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CIRCULATION.

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THE GAS FIELDS OF NEW BRUNSWICK

Rarely in the history of Canada has there been such an addition to the wealth and potentialities of a large settled area as in the case of the region centering in Moncton, New Brunswick.

It may be well first to glance at the geographical situation of Moncton. The city has its site in the rich valley of the Petitcodiac River, a large tidal stream flowing into Chignecto Bay, which is an arm of the Bay of Fundy. Easy harbourage for large steamers is available on the river during most of the year. As a railway centre Moncton is easily the most important in Eastern Canada. Its manufactures are growing rapidly, and it is surrounded by a singularly fertile farming and fruit-raising country.

St. John lies 90 miles to the west; Sackville, about 40 miles south; Amherst, one of the most flourishing manufacturing towns in Nova Scotia, 38 miles in the same direction; whilst the distances to Truro, New Glasgow and Pictou do not exceed 150 miles. All these towns are on the Intercolonial Railway system, and that system has its headquarters in Moncton. In all of these towns, also, new and important manufacturing enterprises have sprung up of late and are being organized to such an extent as to indicate a strong industrial revival.

From even this meagre outline, it will be seen that the discovery of natural gas in the vicinity of Moncton (under such conditions, and in such quantity as to warrant fully the statement that the supply is fully adequate to any demand that may arise for years to come) is fraught with enormous significance.

The present available supply measures about 60,000,000 cubic feet of gas per day. This amount can be obtained, under natural pressures ranging from 200 to 600 pounds per square inch, from 17 wells drilled within an area of three square miles. Incidentally, the rights of the owners extend over 10,000 square miles, much of which is probable or possible territory. At present gas has been piped to Moncton where it is consumed to the extent of about 2,000,000 cubic feet per day. Even the casual visitor is impressed with the metamorphosis that Moncton has undergone since this event. The gas is used by the consumer at a pressure of less than 10 ounces. The prices per thousand cubic feet are less than half those obtaining in other cities. The gas itself is clean and of very high calorific value.

In a forthcoming issue we shall devote a considerable amount of space to this new field, and to its bearing upon the Maritime Provinces. Here we mean

merely to remind our readers of its existence. But we cannot close without reference to the indomitable pluck, patience, and farsightedness of the man who first exploited the field, and whose sagacious leadership is bringing the whole enterprise to a successful issue. That man is Mr. Mathew Lodge. Not only has Mr. Lodge brought this boon to Moncton, but he has done much in other directions to assist the community in which he lives. The manufacturer will be enriched by Mr. Lodge's work; the farmer will cut his fuel bill in half or in quarter; but, best of all, the weary housewife will rise up and call him blessed. And, by the same token, we hope that Mr. Lodge and his associates will always make it their policy to favour strongly the domestic consumer.

A PORTFOLIO OF MINES AT OTTAWA.

From Ottawa has lately come news, unofficial as yet but bearing in form some family resemblance to politic newspaper "feeler." It is to the effect that the Dominion Government, during the forthcoming session, is to create a separate Portfolio of Mines. This implies, of course, that one responsible Minister will assume all the duties of the Department and will devote all of his time to those duties. Not only has the Canadian Mining Institute formally urged this change, not only has *The Canadian Mining Journal* repeatedly expressed the conviction that the present condition of affairs could not be continued without injury to the country, but the mining public has long recognized that things administrative at Ottawa were specifically wrong as regards mining. Therefore, we believe that the creation of the new Portfolio will be welcomed without a dissentient voice. And we further believe that the Hon. Mr. Rogers will breathe a sigh of relief at being freed from departmental details that cannot be otherwise than burdensome to a Minister already loaded to capacity.

The Dominion Government may safely take it for granted that no step could meet with more wholesale approval. They may also take it for granted that any objections raised should be totally disregarded.

Mining is the second industry of Canada. Verbum sap.

NOVA SCOTIAN COAL OUTPUTS.

Never has the coal trade of Nova Scotia been in a more encouraging condition. Comparing the first half of the year 1912 with the corresponding period in 1911, we find that the Dominion Coal Company, which is by far the largest shipper, has shipped 248,645 tons more this year than last. At the end of June, 1912, the company's shipments amounted to 1,819,089 tons; last year the total was only 1,570,444 tons. These figures do not include the output of the Springhill collieries, now under the control of the Dominion people, where the shipments have been brought up from 45,893 tons, to 176,622 tons, an increase of 130,729 tons.

At the Inverness mines a small advance is recorded—132,331 tons this year, as compared with 130,992 tons last year. The Nova Scotia Steel and Coal Company reports a gratifying advance of 58,509 tons — 327,210 tons this year, as against 268,701 tons last year.

On the other hand the Acadia Coal Company and the Intercolonial Coal Company have failed to reach last year's figures, the decreases being, respectively, 12,051 tons and 16,228 tons. The net increase, exclusive of several smaller collieries not referred to, therefore, during the first six months of this year is 410,943.

At this rate of growth Nova Scotia's output of coal during 1912 will come close to 8,000,000 tons, whereas last year it was less than 7,000,000 tons. An expansion of 12 per cent. is remarkably healthy.

As indicating future possibilities, the feasibility of shipping fuel from Sydney to Toronto to supply the pressing needs of certain civic departments, is being discussed.

PUBLICITY FOR THE GEOLOGICAL CONGRESS.

Widespread advertisement is being given the Toronto Meeting of the Twelph International Geological Congress, to be held here in August, 1913. In referring to this meeting, the Financial Times, London, urges upon its readers the importance of the event, and alludes very pleasantly to Canadian hospitality.

Apart from such newspaper notices, the publicity that each Canadian mining man can give the Congress is needed. Individual and personal interest must be roused and sustained. The Government and the railway corporations are doing their duty nobly. To supplement the support thus vouchsafed, every member of the Canadian Mining Institute should be a walking advertisement of the Congress. The Toronto Meeting and the numerous excursions may be rendered the most effective stimulus possible for the mining industry of Canada.

THE COALFIELDS OF ALBERTA.

Commenting on Mr. D. B. Dowling's estimate of the quantity of coal available in the coalfields of Alberta, Mr. E. H. Cunningham Craig, in an article to the Mining Journal, thus points out that with such sources of wealth lying ready to hand, it is astonishing that so little development work has been undertaken. Two points become at once apparent to the investigator who is searching for some explanation of this condition of affairs. The first is that the coals seem to have been worked only where they actually appear at the outcrop. There are large untouched areas where fuel of the highest quality can be proved to exist, areas lying directly between successful mines and traversed by main lines of railways, and yet no attempt has ever been made to develop them, simply because a covering of drift or gravel masks all the solid strata, and no coal seams are visible to attract the enterprising prospector. The first mining ventures are often, it is to be feared, conducted in an amateur fashion. Thus the second point: that in many cases a penny-wise and pound-foolish policy has

been followed in the development of mining propositions. An instance is cited whereby an excellent mine was ruined by the manner in which the shallow workings were exploited and pillars robbed with the idea of winning coal cheaply and at a large immediate profit, regardless of the future. There are unquestionably many such examples. Mr. Craig remarks that such short-sighted policy has doubtless done much to cast discredit upon the coal mining industry in Alberta, and even now, with efficient supervision and inspection of mines by trained officials, the fear may still lurk in the minds of investors that the life of coal mines in Western Alberta may be precarious and not of long duration. This may very naturally have deterred the employment of British capital in opening up the coalfields. It may, however, be affirmed that there are now a sufficient number of mines, developed on scientific lines, while others are also being opened, to provide for market requirements for some time to come, notwithstanding the remarkable industrial expansion that is taking place and the consequent increasing demand for coal. Nevertheless, Mr. Craig's conclusion that the fuel resources of the country must not be regarded as an asset merely of importance to the province, is sound. There are, he states, a national and even an Imperial source of power and energy, and their exploitation is in the interests of the Empire as a whole, providing a field for very considerable capital; for the time will come when the export of the better qualities of steam coal will inevitably become a factor in the mining industry. Then the Imperial value of the coalfields will be obvious.

