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CIRCULATION.

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CONTENTS.

ANNOUNCEMENT.

The publishers of the CANADIAN MINING JOURNAL wish to announce that they are prepared to handle the printing of all varieties of annual reports, financial statements, prospectuses, pamphlets, etc., etc. A particularly well equipped plant has been acquired, and it is the intention of the publishers to specialize in the printing of reports and general material pertaining to mining. It is requested, therefore, that our subscribers bear this in mind.

Another matter calls for notice. Heretofore the CANADIAN MINING JOURNAL has refrained from publishing in its advertising columns the annual statements and reports of any mining companies. Many such reports have been published gratuitously in the reading pages. In no instance has any consideration whatsoever been accepted for this kind of publicity.

It is believed now that the JOURNAL is justified in soliciting from reputable Canadian mining companies their patronage of its advertising columns. The JOURNAL will be glad to accept as advertisements, and publish as such, the annual reports, special reports, dividend notices, or other notices of all *bona fide* Canadian mining companies.

Quite apart from commercial considerations, the regular publication of these reports and notices will help to make the CANADIAN MINING JOURNAL a much more complete record of current mining history.

THE HOLLINGER REPORT.

The annual report of no Canadian mining company has been waited for with more interest than that of the Hollinger Gold Mines, Limited. For more than one reason the mining fraternity and the public generally have looked upon the issuance of this report as a critical event in the history of Porcupine.

The Hollinger has bulked large in the public eye. Shares in Hollinger have been much traded in and the mine itself has been the show place of the camp. In many ways, Hollinger is the barometer of the Porcupine mining market.

From the first, the Hollinger directors have been much criticized. To a large extent, however, they have held their peace and have been content to let the future justify their policy. They have been wise enough, also, to throw the mine open for the inspection of all

responsible visitors—a policy that does not obtain at the Dome.

When, last year, it became known that Mr. P. A. Robbins had accepted the position of general manager, confidence was felt that the mine would be developed fairly and in accordance both with the exigencies of mining in the north country and the ethics of engineering. Mr. Robbins, in short, was expected to work the property on its own merits, and to avoid the pitfall of undue optimism on the one hand and the equally dangerous slough of despond on the other. Mr. Robbins was the deliberate choice of the directors.

The peculiar surroundings of the Porcupine gold mining camp must here be brought to mind. Ontario has had several gold mining booms, all of which have left a bitter taste in the mouth of the investor. Porcupine's early days were marked by the fact that the generality of mining men were either incredulous or hostile. Months elapsed ere any degree of enthusiasm was aroused. Even yet, despite remarkably encouraging results and very large bona-fide expenditure, the camp is more or less on trial, and much has yet to be learned concerning the economic geology of the district. The fact is that Porcupine would not have been opened up for years to come had it not been for the energy and money of successful Cobalt investors. In other words, Porcupine until now has been in need of just such a report as circumstances have enabled Mr. Robbins to give us.

Having hurried over these preliminary considerations, let us glance for a moment at the substance of the first annual report of the Hollinger Gold Mines, Limited. Despite the wisdom of the quidnuncs, no positive estimate of ore reserves is made. The estimates published, are based upon very slight extensions of workings already completed and surface work done, and appear to be most cautiously made.

The company owns four claims. Two of these are partly developed, one has had some of its surface prospected, and the fourth has been almost entirely neglected. What is called the mineralized area extends across, and includes almost entirely, the first three claims. No. 1, or the main vein, striking in a diagonal direction across two contiguous claims, is a remarkable body of ore. On the surface the vein is exposed for about 900 feet, the average width being more than nine feet, and the average gold content about $33. At the 100-foot level the ore-shoot is eight feet wide, the average gold content being $31.54 per ton, and the length of drifting 1,000 feet. On the 200-foot level 350 feet of drifting showed a shoot more than nine feet in width and assaying as an average almost $50 to the ton. In making his estimate Mr. Robbins computes upon the basis of a depth of 300 feet. This is by no means excessive. It is a venture that most of us would be glad enough to take. Mr. Robbins both in his ground work and in his assumptions has been guarded, reasonable, and logical. The expectation of a working depth of a thousand or fifteen hundred feet is commented upon by Mr. Robbins thus: "Academically this is a reasonable hypothesis, commercially it is speculation and remains to be proven."

Thorough sampling and measurement showed about 70,000 tons of ore for each 100 vertical feet of No. 1 vein, the average gold content being $36. Working this out for three levels, we get 210,000 tons of ore containing $7,560,000.

On three other veins underground work has been done at the 100-foot level and estimates include an additional 100 feet vertically; and on 11 veins, where surface work only has been performed, the estimates embrace only the first 100 feet in depth. The totals thus obtained are 462,000 tons of ore containing $10,230,000, or about $22 per ton.

It is explained in the report that whilst the allowances for extensions are arbitrary, they will probably be exceeded. The main vein alone, if consistent in gold tenor, will yield $2,100,000 in net profits for each additional 100 feet in depth. Similarly, the aggregate net profit from the present known ore bodies will amount to $2,750,000 for each 100 feet in depth. This latter figure includes the former of course; but it is interesting to speculate as to how greatly this amount will be enlarged if several of the undeveloped veins turn out to be bonanzas. However, the main vein is distinctly the predominating factor at present.

The work of exploitation and the scheme of ore treatment are being planned on a scale commensurate with the magnitude of the ore bodies. These can be safely left in Mr. Robbins' hands.

The financial position of the company, we are assured by Mr. Robbins, is sound. The authorized capital is $3,000,000, divided into 600,000 shares of $5 each. There are 50,000 shares in the treasury. The current market price is about $12. Only a nominal amount of cash is on hand, but satisfactory financial arrangements have been made whereby, when milling operations are commenced in the spring of this year, the company will be in possession of a plant and mine costing about $700,000, and ore reserves containing $10,000,000 gross. These Mr. Robbins refers to as clear assets, the treasury shares being more than sufficient to cover all outstanding construction and development liabilities.

In other words, the property seems amply capable of yielding at least $1,500,000 net per annum for some years to come. Mr. Robbins has estimated on only a fraction of the "probable" ore reserves. The "possible" reserves are on the knees of the gods.

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In summing up our impressions of the Hollinger report we can state, without equivocation that it is more than satisfactory,—it is extremely gratifying. Evidence of care and thoroughness is visible on every page.

It is true that certain minutiae are lacking, but, for our own part, we are quite willing to accept the report as it stands.

The first annual report of the Hollinger Gold Mines, Limited, is a milestone in Porcupine's history. More than that, it marks the turning point in the chequered story of gold mining in Ontario. Our felicitations are proferred to Mr. Robbins and to his directors.

SIR JAMES DECIDES.

On Monday, February 12th, history was made. On that day Sir James Whitney electrified the Legislative Assembly of Ontario, gladdened the hearts of all those who live in the new north, and administered a terrific solar plexus to the vaulting ambition of the Leader of the Opposition, by delivering himself of the news that his Government was prepared to spend the vast sum of $5,000,000 in colonizing Northern Ontario.

For the purpose of controlling expenditure a special commissioner is to be appointed. His task will be sufficiently onerous, for the territory is enormous, the needs of each section are apparent and pressing, and no amount of money could conceivably satisfy everybody. Yet the judicious distribution of $5,000,000 will go far towards ameliorating conditions that are now intolerable.

Roads, of course, are the first need. Then, gradually, all the other prime essentials of transportation and commerce must come. Already the Government has had several lessons in the art of making roads—at least it should have learned by this time how not to make them. So the North may reasonably hope for practical sympathy and help.

* * * * * * * * *

The Government of Ontario has taken a serious view of its duties. It has risen splendidly to the occasion that now offers. In all its future efforts to open and colonize the north it must not, however, lose sight of the fact that the country was opened first by the prospector and the miner, that the mining investor has spent millions in roads and general culture, and that without the mines of to-day and of to-morrow the Province would be poorer by many millions of dollars. It is the bounden duty of the Government not to overlook in any respect the welfare of the mining communities. For a long time to come agriculture will be entirely tributary to mining.

Many good men and true will hanker for the job of distributing and allocating that $5,000,000. It is our belief that no one man should be clothed with too much authority. An advisory committee composed of prominent citizens of northern towns should be called upon to aid and direct. Most certainly the mining towns should be given a very large voice in the whole matter.

No doubt Sir James and his Cabinet will have considered every aspect of the question. We make bold to throw out these suggestions on the chance of correcting a possible sin of omission.

BENJAMIN FRANKLIN PEARSON.

Few men have left a deeper impress upon the industrial development of Canada than the late B. F. Pearson, whose untimely death, as noted in another column, occurred recently in Halifax, Nova Scotia.

Mr. Pearson's was the unique distinction of having promoted the organization of the two largest coal mining and iron making concerns in Canada. In a large sense the Dominion Coal Company and the Dominion Iron and Steel Company were children of his singularly fertile brain. Other important enterprises too numerous to mention owed their birth to the same active intellect.

In addition to his wonderful range of commercial activities, Mr. Pearson was a successful politician, a lawyer, a journalist, and a notably public-spirited citizen.

It will be long ere Nova Scotia produces another B. F. Pearson. His name stands highest in the list of Canadian promoters, far outshining the rapacious product of later days.

THE BRITISH COAL SITUATION.

The prospect of a peaceful settlement of the dispute between the coal miners and the mine owners of Great Britain seems dim. The latest cables, received just as we go to press, indicate that a deadlock still exists. The last conference of the representatives of nearly one million miners brought out the fact that the majority strongly favoured a general stoppage of work on the last day of this month, unless the principle of a minimum wage for all underground employees be accepted and applied.

Already some 30,000 Derbyshire miners have notified their employers of their intention to quit work. It is expected that within a few days every union coal miner will have followed suit.

The situation is grave. The operators, still sore over the Eight Hour Act, feel strongly their humiliating position. Concession after concession has been wrung from them. Seemingly no reasonable measure of compromise will satisfy the miners.

What the outcome will be, no one can guess. Certainly a strong statesman is needed to bring the conflicting parties to a settlement.

LE ROI NO. 2.

One of the instances where even the English investor cannot complain that he is not getting a fair return for his money is Le Roi No. 2 mine at Rossland, B.C. On its capital, the company has paid eleven annual dividends ranging from 5 per cent. to 30 per cent., but nearly always more closely approaching the latter. It was recently decided at the eleventh annual meeting of the company's shareholders in London, that in future the dividend rate would be fixed at 10 per cent. per annum.

In normally prosperous years additional bonus payments will be made, but provision will always be made for adding £10,000 every year to the cash reserve, which reserve now amounts to £20,000. The reserve will be built up until it equals at least one-half of the nominal capital.

Good luck and sane management appear to go hand in hand.

EDITORIAL NOTES.

The gold mining industry of the Witwatersrand pays three-fourths of the total taxation of the country.

Regular reports as to progress at the Hollinger are to be made at stated intervals. This is right and proper.

Some exception has been taken to our editorial on the Report of the Chibougamau Mining Commission. In justice to the members of the Commission we wish to reiterate the fact that we praise warmly the Report as a whole. The only mild suggestion we made related to the form in which it was cast.

The output of Calumet and Hecla during the current calendar year will, it is estimated, reach 130,000,000 pounds. The net earnings per share, with copper at 13 cents, will be $52; at 17 cents, $104. The capitalization is $2,500,000, divided into shares of $25 each. The estimated cost of production is nine cents.

The United States Bureau of Mines superintends and controls the purchase of $8,000,000 worth of coal for the Government annually. The establishment of efficient storage facilities is one of the Bureau's important functions.

The revival of the British Columbia Mining Association promises well. The first meeting will have been held at Nelson ere this number reaches our readers. The object of the Association is to represent adequately the mining industry in all matters political. Mr. S. S. Fowler is president.

Quite unintentionally we deprived the Crown Reserve Company of $1,000,000 in our February 1st issue. Net profits for the last year were $1,279,739.79, not $279,-739.79. The former sum was given correctly in one line, but incorrectly in another. We willingly return the trifle.

PERSONAL AND GENERAL

Mr. James McEvoy, mining engineer, the Stair Building, Toronto, is delivering a series of lectures on coal mining before the mining students of Toronto University. This is a very valuable addition to the course.

Mr. W. N. Bissett, for years mine foreman at the big placer mine in Quesnel division of Cariboo district, British Columbia, operated for years by the Consolidated Cariboo Hydraulic Gold Mining Company, with Mr. John B. Hobson as manager, is in Victoria, B.C., where, in the capacity of one of the executors under the will of the late Mr. Hobson, he is attending to matters connected with the estate of the deceased mine manager.

Mr. Robert R. Hedley, chairman of the Western Branch of the Canadian Mining Institute, and Mr. E. Jacobs, branch secretary, are expected to come from British Columbia to Toronto to attend the annual meeting of the Institute, to be held here early in March. It is probable Mr. S. S. Fowler, general manager of the New Canadian Metal Company, of Nelson, B.C., who is a past president of the Institute, will also be at that meeting.

Mr. Thomas Kiddie has completed his investigations into the French process for the reduction of zinc-lead ores, and has made his report to his principals, who have not yet made public Mr. Kiddie's findings in this connection.

Mr. T. A. Pickard has returned to Vancouver, B.C., after having been for some time superintending development work being carried on at the Apex group in Hedley camp, Similkameen.

Mr. D. C. Stephens is manager of the Tacoma Steel Company's Marble Bay mine, at Van Anda, Texada Island, B.C., formerly owned by Messrs. Palmer and Christie, of Toronto, and long managed by Mr. Alexander Grant, who retired last year on account of ill-health.

Mr. Thomas Graham, chief inspector of mines for British Columbia, has been to Fernie, Crow's Nest Pass district, in connection with the establishment there of a mine-rescue station, with facilities for training miners in the use of the Draeger helmet and auxiliary apparatus.

Mr. A. E. Hepburn, of Vancouver, B.C., has been in San Francisco, California, endeavouring to promote the sale of coal mining property in British Columbia.

Mr. Richard Kirkby, who resigned the position of mining engineer with the Dominion Coal Company recently, has been appointed the general mining manager of the Earl of Weymss's Collieries in Scotland. Mr. Kirkby will have under his charge some eight or nine modern collieries.

Mr. D. H. MacDougall, the assistant general manager of the Dominion Coal Company, left for England on the "Olympic" on the 24th of January. He will return about the 1st of March. Mr. J. H. Plummer, the president of the Dominion Coal Co., will also visit England early in February in connection with the new stock issue recently authorized by the shareholders of the Dominion Steel Corporation and its subsidiary companies. Mr. Plummer and Mr. MacDougall will probably visit some of the steel works and collieries on the Continent, in addition to some of the English plants.

Mr. T. J. Brown, the general superintendent of the Nova Scotia Steel & Coal Co., left for England on the 13th of January.

Mr. J. Dix Fraser, general manager of the Atikokan Iron Company, Port Arthur, is on his way to England.

Mr. Martin Nordegg is in Toronto.

Mr. Allan Greenwell, editor The Colliery Guardian, London, England, will attend the Annual Meeting of the Canadian Mining Institute in Toronto.

MOUNT ROBSON

[Editor's Note:—As round Mount Robson has centred much mountain-climbing effort, and as an officer of the Geological Survey of Canada took the photograph that is reproduced herewith, we do not apologize for reprinting from that officer's report, the following description.]

Extract from Report on the Geology and Natural Resources of the Country Traversed by the Yellowhead Pass Route from Edmonton to Tete Jaune Cache, Comprising Portions of Alberta and British Columbia, by James McEvoy, B.A.Sc.

Geological Survey of Canada, 1900.

Robson Peak.—Looking up Grand Fork is the most imposing view met with on the whole route. Great mountains are on every hand, but over all stands Robson Peak, 'a giant amongst giants and immeasurably supreme.' This, as well as the following, is from the description of the mountain by Milton and Cheadle.* 'When we first caught sight of it, a shroud of mist partially enveloped the summit, but this presently rolled away, and we saw its upper portion dimmed by a necklace of feathery clouds, beyond which its pointed apex of ice, glittering in the morning sun, shot up far into the blue heaven above.' The top of the mountain is usually completely hidden and rarely indeed is it seen entirely free from clouds.

Height of the Mountain.

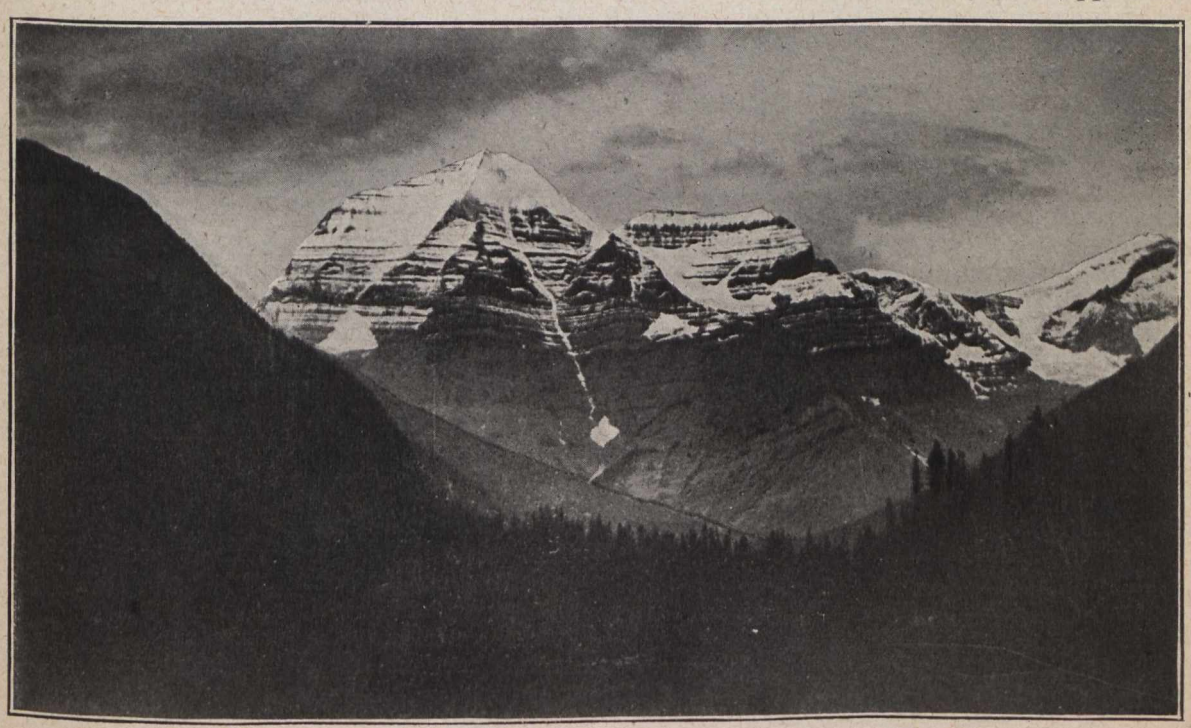
The actual height of the peak is about 13,700 feet, or 10,750 feet above the valley. The face of the mountain is strongly marked by horizontal lines, due to the unequal weathering of the rocks, and has the appearance of a perpendicular wall. From the summit to the base on the Grand Fork, a height of over 10,500 feet, the slope is over 60 degrees to the horizontal.

Although Robson Peak has been long known, its height has never been determined, nor was it supposed to be particularly notable in that respect, but now since the height of Mts. Brown, Hooker and Murchison have been proved to be greatly exaggerated, it has the distinction of being the highest known peak in the Canadian Rockies.

It is interesting to note that in a paper read before the Royal Society of Canada by Dr. G. M. Dawson, the following paragraph occurs:—

"The Kamloops Indians affirm that the very highest mountain they know is on the north side of the valley at Tete Jaune Cache, about ten miles from the valley. This is named Yuh-hai-has-kun, from the appearance of a spiral road running up it." The mountain referred to is undoubtedly Robson Peak, as it is only fifteen miles north from the valley at Tete Jaune Cache. The 'spiral road' is probably an Indian's imperfect description of the horizontal lines on the face of the mountain. As far as can be learned, no one, either Indian or white, has ever succeeded in reaching the summit.

