, a distance of 40 or 50 miles, at about 3s. per cwt. But when the frost breaks the cost of transport is about 10s. per cwt. for two or three miles, as the whole country is one morass or swamp. A good deal of preparation was necessary, therefore, in order that we should start vigorous prospecting as soon as the snow cleared. At the beginning of April we had 90 people carrying on prospecting work upon the property. You are aware that those 50 claims originally belonged to the Timmins-McMartin group. The property does not consist of one mining proposition, but of practically 50 propositions, distributed over a wide field, and some of them occupying most promising positions in close contiguity to well proved mines. The field, as a whole, has not yet been very widely prospected, apart from the two main belts, or ore channels, represented by the Hollinger mine on the west and the Dome system to the east. Mr. Wanklyn referred to our working capital as amounting to about £90,000, and I should like to mention that this company acquired from the Vendors £10,000 or £12,000 worth of good assets in the shape of plant and stores. The examination of the properties has been taken in hand, but naturally over such a large expanse of country it has only been so far of a cursory nature. However, a good deal of work has been done at three or four centres, and at the present moment about 150 men are at work, principally upon the Miller and Ferguson groups. The Miller is situated close to the Hollinger mine, and I consider that the prospects are exceedingly good. We have at present a considerable amount of talent on the field—indeed, I very much doubt whether any field has had the advantage of so many capable and qualified men upon it at the same time. Dr. Maclaren has been on the field for two or three months, and Mr. Moreing has gone out specially to see things for himself, accompanied by his partner, Mr. Loring. You will therefore see that nothing is being neglected in the matter of development. I should like to say something with regard to the Hollinger mine, of which very little is known in mining circles on this side. I saw a good deal of that property while in Canada, and I think that in the course of a year or two the Hollinger will stand as one of the great gold mines of the world. It has an extraordinary prospect at the present moment. It has opened out a pay shoot of 1,600 or 1,700 feet in length and of great width and much richness. The figures would surprise a great many people. It has proved its main shoot down to 215 feet, and here it has a width

of 20 feet carrying very high values indeed. The Timmins-McMartin people, who were the original owners of this property, are to-day practically the owners of the Hollinger mine, and it will be very interesting to the shareholders of this company to know that the Timmins-McMartin people own nearly one-half of the shares of this company. They are, moreover, quite content to remain as shareholders and await the developments of the property. Mr. Noah and Mr. Henry Timmins, as well as Mr. John McMartin, form with us an advisory committee in Canada, and I think we are very lucky in obtaining the co-

operation of such influential and experienced people in this business. The greatest advertisement this field has had has been the fire. The loss of life was a great deal more serious than the loss of property. Most of the mines that suffered in the Dome belt were only in their first stage, so that the buildings were of the most primitive kind, and I do not think that the loss has been so very serious. I think that on the whole there will be more activity consequent upon the fire. The proceedings then terminated.

STATISTICS AND RETURNS

COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending Aug. 4, and those from Jan. 1, 1911, to date:

	Aug 4.	Since Jan. 1.
	Ore in lbs.	Ore in lbs.
Badger		55,200
Bailey		40,000
Barber		6,000
Beaver	122,470	967,678
Buffalo	50,600	1,668,984
Chambers-Ferland		831,000
City of Cobalt		557,980
Cobalt Lake		2,447,736
Cobalt Townsite		578,000
Colonial		88,000
Coniagas	177,540	2,412,954
Crown Reserve		1,539,839
Hargraves		161,100
Hudson Bay	59,700	750,990
Kerr Lake	60,330	1,623,030
King Edward		40,000
La Rose	86,650	3,986,368
McKinley-Darragh-Savage	124,100	3,665,284
Nipissing	126,200	3,902,878
O'Brien	62,950	864,318
O'Brien, M. J.		47,000
Peterson Lake, Little Nip.		58,430
Provincial		101,670
Right of Way		708,995
Silver Cliff		106,680
Standard		102,813
Temiskaming		1,041,372
Trethewey		785,520
Wettlaufer		117,232

The shipments for the week were 930,760 pounds, or 465 tons. The shipments from Jan. 1 to Aug. 4 were 29,317,271 pounds, or 14,658 tons.

B. C. ORE SHIPMENTS.

The smelter receipts for the week ended July 29th were 29,224 tons, and for the year to date 1,093,580 tons. The ore shipments from the Rossland, Boundary and Slocan-Kootenay camps were 31,422 tons and 1,151,995 tons, respectively. The figures in detail are:

Rossland Shipments.

Centre Star	3,223	115,677
Le Roi No. 2	841	16,210
Le Roi No. 2, milled	300	9,000
Le Roi	224	7,670
I. X. L.	11	61
Other mines		388
Total	4,599	149,006

Boundary Shipments.

Granby	15,530	559,964
Mother Lode	2,162	186,317
Rawhide	4,940	118,411
Athelstan	294	4,201
Napoleon	391	4,560
Unnamed	149	1,328
Other mines		51,294
Total	23,466	926,075

Slocan-Kootenay Shipments.

Molly Gibson	75	566
Van Roi, milled	800	14,649
Sullivan	1,066	9,778
St. Eugene, milled	420	17,256
Richmond-Eureka	25	1,472
Queen, milled	420	12,390
Granite-Poorman, milled	250	7,500
Nugget, milled	110	3,300
Emerald	112	1,050
Hope	59	417
Other mines		8,536
Total	3,357	76,914

Granby Smelter Receipts.

Grand Forks, B.C.

Granby	15,530	559,964
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Consolidated Company's Receipts.