A. I. M. E. AFFAIRS.

The report of the Committee appointed at the last annual meeting of the American Institute of Mining Engineers to investigate the affairs of that society and pronounce, in particular, concerning certain constitutional changes submitted for consideration, has just been issued. The committee reports that there has been a considerable annual deficit, representing an expenditure of tow thousand dollars over net income (or of nearly ten thousand dollars, taking into account the payment of the Institute's indebtedness towards the purchase of the office site in New York if met in annual instalments); and they recommend, in consequence, the adoption of a policy of economy and retrenchment "to make the budget of the Institute, all financial obligations of whatever nature included, balance." This course is advocated in preference to the proposal that the annual fees be increased from ten to fifteen dollars per annum, which, among other amendments to the society constitution submitted at the annual meeting in February, was the subject of controversy. The committee further recommends that the proposal to reclassify retroactively the present membership be negatived, "leaving any reclassification of membership for a more careful consideration later on." Other recommendations include, the copyrighting of all papers accepted and printed; and the removal from the membership list of the names of "delinquent members after twelve months' delinquency."

Apropos of the above it may be noted that the Canadian Mining Institute has, of late, been obliged to face problems of a very similar nature. So far, however, it has managed to make both ends meet comfortably enough; but in the last two years the prices of printing have increased so enormously that retrenchment in certain directions has become imperative. To accomplish this without loss of efficiency or effectiveness has, no doubt, been the question the Council has been called upon to decide; and according to an announcement appearing in the last issue of the Bulletin, the solution of the difficulty has taken the form of a change in the method heretofore in force of publishing the transactions. In future the publication of papers in both preliminary and final printings will be discontinued in favour of the system long followed by the Institution of Mining Engineers of Great Britain, and of also, we believe, the Iron & Steel Institute, of publishing an annual volume of transactions in a series of sections or parts at intervals throughout the year. The change will, of course, represent a considerable saving, while at the same time it inflicts no hardship on members, who as now will be given the opportunity of securing, in addition, a bound copy of the completed volume at the end of the year for a nominal sum.

VENTILATION IN RAND MINES.

In the larger mines on the Rand ventilation is being given much attention. Eleven large fans, three of which are of the Rateau type, and eight of the Sirocco type, are installed in the mines of the Central Mining group. The diameters of the fans range from 35 to 126 inches; the capacities being from 25,000 to 288,000 cubic feet of air per minute. The general introduction of spraying also tends to improve workings conditions.

THE ABSORPTION OF GOLD BY AMALGAMATED COPPER PLATES.

A discussion of the absorption of gold by amalgamated copper plates has appeared recently in the transactions of the Chemical, Metallurgical and Mining Society of South Africa. In it are some facts and suggestions that deserve notice.

In explaining away poor preliminary mill-runs, the fact that plates do not absorb gold is often unduly accentuated. The corresponding fact that discarded plants, or portions of these plants, contain quantities of recoverable gold that is not available during ordinary operation, is more or less overlooked.

One case is instanced where plates that had been in use for two and a third years were "sweated" and "scaled" and 12.64 ounces per plate recovered. There remained in one plate, after "sweating," about 45.75 ounces.

It is suggested that, as the plates were originally set with silver amalgam, the original silver amalgam scale

must become worn off and replaced by gold. This seems to be obviously the case. But it is also the case that the use of silver amalgam modifies the absorption of gold, especially during the earlier life of the plate.

The mercury coating the bottom of a plate, on examination was found to carry about 0.10 per cent. of gold. The solubility of gold in mercury is about 0.12 per cent. Hence it is possible that this gold was carried through in solution.

The dry scraping of plates is not recommended except as a regular practice. It should then be an effective preventive of scale. But as an occasional remedy for scale it is too costly and laborious.

ETHICS OR EXPEDIENCY?

A correspondent of ours, who is himself prominent as a mining engineer, was recently confronted with a problem in professional ethics. Some time ago he had made a report for a mining company. That company fell upon evil days and its directors were prosecuted. Those interested in the prosecution approached our correspondent and requested him to report again upon the mine.

At first flush, it seemed to the engineer that he could not honourably accept to this request. Would it not place him in a questionable position were he to lend his services to the antagonists of men who had been his clients? Did he not, at least, owe it to his former clients to assume a negative attitude?

Further thought, and a little discussion, cleared his mind and altered his point of view. His work for his former clients had consisted in observing and recording matters of fact, and in giving his professional advice on the conditions he had observed. His report had been completed and paid for. It became the property of the company. The company was not bound to act upon his report, neither was he in any sense responsible for the company's further action. Should his report be subjected to gross misuse, he had the privilege of making a public protest. Otherwise his connection with his clients ceased, and the incident was closed.

And, therefore, no consideration of duty or fair play entered into the question to deter him from again examining the mine for other clients. Clearly it was his duty to make a new and thorough examination, and not merely to revise his former report. Also, it was his duty to withhold from the new clients all information embodied in the first report, until, at least, the second report should have been made. Similarly, it would be incumbent upon him to regard his second report as confidential, and to preserve it from all persons except those who engaged him—the authentic owners of that particular document.

In other words, the consulting mining engineer is an impersonal advisor. He must be disinterested, both financially and sentimentally. But, apart from questions of personal expediency, there is absolutely nothing in the unwritten professional code to prevent the acceptance of this kind of an engagement.

EDITORIAL NOTES.

Mr. D. Lorne McGibbon has categorically denied the rumour that the La Rose surplus has been invested. It is still wrapped safely in a napkin.

At the low grade nickel deposits at Webster, North Carolina, where nickel silicate has been mined for some time, the Hennig process of reduction to nickel silicide has been abandoned. Experiments are being conducted with the Reid electric furnace. The latter device proved a fiasco in Cobalt. It has nothing to recommend it.

The mineral production of Alaska is rapidly growing in importance. The shipments of copper alone during the first half of the present year represented 18,590,158 pounds, and what is more remarkable this considerable output was for the major part from one mine, the Bonanza, owned by the Guggenheim-Morgan syndicate.

Our gracious Sovereign served a short apprenticeship the other day in an English coal mine. Accompanied by sundry dignitaries he used a pick for a few minutes and succeeded in breaking down some coal. His good example should be followed. We would like to see a few of our glad-hand politicians "muck" for a shift or two in a wet mine.