The North-West Passage by Land, pp. 252-253.



BOOK REVIEWS

The Commercial Handbook of Canada and Boards of Trade Register—Eighth Year, 1912—Edited by Ernest Heaton, B.A. (Oxon.), and J. Beverly Robinson—562 pages—Stiff Cover—Price $1—British Edition, 5 Shillings—Published by Heaton's Agency, 32 Church Street, Toronto—1912.

Each successive year sees this excellent handbook assume more compendious dimensions and more comprehensive character. A list of the contents shows this:—**Official directory,** including the personnel of the Dominion and Provincial Cabinets, members of Parliament, Senate, Departmental Officials, etc.; **Corres-**

pondence, giving rates of postage, parcel post, mails, cable regulations, etc.; **Financial Information,** showing money exchange and transmission, banking information, and similar data; **Credit Reports** and **Regulations; Transportation; Customs Information,** a very full section comprising the Customs Act, Official Tariff, and much cognate material; **Description of Towns and Local Opportunities; General Information,** taking up each industry, profession, and important vocation, and including facts about climate, topography, sport, education, and so on; and a series of mercantile and financial tables.

The volume is carefully indexed.

The most remarkable feature of the Annual is its conciseness. That it has been competently edited is evident. It is given a semi-official standing from the fact that the editor has the co-operation of government officials, of the large corporations, and of many boards of trade.

American Civil Engineers' Pocket Book—Editor-in-Chief, Mansfield Merriman—First Edition, Fifth Thousand—1380 Pages—Soft Cover—Illustrated—Price $5—Published by John Wiley & Sons, New York, and the Renouf Publishing Co., Montreal—1911.

It argues a good deal of moral courage for a compiler to attempt to cover ground that has already been trodden many times. Mr. Merriman has approached his task confidently. With the aid of twelve associate editors he has produced a volume that will at least be useful, and may possibly do more than supplement the older standards. All of the usual engineering data, such as mathematical tables, are given in compact form. Twelve other sections, dealing with the main divisions of engineering, are written by specialists.

The mining engineer must often perform the work of his civil brother. The two professions overlap. In such cases he needs pocket books, reliable pocket books. The American Civil Engineers' Pocket Book is not, however, confined strictly to civil engineering. Certain phases of mining engineering are discussed. Shaft-sinking, core drilling, explosions, etc., are given a fair share of attention.

The aim of the editors has been to compile a volume "better and fuller than any heretofore published in the English language." Time will tell whether they have or have not accomplished that object. In any case they have made a laudable effort. The volume will prove a good investment for any engineer.

Stamp Milling—A Treatise on Practical Stamp Milling and Stamp Mill Construction, by Algernon Del Mar, A.R.S.M., M.A.I.M.E.—129 Pages—Illustrated—Stiff Cover—Price $2 Net.—McGraw-Hill Book Company, 239 West 39th Street, New York—1912.

This is a book written by a practical mill man. It is not trite to say that it has long been needed.

A modest introduction sets forth the author's intent, which is to give in print his own experience and the experience of others. "The sooner," he writes, "the millman recognizes that there is something to attain beyond his mere wages the sooner will the amalagamating of the precious metals be classed among the fine arts." This is something more than true.

A brief historical sketch occupies the first few pages. Then follow concise outlines of the principles of the stamp mill, of the practical working of the mill, of the limitations of the single unit and five-stamp unit batteries, and of amalgamation. The last chapter, which includes nearly half the book, takes up stamp mill construction. Frames, foundations, mortars, cams, shoes, dies, boss-heads, tappets, tables, feeders, bins, in fact, all the integral and incidental parts of the stamp mill are described and their functions outlined.

The merits of the book are that it is modern, readable, practical, concise, and quite devoid of the padding so frequently used in similar volumes. The author has been up against the real thing.

Speaking advisedly, the real literature of stamp milling, apart from the fugitive magazine article, is still to be written. Mr. Del Mar has given us a book that will form a good nucleus for future writers.

Incidentally, we notice that the Nissen stamp, a Canadian invention, is given honourable mention.

With the revival of gold mining in Canada this kind of book should be in demand. The benefit to be derived from thoroughly digesting the principles and practice of any department of mining engineering or metallurgy is not always appreciated. Stamp milling, for instance, simple as it seems in principle, is wofully misunderstood in practice. The deliberate balance that must be maintained, the fine adjustment, and the close control of all the factors, take long to learn. In fact there are but few operators who can "make music in the mill." Mechanical efficiency is only a means to an end. That end is commercial profit.

A Manual of Fire Assaying—By Charles Herman Fulton, E.M., D.Sc.—Second Edition Entirely Re-written and Enlarged—219 Pages—Illustrated—Stiff Cover—Price $2 Net—McGraw-Hill Book Company—239 West 39th Street, New York—1911.

It is the rare text-book that runs through more than one edition. We may take it, therefore, as a sign of grace that a manual enters a second edition.

Mr. Fulton's "Manual" is well known to most of our mining readers. The first edition was published in 1907. Four years have seen much change and progress in the art of assaying. The design and character of assay furnaces have been improved, as have also the routine details and the mechanical incidentals. Of these changes and improvements the author has taken full cognizance in this second edition. As with all good text-books the arrangement of the subject-matter is logical. For the benefit of those who may not be familiar with the book, it may be explained that the following subjects are treated:—Assay furnaces and tools; reagents; the assay of reagents; sampling; weighing; reduction and oxidation reactions; the crucible assay and assay slags; cupellation; parting; assay of ores containing impurities; special methods; errors in the assay for gold and silver; assay of bullion; assay of ores and alloys containing platinum, iridium, gold, silver, etc.; assay of tin, mercury, lead, bismuth and antimony; and an appendix of suitable tables.

The illustrations are better and more numerous than in the first edition.

In size and make-up the book is practically identical with Del Mar's "Stamp Milling" and makes a suitable companion volume with the latter.

COAL MINE FATALITIES IN CANADA.

Written for the CANADIAN MINING JOURNAL by F. W. GRAY.

An article has been going the round of the Canadian newspapers in the mysterious and exasperating way that some newspaper paragraphs do circulate, which purports to summarize the information relating to mine accidents in Canada that is to be found in the Minerals section of the Report of the Commission of Conservation issued from Ottawa in June, 1911. The article referred to, whether purposely or otherwise, quotes in a very misleading manner from the figures given by the Commission, and makes the astounding statement that the fatality rate in Canadian coal mines is the highest in the world, and that whereas European statistics show a decreasing death rate, the Canadian death rate is increasing. Most editors who have clipped this paragraph have accepted it at its face value, and deplored the seeming apathy of Canadian mine owners and officials; while the uninformed reader, with a pathetic faith in the printed page which still lingers amongst us, has received another impression of the dangers of the mine, to add to already exaggerated ideas on this subject.

Reference to the figures furnished in the Report of the Commission establishes the following comparison between the rate of fatal accidents per thousand employees in various coal countries:

	1904	1905	1906	1907	1908
United States	3.38	3.53	3.40	4.86	3.80
Canada.....	3.97	2.10	2.59	3.74	3.31
Prussia.....	1.80	1.85	1.94	2.36	2.61
Great Britain	1.24	1.35	1.29	1.31	1.32
Belgium.....	.93	.91	.94	1.04	1.07
France.....	.89	.84	7.17	1.10	.95

It may be seen from these figures that Canada is the only country where the death rate per thousand employees showed a decrease in the period reviewed by the Commission.

In fairness to Nova Scotia a sharp distinction should be drawn between it and British Columbia. Taking the same years as in the preceding table Nova Scotia and British Columbia compare as follows:

	1904	1905	1906	1907	1908	Av'ge
British Columbia...	8.31	2.72	3.12	5.11	2.95	4.44
Nova Scotia	2.40	1.85	2.39	3.05	3.48	2.63

If the whole decade 1900-1909 is reviewed the fatality rate of British Columbia will be found to average 9.65 per thousand, comparing with 2.65 per thousand in Nova Scotia.

There are two methods of comparing the rate of mine fatalities, namely the rate per thousand employees, and a tonnage basis. On the basis of fatalities per thousand employees Canadian mines compare unfavourably with European mines, but if the tonnage basis is employed the comparison takes a somewhat different aspect. It may be regarded as special pleading to urge a comparison on a tonnage basis, but there are circumstances connected with the development of coal mining in Canada which are of a special nature, and the same is true of the United States in a more marked degree. In European countries coal-mining has become a very specialized science, and the mining of coal is done by a class of men whose fathers and grandfathers were miners before them, men whose ancestry and training have developed in them what may almost be termed an hereditary instinct. The development of the industry has been slow when compared with the phenomenal increase on this side of the Atlantic, and possibly the most striking feature is the great disparity between the rate of production per man employed in Europe compared with America.

A very suggestive article in this connection was contributed to "Coal Age" in the issue of 6th January, by J. T. Beard. In this article, after pointing out the peculiarity of American coal mining conditions, such as the influx of foreign labour, demand for coal, and rapid development of mines, the writer expresses himself as follows:

". . . . . the degree of efficiency with which the mines are managed would be properly represented on a tonnage basis. In other words, the death rate should then be expressed as the ratio of the number of fatalities to the tonnage of the mine, and not to the men employed. This seems to me a more fair basis of comparison."

and concludes his remarks by stating that—"taking the tonnage basis as the proper method of estimate, which I believe to be a nearer approximation to what it is desired to show, the death rates for these years are lower in the American than in the English mines. It will be observed that the death rate, on this basis, has uniformly decreased in Pennsylvania during this period, year by year, while in English mines the rate for the same years shows a uniform increase."

This is a bold contention, which may reasonably be objected to on obvious grounds, but, nevertheless, the article is one to ponder over. There are many reasons why the tonnage yield per man is greater in America than in Europe, but the principal cause is to be found in the differing nature of the coal deposits. Many of the coal seams in the United States offer ideal conditions for the extraction of coal at a very rapid rate. The seams are thick and of but slight pitch, and are so situated in the hill sides that haulage, drainage and ventilation problems really do not exist. It is not overstating the matter to say that American methods of extraction have been, and in many instances still are, wasteful, and that so far but little attention has been paid to thin coal seams such as are being worked in Europe. Electricity is employed underground in a manner that would make a European or a Nova Scotian engineer nervous, and it is only necessary to scan the advertising pages of an American coal-mining journal to see how wide-spread is the use of naked lights and acetylene torches. Not everyone will go so far as to agree with Mr. Beard that "the degree of efficiency with which a mine is managed would be properly represented on a tonnage basis," or that the death rate should be expressed "as the ratio of the number of fatalities to the tonnage of the mine, and not to the men employed." Nevertheless, there is much in Mr. Beard's contentions which would give rise to fruitful discussion.

In the same issue of "Coal Age" coal-mine mortality statistics are discussed by Frederick L. Hoffman, no mean authority, and he comes to the conclusion that—"the record for nearly all the states and provinces is not one which warrants the assurance that material progress is being made in the reduction of the preventable loss of life in coal-mining operations in the United States and Canada."

The following table gives a comparison on both the tonnage basis and rate per thousand, between Great Britain, Canada, Pennsylvania and the two provinces of British Columbia and Nova Scotia, all the figures except those relating to Canadian mines being taken from Mr. Beard's article previously referred to. The figures for Alberta are not included in the 1908 statement, not being available.

TABLE SHOWING PRODUCTION OF COAL, NUMBER OF MEN EMPLOYED, FATALITIES, AND DEATH RATES, AND AVERAGE ANNUAL OUTPUT PER MAN, 1908-09, GREAT BRITAIN, PENNSYLVANIA, CANADA, BRITISH COLUMBIA, NOVA SCOTIA, AND DOMINION COAL COMPANY.

		Production Tons.	Employees inside and Outside.	Total Fatalities.	Death Rate. Per 1,000 men.	Death Rate. Per million tons.	Average Annual Output Per Man.
Great Britain	1908	261,512,214	987,813	1,306	1.32	5.01	329
"	1909	263,758,562	1,013,998	1,453	1.44	5.51	323
Pennsylvania Bituminous	1908	114,937,375	181,840	572	3.15	4.9	753
"	1909	136,205,695	185,921	506	2.72	3.7	893
Pennsylvania Anthracite.	1908	83,543,243	174,503	678	3.88	3.9	672
"	1909	80,223,833	171,195	567	3.31	7.1	651
Canada.	1908	8,030,000	19,028	63	3.31	7.8	422
"	1909	9,380,000	23,708	100	4.21	10.6	396
British Columbia.....	1908	2,088,000	6,095	18	2.95	8.6	343
"	1909	2,328,000	6,418	57	8.88	24.5	362
Nova Scotia	1908	5,940,000	12,933	45	3.48	7.6	460
"	1909	5,046,000	12,083	34	2.81	6.7	418
Dominion Coal Company	1908	3,555,068	4,936	17	3.44	4.8	720
"	1909	2,736,363	3,914	13	3.32	4.7	700
"	1910	3,526,754	5,022	15	2.98	4.2	700
"	1911	3,984,749	5,499	19	3.45	4.8	725

This table shows how much greater the production of coal per man employed is on this side of the water than in Great Britain, but beyond that there is little to be proud of, particularly in the record of British Columbia. The figures given for the Dominion Coal Company's mines are conservative, and in calculating the number of men employed, only the average daily force has been taken. The actual number of employees is about twenty per cent. greater, so that the fatality rate per thousand employees is slightly exaggerated.

That aggressive weekly, the Canadian "Collier's," in commenting on mine fatalities in Canada, says: "Some day there will be a particularly shocking mining accident at Fernie or Sydney. Public opinion will be stirred, and the Government will be stimulated to action. A commission will be appointed to go to Europe to study methods of preventing accidents. The commissionerships will be very popular. A blue book will follow, and in course of time Canada will do what other nations did long ago." Your correspondent cannot speak for Fernie, but he can for Sydney, and if the prophecy of disaster that trips so easily from the editorial pen should unfortunately be ever fulfilled in the Sydney coalfield, it will not be for lack of precautions on the part of those responsible for the safety of the mines, and it may do no harm to remind editorial writers that miners do not relish such prophecies. Men do not talk lightly of that which they most fear, and the mining men of Cape Breton at any rate prefer to take measures for their own safety and that of their mines, rather than wait for a commission, a body which, in the minds of most people, is associated with leisurely delay and lavish expenditure.

THE NATURAL HISTORY OF HARTZ-FOREST.

Written for the CANADIAN MINING JOURNAL by J. C. MURRAY.

(Continued from the issue of Jan. 15.)

I concluded the first chapter of this review with an allusion to "the Water of a Vitriolic Nature" that pestered the miners in the Rammelsberg mine. Observations, pathological and chemical, are made by Herr Behrens. "Some People drink the Water for a Pain in the Stomach, and other Ailments, because it purges violently; yet it doth often more harm than can be repaired. 'Tis of a very nauseous taste." We can, even at this date, feel some pity for the benighted imbibers of acidulous mine-water! The effete twentieth century tum-tum would not long survive such heroic dosing. It is mentioned, by the way, that iron bars deposited in this water accumulated a covering of copper. "Iron turn'd to Copper" is the reference in the index.

Workmen's compensation and employers' liability were not live issues two centuries ago in Hartz Forest. Life may have been a serious matter, but the hereafter was the real thing. It mattered little how many widows were "made in one day." No meddling inspector, no brutal coroner, held the employer responsible. Hence the only real obligation that rested upon the operator in so far as the welfare of his men was concerned, was to see that they were not dashed unwarned or unprepared into eternity. The fate of bereaved families, naturally, mattered not at all. How simple a solution of labour troubles! How peaceful the lot of the mine owner! Thus does the author lead up to the subject: "This Mountain is hollow'd out underground into such large caverns, that they, in some places, are too high to be propp'd; wherefore 'tis very dangerous to work in some of the Mines; upon which account the Miners at Goslar are two Mornings in the Week exhorted by a Sermon to live in the Fear of God, to be prepar'd in case of any Accident; but they are such a fool-hardy audacious Crew, that when the Parson preaches a little longer than ordinary, and when the City-Gates are open, they run out of

the Church, leaving him to preach to himself.'' That God-forsaken and impious crew must have deserved any fate. Our bowels of compassion are moved when we think upon that devoted parson watching his congregation evaporate. Would not our Canadian Lord's Day Alliance have brought these abandoned miners to reason!

''Most of the Mines,'' continues the righteous observer, ''are very well propp'd and secur'd with Timber, so that it is commonly said, There is more Wood underground in Rammelsberg, than in the whole City of Goslar.'' Mighty vaults were there also, ancient places of worship dedicated to long-forgotten ''Sylvian Gods.'' ''In another part hereof is an old Mine, fallen to ruin, call'd The Devil's Mine, by reason (as 'tis said) the Devil used to work amongst the rest of the Miners, to receive his Pay every Week, and to carry away his Share of the Ore: But one day, as the Miners did not share justly with him, he caus'd the Mine to fall to ruin.''

Part VIII. of *The Natural History of Hartz-Forest* treats of metallurgical operations mainly, with incidental mention of mining. Here are directions for the traveller: ''If you have a mind to see the Mines and Smelting-houses on the Hartz . . . . you must go to a House near one of the Mines, to provide yourself with a Guide and a Miner's Dress. First you are carried to a Gabel, or Gapel, to see how the Ore is brought up from the Mines.''

The gapel, or hoist-house, was a wooden structure, sheathed with boards or slate, round at the bottom, and resembling roughly a cone. A circle of about sixty feet diameter was covered. In this was arranged a horse-whim. ''In the midle (this is the original spelling) of the Area is a deep Hole, wherein is placed a Spindle, on whose upper end is wound about the Chain which brings up the Bucket with Ore from the Mine. Lastly, there goes across thro the Spindle a Beam, to which the Horses are put. When the full Bucket is brought up to be emptied, the Man who governs the Horses drives 'em about, to let down the empty Bucket again, and another full one comes up at the same time.''

Windmills had been used. They has fallen into disrepute, however, because of the uncertainty of the wind.

In the ''Forehouse,'' or shaft-house, one could see the shaft ''which is about 5 or 6 foot square, which leads you down to the Mine, and is very well secur'd with Timber to prevent the Ground's falling in. Here you go down upon Ladders of about thirty Steps: At the Foot of each there are some Boards placed to rest upon; the Guide going first with a Candle in his Hand. If you care not to undergo this Fatigue, you may be let down in one of the Buckets.'' No bothersome restrictions in those good times! Nowadays the Ontario miner has to pay for the privilege of riding the bucket.

''The Caves, or places where the Miners dig the Ore,'' were often as high and spacious as a ''midle-siz'd Church.'' Some of the ore ''ran brittle,'' and was won with hammer and gad. In some places it was so tough that the miners were ''obliged to blow it up with gunpowder; which is done thus: They have a long and square Iron Peg, running into a sharp and harden'd Point, with this Iron they make a Hole in the Ore, fill it with Gunpowder, secure the Hole, and put a Thread that is dipp'd in Brimstone to it, which they light on the Extremity, and then run away from it''—a precaution that is even now considered wise. '' 'Tis a very pleasant sight,'' continues our author, ''to see the Miners, of which there are sometimes Thirty together working in one place, each of 'em having a Light before him, and the Ore glittering all about 'em.''

''An Adit,'' remarks the sapient doctor, ''is a Trench begun at the foot of the Mountain, running into one or more Mines: 'Ts pretty large, both Sides and the Roof are secur'd with Timber, and serve to drain off the Water, to admit fresh Air into the Mine, and to let out the noxious metallic Vapours.''

This is the last word on mining. There follow now several paragraphic descriptions of ore-dressing and smelting methods. ''To save the expence of Wood and Coals'' the impure ore is ''stamp'd and wash'd upon the plain Hearth, which is made with several Boards placed in the position of an inclining Plane, to separate the Stone from the Metal.

''The Stamping-Mill-House is a long and broad, but low Building, divided in the midle by a Wall; one Side of the House serving for the stamping, and the other for the washing of the Ore.''

The ore was fed into a strong iron-lined trough. Here it was stamped either dry or wet, as the nature of the Ore requires. The Stamp-Hammers, or Pestles, are lifted up by a Wheel, and, to encrease their Force, there is to the bottom of each of 'em fixed a flat piece of Iron of 50 l. weight.