Trail, B. C.

Centre Star	3,223	115,677
Sullivan	1,066	9,778
Le Roi No. 2	841	16,210
St. Eugene	122	3,847
Le Roi	224	7,670
Molly Gibson	75	566
Richmond-Eureka	25	1,472
Hope	59	417
Emerald	112	1,050
I. X. L.	11	61
Other mines		40,100
Total	5,758	196,848

B. C. Copper Company's Receipts.

Greenwood, B.C.

Mother Lode	2,162	186,317
Rawhide	4,940	118,411
Athelstan	294	4,201
Napoleon	391	4,560
Unnamed	149	1,328
Other mines		21,951
Total	7,936	336,768

Silver Prices.

	New York cents.	London pence.
July 22	52½	24¼
" 24	52½	24¼
" 25	52¾	24¾
" 26	52¾	24¾
" 27	51¾	23½
" 28	52	24
" 29	51¾	23½
" 31	52¼	24½
Aug. 1	52½	24¾
" 2	52¾	24¾
" 3	52¼	24½
" 5	52¾	24¾
" 7	52¾	Holiday

Kerr Lake	4.80	5.10
La Rose	3.95	4.05
Little Nipissing	.03	.03¾
McKinley	1.55	1.60
Nancy Helen	off	.01½
Nipissing	8.25	8.40
Nova Scotia	.10¼	.14
Ophir	off	.10
Otisse	off	.02
Peterson Lake	.08	.09
Right of Way	.06	.08
Rochester	.03¾	.03¾
Silver Leaf	.03	.03¾
Silver Queen	.02	.05
Temiskaming	.41½	.42
Trethewey	.74	.76
Wettlaufer	.85	.98

TORONTO MARKETS.

Aug. 9.—(Quotations from Canada Metal Co., Toronto).

- Spelter, 6.25 cents per pound.
- Lead, 3.85 cents per pound.
- Antimony, 8 to 9 cents per pound.
- Tin, 45 cents per pound.
- Copper, casting, 12.85 cents per pound.
- Electrolytic, 12.75 cents per pound
- Ingot brass, 8 to 12 cents per pound.

General Markets.

- Coal, anthracite, \$5.50 to \$6.75.
- Coal, bituminous, \$3.50 to \$4.50 for 1¼ inch lump.

Coke.

- Aug. 7.—Connellsville, coke, (f.o.b. ovens).
- Furnace coke, prompt, \$1.50 to \$1.55 per ton.
- Foundry coke, prompt, \$1.85 to \$2 per ton.

- Aug. 7.—Tin, Straits, 42.70 cents.
- Copper, prime lake, 12.65 to 12.75 cents.
- Electrolytic copper, 12.50 to 12.60 cents.
- Copper wire, 13.75 cents.
- Lead, 4.60 cents.
- Spelter, 6.00 cents.
- Sheet zinc (f.o.b. smelter), 7.75 cents.
- Antimony, Cookson's, 8.50 cents.
- Aluminium, 19.75 to 20.25 cents.
- Nickel, 40.00 to 45.00 cents.
- Platinum, ordinary, \$43 per ounce.
- Platinum, hard, \$45.50 per ounce.
- Bismuth, \$1.80 to \$2 per pound.
- Quicksilver, \$48 per 75 pound flask.

SHARE MARKET.

(Courtesy of Warren, Gzowski & Co.)

Aug. 8, 1911.

Cobalt Stocks.

	Bid.	Ask.
Bailey	.03¾	.04¾
Beaver Consolidated	.43	.44
Buffalo	1.55	1.85
Chambers-Ferland	.10	.11½
City of Cobalt	.09½	.11
Cobalt Central	.01	.03
Cobalt Lake	.23	.24
Coniagas	6.25	7.50
Crown Reserve	3.15	3.40
Foster	.03	.05
Gifford	.01¾	.02
Great Northern	.10	.11½
Green Meehan	.02½	.02¾
Hargraves	.09¾	.10

Porcupines.

Apex	.12	.17½
Coronation	.05	.13
Foley	1.10	1.15
Detroit	.50	.51
Hollinger	10.30	10.50
Monita	off	.20
Pearl Lake	.50	.51
Preston	.29½	.30¼
Tisdale	.04	.06
Imperial	.09¼	.10
Central	.72	.73
Porc. Canada	.85	.95
Porc. Northern	.60	.61
United	.01	.04
Porc. Gold	.46½	.48
West Dome	1.90	2.00
Rea	3.65	3.80
Swastika	.44½	.45½
Dome Extension	.61	.62
Dobie	.97	1.10
Standard	off	.05
Eldorado	.14	.16
Gold Reef	.10	.25

New York Curb.

Braden Cop	5	5¼
Brit. Col. Cop.	4	4¼
Butte Coal	16¾	17½
Ely Cent.	2	4
Ely Cons.	¾	½
First Nat. Cop.	1	1½
Giroux	5½	5¾
Greene-Can.	6¾	7
Inspiration	7¾	7¾
Nevada Hills	3½	3½
New Baltic	..	..
Ohio Cop.	1¾	1½
Ray Central	1¾	1½
Union Mines	..	..
Yukon Gold	3½	4
Nevada Con.	18	18¼
Miami	20¼	21½
Granby	30	60
Con. Min. & Smelt.	45	50
Davis-Daly	¾	1
Con. Ariz	½	¾
Rawhide Coal	..	..
Ray Cons.	16	16½
Chino	21¼	21¾
Goldfields Cons.	5¾	5¾