Mr. Eugene Coste is to be congratulated on the completion of the undertaking of which he has had direction —the laying of the pipe line to convey natural gas from Bow Island to Calgary, a distance of 181 miles. The contract for this work represents, it is said, the largest single order ever given for piping and has entailed an expenditure of approximately three million dollars. Incidentally it means a great deal to Calgary, whose industries will be stimulated by this provision of cheap power.

The coal mining department of the Delaware, Lackawanna and Western Railway has found a new use for photography in educating the foreigner unable to speak or understanding English in things he should not do if he would avoid injury. Thus the company has issued a volume of some two hundred pages illustrated with photographs depicting on opposite pages the right and wrong method of procedure in mining, the wrong being indicated by the word "don't" printed in red. The idea is an admirable one.

Hereafter the common or garden fowl should be recognized as a necessary addition to every prospector's equipment. We are informed that as a result of the discovery of gold in the crops of a number of chickens several rich claims were recently staked near Winnipeg. There can be no doubt that with a little direction where to scratch fowls could be made to play a very useful part in aiding the prospector. They could also be eaten if they didn't do their duty or when other

grub was at a discount. The eggs, too, would come in handy.

According to the telegraphic reports, excellent results are being obtained this year from dredging operations in the Yukon. Thus the Yukon Gold Company's returns for June show that 856,600 cubic yards were dredged during that month, as compared with 667,339 cubic yards in June, 1911; the average recovery being 73 cents per yard as against 57 cents; while the value of the bullion produced was $626,400, or nearly as much as over half last season's yield. During the present season to date gold to the value of $1,116,700 has been recovered.

The aggregate amounts distributed by the Dominion Government in the form of bounties on minerals and mineral products during the year ending March 31st last, was $538,529, as compared with an outlay on this account in 1910-1911 of $1,591,663. The sum was made up as follows: Wire rods, $160,750; crude petroleum, $141,935; lead, $179,288; manila fibre, used in the manufacture of binder twine, $50,556. Since 1896, when the bounty system was introduced, the total payments have been rather over $21,000,000, of which seventeen million dollars have been paid in bounties for iron and steel manufacture.

It is surely an anomalous state of affairs that, though the greater proportion of the nickel produced in the world is derived from Canadian mines, there is no Canadian nickel currency. France, by-the-way, is now proposing to substitute nickel for copper in the smaller denominations, as well as for 25 centime pieces, which, of course, have been in circulation for some time past. If for no other reason than that of sentiment, the Dominion should follow suit. In fact, it would be a fitting tribute to Canadian metallurgical achievement to provide for the coinage of "Monel" metal. This alloy should, moreover, be eminently suitable for coinage purposes.

The discovery of a large body of nickeliferous ore is reported to have been made near Kremmling, Grand County, Colorado. The nickel occurs as millerite, in it is said a vein of eighteen feet wide that has been followed by a 60-foot drift at a depth of sixty feet. The ore has been assayed in Denver, Leadville and New York, the samples yielding from 10 to 20 per cent. nickel. It is remarked that the owners are confronted with the problem of finding a market for nickel in the West; but if it averages over ten per cent. this difficulty is one that should not be the occasion of overwhelming anxiety. A 15-foot of millerite seems almost too good to be true.

We are informed that recent developments have resulted in greatly extending the productive area of the platinum placers of the Tulameen River, in the Similkameen District, B.C. A small production of the metal has been maintained from this field for some years past, but not to a sufficient extent to become a factor in the world's production, which at present amounts to about 6.3 tons, of which the bulk, namely 6 tons, is produced in the Urals, and the balance mainly by Colombia. In a minor degree, Abyssinia and Borneo contribute to the annual yield, and there are also unimportant deposits in Brazil; but notwithstanding the search of recent years no new sources of platinum have been discovered and meanwhile the reserves are gradually being depleted.

Dredging for tin was begun in Alaska last year, on Buck Creek, on which are the best tin placers now known in the country. This stream is about four miles long and the gravel is probably nowhere over 9 feet deep, while very few of the pebbles are over 4 to 5 inches in diameter. In the creek bed the content of stream tin, carrying in the neighbourhood of 65 per cent. metallic tin, has been found to be as high as 400 pounds per cubic yard in rich spots, though the average is much lower. The dredge, which was built specially for shallow digging, has buckets holding 2½ cubic feet., and is driven by gasoline engines. It is equipped with two sluice boxes to provide for continuous operation, and digs from 950 to 1,000 cubic yards each 24 hours. Operations were stated on September 10th of last year and continued until the season closed on October 15th The ground dug is said to have been yield represented between 6 and 7 pounds of stream tin per cubic yard. The total output was 92 tons of stream tin averaging 66 per cent. tin, or an equivalent of 101 tons carrying 60 per cent. tin, and sold for $52,000.

The reports for last year of two of the great Alaskan mines are now available, and as usual contain much information of technical interest especially in the matter of operating costs. These, in the case of the Alaskan Mexican, represent a total, including mining development, milling administration and construction and repair costs, of $1.7725 per ton of ore milled, leaving a net profit of $1.0909. Of the individual items, the chief expense naturally is that of mining development and stoping, representing $1.2036 per ton; while the milling costs (carried also to four places of decimals) were .2697 cents per ton —a truly remarkable record, notwithstanding the peculiarly favourable conditions obtaining. About half the values in the Treadwell ores is recoverable by amalgamation, and until recently the concentrates were smelted at Tacoma. Last year, however, a plant, jointly owned by the three companies, was erected on Douglas Island, for local treatment, by cyanidation, of this product. The operating costs at this plant, for the period from May to December, 1911, are tabulated in detail, the total cost per ton being $2.8115.

A new course has been added to the curriculum at the University of Birmingham, England, the object of which is to create specialists in petroleum engineering. It is an excellent move, and if one of our Canadian universities would follow suit, such a course would undoubtedly be both useful and popular, particularly if the university in question were enterprising enough to secure the services of Mr. Eugene Coste as lecturer. There is, meanwhile, no reason to doubt that in due time new Canadian oil fields will be discovered and developed; but even at present there are openings and opportunities in the Dominion for men specially trained in this branch of mining. For some years the University of Birmingham has provided special courses in petroleum mining, and many of those who have taken advantage of the facilities thus afforded are now holding responsible positions in the industry. It is now designed, however, to grant a degree of B. Sc. (Petroleum), candidates for which are required to matriculate in the faculty of science before entering the special course of study, the features of which include boring (in all its branches) surveying and borehole surveying, petroleum mining geology, petroleum mining law, and the transport, storage, and refining of petroleum, in connection with which the students will attend lectures and laboratory classes in the sciences allied to the subject.

Many expressions of regret have reached us at the discontinuance of the series of annual reports as formerly issued by the Geological Survey of Canada. The present practice is to issue a summary report and in addition thereto a number of separate "memoirs," or individual reports as occasion demands. There are several reasons for the abandonment of the old method of publishing, none of which, however, would appear to be entirely adequate. It is claimed, for example, that there may be an exceptional demand for one memoir in particular and that if it were included in the annual report the issue would be speedily exhausted; and that, moreover, to present a man with a big volume when he merely requires one of the reports incorporated in it, is an extravagant procedure. In this we agree; but surely the obvious way of meeting the difficulty and objection at the same time is to publish a certain number of the reports in separate form, reserving the balance for inclusion in a volume at the close of the year. There are many mining engineers, and geologists in Canada who are anxious to preserve the sets of the Survey's publications intact. To public and institution libraries this is even more important. The publication of an annual volume provides for this requirement better than is possible by any other means. We would, therefore, urge that the matter be given further consideration by the Director.