When stamped dry, the ore was passed through a sieve or a Brass Cullender; but when stamped wet it was laundered into a brass vessel with a wire bottom. Thence the crushed material went into ''another Trough, where 'tis wash'd so long, till all the stoney Particles are separated from it.

''What remains in the first Trough is clean'd in the following manner: In the other partition of the Building there are several inclining Plains, or plain Hearths, which are cover'd with coarse Linnen; the Ore in pouder, just now mention'd, is put upon the upper end, and the Water running upon it, 'tis wash'd down from one Plain to the other, till at last all the metallic Particles subside to the Linnen, and the Stone is carried by the Water into the Troughs at the foot of these inclining Plains; but as this carries still some Metal with it, they let it run from thence into large Reservoirs, where they allow it time to settle: And when they have no Ore to stamp, they put it again under the Stamp-Hammers, to wash it as before, to separate the Metal entirely from the Stone.

''The Ore subsiding upon the uppermost Board of the Plain Hearth is pure Metal, but that of the second, third, etc., is wash'd over again.

''This Labour is perform'd by little Boys and Girls.'' All of which goes to prove that our predecessors knew something about the commercial aspects of ore treatment. The flow sheet signified above probably implied an effective, cheap and suitable method of milling the Hartz-Forest ores, and certainly the labour could not have been exorbitantly costly.

We now come to considerations metallurgcal. The roasting ovens stood, with all the other reduction equipment, in one large building. ''The Oven is made exactly like a Baker's Oven, only bigger: Herein they make a Fire with split Wood, and sling the last washings of the stamp'd Ore in it; then burn it twelve hours, to clear it of the unripe, volatile and poysonous metallic Particles; for otherwise both the good and bad would fly away in Smoak in smelting.'' Part of the sulphur was condensed, purified, and made into the brimstone of commerce. Open heap-roasting was also resorted to.

Of smelting ovens there were numberless varieties. The author points out this fact and, very astutely, refuses to describe any of them. The refining oven is, obviously, a large cupel. "When the Oven, and Coppel that stands in it, are duly heated, the Refiner puts the Metal upon the Coppel, and encreases the Heat till it flows; then he scums off the Flakes, and the remaining Impurities are carried away by the blowing of the (hydraulic) Bellows, which are directed upon the Metal when it stands in Fluss.—This operation is practis'd only upon Silver and Gold."

Further purification of silver was effected in a muffle, after which it was cool'd in a pail of water.

For coinage purposes the refined silver was melted in a crucible, alloyed with copper, cast into long ingots, and cut into discs the size of the coin required. The metal was then cleaned and stamped. The latter process was affected by a sledge-hammer and man-power, or by horse-driven machinery.

On the "Refresh-oven," the "Seiger or Streining-Oven," the "Darr" and the "Defting-Oven," time does not permit us to dwell. Nor may we touch on the "Copper-Mill," or the "Brass-Houses," or the "Vitriol-Houses," or the "Iron Smelting-Houses," or the "Glass-houses."

The caption of the concluding Part IX. reads: "Of some other Remarkable Things in and near Hartz-Forest." In this category fall both Dr. Behrens and his translator.

THE McKENZIE GOLD MINE

(Extract from Report of the Chibougamau Mining Commission.)

This property of "The Chibougamau Gold and Asbestos Mining Company" is on a southern hillside of Port age Island, 125 feet above Lake Chibougamau.

More work has been done at this place than anywhere else in the district; this work consists of a clearance of the surface and many cross-cutting trenches in earth and rock, at short intervals. There is about 1,000 feet of trenching altogether. This is distributed over 25 cuts and pits; also there is one shaft 35 feet deep; the cuts are up to 12 feet deep. The greatest apparent dimensions of the mineralized area are 700 feet long by 100 feet wide. Neither workings nor rock exposures indicate further extensions.

Within this area are large masses of quartz, as shown on the plan of this property. This quartz is somewhat mixed with masses of green schist, patches of oxides and a scattering of copper and iron pyrites. The oxidized portions show very minute colours of free gold in some cases when panned.

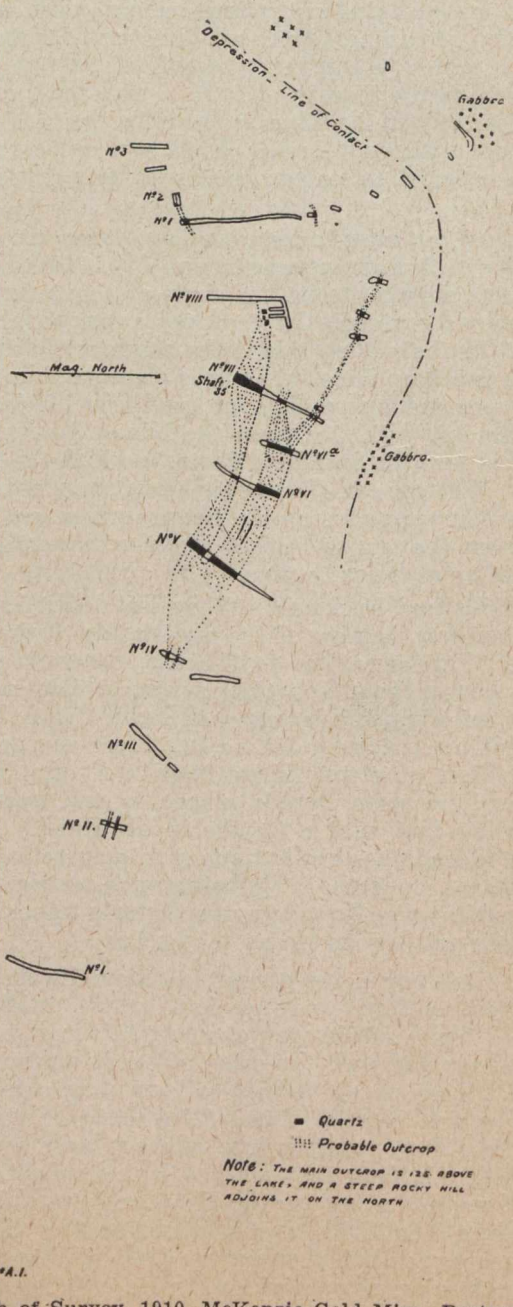
These quartz occurrences are most irregular; they are in masses, slabs, spurs, and veins, intermixed with the schistose country rock, a Keewatin diabase near its contact with gabbro.

The quartz shows a disposition to trend with the schists or across them on joint planes; the schists dip steeply southwards, the joint planes lie nearly flat, slightly inclined towards the north; this condition is illustrated by the cuts and by the shaft sections.

Surface erosion wearing down to one of the flat lying masses of quartz would be arrested by its resistance, and so, large outcrops, such as the one at the shaft, would be formed. Other similar masses may recur at depth.

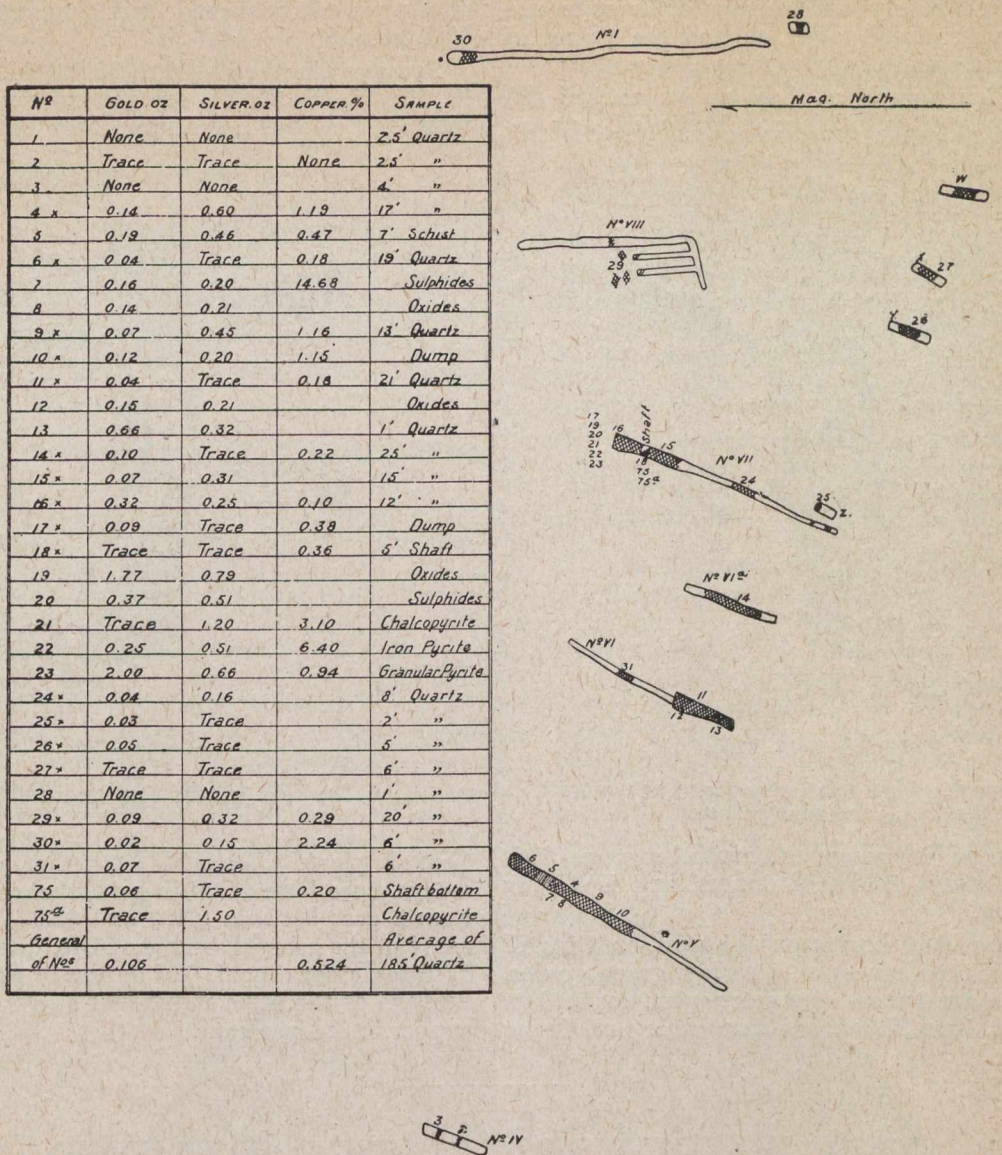
Under such conditions no great dependence can be placed upon the surface section. I estimate the total outcrop of quartz, as it exists in workable sizes as veins, spurs, and segregations, through the schist, at an average total width of 35 feet by 300 feet long. This would give about 800 tons of quartz for each foot of depth.

The largest continuous outcrop of quartz occurs in, and is cross-cut by, Cuts V and VI and VII, as numbered by Mr. Dulieux. These are the same cuts as B, C, A, of Mr. Hardman's report. In Cut V quartz is almost continuous across 50 feet; in Cut VI, 21 feet; in Cut VII, 32 feet. This band appears to be continuous from a little west of Cut V to a little east of Cut VII, a distance of at least 300 feet. This then is the heart of the deposit, as far as surface appearances go; the quartz outcrops on the west, northeast, and southeast extensions are com-

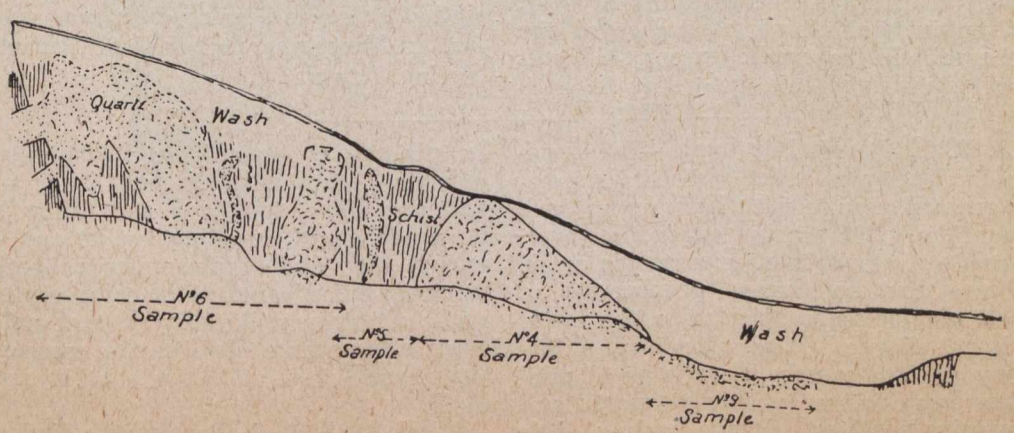


—Sketch of Survey, 1910, McKenzie Gold Mine, Portage island. Scale: 200 feet equals 1 inch.

No	Gold oz	Silver oz	Copper %	Sample
1	None	None		2.5' Quartz
2	Trace	Trace	None	2.5' "
3	None	None		4' "
4 x	0.14	0.60	1.19	17' "
5	0.19	0.46	0.47	7' Schist
6 x	0.04	Trace	0.18	19' Quartz
7	0.16	0.20	14.68	Sulphides
8	0.14	0.21		Oxides
9 x	0.07	0.45	1.16	13' Quartz
10 x	0.12	0.20	1.15	Dump
11 x	0.04	Trace	0.18	21' Quartz
12	0.15	0.21		Oxides
13	0.66	0.32		1' Quartz
14 x	0.10	Trace	0.22	25' "
15 x	0.07	0.31		15' "
16 x	0.32	0.25	0.10	12' "
17 x	0.09	Trace	0.38	Dump
18 x	Trace	Trace	0.36	5' Shaft
19	1.77	0.79		Oxides
20	0.37	0.51		Sulphides
21	Trace	1.20	3.10	Chalcopyrite
22	0.25	0.51	6.40	Iron Pyrite
23	2.00	0.66	0.94	Granular Pyrite
24 x	0.04	0.16		8' Quartz
25 x	0.03	Trace		2' "
26 x	0.05	Trace		5' "
27 x	Trace	Trace		6' "
28	None	None		1' "
29 x	0.09	0.32	0.29	20' "
30 x	0.02	0.15	2.24	6' "
31 x	0.07	Trace		6' "
75	0.06	Trace	0.20	Shaft bottom
75a	Trace	1.50		Chalcopyrite
General of Nos	0.106		0.524	Average of 185' Quartz



—Assay Chart. McKenzie Gold Mine.
Scale: 80 feet equals 1 inch.

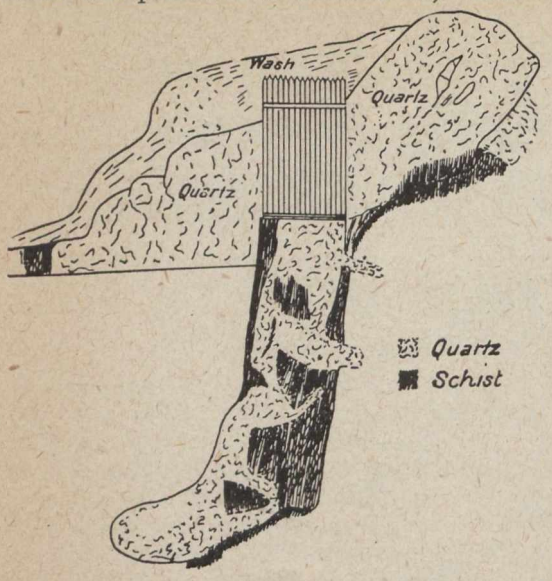


Side View No. V Cut, looking Eastward.

paratively of little size or importance.

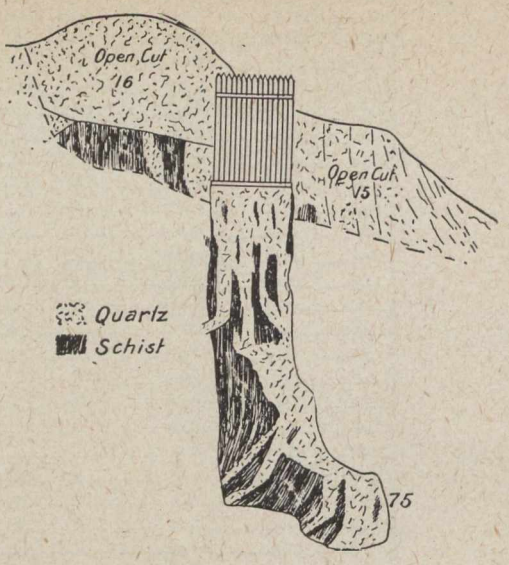
Nine days were spent in the sampling and examination of this property. Thirty-four samples of average and particular character were taken, to find the values of measured exposures and of the various classes of ore.

A duplicate final sample of these assays marked (*) was taken and placed in a common lot, which was reserved for a free milling assay, and control average. This general sample assays gold 0.07 ounces, and is 47 per cent. free milling.



—McKenzie Gold Mine.

No. VII Open Cut and Shaft, looking Westward.
Scale: 15 feet equals 1 inch.



—McKenzie Gold Mine.

No. VII Open Cut and Shaft, looking Eastwards.
Scale: 15 feet equals 1 inch.

The quartz ore body begins on the west, in Cuts II and IV, as small occurrences of very low grade quartz, it swells out to a great mass of greater value about Cuts V, VI and VII, then fades into two divergent, lesser bodies, of very low grade, one which passes northeasterly across the north ends of Cuts 1 and 2, east; and one which passes eastwards from the southern end of No. VII trench.

Samples numbered 4, 6, 9, 10, 11, 14, 15, 16, 17, 18, 24, 25, 26, 27, 29, 30, 31, are general samples which cover most of the chief exposures; they represent 217 lineal feet of quartz when added together, only one of them assays more than $3.00 in gold, the greater mass of this quartz goes between $1.00 and $2.00, gold value. The assay of the general sample of 1-lb. duplicates from these 17 cases, assays: gold, 0.07 ounces or $1.70. A computed average of the same individual assays gives gold $2.12; copper, 0.524 per cent.

THE PETROLOGICAL DEPARTMENT

By G. S. SCOTT

This department has been arranged with a view to aiding those of our readers who are far removed from facilities for making microscopic and other laboratory examinations of rocks and ores. Thin sections will be cut from specimens received and the results of their study briefly given in the following number of the Journal. No charge will be made, except 35 cents to cover the cost of making the thin section in each case. Samples should be about the size of an egg and as fresh as possible. A few notes on the occurrences of such is required. Mention should also be made of any theory or inference held by the collector, so that evidence bearing on it may specially be looked for. Address the Petrological Department, Canadian Mining Journal.

1. Swastika, J. R. J., Quartz Porphyry.—The hand-specimen of this light grey rock has a striking resemblance to a fine grained granite with little or no dark minerals. Examination of the thin section, however, shows that it consists of a matrix of microscopic grain, through which are scattered large phenocrysts of quartz, orthoclase, plagioclase, and chlorite, the latter representing original biotite. It is, therefore, a biotite quartz porphyry. The matrix is made up of minute grains of the same minerals, chiefly quartz and feldspar; and contains no glass. Pyrite with a little magnetite is abundant in cubes and irregular grains. In practically every case it is associated with the chlorite. Only a small amount of it appears to be primary. The feldspars are fairly fresh. There is no evidence of crushing or of any other alteration except that due to atmospheric agencies. This rock is comparatively recent in comparison with the other rocks of the Swastika district, and, unless the specimen were chosen from close to the contact, the fineness of the ground mass indicates that it must form a small body.

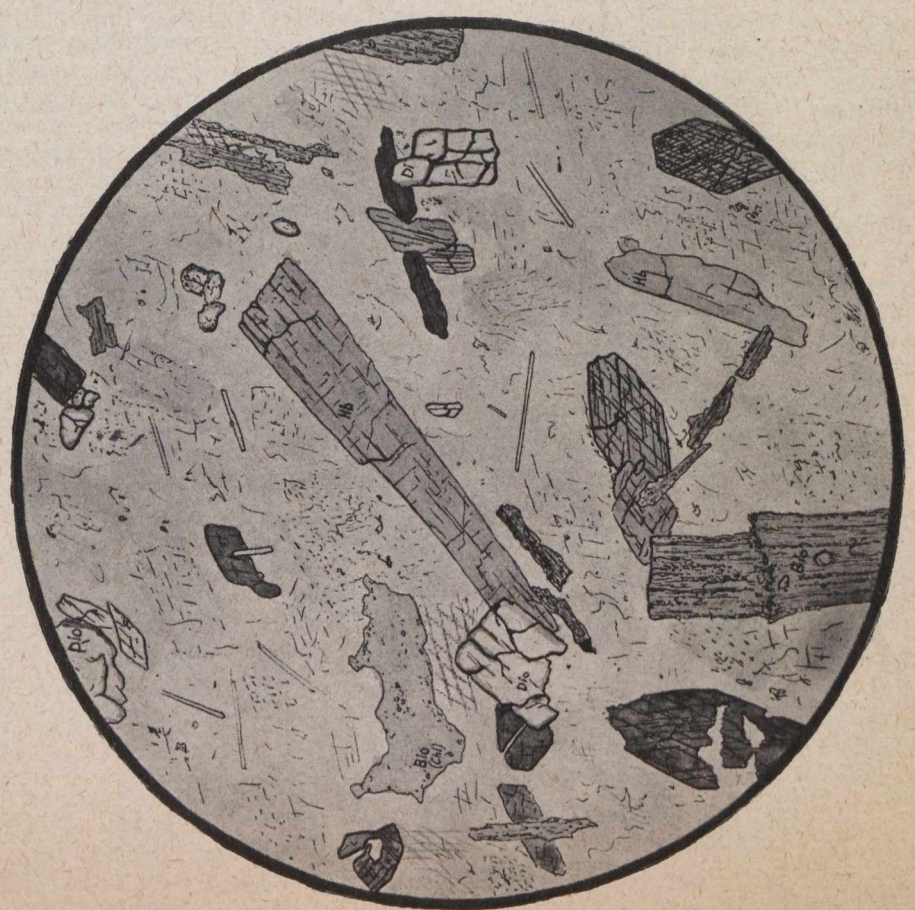
2. H. R., J. R. J., Porphyry.—Under the microscope this compact dark red rock is seen to consist of large

crystals of feldspar lying in a fine grained matrix of the same mineral. It has suffered much from crushing and now contains many streaks and nests of calcite, probably derived from the crushed parts of the rock, as the uncrushed parts are quite fresh. It is well known that acid plagioclases, such as are present in this specimen, yield more calcite upon decomposition than do the basic ones which contain more lime. Several of the calcite areas exactly resemble in form the biotite plates common in porphyries. But the connection may extend no farther; the writer does not know of any case on record where biotite has been replaced by clear carbonate with sharp outlines. A few shreds of chlorite are the only other possible indication of biotite. Several zirkons and apatites are visible. There is no trace of the rock having ever been subjected to metamorphic processes.

3. H. R., 1112, Deloro, J. R. J., Graywacke Schist.—This is a fine grained dark green rock, distinctly schistose but not cleavable. The thin section shows that the rock was originally an ordinary graywacke (consolidated feldspar-quartz-clay sediment) and has since been subjected to conditions which have induced partial re-crystallization of its constituents. Thus a large amount of chlorite and much new albite have been formed. The parallel arrangement of the chlorite scales is responsible for the schistosity. Scattered throughout the slide are small rutile needles. These are characteristic of all slightly metamorphosed argillaceous sediments such as slate, phyllite, graywacke, and graywacke schist. The conditions of metamorphism referred to were moderately low temperature and pressure—both probably due to burial within the earth's crust. Had this burial been deep enough and the temperature and pressure correspondingly high, a garnetiferous biotite gneiss with little or no schistosity would have resulted.

27. M. G. E., Swastika, Hornblende Minette.—The gray speckled hand specimen is characterized by slender hornblende needles averaging one-eighth in length and a few glistening plates of chlorite. In a coarse hypidiomorphic aggregate of orthoclase and plagioclase lie phenocrysts of hornblende, biotite (now chlorite), and a few stout prisms of diopside. Apatite is an abundant accessory. While the biotite has completely changed to chlorite with epidote, carbonates and rutile, the other constituents are quite fresh. Minette is the commonest member of the so-called "dike rocks." This class of rocks is distinguished by a composition abnormal in comparison with that of the parent magma, and as a rule the representatives are found in dikes,—but not necessarily, nor are all rocks in dike form "dike rocks." The accompanying illustration shows the appearance of this rock under the microscope.

E. B. H., Porcupine, Carbonate Phyllite.—This rock is distinctly schistose and the section shows that the chief minerals are carbonate, chlorite, albite, sericite and quartz. Part of the carbonate forms sharp sided rhombs and is, therefore, either dolomite or ankerite, as calcite never occurs with crystal boundaries in such conditions. A few quartz and feldspar grains are apparently relics of the original calcareous sediment from which this rock was probably formed. Rutile needles are abundant. The moderate degree of metamorphism exhibited is about the same as shown by most rocks from the Porcupine district.



Hornblende Minette, Swastika, Ontario, X50

THE CONSOLIDATED OPHIR MINES, LIMITED

Lake of the Woods, Ont.

(Written for The Canadian Mining Journal.)

The revival of interest in gold mining in Ontario and the recent issue by the Ontario Government of the Charter of The Consolidated Ophir Mines, Limited, make the contribution printed below exceedingly opportune. The work on the Ophir Mine by the English Syndicate, which Mr. McMicken described, was restrained by an injunction issued by the late Mr. Justice McMahon. The British investors, finding that they were liable to become involved in a costly constitutional struggle, abandoned their work and left the country and for about a quarter of a century capital for gold mining in Ontario could not be secured.

The titles upon the faith of which the British investors proceeded, were issued by the Federal authorities at Ottawa on the supposition that the lands granted had been included in an Indian reserve. This reserve was surrendered by the Indians to the Dominion Government in trust to sell, and, relying on the Federal jurisdiction over Indians and lands reserved for Indians, the Dominion Government sold and patented the lands.

The Province of Ontario, however, claimed sovereign rights over these lands and absolute ownership and granted the lands accordingly, vesting undivided interests in the various claimants, the amount of the interest of each being determined by considerations of equity.

The area dealt with by the Province of Ontario included the lands previously patented at Ottawa, and the same lands having been thus granted by different Governments to conflicting claimants, the Ontario Mining Company which had acquired a Dominion patent, attacked the Ontario grants in the Courts.

The Judicial Committee of the Privy Council sustained the Ontario Courts in upholding the Ontario grants and in declaring the Dominion patents void, and thus wrote the last chapter in the history of the bitterly fought Constitutional contest between Sir John Macdonald and Sir Oliver Mowat in regard to the nature of the Indian title.

While this question has been finally settled as far as Ontario is concerned, a similar dispute has arisen in British Columbia. In Ontario a surrender by the Indians of their title was considered necessary before the Crown would deal with any lands. The same principle was adopted in Manitoba, Alberta, Saskatchewan, and the Northwest Territories. The Province of British Columbia, on the other hand, denies the Indian title and claims to be empowered to deal with lands in the province without any surrender of the Indian title thereto.

The Indians have petitioned the Imperial Government asking that the dispute be referred for decision to the Judicial Committee of the Privy Council, under Lord Brougham's Act.

As the Imperial Government, which pledged the honour of the Crown to the Indians, the Dominion of Canada, which has exclusive jurisdiction over the Indians and lands reserved for the Indians, and the Province of British Columbia, which has exclusive jurisdiction over property and civil rights in the province, are all concerned, the constitutional questions involved are interesting and their solution will be followed by far-reaching consequences.

Meantime it is important that it should be generally known that all these questions, as far as Ontario is concerned, were finally and forever settled by the Privy Council in November, 1902.

As was naturally to be expected, it took several years after the title to the Ophir was established, to restore confidence. and it was not until about two years ago that capitalists from the United States became interested in the Ophir property and proceeded with its development. The shaft which had been commenced by the Canadian Pacific Exploration Company was continued to a depth of one hundred feet and considerable drifting done. Besides the main vein, which is known as the Ophir vein, a number of other veins parallel to the Ophir have been proved, nearly all of which carry values. Development work was done on the Ophir vein which shows up well. At the depth of one hundred feet there is a width of vein matter of thirty feet. Some of the ore is rich, showing gold in many places; but, what was more important, the average is very satisfactory, showing what is described as "a good, profitable, working grade of ore."

A charter was granted in January, 1912, by the Ontario Government to a company with an authorized capital of five million dollars, formed to operate the Ophir and some surrounding properties which have been quietly secured by the same interests during the past year. The name of the company is the Consolidated Ophir Mines Limited. As soon as its organization is complete, mining operations on a large scale will be pushed. Electric power from Kenora, where the waters of the Lake of the Woods drop into Winnipeg River, will be utilized.

Mr. H. G. McMicken, formerly of Winnipeg, but now of London, England (who is a son of the late Honourable George McMicken), was one of the pioneers of the District and he has written from personal knowledge the following:

The History of the Ophir Mine in the Kenora District.

In 1880 some prospectors found gold bearing quartz on Hay Island. They sent Jacob Hennessy into Winnipeg to get somebody to take hold of the property. Hennessy came to me and I with a Mr. McLean, Hennessy, and Mr. Doupe, a surveyor, went to the Lake of the Woods to take up the claim. As there was no railroad there at that time we had to go by canoe, which took some days. As we were paddling up to the Island we saw a canoe leaving it and found on landing that it had been taken up. A surveyor, D. B. Davidson, happening to come out to Rat Portage, as Kenora was then called, after Hennessy left, the others took him out and staked the claim. We then started for Rat Portage and landed on what is now known as Sultana Island to cook our dinner. While there we found a vein of rich looking quartz and prepared to survey the location. We ran a line probably three hundred yards but decided to go to Rat Portage for the night, as we were but seven miles from it and needed some supplies. In the morning we found that it had turned very cold

in the night and the lake was frozen, so we abandoned the idea of any more survey, and as we could not get back by canoe we had to walk from Rat Portage to Cross Lake, where we got a work train for Winnipeg.

On June 17th, 1881, Charles Moore, Hennessy, and Gadboy applied for X42 and X43, surveyed by O. B. Davidson. This is now known as the Sultana mine. Hennessy applied for a patent but could not get it. In the winter of 1882-1883 I made arrangements with Messrs. Snow, Hanan & Colwell to survey the balance of the island and we would divide it into eight interests, of which Snow was to have one-eighth, Hennessy one-eighth and myself one other eighth. Four-eighths were to be used for development and other purposes.

One-eighth was allotted to McDonald, Tupper, McArthur and Dexter, prominent Winnipeg lawyers, for their services in attending to any legal affairs.

Application was made for this property, but the Ontario Government informed us that they had nothing whatever to do with it and could not deal with it because it was claimed as an Indian Reserve by the Federal Government. We then made application to the Indian Department of the Federal Government and they told us that until the Indians released their rights to the Government nothing could be done. I then made arrangements and got up a pow-wow with the Indians and got their releases. We then applied again, but were told that there was no way at that time that the property could be dealt with.

In 1883 Sir John Macdonald, then Prime Minister of Canada, visited Winnipeg, and I interviewed him on the subject and asked him if arrangements could not be made to get the Government to deal with the property. He stated this could be done, but would make no promise. I told him I did not ask him to make such promise. The only thing I asked was that on his return to Ottawa he would look carefully into the whole matter and I felt sure that with the information he would find he would cause some kind of arrangement to be made so that the property could be handled. This he said he would do.

Nothing, however, was done until I received word from Ottawa that the Government had passed an Order-in-Council dealing with mineral lands other than coal on Indian Reserves. This was the result of my interview with Sir John Macdonald. I found on studying the regulations that anyone after its date could take the property up in 40 acre lots only. This necessitated change in our plans. So taking a number of my friends from Winnipeg and Rat Portage, I hired a surveyor and we all went to camp on the island for two weeks and surveyed it into forty-acre claims or thereabouts.

These regulations, in which I take a fatherly interest, are printed in the appendix to McPherson & Clark's Law of Mines in Canada. One of the authors of this book was Mr. J. Murray Clark, K.C., of Toronto, who was the successful counsel in the Ophir fight before the Privy Council.

Application was made to the Ontario Government in the name of Mrs. Margaret Geerie for the whole island except the Sultana claims.

I at once commenced a vigorous prospect of the locations and discovered rich deposits of gold. Mining men from all parts of the United States, Canada and England began to flock to the country. Everybody wanted to get an interest in the property and among them Mr. Caldwell, the present owner of the Sultana. He finally prevailed upon me to allow him an interest in the Ophir, which I did. He was so impressed with the showing that, not being able to control the Ophir, he made arrangements to buy the Sultana claims.

I made a deal with an English syndicate, who developed the Ophir property, and they sent out their expert and commenced operations. But Mr. Mather, of Ottawa, under an old timber lease or license, obtained an injunction after they had sunk a shaft about 35 feet. The English syndicate notified us that if we would protect them and get title and carry out our part of the contract they would go on with the work, but there were other influences at work to prevent this being done. I insisted on faith being kept with the English syndicate, but was not backed up in this by the others concerned, who desired to deal with other people. Then there was a squabble among those interested and, as shortly after I had to come to Toronto, I gave a Quit Claim of my interest in the property to the Ontario Mining Company, which had been formed by Mr. Caldwell and his friends. In this Mr. Caldwell was associated with Messrs. Alloway & Champion, financiers, of Winnipeg.

Nothing further was done with the property for some years, when some Ottawa people staked out the richest part of the island and applied to the Ontario Government for three claims of forty acres each. All parties were brought before the Ontario Government and there was a tremendous fight lasting for several years. Finally the Ontario Government divided up what was originally the Ophir with the eight adjoining locations, making in all about 440 acres. The Ontario Mining Company, instead of perfecting the title, brought a suit to set aside the grants by the Ontario Government, and thus starting the famous Ophir litigation which went through to the Privy Council. A company was formed, called the Sultana Ophir Mining Company, to which all the interests were transferred and as the company was willing to protect the original prospectors and to proceed with the development of the property, I naturally backed its claim which succeeded before the Privy Council.

The title of the Sultana Ophir Mining Company is a Torrens title, which means that any person making a claim adverse to the certificate of title would have to refer to what is known as the Assurance Fund Act, and could not disturb the holding of the Sultana Ophir Company or their purchasers under the Torrens title.

The value which those holding the Dominion title and in fact all parties attach to the property, can be indicated by the desperate fight that was made, the case having been carried to the Judicial Committee of the Privy Council, and I think that in the whole fight over one hundred thousand dollars has been spent in costs.

The appeal to the Privy Council from the Supreme Court of Canada was argued in the year 1902. In the record of the proceedings of the Privy Council the case was stated to be between the Ontario Mining Company, Limited, plaintiffs and appellants, and Edward Seybold, Edmund B. Osler, J. W. Moyer, Elizabeth Johnston, Edward H. Ambrose, John W. Brown and John S. Ewart, defendants and respondents.

Edward Seybold is a successful manufacturer of Ottawa, and represents a syndicate there. E. B. Osler, M.P., is well known in the public life of Canada. He has since sold out his interests in this property, and it is understood his interests are now held by English investors. Mrs. Johnston has transferred her interest to the National Trust Company, which company has

tario Act, known as the Sultana Ophir Mining Co., sold this interest to a company organized under the On- Limited. John W. Brown represents the J. J. Nill interests at Winnipeg. J. S. Ewart, K.C., is a well-known barrister of Ottawa, who took a prominent part in the deliberations at The Hague last summer. So, altogether, the litigation concerning this one mine in the Rainy River District, namely the Sultana Ophir, has been a celebrated case involving many prominent men and large financial interests.

In the early days of the Ophir mine development, many men in Winnipeg, prominent in public life, were interested. The original solicitors for the company that proposed to take over the Ophir mine, were Macdonald and Tupper. They were lately succeeded by Hough & Campbell and Heber Archibald. Among the men who signed the papers connected with the incorporation of this company were: J. F. Caldwell, M. T. Hunter, A. C. McMicken, A. T. R. Blackwood, C. S. Hoare, Hon. H. J. Macdonald, George Heenan, J. A. Kirk, B. H. R. Wainwright and J. Fred Snow.

ANNUAL REPORT OF THE COAL MINES BRANCH, ALBERTA

(Continued from last issue.)

LETHBRIDGE DISTRICT.

Royal Collieries, Ltd., Lethbridge.

During the past twelve months extensive alterations have been made on the surface plant of this mine. The tipple has been rebuilt and a rotary dump installed capable of handling four cars at one time. A rubber belt conveyor 28 inches wide by 34 ft. long has been erected by the Robins Belt Co. The screens are arranged for three sizes of coal. A Jenckes hoisting engine of a capacity of 300 h.p. has been installed for hoisting the cars from the bottom of the slope to the tipple. A compound air compressor has been installed by the Canadian Rand Drill Co. Considerable development has been done in the underground workings during the past year.

Diamond Coal Co., Ltd., Diamond City.

The following plant has been installed at this mine during the year 1910. A Sirocco fan 90 inches in diameter capable of giving 100,000 cubic feet of air per minute with a six inch water gauge. The fan is driven by a 75 h. p. motor. The foundations for fan and motor are built of concrete and also the adit from the fan to the mine entrance a distance of 70 ft. A compound two-stage Reidler air compressor with Whitworth governor and Reidler valves has been installed. A battery of Babcock & Wilcox boilers has been erected fitted with B. & W. chain grates and automatic stokers. A Weir boiler feed pump 7½ in. x 5 in. x 6 in. with a capacity of 100 gallons per minute has been installed. A duplex Fairbanks service pump has been installed for pumping water from the river into the water tank at the plant. This pump is 10 in. x 4 in. x 10 in., with a capacity of 108 gallons per minute. A five-feet reciprocating feeder has been added to the screening plant. A power house and boiler house built of brick on concrete foundations have been erected. The electric coal cutting machines underground have been replaced by punchers.

Lethbridge Collieries, Ltd., Kipp.

This company controls about fifteen square miles of coal lands and it is intended to erect a plant for 1,500 tons per day. The two shafts have been sunk to the coal which is at a depth of 573 feet from the surface. The hoisting shaft is 17½ ft. x 21½ ft. in the clear. The second shaft is 10 ft. x 20 ft. Both shafts are dvided into three compartments and timbered with 10 in. x 12 in. timbers at 3 ft. 10 in. centres with 3 in. lagging. The plant at present at this mine is only temporary consisting of two Jenckes hoisting engines of 50 h. p. each. Two Sullivan air compressors, one Allis-Chalmers generator connected to a 12 h. p. Ajax horizontal engine, two 150 h. p. Robb-Mumford boilers have been installed. A temporary wash-house has been built. All shots are fired by means of the electric battery, the explosives used being dynamite. Electric lights were used underground during sinking operations.

TABER DISTRICT.

Alberta Consolidated Coal Co., Ltd., Taber.

The output at this mine has been increased and development pushed ahead so that it will be able to produce a still larger output next winter. A Fairbanks railway, track scale has been installed.

Rock Springs Sootless Coal Co., Ltd., Taber.

During the past year the following plant has been installed at the mine operated by this company: One straight-line air compressor built by the Canadian Rand Drill Co., a Fairbanks duplex pump with a capacity of 100 gallons per minute has been installed at the river for pumping water to the plant. A wash-house fitted with lockers has been erected. A rotary dump with a capacity of 300 tons per day has been installed. Ingersoll punching machines are in use at this mine.

There are several other small mines operating during the winter months in the Taber District but as the demand is purely local they close down for a number of months during the summer. The Belly River mine, operated by G. Erickson, has been equipped with a 25 h. p. gasoline engine for hoisting coal up an incline of 800 ft.

A number of small mines are operating in the Grassy Lake District and a considerable amount of prospecting is being done.