CORRESPONDENCE

Editor Canadian Mining Journal:

Sir,—"E. J." in your issue of August 1, avails of a palpable slip, to intimate that Mother Lode, Sheep Creek, recovery per ton is in doubt. My calculation that a monthly profit of $25,000 would probably be earned, was based upon the assay plans of Mr. Watson and the milling returns on several shipments to smelters. A net recovery—and the "net" was inadvertently omitted from what appeared in The Mining Journal of London—of $14 per ton, is what is expected. This allows for working costs of $7 per ton. So that, whatever the contrary view may be, it is beyond question that the Mother Lode ore developed is expected to yield a per ton profit of $14. With low power costs and a very high extraction, there is no reason to doubt a profit of 66 per cent. on the gold contents being recovered.

Very truly yours,

ALEX. GRAY.

A bill has been introduced to the United States Senate providing for the acquisition and title to coal lands in Alaska. Legislative sentiment in the United States is now strongly disposed towards the leasehold rather than freehold, system of tenure with respect at any rate, to the fuel minerals, such as coal, oil, and natural gas, and despite the pressure brought to bear by influential interests, it is certain that the principle on which the present Alaskan coal bill is based will be upheld. The committee in charge of the measure have, however, recommended certain modifications in detail, which would appear to be advantageous. These include an increase in the term of the lease from thirty to fifty years and provide also for the renewal of the lease at its termination. It is further recommended that the royalties proposed be reduced to a minimum of 2 per cent., and a maximum of 5 per cent. upon the value of the coal at the mine.

In a paper contributed to the American Institute of Chemical Engineers, Mr. L. S. Hughes discusses the use of pulverized coal for furnace fuel. In Europe the accumulated colliery waste of years is now being utilized with success. As Mr. Hughes points out the chief difficulty has been the destruction of the fire-box and crown sheet. Both bricks and steel "melted" little by little, which effect has been attributed to the high temperature of the flame produced by pulverized coal. When the temperature of the flame was reduced the grate-bars, crown-sheet, and walls of the fire-box became covered with a vitreous, adherent coating of slag or clinker. This clinker is similar to the slag produced in blast furnaces, and is evidently formed by the action of the silican of the ash with iron oxide. The silica would also act on the firebrick by reducing its melting point. The remedy tried and suggested consisted in introducing powdered limestone with the coal dust. A simple air-blast injector fed the coal into the fire-box, and a small quantity of limestone, roughly equal in weight to the ash of the coal, was introduced with it. Immediately the character of the ash formed changed from a sticky shower to a dry, powdery material which displayed no tendency to cohere or clinker in any way. It is stated that pulverized coal is now being used in the furnaces of the Canadian Copper Company, at Copper Cliff.

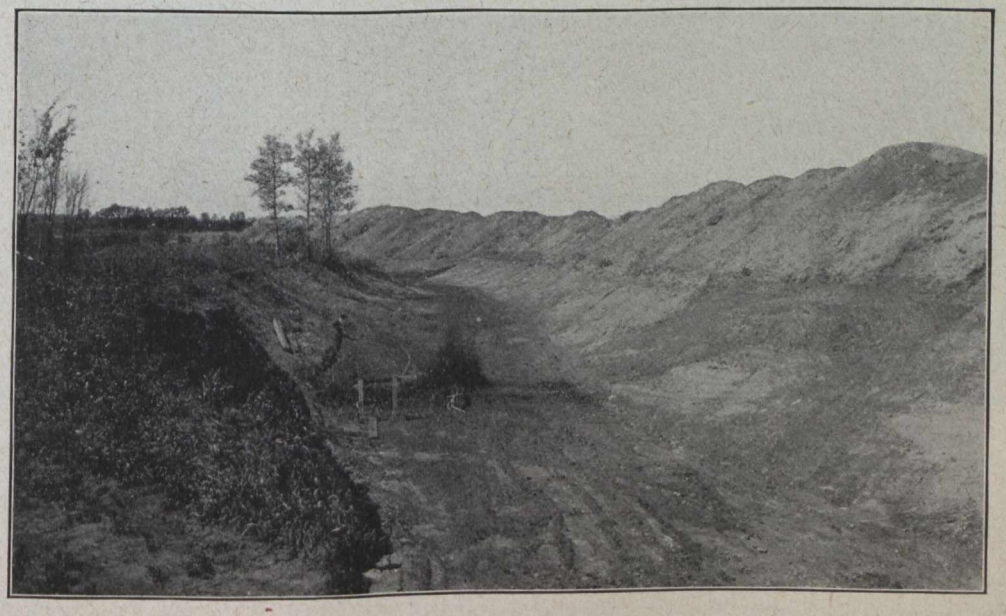
COAL STRIPPING IN ALBERTA

By D. B. Dowling.

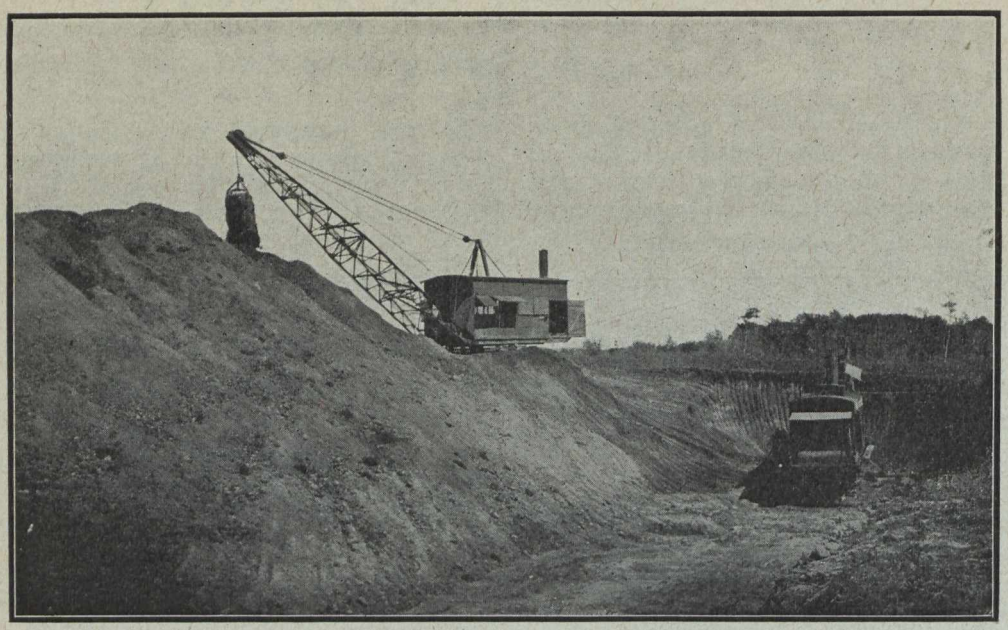
It may be said with a good deal of truth that all kinds of coal are to be found in Western Canada and likewise examples of all kinds of mining. The outcrop of coal gives long and wide areas in which the cover over a seam is shallow. In this district the cover is generally of a soft nature, and so renders underground mining seams in the flat lying measures of Eastern Alberta difficult.