There are a number of mines operating in the Medicine Hat District, chief of these being the mines operated by the Red Cliff Brick Co., Ltd., and the Ansley Coal Co. The latter company put down two drill holes on different parts of the property with the result that

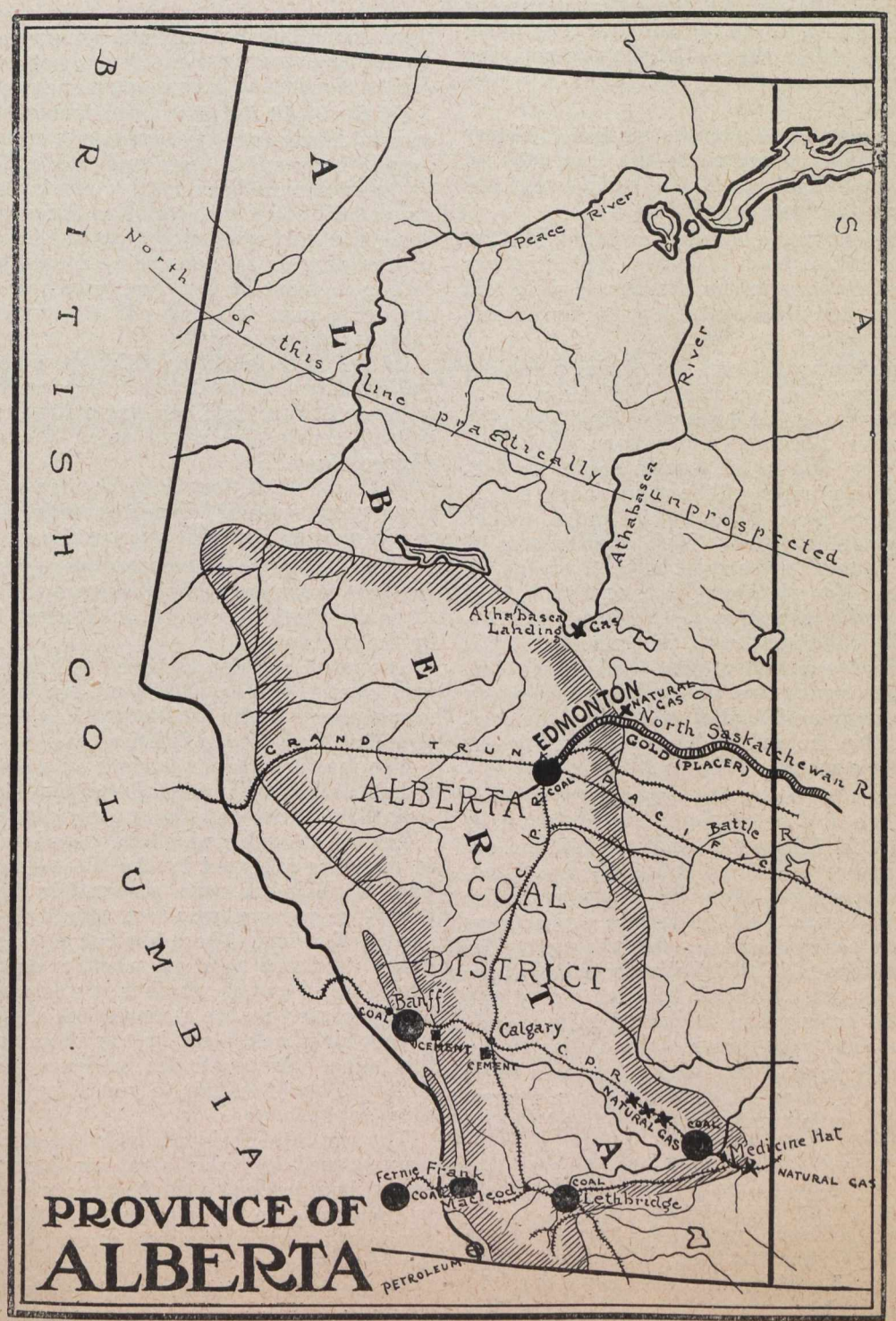
a seam of coal 7 ft. thick was found at a depth of 250 ft. from the surface.

A number of small mines are also operating in the Little Bow District but as the demand here is also purely local they only operate during the winter months.

WORK OF INSPECTION.

The inspection work of the province has increased considerably during the year 1910. A large number of new mines have been opened up, and as most of these are in the outlying districts at a considerable distance from the railway a large amount of time is taken up by the inspectors in travelling. In the larger mines, especially in the Crow's Nest Pass District, the outputs from the various mines have considerably increased, and it is consequently necessary to have much more rapid transportation for the coal. In order to obtain this a number of compressed air locomotives have been installed and a higher speed of transportation obtained, making it necessary for a more thorough inspection of the haulage roads to be made owing to the greater liability for accidents.

The "Eight Hour Law" which came into force on April 1st, 1909, and which also includes the persons engaged in transportation, is now working fairly satisfactorily, but I am of opinion that owing to the largely increased output which has to be hauled over an increased distance and entails more rapid transportation



more danger is to be apprehended. All fatal and serious accidents have been investigated and all inquests attended. The inspectors have made their rounds of inspection as often as was possible and have thoroughly investigated the cause of all accidents, and as far as practicable have had the causes of these accidents removed.

I am pleased to report that safety lamps have been installed in all the mines in the Crow's Nest Pass District, with the exception of Bear Valley Mine, operated by the West Canadian Collieries, Ltd., at Lille. Permitted explosives are now being used for blasting coal in all mines where gas has been found, and in a large number of cases Samsonite is used for blasting rock. We have had considerable trouble in getting these permitted exposives put into use, but the different persons interested are beginning to see the advantage of using them, and I believe before the end of the present year only permitted explosives will be used in mines where gas has been found.

A telephone has been established to connect the inner workings of No. 2 mine, operated by the International Coal & Coke Co. at Coleman, with the surface and has proved to be a great advantage.

A gob fire broke out in the old mine at Frank on 11th day of November, 1910, above 71 angle. This fire was dealt with by building stoppings across the main and counter gangways, and thus excluding, as far as possible, air from the seat of the fire.

I am also pleased to report that shot firing has been reduced as far as possible in a number of mines, more particularly in the Nos. 2 and 4 seams at Coleman. No shots are fired in No. 2 seam except in some of the pillars near the outcrop, and in No. 4 seam no shots whatever are fired. In a number of the other mines shooting off the solid has been discontinued and a proper system of mining coal adopted. The breast system of mining coal was adoped in the shaft mine, operated by the Canadian Coal Consolidated, Ltd., at Frank, and was considered by the inspectors to be dangerous. Action was taken by the department in connection with this matter under Section 48 of The Coal Mines Act, and I am pleased to report that before it was necessary to put the matter before a board of arbitration the company abandoned this method and is now opening out its mine on the angle system.

Proceedings were taken by the department against the West Canadian Collieries, Ltd., for violation of Section 6 of The Coal Mines Act, and a conviction obtained. The company was fined $20 and costs. Acting on instructions received from the department, the West Canadian Collieries, Ltd., instituted proceedings against a miner, Charles Germain, for having lucifer matches in his possession in the Blairmore mine where safety lamps are in use. Germain pleaded guilty and was fined $10 and costs. The Bankhead Mines, Ltd., took proceedings against a miner, John Belish, for a contravention of The Coal Mines Act by passing a fence which had been put up across the entrance to a dangerous place. Belish pleaded guilty and was fined $5 and costs.

ACCIDENTS.

From the list of accidents for the past year it will be seen that fifty-nine persons lost their lives underground and two above ground, making a total of sixty-one. Of the fatal accidents below ground four were caused by falls of coal; eight by falls of rock; eight by mine cars; three by falling down chutes; two by premature explosion of explosives; one by gas explosion; thirty-one by carbon monoxide poisoning; one by stone falling down from side of shaft during process of sinking; one by asphyxiation by fumes from blasting. The two fatal accidents which occurred above ground were caused by mine cars.

Of the four fatalities which occurred by falls of coal two occurred at the working faces and two were caused by pillars dropping out while the persons were walking over the top of them. These pillars were not left of a sufficient thickness and when the first squeeze of the seam took place they dropped out, thus causing the men who happened to be on them to fall and become buried.

Of the eight fatalities caused by falls of rock, two of them were caused while main gangways were being repaired and five were due to falls of cap rock, and one due to the sides of a prospect trench caving in.

Of the eight fatalities which were caused by mine cars underground, two persons were killed by being caught between the cars and the loading chutes; two by being caught between two moving cars; one by being caught between sides of roadway and cars; one by being caught between the top of the car and the roof while riding on car; one being caused by the brakeman falling in front of the compressed air locomotive, and one by a man jumping off a moving car and being crushed against a chute.

Of the three fatalities which were caused by persons falling down chutes, two were workmen who were working at face, and one was a fire boss who was travelling across the chute when the coal above him slipped away.

Both the fatalities which occurred through the premature explosion of explosives occurred in rock tunnels which were being driven across the measures.

The fatality which occurred by axphyxiation was owing to a workman going back into his place too soon after the shots were fired, and before it was examined by the fire boss.

The fatality which occurred owing to a gas explosion was caused by one of the miners in the lignite field going over a fence which had been erected across an abandoned place and igniting gas.

The fatality which occurred by a stone falling down a shaft took place in a small shaft which was being sunk near Milk River, and was entirely due to lack of timber.

The catastrophe which happened on December 9th in the mine operated by the West Canadian Collieries, Ltd., at Bellevue, was responsible for the deaths of thirty-one persons, who lost their lives by carbon monoxide poisoning. There has not yet been sufficient evidence produced to show whether or not this was an explosion of gas or whether it was caused by heat being generated by the compression of air due to a large cave which took place in the abandoned workings of this mine. After all the evidence possible has been gathered I will submit to you a further report on this catastrophe.

The two fatal accidents which occurred above ground were caused by mine cars, one being caused by the driver jumping on to the bumper while the trip was in motion, and the other being caused by the man being run over by a trip of empty cars while proceeding from the wash-house to the mine mouth.

In connection with the fatal accident which occurred whereby a brakeman on the compressed air locomotive

in the Bellevue mine was killed, I found it necessary to take proceedings against the West Canadian Collieries, Ltd., for two contraventions of The Coal Mines Act.: one for employing the deceased underground while he was under sixteen years of age, and the other for employing the same person above ground during 1908 while he was under thirteen years of age. The company pleaded guilty in both cases and was fined $20 and costs.

A number of fatal accidents which have occurred, more especially in connection with the transportation, have been entirely due to the lack of discipline, and if The Coal Mines Act and the special rules in force at these mines had been strictly observed it is possible that the number of these accidents would have been diminished. In order to remove, as far as possible, the dangers to be apprehended by persons being crushed between the moving cars and the chutes, the inspectors have been taking steps to remove this danger as far as possible by requiring such alterations to be made in the construction of chutes as local conditions will permit.

There have also been five serious accidents above ground and thirty-six below ground, and seven slight accidents above ground and fifty-one below ground, making a total of one hundred and sixty accidents.

TABULATED LIST OF ACCIDENTS ABOVE AND BELOW GROUND.

Cause	Fatal		Serious	
	Above	Below	Above	Below
Falls of coal	..	4	..	3
Mine cars	2	8	..	17
Shaft accidents	..	1	4	1
Gas explosions	..	1	..	..
Carbon monoxide poisoning	..	31	..	..
Machinery	..	..	..	..
Falls of rock	..	8	..	10
Explosions	..	2	..	4
Asphyxiation	..	1	..	..
Falling down chutes	..	3	..	..
Railway cars in mine yards	..	..	..	..
Other causes	..	..	1	1
Total	2	59	5	36

Before going to press I am pleased to report that there has been a considerable decrease in the number of fatal accidents during the first three months of this year as compared with the first three months of the year 1910.

MINING EXAMINATIONS, PROVINCE OF ALBERTA

Examinations held by the Albertan Department of Public Works

(Continued from February 1st Issue.)

Mine Manager's Examination.

Paper No. 6. Time allowed, three hours. The value attached to each question is given in parenthesis. Candidates must obtain 60 per cent. of the allotted marks to pass.

LEVELLING.

1. Describe how you would level a road having a gradient of 1 in 1½, also how you would level a road having a gradient of 1 in 150. State your reasons for any alscribe. ( )

2. Fill in the following level notes, showing height of instrument, elevation and grade, and state what is the average grade from Station 0 to Station 18. Stations are 100 feet apart.

Station.	B.S. Feet.	I.S. Feet.	F.S. Feet.	H.I.	Elev. Feet.	Grade.	Rem'ks.
O.B.M.	6.70	....	....	....	20.00	....	....
1	....	3.40	....	....	....	....	....
2	....	4.20	....	....	....	....	....
3	....	2.80	....	....	....	....	....
4	....	5.70	....	....	....	....	....
5	....	1.80	....	....	....	....	....
6 T.P.	....	....	2.90	....	....	....	....
7	8.30	....	....	....	....	....	....
8	....	7.40	....	....	....	....	....
9	....	6.50	....	....	....	....	....
10	....	2.80	....	....	....	....	....
11	....	8.40	....	....	....	....	....
12	....	3.50	....	....	....	....	....
13	....	2.40	....	....	....	....	....
14 T.P.	....	....	1.80	....	....	....	....
	5.40	....	....	....	....	....	....
15	....	2.20	....	....	....	....	....
16	....	6.80	....	....	....	....	....
17	....	4.30	....	....	....	....	....
18	....	....	3.82	....	....	....	....

3. Plot the notes given in question 2, on a vertical scale of 10 feet to the inch and a horizontal scale of 100 feet to the inch, marking on the number and elevation of each station. (25)

4. Describe an Engineer's level, and explain how you would determine whether or not the instrument was properly adjusted. (10)

5. Two drill holes one mile apart are put down to a seam of coal; the depth of the first is 634 feet, and that of the second 850 feet. The surface of the former is 25 feet above the top of the latter. What is the inclination of the coal seam between the two points measured in inches per year? (15)

6. Describe a levelling rod, and state for what purpose it is used. (10)

Mine Manager's Examination.

Paper No. 7. Time allotted, three and one-half hours. The value attached to each question is given in parenthesis. Candidates must obtain 60 per cent. of the allotted marks to pass.

SURVEYING AND MAPPING.

1. What is meant by declination and variation when speaking of the compass? (10)

2. What are the ordinary sources of error to be

avoided when laying down new surveys on old plans? (12)

3. Calculate by sines and cosines the bearing and length of the closing lines of the following traverse: (10)

Station.	Azimuth.	Distance.
0 to 1	22.18 degrees.....	240 feet
1 to 2	68.15 degrees.....	305 feet
2 to 3	118.36 degrees.....	270 feet
3 to 4	172.45 degrees.....	380 feet
4 to 5	248.30 degrees.....	265 feet
5 to 6	285.14 degrees.....	160 feet

4. Plot the traverse given in question 3 on a scale of 100 feet to 1 inch, draw the closing line from station 0 to station 6 and calculate the area of the enclosed figure. (15)

5. Give a general description of a theodolite and explain in detail the method of making an underground survey with it. (10)

6. Explain what is understood by the terms "True North" and "Magnetic North" and how each is ascertained. (10)

7. Explain in detail what steps you would take for connecting an underground survey with a surface plan so as to secure their true relationship. (10)

8. If a roadway is driven a distance of 500 feet on a rising grade of 10 degrees, what should be the distance represented on the mine plan, and what height has the breast attained above the gangway level? (10)

9. Draw to scale, showing side and elevation what you consider the best way of forming an air crossing in stoop and room workings. (13)

Pit Boss Examination.

Paper No. 1. Time allowed, two hours. The value attached to each question is given in parenthesis. Candidates must obtain 60 per cent. of the allotted marks to pass.

COAL MINES ACT.

1. What are the stipulations in The Coal Mines Act relating to the use and handling of explosives in mines? State fully. (12)

2. What are the qualifications and duties of a Pit Boss as laid down in The Coal Mines Act? (8)

3. What are the provisions of The Coal Mines Act with special reference to shafts and outlets? (7)

4. What are the provisions of The Coal Mines Act relating to ambulances or stretchers? (5)

5. What do the general rules say regarding signals and manholes on planes worked by machinery? (11)

6. State fully all the provisions of The Coal Mines Act as to the use and handling of safety lamps. A quantity of fire damp is found at the face of a working place; state what steps you would take to comply with the Act. (15)

7. State shortly the provisions of the Act with regard to the employment of females and boys. (10)

8. What are the provisions of the Act with regard to necessary ventilation? (10)

9. What are the provisions of The Coal Mines Act regarding abandoned mines? (7)

10. What are the provisions of The Coal Mines Act relating to the withdrawal of workmen in case of danger? (10)

11. What are the provisions of The Coal Mines Act relating to the inspection of machinery? (5)

Pit Boss Examination.

Paper No. 2. Time allowed, two and one-half hours. The value attached to each question is given in parenthesis. Candidates must obtain 60 per cent. of the allotted marks to pass.

VENTILATION.

1. What gases are met with underground, and to what extent are they dangerous in the air of mines? (12)

2. What dangers are to be apprehended from the presence of coal dust in dry mines? And what systematic precautions are best suited to them? (8)

3. What circumstances would guide you in determining what quantity of air necessary for the ventilation of a mine? (7)

4. There is passing along an airway 35,000 cubic feet of air per minute. What will be the velocity per second if the size of the airway is 7.5 ft. by 5.5 ft. (5)

5. Describe the water guage and state where and why it is applied. (8)

6. What horse power would an engine exert when

5. Describe the water gauge and state where and why it is applied. (8)

7. A barometer registers 30 inches at the surface, what will it register at a point 1,890 feet below the surface? (8)

8. Explain the term "Motive column," and how is it expressed and how is it ascertained. (6)

9. A shaft is 500 yards deep and 16 feet in diameter. What is the extent of the rubbing surface? (5)

10. Describe the barometer. Of what use is it in connection with mine ventilation? ( )

11. Explain the principal and construction of a safety lamp of which you approve. What are the features that render one safety lamp more sensitive to gas than another? (11)

12. Ventilate the given plan showing direction of air currents and marking on all stoppings, doors, air crossings, etc. (14)

Pit Boss Examination.

Paper No. 3. Time allowed, three and one-half hours. The value attached to each question is given in parenthesis. Candidates must obtain 50 per cent. of the allotted marks to pass.

PRACTICAL WORK.

1. Describe the process of timbering (a) Circular shaft; (b) Rectangular shaft, in soft ground. (11)

2. Explain with sketches, two methods of timbering a main haulage road in a seam 6 feet thick with soft roof, and pavement at a depth of 250 yards. Assume the size of the roadway, and give the dimensions of timber used. (12)

3. Assuming that a large number of accidents occur on underground haulage roads, what precautions and rules do you consider necessary to insure the safety of persons working and travelling on these roads? (8)

4. Explain the various kinds regular and irregular cleavages, joints and fractures which you have noticed in coal seams, and in the roofs of coal seams. Describe their influence on the mode of working, and the safety of the workmen. (9)

5. Explain in detail the precautionary measures you would adopt when driving towards old abandoned

workings, which may contain an accumulation of gas or water. (7)

6. In determining the size of a shaft pillar what effect will the depth of the shaft, and the inclination of the seam have? (5)

7. What explosive would you use for blasting in coal in a mine giving off C. H. 4? Give your reasons for preferring it, and describe the method of procedure you would adopt if you were acting as shot lighter, from the time the hole is drilled until the workmen return to work after the shot is fired. In the event of a shot missing fire, what action would you take? (11)

8. What are winding and haulage ropes made of, and what regulations for their preservation are required in the interests of safety and economy? (10)

9. What observation and data are required to determine the quantity of air pass in a mine, and the efficiency of the ventilating appliances? (7)

10. Is spontaneous combustion possible in a coal mine? If so, what are the probable causes producing it, and what means would you employ to prevent it? In the event of a mine fire what precautions would you take to protect the workmen employed in extinguishing the same? (10)

11. How would you proceed to remove a body of C. H. 4 from a series of breasts pitching 30 degrees, the gas having accumulated during a stoppage of fan? (7)

12. In case a squeeze occurs in a mine of which you had charge, endangering a heading and threatening to shut off part of the work, how would you proceed to stop its progress? (6)

Pit Boss Examination.

Paper No. 4. Time allowed, three and one-half hours. The value attached to each question is given in parenthesis. Candidates must obtain 50 per cent. of the allotted marks to pass.

MACHINERY.

1. What is the object of a safety valve on a steam boiler? What form of safety valve would you use? Describe it and give your reasons for preferring it. (10)

2. Explain what you mean by the term "unit of work," and the term "unit of heat"? How was the term horse-power arrived at and what does it represent? (8)

3. Show how you determine the horse-power of a pair of engines 24 inch cylinders and 4 feet stroke, running 50 revolutions a minute, and having an average effective steam pressure of 50 pounds per square inch. What do you understand by the term average effective pressure? (12)

4. What provisions would you make at a colliery for keeping up the ventilation in case of a break-down of the ventilating appliances? In the event of a serious stoppage of ventilation when the men were at work, what action would you take? (9)

5. Describe briefly how you would prevent the oscillation of the bucket in a shaft being sunk to a considerable depth. (10)

6. Describe in general terms the plant you would require for sinking operations. (9)

7. Is it necessary in colliery winding engines on the second motion to have a brake applied both to the crank shaft and also to the drum itself? Give reasons for your answer. (6)

8. If you were asked to advise generally as to the safety appliances in colliery winding, what generally would be the appliances you would recommend? (8)

9. What are the dangers to be apprehended in connection with the application of electricity to mining operations? What precautions would you take to guard against these dangers? (10)

10. What is the safe working load for a steel hoisting rope seven-eighths inch in diameter? (10)

11. What useful horse-power is expended in raising 435 gallons of water per minute to a height of 528 feet? (8)

Pit Boss Examination.

Paper No. 5. Time allowed, three and one-half hours. The value attached to each question is given in parenthesis. Candidates must obtain 60 per cent. of the allotted marks to pass.

SURVEYING AND LEVELLING.

1. Describe how you would make a survey of underground workings, where in many places the needle is liable to be affected by attraction. (12)

2. Plot the following compass survey to a scale of 100 feet to the inch:

Station	Bearing	Distance
1	S. 47 E.	240 feet
2	S. 79½ W.	130 feet
3	S. 30¾ W.	210 feet
4	N. 62½ W.	325 feet
5	N. 41 E.	230 feet (15)

3. Give the bearing and length of the closing line of the above survey. (10)

4. Describe how you would proceed to level with a spirit level, and a straight edge, and also with a regular levelling instrument, and under what conditions you would use the one in preference to the other. (14)

5. Show by diagram how you would have the sights of a compass placed in relation to the needle in laying out a roadway to be driven N. 75 W. (9)

6. What are the dangers and consequent results arising from not having accurate and complete surveys of the workings of a mine? (12)

7. An annemometer registers 30,000 feet velocity per hour in an airway 8 feet by 5 feet. What is the volume of the air passing per minute and how would you ascertain whether or not the annemometer is in good working order? (9)

8. Describe how you would proceed to put up sights for the guidance of workmen in driving their working places. (11)

9. What angle is included between N. 87½ E. and S. 15 W.? (8)

Fire Boss Examination.

Paper No. 1. Time allowed, three hours. The value attached to each question is given in parenthesis. Candidates must obtain 60 per cent. of the allotted marks to pass.

COAL MINES ACT.

1. State the requirements of The Coal Mines Act as to the duties and qualifications of: (a) Fire Boss, (b) Shot-lighter. Write an imaginary report you would make after examining a mine as Fire Boss. (12)

2. What are the provisions of The Coal Mines Act relating to the use of safety lamps? (16)

3. State the provisions of The Coal Mines Act regarding manholes. (14)

4. What are the provisions of The Coal Mines Act relating to the use and handling of explosives in mines? (16)

5. What are the provisions of The Coal Mines Act regarding the appointing of stations at a mine? (10)

6. What does The Coal Mines Act say regarding: (a) Inspection of Machinery; (b) Fencing of Machinery? (10)

7. What are the provisions of the General Rules regarding the division of a mine into districts? (10)

8. If you found a part of a mine dangerous from any cause whatever, when making your daily inspection while the men are at work, state fully what action you would take. (12)

Fire Boss Examination.

Paper No. 2. Time allowed, two and one-half hours.

The value attached to each question is given in parenthesis. Candidate must obtain 60 per cent. of the allotted marks to pass.

VENTILATION.

1. What noxious gases are met with in coal mines? Give their composition, and say under what conditions they are found. (14)

2. Describe in detail how you would test for gas with an ordinary safety lamp so as to incur the least risk to yourself during the test. How would you tell whether or not gas was present in dangerous quantities? (11)

3. Give a short description of the barometer and thermometer. Explain the action of each, and say what their use is in connection with the ventilation of mines. (11)

4. Ventilate the given plan, showing direction of air currents, and marking on all stoppings, doors, air-crossings, etc. (15)

5. Describe the construction of a safety lamp of which you approve. Give your reasons for approving of it and say what are the essential features of a good safety lamp. (9)

6. Is coal dust dangerous in a mine without the presence of C.H.4? If so, describe the conditions under which it becomes dangerous, and say what precautions you would take to overcome these dangers. (8)

7. Make a neat sketch of a stopping you would build in a cross-cut between the main intake and main return airways of a pitching seam giving off a quantity of C.H.4. Give dimensions and material used. (9)

8. What precautions would you adopt to prevent loss of life and property in mines subject to sudden outbursts of carburetted hydrogen?

9. Which do you consider should be the larger, the main intake or return airway, and why? (6)

10. What are the dangers due to shot-firing in gaseous mines and what precautions would you adopt to prevent these dangers? (7)

Fire Boss Examination.

Paper No. 3. Time allowed, two hours.

The value attached to each question is given in parenthesis. Candidates must obtain 50 per cent. of the allotted marks to pass.

PRACTICAL WORK.

1. Give a full account of your experience in coal mining. (12)

2. Describe two methods of firing shots. Say which you prefer and give reasons. Under what conditions would you prohibit shot firing? (11)

3. How would you determine whether a fault met with in the coal was a downthrow, upthrow or overlap? Describe how you would prove the fault. (11)

4. State in detail what precautionary measures you would adopt when approaching old abandoned workings. (12)

5. Give your opinions as to the comparative efficiency and safety of (a) black powder; (b) monobel powder; (c) dyanmite. Say under what conditions you would use each. (14)

6. Describe with sketch the driving and timbering of a main haulage road with soft roof and pavement. Show how the alignment and gradient are kept. (14)

7. Describe with sketch the principle and action of the syphon. (11)

8. Describe a longwall system of working for moderately thick seams. (15)

Fire Boss Examination.

Paper No. 4. Time allowed, one hour.

The value attached to each question is given in parenthesis. Candidates must obtain 50 per cent. of the allotted marks to pass.

ARITHMETIC.

1. What is the area of a roadway 10 ft. 4 inches wide at the top by 9 ft. 3 inches wide at the bottom by 8 feet high? (12)

2. Divide 8758923 by 1934 and multiply the result by the difference between 3867 and 233. Work your answer to three places of decimals. (12)

3. A rectangular shaft 16 ft. by 9 ft. is sunk to a depth of 150 yards. How many cubic feet of material have been excavated from it? (14)

4. The velocity of the air in an airway is 6 ft. per second. What is the total quantity passing per minute if the size of the airway is 8 ft. 6 in. by 5 ft. 3 in? (12)

5. There are 900 yards of roadway to be timbered every four feet with props 5 feet long on each side of the road. How many lineal feet of prop wood will be required, and what length of crown trees will be required for same road if each crown tree is 5 feet long? (14)

6. If 150 cubic feet of air per minute is required for each man and horse employed in a mine, what total quantity per minute will be required if 85 men and four horses are employed on each of two shifts? The horses remain in the mine and are not taken out at the expiration of the shift. (15)

7. A mine working eight hours per day produces a daily output of 950 short tons, how many mine cars per hour will be required to handle this output if each car carries 2,300 pounds? (10)

8. A pump working 10 hours per day pumps 250 gallons of water per minute from a mine. What is the total feeder of water in gallons per 24 hours? (11)

THE ELMORE VACUUM PROCESS.

The report of the Ore Concentration Company controlling the Elmore vacuum concentration process mentions that the 12 unit plant at Sulitelma, Norway, where pyritic tailings are being treated, has been extended to 18 units, and that the 10 unit plant at the British Broken Hill mine is doing good work. In Mexico a mine has increased its plant to 3 units, and two plants have started in Canada. Applications have been filed for new patents which will, it is hoped, extend the use of the process.

THE LATE MR. JOHN B. HOBSON

BY E. JACOBS, VICTORIA, B.C.

(CONTINUED FROM FEBRUARY 1ST ISSUE.)

Mr. Hobson had so large a share in the establishment of hydraulic mining as an industy in the province that it is due to him and his memory, acknowledgment shall be made of this fact. Unfortunately a connected account of his activities in establishing this industry is not just now obtainable, so it must suffice for the present that quotations be made from known published reports, so that in this way a fairly adequate idea of the extent and importance of his work in the Quesnel mining division may be conveyed. In his official report for 1893, the late Mr. John Bowron (who, by the way, was another man to whom the Cariboo district owes much, for by his many years of faithful and useful official work he also, though along different lines to those Mr. Hobson worked, greatly advanced the interests of the district), wrote:

"On the Horsefly River, the Horsefly Hydraulic Mining Company, Ltd., of which Mr. Henry Abbott, of Vancouver, is president, and Mr. J. B. Hobson, manager, has acquired, either by location or purchase, a large area of hydraulic mining ground, situated immediately above the Falls, having admirable dumpage, which is of the utmost importance in hydraulic mining. This company, which kept a force of men employed during last winter in running tunnels, is well pleased with the prospects obtained, and as soon as the ditches are completed, will bring in an immense quantity of steel piping, preparatory to commencing work on a scale of magnitude hitherto unknown in the district. This company, under the same management, having obtained by purchase the South Fork Co.'s concessions, and the well known Hop E. Tong claim, and intermediate ground near Quesnelle Forks, is now making improvements to open up what is generally believed will prove one of the most productive mines ever worked.

Mr. W. Stephenson, then Provincial Government Agent at Quesnelle Forks, the same year reported, in part: "The expenditure of the Horsefly Hydraulic Mining Company on Horsefly River, I think, will amount to about $100,000 before its mine will be in thorough working order, while it is estimated the purchase and cost of preparing the South Fork of Quesnelle property for working will be about $300.00. A few such enterprises as these, managed by thoroughly competent and practical men, will go a long way to bring Cariboo once more to the front as a mining district."

The Cariboo Hydraulic Mining Company, prominent in which were Messrs. H. Abbott, J. B. Browning, and other Canadian Pacific Railway Company men then resident in Vancouver, worked the South Fork property for some years until the larger organization, the Consolidated Cariboo Hydraulic Mining Company, Ltd., incorporated in 1898, took it over and greatly extended the scope of its operations.

In the "Annual Report of the Minister of Mines" for 1897, the then Provincial Mineralogist, Mr. William A. Carlyle, described the property of the Cariboo Hydraulic Mining Co., at Quesnelle Forks, among others in the Cariboo district. An excerpt from that report will serve to indicate in some manner the difficulties Mr. Hobson had to contend against in preparing the big hydraulic mine for producing gold. He wrote: "The opening up of this mine has already required a large amount of capital, more than was estimated when preliminary calculations were made, but the difficulty of transporting equipment and supplies was great and the freight charges heavy, as after leaving the main Cariboo road there was 60 miles of execrable road, and much of the freight was so delayed that it could not be brought in on the better winter road, but was detained until the spring, when it had to be taken in under heavy expense or else work at the mine had to be postponed for another year. As to drainage area or average amount of snow and rainfall, there were no data whatever, and to explore the country in search of water supplies, an almost impenetrable thicket had to be cut through. To-day, with roads and trails cut and rough places smoothed out, it seems a comparatively easy undertaking, and the past difficulties and annoyances cannot be fully appreciated. But, although in an unbroken country more than 200 miles from the railway, Mr. Hobson, assisted by Mr. L. F. Warner, has clearly shown himself to be a pastmaster in undertakings of this character, as all the work so far done has been imperative and what the conditions demanded, and all such work has been done in the best manner, with a view to permanence and the correct method of mining; and while much of the work has been costly it has yet been done in the cheapest way, for thorough work in the first place always proves the most economical in the long run. That there is here a great property that will, when fully opened out, pay largely, is unhesitatingly believed by all who have studied the mine, and it will be many years before the deposit within the confines of this property will have been exhausted."

In 1902, Mr. Wm. Fleet Robertson, who succeeded Mr. Carlyle as Provincial Mineralogist, paid an official visit to Cariboo. In his account of the Horsefly Hydraulic mine, included in his report, which was printed in the "Annual Report" for 1902, wrote: "This property is under the management of Mr. John B. Hobson, who is also manager of the Consolidated Cariboo Hydraulic Mining Company, at Bullion. Mr. Hobson, hearing of the writer's visit to the district, had, with that courtesy which he so invariably extends to all visitors in the vicinity, driven all the way from Bullion to Harper's, a distance of 35 to 45 miles, in order to conduct him to and show him over the company's properties at Horsefly. He had also sent two men from Bullion to Horsefly to clear up any of the drifts, etc., which required it, so that the mine could be inspected."

Further on in his report, Mr. Robertson says: "Unquestionably much of the interest taken in later years in the placer gold of the old or high channels of the Cariboo district has been due to the action of the syndicate which brought Mr. Hobson into the country, and which was prepared to invest such large amounts of money in the plant and equipment necessary to develop the latent wealth of the old deposits of gravel. Added to this the extended experience of Mr. Hobson, his personal enthusiasm in his work, and his profound belief in the great future of the immense gravel deposits of the vicinity, have done much to stimulate that in-

vestigation which the district so needed. Mr. Hobson has been doing pioneer work in the district and has had all the difficulties of the pioneer in any new enterprise to contend with."

The extent of the hydraulic mining operations carried on under Mr. Hobson's management was indicated in a report made by him to his directors in February, 1900. Only a brief excerpt may be reprinted here, as follows: "The property comprises 34 placer mining leases, aggregating 2,584 acres of land. These leases cover for a distance of about ten miles, the auriferous deposits of a system of ancient rivers. The deposits included in the company's property vary from 400 to 600 feet in depth from surface to bottom of channel. The quantity is estimated at 500,000,000 cubic yards of auriferous gravel that is available for future washing by hydraulic process. The company's water-supply system, as now completed, consists of 33 miles of well-constructed canals, having a capacity for delivering at the mine 5,000 miner's inches of water, under a head of 420 feet. The sources of supply are at Bootjack Lake and Polley Lake, about 19 miles distant, and Morehead Lake, 10 miles distant, from the company's mines at Bullion. These lakes have an aggregate capacity for storing 1,016,000,000 cubic feet of water. This storage supply is augmented by the waters of other streams tributary to the main canals between the storage reservoirs and the mines. The mine equipment consists of a portable hydraulic plant of four lines of 30-in. and 22-in. rivetted steel pipes, aggregating 6,000 feet; six No. 8 hydraulic giants, with deflecting nozzles, varying from six to ten inches in diameter; one steam power hoisting and pumping engine for sinking shafts for bank blasting; also a complete outfit of mechanics' and mining tools, and implements of all kinds, sufficient for 150 men. The mine lighting plant consists of six Wells' lights of 3,000 candle-power each. The telephone system includes three lines, aggregating 35 miles, with 15 instruments. The gold-saving appliances consist of a double-extended system of sluices, 7 feet wide by 4 feet deep, aggregating 2,380 feet in length.

During nine years, 1897-1905, nearly a million cubic yards of gravel was washed and gold to the aggregate of $1,042,708 recovered. Dry seasons experienced in several years made the water supply very inadequate, but as confirming Mr. Hobson's persistent contention that with an abundant supply of water, the recovery of gold would be large and the results profitable, it is on record that in 1900, when the time run was 172 days and the quantity of water used 460,278 miner's inches, gold to the value of $350,086 was recovered, at an aggregate cost of $151,182, against which may be placed the extremely disappointing results in 1903, when the time run was 53 days, the quantity of water used 127,083 miner's inches, and the gold recovered only $44,944, and that at an operating cost of $81,451.

Before the opening of the 1906 season, the Consolidated Cariboo Company's interests had all been disposed of to the Guggenheims, of New York, and it then seemed that the great ambition of Mr. Hobson's life during many years would be realized. This ambition had been the obtainment of an ample supply of water to enable him to demonstrate that his belief was justified, that with plenty of water operations would be profitable every year. His estimates called for an expenditure of $498,243 to complete the Spanish Lake water supply. He was assured the money would be provided, and the season of 1906 was spent But it was not to be. The "Annual Report" for 1907 has this reference by the Provincial Mineralogist to the undertaking:

"The most important mining property in Quesnel mining division has, for many years, been that of the Consolidated Cariboo Hydraulic Mining Co., at Bullion, in carrying out the necessary work as far as could be. on the south fork of Quesnel River. This property was taken over in 1906 by the Guggenheim Exploration Company, of New York, which company started in, after a careful examination of the property, to bring in a large additional quantity of water from Spanish Lake. The estimated cost of this additional water system was about $500,000, of which more than $200,000 was spent in 1906. The work was actively renewed in the spring of 1907 and carried on until July, when all work was suspended and since then the property has been idle. The new company has since announced its intention of abandoning the enterprise completely. The cause of this stoppage of work is not definitely known, but it is reported to have been, at least partially, that the then approaching financial panic in the East, which subsequently involved the New York company, necessitated a curtailment of outlay of capital."

Result of Abandonment of Mines.

There is little doubt the decision of the Guggenheims to abandon the great enterprise with which Mr. Hobson had for so many years been closely associated, and in the building of which he had spent some of the best years of his life, was a great shock to him. He became seriously ill, and for a time many of his friends feared he would not recover sufficiently to enable him to again actively engage in mining. However, he rallied sufficiently to enable him to resume work, and, under the impression that the leases of the whole of the property had been allowed to lapse, he once more engaged in hydraulicking on the old ground. His success was sufficient to cause the Guggenheim interests to pay up arrears of rentals on some of the leases, and then they obtained from the court an injunction which prevented Mr. Hobson from continuing his work there. Since then, "dog-in-the-manger" like, the holders of those leases have neither worked the ground themselves nor permitted Mr. Hobson to do so. But he was not to be beaten, for he set about bringing water on to ground on the north fork of Quesnel River, near the mouth of Spanish Creek, which ground was covered by his own leases and from which he could not be ousted, and throughout 1910 he, with dogged persistence and pluck, carried out his new plans. The season of 1911 saw him back again, after having wintered in California and returned in the spring in greatly improved health, but conditions did not permit of much gravel-washing being done. As the season closed, his health again failed, and on November 28, last, he left Casa Banca, on Quesnel Lake, for Victoria, where he was at once taken to the Jubilee Hospital. Two weeks later he was removed to "Gisburn," and slowly his condition improved until, on Sunday, January 7, he was able to walk a little in the garden, while his cheerfulness increased the confidence of his family that he would soon get better. Early Monday morning, though, he became very ill, and by daylight on Tuesday morning he was dead. He left a widow, and three sons of 18, 13, and 5 years of age respectively.

His Belief May Yet be Vindicated.

It may be that in the near future the firm belief of the late Mr. Hobson in the practicability of deriving

large profits from hydraulic operations under such conditions, in regard to an abundant water supply, as he always laid down as indispensable, will be proved to have been well grounded, and his great ability be thereby vindicated, for another hydraulicking enterprise has been established, in connection with which it is claimed that an ample water supply has been provided. Mr. Howard W. DuBois, of Philadelphia, general manager and engineer for the Quesnelle Hydraulic Gold Mining Company, which last season completed its water supply system and commenced hydraulicking, remarked to me: "With only a moderate supply of water, Mr. John B. Hobson has demonstrated what can be done in hydraulicking the low-grade gravels of this district, so there is little room for doubt that with the abundant supply of water possessed by the Quesnelle Company, success is assured.