Several enterprises have been originated with the object of mining the coal by removing this cover, and the accompanying photographs of the principal one will, it is hoped, prove interesting as a new departure in coal mining. From the large area to which this class of mining may be applied, it is readily seen that the success of the venture is important. From Tofield, where one of the Edmonton seams outcrops, southward for 130

Castor, Alberta—Uncovering 7 foot Seam by Team and Scraper



Tofield, Alberta—Bench Made by Steam Shovel. Bottom is on Coal. A Blast is going off



Tofield, Alberta—Steam Shovels in Operation. Lower Shovel on Coal

Tofield, Alberta—Loading Coal from a 9 foot Seam

miles, what is practically the continuation of one seam of coal has been discovered at intervals by settlers, partly in digging wells and at other places exposed in shallow valleys. The results demonstrate that for this distance and for possibly a width of over half a mile, coal with a thickness varying from a maximum of eleven feet to a minimum of about four feet, can be obtained by stripping the surface cover. The photographs of the Tofield locality show the operation of steam shovels removing about 19 feet loose sandstone and shale and the loading of coal from a 9-foot seam. Another photograph is of stripping by team and scraper at Castor, Alberta, and the exposure of about seven feet of coal.

THE ACTION OF ALUMINA IN SLAGS.

In his presidential address before the Australasian Institute of Mining Engineers, Mr. H. C. C. Bellinger made an interesting reference to the diversity of opinion among metallurgists regarding the action of alumina in the formation of copper slags, and accounted therefor on the grounds of the erratic behaviour of this element. Speaking from his own experience in treating the copper ores of Rossland and Crofton, B. C., he first quoted the following description of the Rossland deposit by Kemp. "The ore bodies exist at or near the contact of gabbro and porphyry, the extent of the mineralized zone being about four miles long by one mile wide. The contact is not abrupt, but the gabbro passes gradually into augite, porphyrites and diabases, seldom more than one mile wide, and brecciated." The gangue matter of these ores analyzed approximately:

From 14 per cent. to 18 per cent. alumina.
From 10 per cent. to 12 per cent. lime.
From 2 per cent. to 3 per cent. potash and soda.
From 40 per cent. to 46 per cent. silica.

Mr. Bellinger stated that the first metallurgist who attempted to smelt these ores arrived at the conclusion that the alumina should be calculated as an acid and found, on this assumption, that a certain percentage of limestone was required. The furnace was blown in, but the campaign abruptly terminated at the end of two hours by the freezing up of the furnace. The metallurgist concluded that the alumina was more active than he had first considered, and therefore increased the percentage of limestone, with the same disastrous results. The company then decided to call in another metallurgist, who took an entirely different view of the alumina. He assumed that that part of the alumina which was in combination with silica would continue to perform the function of a base, while the balance would probably assume the opposite role, which happened in this case to be equivalent to eliminating the alumina entirely from the calculation. A charge was made up on this assumption, and no difficulty whatever was experienced, the result being in every way highly satisfactory. No practical alteration was made in the composition of the charge for some years, the regularity of the ore making this unnecessary.

While in this particular instance the alumina appears to have played no prominent part in the formation of the slag, at one of the metallurgical plants at Butte, Montana, where the economic conditions demanded the formation of a slag ranging from 45 per cent. to 50 per cent. of SiO_2, the alumina definitely assumed the role of a base, as the following analysis will testify:

SiO_2, 45.4; FeO, 24.0; CaO, 18.5; Al^2O^3, 7.9.

Thus, he remarked, we have here 24.2 Oxygen united contained in the acid, while the base units gave 10.62 units of Oxygen, the result being a true bi-silicate slag. If the alumina be included on the acid side, we have the ratio of 2.6 to 1.

A similar instance is shown in the North-Port slags of the following composition:

Cr_2, 43.5; SiO_2, 43.5; Fe_2, 20.0; CaO, 16.0; MgO, 4.5; Al_2O_3, 14.5.

Here we have 23.3 units of oxygen in the silica, and 10.81 base units in the FeO, CaO, and MgO, while 6.75 units are included in the alumina. If the latter be taken as acid we have an oxygen ratio of 2.8 to 1.

The following slag represents a two weeks' run on the Britannia plan, Vancouver Island:

SiO_2, 50.4; FeO, 20.5; CaO, 22.22; Al_2O_3, 6.5. Here we have 26.88 acid units of oxygen in the slag, and only 10.7 in the base. Including the alumina as a base, the oxygen ratio approximates the bi-silicate; while including it as an acid, the ratio would be 3 to 1, which is beyond reason.

At Crofton, Mr. Bellinger was engaged in the smelting of a baryta ore, containing on the average from 40 to 45 per cent. barium sulphate. The ores also carried from 8 to 9 per cent. zinc. On account of the low formation point of the slag resulting from this ore, it was necessary to add both silica and alumina before the furnaces could be made to run satisfactorily. The slags ranged from 5 per cent. to 12.2 per cent. alumina, and the action of alumina here was most confusing. The aim at this, as well as at other plants, was to utilize, so far as possible, the base units, and the object, therefore, was to crowd as much silica on to the charge as possible. All of the slags resulting from the various mixtures made were commercial, and ran in a highly satisfactory manner; still, I found that in some cases the alumina apparently acted as an acid, while in the other cases similar assumption would clearly have resulted in an impossible slag, since the result would have been a ratio of 2.7 of acid to 1 of base. Neglecting the alumina we have a ration of 1.91 to 1, closely approximating a bi-silicate type.

At Cobar, where Mr. Bellinger is at present engaged as general manager of the big copper mines there, other conditions obtain, as shown by the following analyses:

Neutral Alumina.

Cu.	FeO.	SiO_2.	Al_2O_3.	CaO.
.2	49.2	41.4	5.8	1.0

Acid Alumina.

Cu.	FeO.	SiO_2.	Al_2O_3.	CaO.
.3	51.4	39.2	6.5	.6

Thus in the instances enumerated, the action of alumina is in each case different, at once acid, base and neutral. And Mr. Bellinger points out that obviously it is impossible to deduce from such data the exact function of alumina. To quote his concluding remarks: "Personally, you will note, I have operated plants where the slags seem to have placed beyond all doubt the definite action of alumina in one or other of the various allocated roles. But from diversified experience it is plain to me that we must look beyond the mere chemical analysis of the ores in order to evolve a reasonable and definite process of action for alumina. Take, for instance, the porphyritic formations with the large influence of the felspars in evidence, and we have certain combinations for silicates of alumina and other bases. The felspars constitute an extensive list of minerals with a wide range of composition, from othoclase with 18.4 per cent. of alumina and 16.9 per cent. of potash, to anorthite with 36.7 of alumina and 20.1 CaO. Both these felspars, physically and chemically, in their respective behaviours under similar treatment, are widely divergent. Thus, on through the various meta-silicates, orthosilicates, to the hydro-silicates, we find the same varied conditions physically and chemically with widely different genetic laws. The range of oxygen ratios varies from less than one to one in the sub-silicates, to four to one in the disilicates. It is when one considers the many conditions of combination in aluminous compounds, and has noted the definite changes in the action of the alumina in sympathy with variations in such combinations that it becomes quite feasible that, under similar furnace conditions, we could reasonably expect the compounds to adopt roles suited to their peculiar forms. Many engineers have for instance, found, under

certain conditions, that by calculating the alumina soluble acids on the acid side and treating the insoluble alumina either as base or as an independent elementary magma they have obtained excellent results. Though Peters says that this method has no scientific foundation, it is interesting to note that it has been a success in some cases, and the reason for this success may in future be condensed to a scientific basis.