The magnitude of the prospective hydraulic gold-mining industry is indicated in the following excerpt from a report on the district, made by the Provincial Mineralogist, included in the "Annual Report" for 1902:

"The Consolidated Cariboo may be taken as an example of what to expect, namely, gold value of about ten cents per cubic yard. Mr. Hobson claims for his company that he has leases of 500,000,000 cubic yards of auriferous gravels, and it is safe to say that he has not, in these leases one-fifth of the available gravels, so that in this section alone there must be from 2,500,000,000 to 3,000,000,000 cubic yards of auriferous gravels. which there is every reason to think will be as rich as the Consolidated Cariboo Co.'s deposit. The immensity of these figures is hard to grasp, but to illustrate —if ten cubic yards yield $1 in gold, then there is in the Quesnel section alone $300,000,000 worth of gold. This vast amount of gold is so diluted with sand and gravel that the only possible means of extracting it is by the use of immense volumes of water under pressure; in other words, by hydraulic mining."

May it be my privilege, as in such case it would be my happiness, to, ere many years shall have passed, remind the public that in the recovery of large quantities of gold from the gravels of Quesnel district exists a lasting and abundant testimony to the skill, wisdom, and foresight of John B. Hobson, pioneer of hydraulic mining in the district, though he has been called to his rest without having first enjoyed the full fruition of his many years of arduous and efficient labour.

WAGES IN THE COAL MINES OF ALBERTA.

The scale of wages paid in the province during 1910 was practically the same as paid during the two previous years,

The general wage schedule for day labour is as follows:

Inside Men.

Fire bosses	$85.00 to $110.00 per month
Shotlighters	3.00 to 3.50 per day (8 hrs.)
Bratticemen	3.00 per day (8 hrs.)
Bratticemen helpers	2.50 per day (8 hrs.)
Timbermen	3.00 per day (8 hrs.)
Timbermen helpers	2.75 per day (8 hrs.)
Drivers	2.75 per day (8 hrs.)
Drivers, wet places	3.00 per day (8 hrs.)
Team drivers	3.00 per day (8 hrs.)
Tracklayers	3.00 per day (8 hrs.)
Tracklayers' helpers	2.75 per day (8 hrs.)
Rock miners	3.50 per day (8 hrs.)
Miners	3.00 per day (8 hrs.)
Miners, wet places	3.50 per day (8 hrs.)
Locomotive engineers	3.00 per day (8 hrs.)
Switchmen	2.75 per day (8 hrs.)
Chute loaders	2.75 per day (8 hrs.)
Labourers	2.50 per day (8 hrs.)
Timber handlers	2.75 per day (8 hrs.)
Machine men	3.50 per day (8 hrs.)
Machine men helpers	3.00 per day (8 hrs.)
Switch boys	1.50 per day (8 hrs.)
Door boys	1.50 per day (8 hrs.)
Hoistmen	3.00 per day (8 hrs.)
Rope riders	2.75 per day (8 hrs.)
Couplers, boys	1.50 per day (8 hrs.)
Couplers, men	2.50 per day (8 hrs.)
Pushers	$2.75 to 3.00 per day (8 hrs.)

Outside Men.

Pithead men	$2.50 per day (10 hrs.)
Dumpers	2.50 per day (10 hrs.)
Slate pickers, men	2.00 per day (10 hrs.)
Slate pickers, boys	1.25 per day (10 hrs.)
Car oilers, boys	1.25 per day (10 hrs.)
Car oilers, men	2.00 per day (10 hrs.)
Tally boys	1.25 per day (10 hrs.)
Teamsters	2.50 per day (10 hrs.)
Blacksmiths	3.50 per day (10 hrs.)
Blacksmiths' helpers	2.50 per day (10 hrs.)
Mine carpenters	3.50 per day (10 hrs.)
Mine carpenters' helpers	2.50 per day (10 hrs.)
Car repairers	3.00 per day (10 hrs.)
Power house engineers.	3.50 per day (10 hrs.)
Tipple engineers	3.25 per day (10 hrs.)
Locomotive engineers	3.25 per day (10 hrs.)
Loco. engineers' helpers.	2.80 per day (10 hrs.)
Firemen	2.50 per day (8 hrs.)
R.R. car handlers	2.40 per day (10 hrs.)
Fanmen	2.50 per day (12 hrs.)
Outside labourers	2.25 per day (10 hrs.)
Fan firemen	3.00 per day (12 hrs.)
Lampmen	2.50 per day (8 hrs.)
Machinists	3.20 per day (10 hrs.)
Machinists' helpers	2.50 per day (10 hrs.)
Couplers	2.25 per day (10 hrs.)
Sawyer	3.00 per day (10 hrs.)

SPECIAL CORRESPONDENCE

NOVA SCOTIA

Dominion Coal Outputs.—The output of the Glace Bay mines for January will be about 281,000 tons, compared with 293,257 tons in January, 1911. The decrease in tonnage has been caused by the unusually severe weather conditions. High winds combined with low temperatures have hindered the banking of coal, and gales off the coast have delayed the freighting, making it necessary to lay the mines idle on a great many occasions.

The Springhill Mines did very well, having raised 38,700 tons in the month. This is the best month's work since before the strike in 1909. On two days the output has reached 1,690 tons from the two slopes. The mines are being gradually put into good order, as the steadily increasing outputs evidence.

The mining community of Cape Breton has suffered a great loss in the death of Dr. R. A. H. McKeen, who filled the arduous position of a colliery physician for a period which extended back to the very early days of coal-mining in the Glace Bay district. At that time facilities for communication between the collieries were but meagre, and the provision for injured men was of the rudest. The work of the colliery doctor is of a most exacting nature, and, although it calls for the exercise of great surgical skill and wide experience, it does not bring the same monetary reward or advancement that would come to a medical man of similar attainments in a wealthier community. Dr. McKeen was one of the finest types of a body of men whose worth is not properly appreciated, and the concourse of miners who attended his funeral showed to some small extent how great was the regard with which his life of self-sacrificing labours had invested Dr. McKeen in the minds of the community amongst whom he had worked for so many years.

New Colliery Officials.—Each time that the Dominion Coal Company adds a colliery to its steadily growing list several new officials are required, and as it has for a long time been the commendable practice of the company to make its promotions from amongst its own staff, it is natural that as each colliery reaches the producing stage there should be a great deal of curiosity as to those "in line" for the new positions. The latest collieries to require managers are Nos. 15 and 22, and the new appointments have caused a general promotion all along the line. The new officials are as follows:

Michael McIntosh, Manager No. 15 Colliery, transferred from the managership of No. 8 Colliery.

W. R. MacDonald, Manager No. 8 Colliery, promoted from Underground Manager of No 14 Colliery.

Robert Simpson, Manager Nos. 21 and 22 Collieries, transferred from the managership of No. 10 Colliery.

Joseph Bosh, Manager of No. 10 Colliery, promoted from the position of Underground Manager.

Malcolm Beaton, Manager of No. 16 Colliery.

The Dominion Coal Company now has fifteen colliery managers and four district superintendents at their Glace Bay collieries, in addition to the official staff of the Springhill Mines. Every one of these men, without exception, has worked his way from some subordinate position in the mine, and has gained the knowledge necessary to obtain his certificate of competence either in the provincial night schools, or through the medium of correspondence school tuition, generally by a combination of the two.

ONTARIO.

Cobalt and South Lorrain.—The first company controlled by English capital operating in Northern Ontario to pay a dividend paid a 5 per cent. dividend on February 12. This was the Cobalt Townsite Mining Company. The dividend calls for a disbursement of $50,000. The Cobalt Townsite, two years ago believed to be derelict, has been retrieved and last year produced a million ounces and had at the end of a year another million ounces definitely blocked out.

By shipping seven cars of high-grade mine ore and concentrates the Coniagas in the last week of January broke all its previous records. The average monthly shipment of the Coniagas to date for the year 1912 has been 152.02 against 105.69 last year. All the ore runs between 2,500 and 3,000 ounces.

The Casey Cobalt, another company controlled in England, has just shipped nine cars of low-grade ore from New Liskeard for treatment at the Northern Customs plant at Cobalt. The ore runs about 40 ounces to the ton. Last year total shipments amounted to 150 tons, but this was all of high-grade ore.

With the resignation of Mr. John Seward from the management of the Kerr Lake mine at the end of January the control of that property passed out of the hands of the Lewisohns, of New York, to that of the Mines Finance Company, of New York. The manager for the new interests, Mr. Robert Livermore, is already on the property, but Mr. Seward will remain till the end of the month. The Lewisohn interests are now definitely out of the Northern Ontario mining area, having some time ago sold out controlling interest in the Wettlaufer Lorrain mines to the Mines Finance Company.

The main shaft is now down at the Beaver to the 550-foot level, and a level is being established at the 530-foot level. From the lower levels of the Beaver a 30-ton car yielded about $50,000 recently. The ball and pebble mill of about 60 tons capacity at the Beaver should be running by about the end of February.

At the shaft 122 of the Nipissing on the hill another ore body has been cut at the intermediate level. The vein is from three to six inches wide and shows remarkably rich ore.

At the La Rose mine a shaft is now being sunk down to get below the big fault which cut off the vein and the ore just above the 200-foot level. It is believed that if the values are to be picked up at all they will be found in the conglomerate immediately above the Keewatin contact and the shaft is therefore being put down until the Keewatin is reached, when exploration will commence in the conglomerate immediately above. At the Lawson another nice body of very rich ore has been struck at the lower level of No. 9 vein and it is now being drifted upon. At the Princess another small vein has been picked up at the lower levels of the mine and the main stope is now full of broken ore.

The annual report of the Crown Reserve Mining Company showed that the net profits for the year would be $1,257,239. The directors reported a cash surplus of $764,851. The total production of the mine was valued at $6,581,847, and the total dividends paid at $3,714,509. The production of the mine during 1911 was valued at $1,833,516, with a net profit of $1,279,739. There was a surplus on the year's working of $104,865, leaving a total cash surplus of $764,851.

Porcupine, Swastika and Larder Lake.—The advent of the first comprehensive report by any of the larger Porcupine companies, namely the Hollinger statement, has given stability to the camp and forms a basis for sane conclusions. As far as

can be ascertained from the digest of the report that has appeared it would seem that of the $10,000,000 ore reserves, $4,000,000 is in ore actually blocked out and the residue in indicated ore. There has been some criticism among the mining men of the camp that the two items should not have been more definitely set apart. The values are much higher than was generally expected in the camp and it is felt that now the new power plant is running with power from the Mattagami River the underground work should make much more rapid progress. The structure of the mill is now almost completed and some of the machinery has arrived. Though set forth in the digest handed to the press by the Timmins syndicate it has not been officially announced yet that the merger of Hollinger, Dixon and Miller Middleton properties would go through. There is no doubt that as far as the mining situation goes the Hollinger report has cleared the air and companies in the vicinity of Pearl Lake will be able to go ahead with their development with much more confidence. The era of gold bars is not very far off now. The Dome mill will be in full operation by the middle of March and it is expected that the McIntyre and the Little Pet respectively of five and five stamps will be dropping by the first of next month. Generally in the Pearl Lake section the completion of the power plants of the various mines and the operation by current from Sandy Falls has induced more underground development work in one month than in any previous three years before. Half a dozen companies are now beyond the construction stage and can concentrate their efforts on underground development work.

The staff at the Dome has been further strengthened by the inclusion as superintendent of underground development of Mr. Chas. H. Henrotin, an engineer of South African experience. In blocking out ore at the fifty-foot level recently some very high-grade ore, as spectacular as is to be seen on the surface, was opened up. This ore body was encountered in driving from the main cross-cut.

Stations have been cut in both shafts at the Plenaurum mine at the 200-foot level and drifting and crosscutting will commence forthwith. The new electrically-driven compressor is now running smoothly and with seven or eight drills operating rapid progress with underground development work is now assured.

At the North Dome property, which the Temiskaming Mining Company has under option for $229,000, crosscutting has commenced from the 50-foot level of B shaft. As the vein only dipped from the shaft a few feet from the bottom of the present working it should soon be picked up.

The Bewick-Moreing Company, of London, has acquired a large block of McIntyre stock and is now considering a proposition which the Flynn syndicate has formulated for control. This provides that the company will take up 10,000 shares of stock at $6 for six months, and at the end of that period, 211,000 at $10 each if development is satisfactory. Meanwhile development continues to give satisfactory results. At the 200-foot level, 100 feet north of the No. 4 shaft, another ore body from three to four feet wide was struck carrying some visible gold and heavy in sulphides.

It is stated that operations will soon be resumed on the Porcupine Hecla, a property located on the base line between Ogden and Mountjoy Townships. So far beyond some surface trenching and the building of camps and the sinking of a few test pits nothing has been done.

In an official report President Ward, of the Vipond, states that since November 17th to January 15th cross-cuts at the 200-foot level had cut both No. 2 and No. 3 veins. The compressor is now running smoothly and the president expects that delivery of mill machinery will commence about the middle of this month. The blind vein which has been picked up on the Vipond at the 200-foot level, has every appearance of adding definitely to the ore reserves.

In crosscutting at the 100-foot level of the Dome Extension stringers of rich ore have been encountered, and like discoveries have been made in the shaft of No. 4. Captain Anchor is of the opinion that the workings are now entering the big ledge of the Dome. In diamond drilling near the Dome line an ore body about five feet wide was opened up with satisfactory values, it is reported.

On the Jupiter, No. 2 vein has been cut at the 200-foot level. The vein here has been split by the intrusion of twelve feet of schist. The aggregate width of the quartz in which the values occur is about eight feet. It does not show gold, but it assays well.

Mr. Ellis P. Earle, president of the Nipissing Mining Company, has, on his own account, signed an option to spend $50,000 on the Tommy Burns claims, in the southeast corner of Shaw. He will examine the properties early in the spring, when the snow goes off, and will then determine if they are worth the spending of development money as stated in the option. The claims are about nine miles from Porcupine and one mile from the Redstone River. Dr. Harvey Reed reported on them last summer and it is stated favourably.

The Swastika Mining Company has now cut its station at the 300-foot level and is crosscutting for the main vein which was struck with good values and width in the shaft at a depth of 290 feet. The Lucky Cross of Swastika has now opened up its main vein at two places 60 feet apart. In one spot it is from three to four feet wide and in the other only about eight inches. Values have not been declared.

Work has now definitely been commenced on the East Dome claims where the Preston East Dome Mining Company made a good strike last fall. A small plant is in operation and camps have been erected.

Development work is in full progress at the Langmuir Nighthawk Lake Gold Mines, with five claims in Langmuir. Camps have been built and a shaft is being sunk. Oscar Turner, the New York promoter, is interested in the scheme.

Development work on the Dome Lake property being satisfactory a six drill compressor has been ordered and work will be pursued with vigour. Two shafts have been sunk below the 100-foot level on a large sulphide dyke which, it is stated, gives good assay results.

Having exhausted the present water supply for its plant the Porcupine Apex has determined to shut down until the spring, when it will be readily available. It is stated that just before work was discontinued some visible gold was discoyered in the shaft which was being sunk.

At the 90 and 60-foot levels of the Dobie mine in Whitney crosscuts are now being run to pick up the ore body so spectacular on the surface. Work on the Deloro claims of the same company continues to be most satisfactory.

BRITISH COLUMBIA.

A "Preliminary Review and Estimate of the Mineral Production of British Columbia in 1911," issued by the Provincial Bureau of Mines, gives the total value of the mineral of the province for last year as $23,211,816, which amount is less than that for 1910 by $3,165,250. The quantities and value of the various minerals are as follows: Placer gold, $468,000; lode gold, 225,083 ounces, $4,652,465 (total gold, $5,120,465); silver, 1,921,300 ounces, $972,946; lead, 27,975,000 pounds, $1,113,405;

copper, 39,500,000 pounds, $4,890,100; zinc, 2,600,000 pounds, $127,400; coal, 2,435,000 long tons, $8,522,500; coke, 77,500 tons, $465,000; building materials, etc., $2,000,000. The proportion of metalliferous minerals is $12,224,316, of coal and coke $8,987,500, and of miscellaneous $2,000,000. The decrease in value of production is attributable chiefly to the strike of the coal-mine employees in the Crow's Nest district, which involved non-production of coal and coke from Crow's Nest collieries in the province over a period of practically eight months, and, too, seriously interfered with the production of metals from Boundary district mines.

Quesnel.—It has been ascertained that the water system of the Quesnelle Hydraulic Gold Mining Company, the construction of which was sufficiently advanced to allow of a commencement to hydraulic gold-bearing gravel being made last August, has been found in operation to be most effective for the purpose for which it was designed and established. There was practically no interruption from the time operations were commenced until the cold weather of the approaching winter season necessitated the close-down customary in Cariboo district until the return of weather conditions suitable for hydraulicking.

Necessarily a large amount of preliminary washing had to be done in order to get the pits open, so that the work for some time could not be expected to result in the saving of nearly as much gold as when everything shall have been placed in such condition as will admit of practically all the work being productive. It has not yet been made public what quantity of gold was recovered last season, the information having to be first reported to the directors of the company, which has its headquarters in Philadelphia, Pennsylvania.

Minor defects were developed in the paving of the sluices, but as from the first it had been intended to eventually substitute steel plates for the diorite boulders put in with the idea that these could be made use of until the opening of the Grand Trunk Pacific Railway would lessen the present high cost of getting in heavy materials, the necessity for this change had been foreseen. However, it has been decided that it will be to the greater ultimate advantage of the company, owing to the excessive wear on the diorite lining of the sluice, to at once put in steel at the lower end of the sluice as a tail-race. The plates, which are now in course of transit to the mine, are made of high carbon steel from 0.80 to 1.20 per cent. carbon; they are half-inch plated, 58 inches square. The physical test to which they were subjected before being shipped from the manufactory showed that, although they are extremely hard, they have not the usual brittleness of such high carbon steel.

These steel plates will be placed in the tail-race two inches apart and will be so arranged that each will be half-an-inch lower than the one preceding it. This method of arrangement will have the effect of reducing to a minimum the wear on the upper part of each plate, and it is expected that the maintenance charge will be lower and that the use of these plates will admit of the property being worked with fewer men than under former conditions.

The head of the sluice will be provided with 40-pound manganese rails, placed transversely, which will act as a gold-saver. Manganese rails have been selected for the reason that they afford great resistance to abrasion, and the life of such rails in the sluice had already been determined to be many times that of the ordinary steel rail, which will last only a few months under conditions such as prevail in the sluice of this company at its mines in Quesnel mining division.

While, as already stated, the quantity of gold saved last season has not yet been made public, the fact that the company has gone to the heavy expense of putting in the steel equipment above mentioned would appear to indicate that the management has full confidence that results will be profitable from washing the two and a half million cubic yards of gravel it is estimated will be moved next season.

Slocan.—The Spokesman-Review, of Spokane, Washington, included the following information relative to the Rambler-Cariboo mine, in Slocan district, in the mining news printed in its issue of January 13th: "Mr. A. F. McLaine, president of the Rambler-Cariboo Mines, Limited, yesterday stated that he had just received a delayed report from Mr. W. E. Zwicky, of Kaslo, the company's manager. During the two or three weeks the report covered, the drift on the 1200-foot level had continued to show a good body of shipping ore, while the other workings in the mine revealed no material change in conditions. The orebody had not yet been reached on the 1400-foot level. The heavy snowfall of the previous week had completely blocked the sleigh road to Three Forks, over which the ore has to be hauled to the railway for shipment to the smeltery. All the men from the mine had been employed for two days in clearing the snow off the road, so as to admit of the shipment of ore being continued." To the Spokesman-Review's news may be added the information that in November 117 tons and in December 151 tons of Rambler-Cariboo ore was received at the Trail smeltery, making the total quantity from that mine received in 1911, 1801 tons.