"At Cobar we are carrying out a series of experiments. While the outcome of these many not alter the present status of alumina, we trust that the information secured will be of some value."

PHYSIOLOGICAL EFFECTS OF CARBON MONOXIDE

*By Prof. Henry S. Munroe.

An interesting pamphlet on carbon monoxide has recently been issued by the Bureau of Mines, in which attention is drawn to the dangerous properties of this gas and to the use of mice and birds for detecting its presence in mine air. The author quotes largely from various publications of Dr. J. S. Haldane of Oxford University, who for many years has made special study of the subject of mining hygiene and the dangerous gases met in mines. The author states (p. 6) "According to Haldane, carbon monoxide has no other effect than that resulting from its interference with the oxygen supplied to the tissues, and apart from its property of combining with the hæmoglobin it is physiologically indifferent, like nitrogen." The author also outlines an experiment in which he remained for twenty minutes in an atmosphere containing 0.25 per cent. of carbon monoxide, "at the end of which time he suffered only a slight headache, although later he became ill. The illness lasted for several hours and was accompanied by nausea and headache." The quotation from Haldane and this experiment, are likely to give a false impression as to the dangerous properties of this gas; it has therefore seemed wise to give a few facts that others may not be led to repeat the experiment made by the author of the pamphlet, and to give some idea of the dangerous nature of this gas even when present in very small amount.

Carbon monoxide is a product of incomplete combustion. It is present in large qnantities in producer gas and water gas, and in dangerous amounts in the gases from boilers and furnaces of all kinds. It is often present in large proportions, and always in dangerous amounts, in powder smoke, in the gases from underground as well as surface fires, and in the afterdamp from explosions of firedamp and coal dust.

Carbon monoxide has the property of forming a compound with the hæmoglobin of the blood. The effect of this is to make the hæmoglobin, so combined, practically inert and to prevent it from acting as a carrier of oxygen. When so much carbon monoxide is absorbed that the greater part of the hæmoglobin is inert, death results. The affinity of carbon monoxide for hæmoglobin is more than 200 times greater than that of oxygen, so that when present in the air, even in small quantities, it is freely absorbed by the blood. Carbon monoxide is not displaced by oxygen but is dissociated by natural processes, and escapes in the expired air. Where large quantities are absorbed, it may be several days before the last traces disappear. According to Doctors Edsall, von Jaksch, Haldane and other authorities, 0.05 per cent. of carbon monoxide is dangerous. According to Haldane, severe symptoms were observed from breathing air containing 0.02 per cent., or one part in 5000. With this small amount present the blood becomes 20 per cent. saturated after about 20 hours, producing slight giddiness and shortness of breath. At this point an equilibrium seems to be established, and the dissociation of the gas keeps pace with its absorption. With increasing percentages of carbon monoxide, the saturation of the blood becomes greater and the time required to produce the maximum effect shorter. With 0.08 per cent. present, the blood becomes 50 per cent. saturated within a few hours; it becomes scarcely possible to stand and even slight exertion results in loss of consciousness, the senses are confused and the judgment is impaired. Sometimes the victim either becomes stupid and drowsy, or much excitement results, not unlike the effects of alcohol. Another experiment by Doctor Haldane proved that with 0.20 per cent. CO in the air the blood becomes 50 per cent. saturated in 70 min. With 0.25 per cent., the amount present in the Bureau of Mines, experiment, this dangerous condition would be reached in less than one hour.

According to von Jaksch, the absorption of 0.8 gram of carbon monoxide is fatal. According to Haldane, if death occurs gradually the hæmoglobin is usually about 80 per cent. saturated with carbon monoxide. Post-mortem examinations of persons who have died from carbon monoxide poisoning show that the effect is to produce intense congestion of the vital organs, especially in the brain, usually accompanied by small hemorrhages. It is possible that this congestion is due to the attempt of nature to make good the diminished efficiency of the blood by supplying larger volumes at needed points.

Even when death does not occur, serious results are likely to follow from the absorption of this gas by the blood. The after effects are lesions, cysts and local softening of the brain tissue, inflammation of the membranes of the stomach and intestines, pneumonia, bronchitis, pleural effusions, inflammation of the kidneys, fatty changes in the heart, ænemia, splenic enlargement and other derangements of vital organs, sometimes resulting in death even after several years. It is believed that Sir Clement LeNeve Foster was a victim to carbon monoxide poisoning which occurred on a visit as chief inspector of mines to a mine in Cornwall a few years before his death. From the full record given by Mr. Foster of his symptoms while exposed to the gas underground it does not appear that there could have been more than 0.08 per cent. of carbon monoxide present, nor that his blood could have been more than 50 per cent. saturated, although direct evidence on both these points is lacking. The experiment made by the author of the paper recently issued by the Bureau of Mines, in which he exposed himself for 20 minutes to an atmosphere containing five times as much carbon monoxide as is known to be dangerous was therefore hazardous and even though the experimenter apparently suffered but little ill effect a some-

*Article by Prof. Henry S. Munroe, "Physiological Effects of Carbon Monoxide," in the School of Mines Quarterly, July, 1912.

what longer exposure would certainly have resulted in serious injuries, the after effects of which might have proved fatal.

One of the most serious dangers from the presence of carbon monoxide in the air of mines is the effect upon the health of workmen who are daily exposed to the breathing of small amounts of this gas. The blood, when partly saturated, is thereby rendered less able to perform its proper functions, so that the patient suffers from ænemia and all the complications that may result from this weakened condition. According to Doctor Edsall, the disease known as miners' phthisis has been shown to be due chiefly to carbon monoxide poisoning. Recent observations have shown that for some hours after a blast, under the conditions of ordinary mining, carbon monoxide may be present in the air in dangerous amounts, and undoubtedly the blood of men engaged in sinking, drifting, and stoping where the circulation of air is deficient is partially saturated with carbon monoxide the greater part of the time.

By some authorities it is believed that the serious effects above outlined, due to absorption of carbon monoxide by the blood, are supplemented by direct toxic action on the nervous system, on the muscles, the heart and other organs. It is believed by others that there is a cumulative action and that those who have been poisoned by this gas are more likely to become victims when again exposed to it. It is quite certain that dissociation of carbon monoxide from the blood is slow and that those whose blood is partly saturated will sooner fall victims where larger quantities of the gas are breathed than those whose blood is free from this gas. Men who have repeatedly suffered from carbon monoxide poisoning becomes very sensitive to the gas, and in most instances are compelled to abandon work in which they are compelled to breathe air containing it.

The symptoms by which carbon monoxide poisoning may be detected are not difficult of recognition. The blood becomes a brilliant cherry red, and in serious cases red or bluish-red spots appear on the front of the neck, on the trunk, thighs and elsewhere, lasting for some days, and in fatal cases apparent after death. The mental disturbances, weakness and lassitude, have been noted. This is followed by headache, accompanied by nausea, often lasting 24 or 48 hours, even in slight cases. In more serious cases, headache may recur at intervals for some months. Loss of consciousness with convulsions, may occur several hours after the poisoning. One of the first symptoms is weakness in the knees and legs, sometimes lasting for days, with aching from the knees to the ankles. Local pains in the region of the heart, and palpitation of the heart, are common and may recur at intervals for a month or more. Foster, and several others, have published valuable notes on these symptoms, which wil be found in the appendix of Foster and Haldane's "The Investigation of Mine Air."

EARLY MINING OF COAL IN GLACE BAY DISTRICT, C.B.

(Paper read June 12th, 1912, by J. C. Mitchell, South Cape Breton Mining Society.)

As requested by the members of this Society, I will, in as brief as space as possible, and altogether from memory, give a description of the methods and appliances used in the early mining of coal in the Glace Bay district.

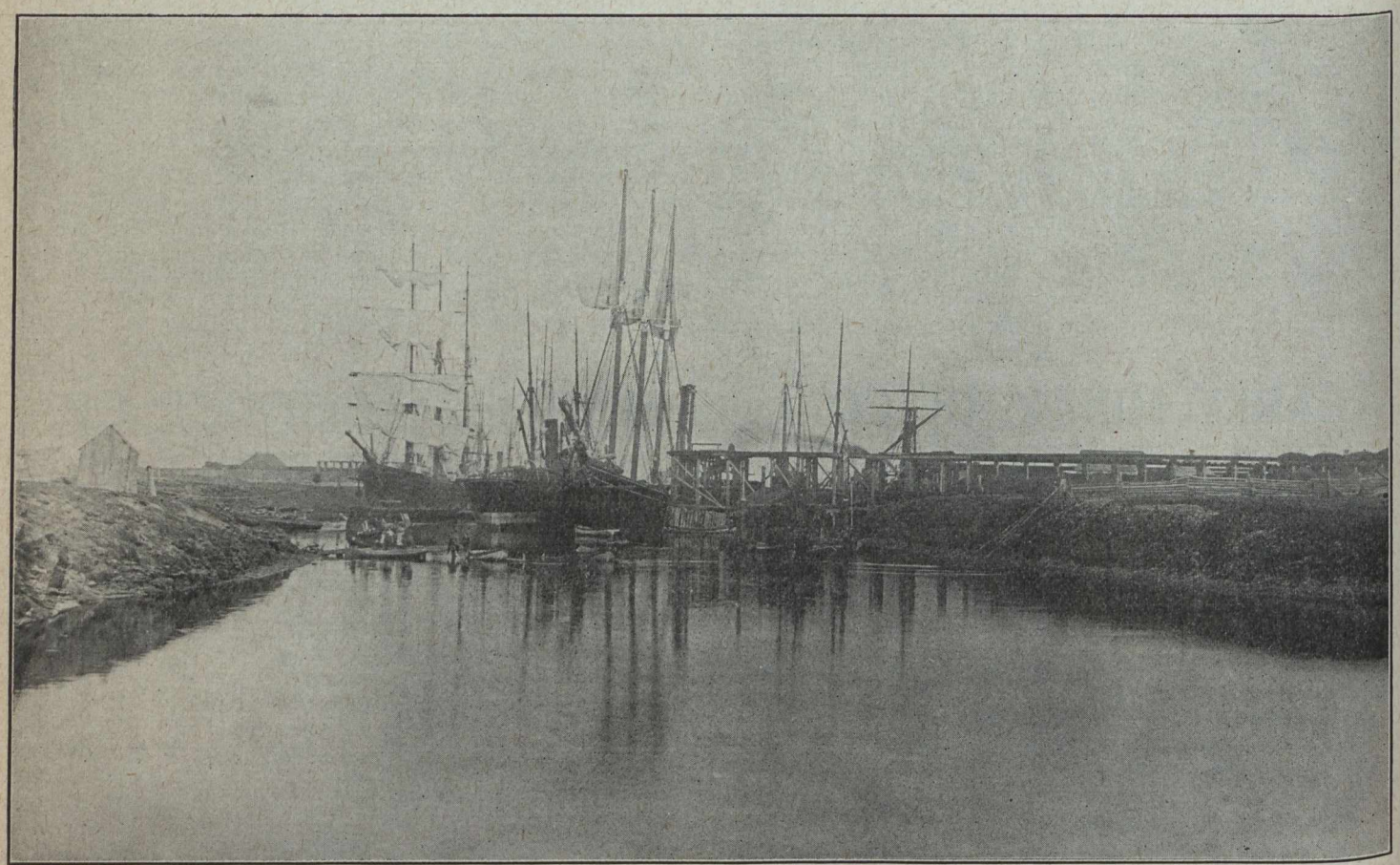
The history of the mining of coal on the Island of Cape Breton, including the Glace Bay district, from the year 1498 when the Island was discovered by Sebastian Cabot up to the year 1857, is given in the "Coal Fields of Cape Breton" by the late Richard Brown, Esq., F.G.S.

The first mining of coal that could be called mining, was started by my venerable father in the year 1857 in what was then called the Roost Seam, in the cliff on the west side of what is known as the Burnt Mine, or Red Head; and I believe that there are some members here to-night, including our worthy president, who can call to mind this particular locality from events that transpired there in recent years.

An opening was made in the seam above high-water mark and a small wharf built on the shore from which scows were loaded with coal by means of wheel-barrows. These scows were rowed off to vessels anchored in bold water and the coal shoveled on board and shipped to the Halifax market. Another opening was made in the same seam on the east side of Burnt Head. A drift was driven in through the burnt stone and coal for quite a distance before the solid coal was reached. This work had to be done very carefully as the cover was very bad. The coal from this opening was shipped in the same manner as that employed at the first opening; but, on account of it being impossible to build a wharf that would withstand the violence of the storms, and as the coal from the Roost Seam was well liked by the consumers, another and more favourable place was started at what was then known as the Shag-Roost—the place getting this name from the fact that great flocks of large birds called shags were accustomed to roost there overnight. After a few years the word "shag" was discarded and all of that district was known as the Roost. Hence, the Roost Pit; Roost Wharf; Roost Row; etc. A slope was driven down on the crop of the coal, and a small but substantial wharf built at the Roost Head, at which vessels drawing thirteen feet of water could be loaded. The first coal was taken down to the vessels with horses and carts, but later on an inclined plane was built. A large wooden drum was put up at the top of the plane. It was set up in a strong frame about seven feet above the tracks, and the horses hauling the coal tubs out of the slope would pass under the arm to the top of the plane leaving the full tubs and taking back the empties. The track on this plane was laid with hardwood plank 10 inches wide x 2 inches thick; and a 2-inch square of hardwood fastened on the inside edge with trunels. This strip kept the tub on the track. A manilla rope was used on the inclined plane. The system of mining was room and pillar; the coal was mined on a "bench" sheared on both ribs, and taken down with maul and wedge. Very little powder was used as the "bench" was also sheared on both ribs and taken up with wedges. In the shipping season, the coal was riddled in the mine and the slack stored back in the room; but in the winter the coal was banked as run of mine and riddled in the bank before being shipped. The coal was hauled right up on the bank by horses; some times