Trail.—The figures showing quantity of ore treated at the smeltery at Trail of the Consolidated Mining and Smelting Company of Canada, Limited, during the calendar year 1911, together with the gross value of the metals recovered therefrom, are as follows: Tons of ore and concentrate treated, 330,668 (of which 324,431 tons was from British Columbia mines and 6,237 from the United States). Gross value of metals recovered: Gold, $2,754,189; silver, $773,906; lead, $834,644; copper, $522,774; total, $4,885,513. The proportion of gold was 56.4 per cent. of the whole value. The report for the month of December gave this information: "During December the Consolidated Company received 22,622 tons of ore and smelted 24,512 tons. The value of the month's production was $313,320, of which 38 per cent. was gold; the value of six months' production was $2,477,112, of which 58 per cent. was gold."

Gold at Hedley.—The Hedley Gazette, in a review, printed a short time ago, stated that the new policy inaugurated by the present owners of the Nickel Plate group of mines, situated in Hedley camp, Similkameen, of keeping development work ahead, is being rigidly pursued, and the year 1911 saw much more done than had been for years previously. Continuing, The Gazette mentioned that one of the important works done by the company last year, in addition to the development above referred to, was the excavation of 7,000 feet of ditch, for the purpose of adding to the water supply stored for use as required. The result of the year's development underground in discovering and blocking out new ore bodies, although not yet made public, is known to be very satisfactory. A comparatively large reserve of ore broken down is maintained in the mines. The Gazette closed its instructive and interesting review with complimentary mention of the management, thus: "Altogether the year has been one which must prove gratifying to the resident general manager, Mr. G. P. Jones, under whose careful supervision the results have been obtained, and to the president of the Hedley Gold Mining Company, Mr. I. L. Merrill, of Los Angeles and New York, who has given the mines and works his special attention."

About Princeton.—The prospecting of the Voight group of mineral claims, on Copper Mountain, near Princeton, by the British Columbia Copper Company, which is doing development work under a bond and option of purchase, gives much encouragement to those interested in metalliferous mining in this

part of the Similkameen district. The company mentioned is very desirous of obtaining new sources of ore supply for its large smelting works at Greenwood, Boundary district, so may be depended upon to give the Voight property a fair test within the bounds of expenditure fixed by its directors. Its success in finding here large bodies of ore of a sufficiently high copper content for profitable smelting would conduce to the considerable advantage of both the company and the district.

The construction and equipment of cement works at East Princeton is in progress, and it is hoped that the manufacture of cement will be commenced before the close of 1912.

GENERAL MINING NEWS

ONTARIO.

THE T. & N. O. FREIGHT RATES.

(From the Daily Cobalt Nugget.)

It is persistently rumoured that the T. & N. O. Commission will announce a decided reduction in the freight rates within a few days, and while nothing official has come out in regard to the matter the impression is very general that the requests of the people of this north country are to be met in a fair manner and a very much needed cut made in the freight rates.

In the event that this proves to be the case it will be a matter of decided congratulation on the part of this north country. The freight charges are a heavy item in the cost of doing business here. When the rates are exorbitant it makes it almost impossible for the Northern Ontario business men to meet outside competition. Relief has been asked for repeatedly from the T. & N. O. Commission and even if it has been slow in coming it will be none the less welcome when it does arrive.

The general impression has been that the government owned railway opening up this north country has been excessive in its freight charges. It is fair to admit though that privately owned roads through new sections of the country also charge excessive rates, and possibly Northern Ontario has not been any more burdened than in that section of New Ontario west from Sudbury for an equal distance towards the Soo.

The people along the T. & N. O. have always claimed this distinction though, that the volume of business should make some difference in the freight rates and that in view of the fact that this north country provides many times the business that the section west of Sudbury does that the T. & N. O. should recognize this fact and cut the rates in accordance. The T. & N. O. Commission cannot complain of the amount of business that this north country has given the railroad. It has been ten times as great as the expectations when the building of the railroad was commenced. The mining industry is responsible for the greater share of the business and it looks as though the mining industry will keep on increasing instead of showing any falling off for many years to come. That is, as the older camps get down to a milling proposition which reduces freight requirements, new camps will more than keep up the general average.

When the new rates are officially announced there will be general rejoicing among the shippers of this north country and it is to be hoped that the reduction will result in a far larger amount of business being done.

Cobalt, February 9.—One hundred and thirty-one bars of silver bullion, of a total value of $79,257, were sent out of the Cobalt camp during Monday, Tuesday and Wednesday of this week, which comes very near being a record three days' shipment. The rush is largely due to the fact that the Nipissing reduction plant has resumed operations, and that, owing to the high price of silver, all the mines which can ship are doing so. For the three days the total ounces shipped are as follows:—Nipissing, 70,190; O'Brien, 19,570; Crown Reserve, 18,000. The ore shipments last week were also particularly heavy, totalling 18 cars, of which 16 were high-grade ore.

Port Arthur.—The Silver Cross Mines, Limited, a company which has had no success in the Cobalt district, has secured control of a property near Port Arthur. This new property consists of 320 acres in the district of Thunder Bay. It is 2½ miles distant from the C.P.R. main line. The Canadian Northern will go through the property. The station, "Silver Harbour," will be built on the property. There have been several working mines in the district, but owing to difficulty of transportation and other obstacles, all the mines were closed down about 1890. The financial plan of campaign is unique. In order to secure funds to develop the property an issue of 8 per cent. $100,000 of ore certificates, and with each dollar invested in ore certificates, a bonus of one share, par value $1.00 of Silver Cross stock will be given free. The ore certificates are redeemable at their face value par.

BRITISH COLUMBIA.

INVESTIGATION OF PRICE OF COAL.

Nelson (From The Daily News, Nelson, B.C.).—In Nelson and the Kootenays, in common with many other districts in British Columbia, the price of coal is a burning question. To householders the cost of fuel is a considerable item in living expenses, and there is a general impression that the price charged to the consumer is altogether out of proportion to the cost of production.

The matter has been taken up on several occasions by the Nelson Board of Trade and there is a strong desire that the whole matter should be the subject of thorough investigation. The retailers disclaim any responsibility for the exorbitant price that is apparently being charged, and whether the high price is due to an excessive charge at the pit's mouth, to extravagant transportation rates, or to inordinate profits of dealers through whose hands the fuel passes can only be conjectured. There was hope that evidence taken before the conciliation board at the time of the recent strike would throw much needed light upon the subject, but that anticipation was disappointed and the need for investigation remains as urgent as before.

There is now assurance that an enquiry will be put into effect, and if it discloses an imposition upon the public some method will doubtless be found of giving relief. Last year, while the Laurier government held office at Ottawa a petition, strongly endorsed by the provincial government, was sent to the minister of trade and commerce petitioning the Dominion authorities to inaugurate a thorough investigation into the question of the price of coal, but the federal administration made no move and nothing was done. There has since been a change of government at Ottawa and the advisability of taking action will in due course be taken into consideration by the new cabinet.

There is no reason to believe that the Ottawa government will decline the investigation which is sought, but even should it do so an enquiry is now assured. Premier McBride's statement in the legislature is explicit. He believes that an investigation is a duty that should be undertaken by the Dominion

government, but he declares that should the Ottawa adminisration fail to act the provincial government will cause an inquiry to be instituted.

The fact that a proportion of the coal supply of British Columbia lies beyond the borders of the province makes it desirable that the investigation should be under federal auspices, and might tend to limit the scope of a provincial inquiry. But even so, an investigation under the direction of the McBride government is likely to have results that would be a boon to the consumers of coal in British Columbia. In spite of obstacles, Mr. McBride and his colleagues have a way of accomplishing objects that they believe to be for the advantage of the province.

Grand Forks.—The eighth furnace at the Granby reduction works at Grand Forks was blown in last week and it is believed the smelter is entering upon an era of record-breaking production. With the price of copper ranging around and about 14 cents, the Granby is in a position to make profits, and it is intended to operate at full capacity in order to get some copper on the market. It usually requires two or three months for the blister copper to reach the east and be refined ready for sale.

COMPANY NOTES

INTERNATIONAL COAL AND COKE.

The International Coal & Coke Co., which passed its quarterly dividend in November, also passed the quarterly dividend payable February 1st. Mr. A. C. Flumerfelt, the president, in a MINING—8-point—FIVE .... Pwllll circular, explains the reason as follows: "As you are perhaps aware, our mines were shut down during the last year for some eight months, owing to a general strike among the miners of Alberta and British Columbia. While there was no special controversy between this company and its miners—and their quitting work was in sympathy with the other miners in this district—it nevertheless caused a very heavy loss. The men returned to work last November, and our mines are now working full force. Because of this suspension of operations it was necessary to pass the last quarterly dividend, and it considers it good business judgment to pass the dividend which would regularly be payable on February 1st. With matters moving as they are now, it is hoped we can resume the payment of dividends in the near future."

DOME REPORT.

The first annual report of the Dome Mines Company, Limited, of Porcupine, shows that in the period ended November 30th last the company expended $1,097,745 and had $202,192 cash on hand November 30th, with but $13,545 in accounts receivable.

Of the $1,097,745 the company paid $672,060 on plant and equipment and $69,012 on general development. Bonds of $450,000 were redeemed in September. From gold produced the company received $4,276, and following the fire which destroyed the partly completed mill in July, the company collected in insurance $309,236. The mill is practically complete. The stamps will commence dropping next month.

When the property begins operations next month, it is expected to treat from 350 to 400 tons a day; the mill has 40 stamps with the necessary tube and other milling appliances to enable the operation of an 800-ton mill. The mill, rockhouse and power buildings are of steel and concrete and fireproof; the storehouse, laboratory and other buildings are of steel and brick. The company has completed a two-mile railroad spur connecting the mill with the Temiskaming & Northern Ontario Railroad.

No attempt is made in the report to give the tonnage in sight. It is stated that the diamond drill has indicated a large body of ore of good milling grade and that the ore has been cut at various depths to 1,000 feet and sufficient ore has been disclosed to justify permanent equipment of large capacity.

Eight shafts have been sunk from 35 to 200 feet and at the 50-foot level, 1,310 feet of drifting and crosscutting have been done; diamond drill holes have been put down for a total length of 9,046 feet.

The report adds that the insurance collected has been deducted from the amount shown as expended on the property and that in addition to the expeditures shown, the Monell syndicate expended $375,000, which makes a total of $1,169,588 spent in development and equipment.

The Dome directors and officers are Ambrose Monel, president; W. S. Edwards, E. F. Wood and W. A. Bostwick, vice-presidents; Alex. Fasken, secretary; E. C. Converse, Captain J. R. Delamar, C. I. Denison and J. S. Wilson.

STATISTICS AND RETURNS

CONSOLIDATED MINING & SMELTING.

The Consolidated Company's smelter at Trail received, during December, 22,622 tons of ore, and smelted 24,512 tons. The value of the month's production was $313,320, of which 38 per cent. was gold, and the value of six months' production was $2,477,112, of which 58 per cent. was gold.

BRITISH COLUMBIA COPPER.

The production of the British Columbia Copper Company for the fiscal year ended November 30th, was 9,969,026 pounds of copper, 130,441 ounces of silver and 30,742 ounces of gold, comparing with 7,143,456 pounds of copper, 84,180 ounces of silver and 24,962 ounces of gold in the previous year.

COBALT ORE SHIPMENTS.

The shipments for the week and year to date in tons are:—

	Week of Feb. 2.	Total.
La Rose	133.07	259.19
Coniagas	102.02	221.92
O'Brien		61.15
Right of Way		35.88
Chambers-Ferland		32.00
McKinley-Darragh	73.28	208.41
Nipissing	35.25	118.65
Hudson Bay	31.42	62.95
Buffalo	28.12	57.31
Crown Reserve	22.45	68.25

Cobalt Townsite	65.29	88.79
City of Cobalt	66.33	66.33
Trethewey	42.28	42.28
Colonial	20.00	20.00
Kerr Lake	30.46	30.46
Cobalt Lake	37.54	37.54
Totals	667.51	1,411.11

The bullion shipments for the year to date are:—

Nipissing	$101,039.83	$181,019.00
Crown Reserve	42,080.40	78,728.08
Temiskaming	13,459.96	24,924.00
O'Brien	9,166.32	17,292.00
Nova Scotia	21,500	31,710.00
Buffalo	4,900.00	9,000.00
McKinley-Darragh	1,390.37	2,528.00
Miscellaneous	3,802.00	6,670.94
Totals	$198,421.88	$357,689.64

Eight mines shipped ten cars of ore during the week ended January 27th. Out of the total eight of these cars were high-grade, the total weight of ore shipped being 662,601 pounds. The increase in the shipments of ore this week has been offset by the decrease in the bullion shipments. The only shipment of bullion to go out during the week was a consignment forwarded by Campbell & Deyell to Mocatta & Goldsmid, of London, England, which consisted of eight bars, valued at $2,802. The increase in the ore shipments to be noted this week will undoubtedly be continued next week, when several other mines which are regular shippers come back into the list.

The shipments for the week and year to date, in tons, are:—

	Week Jan. 26.	Total.
La Rose	65.29	146.12
Coniagas	....	119.90
O'Brien	....	61.15
Right of Way	....	35.88
Chambers-Ferland	....	32.00
McKinley-Darragh	31.80	135.23
Nipissing	35.25	118.65
Hudson Bay	31.42	62.95
Buffalo	29.46	90.19
Crown Reserve	29.95	45.80
Cobalt Townsite	65.29	88.79
Total	281.66	936.66

The bullion shipments for the year to date are:—

Nipissing	$74,990 23	136,401.9
Crown Reserve	35,840 40	68,061.8
Temiskaming	13,459 96	24,924.0
O'Brien	9,166 32	17,292.9
Nova Scotia	9,500 00	11,710.0
Buffalo	4,900 00	9,000.0
McKinley-Darragh	1,390 37	2,528.0
Miscellaneous	3,802 00	6,670.94
Totals	$151,049 28	277,089.54

COBALT ORE SHIPMENTS FOR JANUARY.

Cobalt shipments for the month of January in tons were:—

La Rose	217.60
McKinley-Darragh	170.77
Coniagas	170.01
Nipissing	118.63
Cobalt Townsite	96.85
Buffalo	90.20
Crown Reserve	68.26
Hudson Bay	62.95
O'Brien	61.15
Temiskaming	41.87
Right of Way	35.88
City of Cobalt	33.33
Chambers-Ferland	32.00
Colonial	20.00
Trethewey	17.62
Total	1,237.12

COBALT DIVIDENDS

The total dividends paid in 1911 by Cobalt companies were $8,770,236, an increase of $2,000,000 over 1910, when $6,560,694 was declared.

The mines to decrease their declarations from 1910 were Kerr Lake, Nipissing, Right of Way, Temiskaming, and Hudson Bay.

Total dividends for the camp since its inception are placed at close on to $30,000,000.

Dividends declared for the year to date are:

	1911	Total to date.
Beaver	$170,000	$170,000
Buffalo	660,000	1,568,000
Cobalt Central	.....	190,460
City of Cobalt	.....	139,377
Coniagas	1,440,000	2,840,000
Crown Reserve	1,238,162	3,891,383
Foster	.....	45,700
Kerr Lake	990,000	3,720,000
La Rose	600,000	3,632,563
McKinley	1,123,666	1,932,677
Nipissing	1,800,000	7,290,000
Right of Way	33,710	526,904
Silver Queen	.....	315,000
Temiskaming	225,000	1,099,156
Trethewey	200,000	701,999
Hudson Bay	139,698	1,472,325
Wettlaufer	150,000	150,000
	$8,770,236	29,655,544

Dividends on Drummond and O'Brien, which are private corporations, are not included.

BRITISH COLUMBIA ORE SHIPMENTS.

The shipment last week of 52 tons by the Number One mine at Ainsworth, which has been bonded by the Consoldiated Company, marks the entry of another lead producer on the regular shipping list. This property is located at Ainsworth and has been under steady development by the Trail smelter company for some months. It was bonded from H. Giegerich and associates of Kaslo, B.C.

The shipments for the week ending January 27th smashed all records for the past twelve months, totalling 42,715 tons. The smelter receipts were 40,500 tons. The figures are:—

Rossland Shipments.

Centre Star	3,031	10,440
Le Roi No. 2	478	1,678
Le Roi No. 2, milled	300	1,200
Le Roi	1,250	2,904
Other mines	.....	33
Total	5,059	16,255

Boundary Shipments.

Granby	24,176	83,579
Mother Lode	8,832	29,227
Emma	656	2,478
Unnamed	172	934
Jack Pot	374	1,382
Other mines	.....	2,937
Total	34,210	120,537

Slocan-Kootenay Shipments.

Sullivan	479	1,175
Emerald	109	327
Arlington (Erie)	91	265
Standard	172	463
Van Roi	31	329
Utica	21	132
Ferguson	30	59
Rambler-Cariboo	60	125
St. Eugene, milled	420	1,680
Queen, milled	420	1,680
Granite-Poorman, milled	250	1,000
Van Roi, milled	800	3,200
Standard, milled	300	1,200
Richmond-Eureka	29	125
Ruth	36	73
Noble Five	94	124
Number One	52	52
Slocan Star	4	24
Ottawa	28	28
Other mines	..	176
Total	3,446	12,237

British Columbia Copper Company's Receipts.
(Greenwood, B.C.)

Mother Lode	8,832	29,227
Emma	656	2,478
Unnamed	172	934
Jack Pot	374	1,382
Other mines	...	2,937
Total	10,034	36,858

Granby Smelter Receipts.
(Grand Forks, B.C.)

Granby	24,176	83,579

Consolidated Company's Receipts.
(Trail, B.C.)

Sullivan	479	1,175
Emerald	109	327
Arlington	91	265
Standard	172	463
Van Roi	31	329
Utica	21	132
Ferguson	30	59
Rambler-Cariboo	60	125
Richmond-Eureka	29	125
Ruth	36	73
Noble Five	94	124
St. Eugene	101	302
Knob Hill	111	345
Queen	35	70
Centre Star	3,031	10,440
Le Roi No. 2	478	1,678
Le Roi	1,250	2,904
Number One	52	52
Slocan Star	4	24
Ottawa	28	28
Granite-Poorman	28	28
Other mines	....	285
Total	6,290	19,353

TORONTO MARKETS.

Feb. 12.—(Quotations from Canada Metal Co., Toronto.)
Spelter, 6.50 cents per lb.
Lead, 4.25 cents per lb.
Antimony, 7 to 9 cents per lb.
Tin, 45 cents per lb.
Copper, casting, 14.50 cents per lb.
Electrolytic, 14.50 cents per lb.
Ingot brass, 7 to 12 cents per lb.
Feb. 12.—Pig Iron (Quotations from Drummond, McCall & Co., Toronto.).
Summerlee No. 1, $23.00 (f.o.b. Toronto).
Summerlee No. 2, $22.50 (f.o.b. Toronto).
Midland No. 1, $19.00 (f.o.b. Toronto).
Midland No. 2, $18.50 (f.o.b. Toronto).

GENERAL MARKETS.

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

Coke.

Feb. 9.—Connellsville coke (f.o.b. ovens).
Furnace coke, prompt, $1.80 to $1.90 per ton.
Foundry coke, prompt, $2.20 to $2.35 per ton.
Feb. 9.—Tin, straits, 44.25 cents.
Copper, Prime Lake, 14.37½ cents.
Electrolytic copper, 14.25 cents.
Copper wire, 15.25 cents.
Lead, 4.05 cents.
Spelter, 6.62½ cents.
Sheet zinc (f.o.b. smelter), 8.00 cents.
Antimony, Cookson's, 7.25 cents.
Aluminium, 18.50 to 19.00 cents.
Nickel, 40.00 to 45.00 cents.
Platinum, ordinary, $46.00 per ounce.
Platinum, hard, $48.50 per ounce.
Bismuth, $1.80 to $2.00 per lb.
Quicksilver, $44.50 per 75-lb. flask.

SILVER PRICES.

	New York. cents.	London. pence.
Jan. 25	57¾	26 9/16
" 26	57¾	26 9/16
" 27	57¾	26 9/16
" 29	58⅛	26¾
" 30	58¼	26 13/16
" 31	58¼	26 13/16
Feb. 1	58½	26⅞
" 2	58¼	26 13/16
" 3	58½	26⅞
" 5	58⅝	26 15/16
" 6	58¾	27
" 7	58⅞	27 1/16
" 8	59⅞	27 9/16
" 9	60⅛	27 11/16