a tandem team being used. The tubs were built to carry a half-ton and I feel quite sure that they did. The tub was made with iron frames the same as some of the present day tubs, but rivets were used to fasten the lumber to the frames instead of bolts. The wheels of this tub were made of wood, just the same as the present day cast wheel but, of course, only 16 inches in diameter. The tire was 2 x ⅜ inches and shrunk on the wheel, and the bushing that was in the hub of the wheel was the same as tat used in the old Dutch ox-cart and Pharoah's chariot. The track in the slope was the same as the track on the incline; viz., hardwood plank; but in the rooms, the tub was hauled on the pavement and used to run very well. The rooms were driven 16 feet wide and as the cover was light the pillars were small.

this time Glace Bay got its first "boom." A strong company, for these days, was formed of Halifax and Boston gentelmen, with the late James A. Moren, of Halifax, who was also president of the Union Bank of Halifax, as president, and the late E. P. Archibald as secretary. Other Halifax gentlemen were also in the company. The principal Boston men were Captain Barret, Mr. Conves, Dr. Howe and Mr. Emery. Enough capital was subscribed to sink what is known as the Stone Slope, build a bankhead and screens, and to purchase an engine to haul the coal up the slope. A short description of this engine will be given later on. A small house for the manager, as well as colliery buildings and a number of dwellings for the workmen, were built. The present Glace Bay harbour was opened up, the railway built to the mine, and warehouse, office,

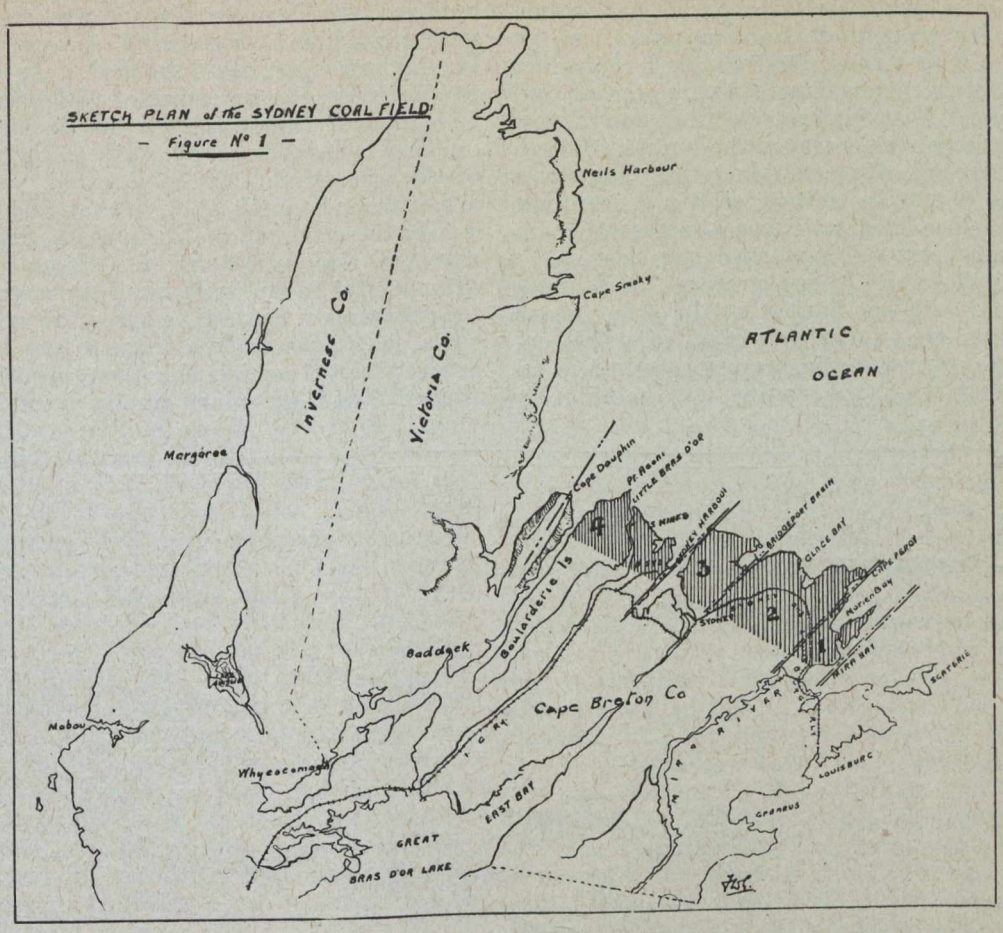


Glace Bay Harbour 25 Years ago. Shows the Old Caledonia Pier, and the Pelr of the Glace Bay Mining Company, Seaword.

The mine was ventilated by natural ventilation, a small shaft being used for an upcast. All the water that this mine made was hauled out by horses and water tubs, but, later on, a level was driven from the shore at a point just above high water which drained quite a strip of the crop coal. Very few buildings were required at the mine. The Mines' Office was in one end of a large building called a "shanty" which was made of round logs and had a large chimney and fireplace in one end. A blacksmith shop was built in the same way. A very good barn was also built. This was a frame building with stable room for seventeen horses, as the pit horses were stabled on the surface at that time. All the settlers of the place used to work at this mine in the summer, and any extra men required used to get board at the farmhouses. About

carpenter and blacksmith shops, large barns and other buildings required, including a "Pluckme," were erected. The first coal that ws shipped from the new harbour was hauled from the Roost with horses and carts. The price paid for a load of a half-ton was twelve and one-half cents, or two loads for a quarter. After the railway was finished the coal was shipped in cars, but horses were employed to haul them to and from the mine and harbour.

The first cars that were used were known as the hopper car. They carried two chaldron or three tons. The wheels of these cars ran on the outside of the car and had what is known as inside bearings, just the same as the ordinary pit tubs, but, of course, larger. The axles could be greased with a brush from underneath. I think it was two of these cars that were in



use, but the second lot of cars were a much better kind and carried four tons. This car had outside bearings with an axle box in which wool and oil were used, and I often heard the railway drivers say that the horses could haul the four-ton cars with less labour than the three-ton, due to the different style of bearings. This way of hauling the coal was continued for two years, then a small locomotive was purchased in Glasgow, Scotland, from the firm of Nelson. This engine pump was running light to supply air instead of water. The engine was supplied with the old-fashioned hand-brake, on which was used wooden blocks instead of iron. As the engine did not have any cab the men were exposed to all kinds of weather. We did not have any cylinder oil in those days, but tallow was used as a lubricant. As a rule, the tallow was always kept ready for use in a kettle placed on the steam chest cover, and when the engine wanted tallow, the fireman,

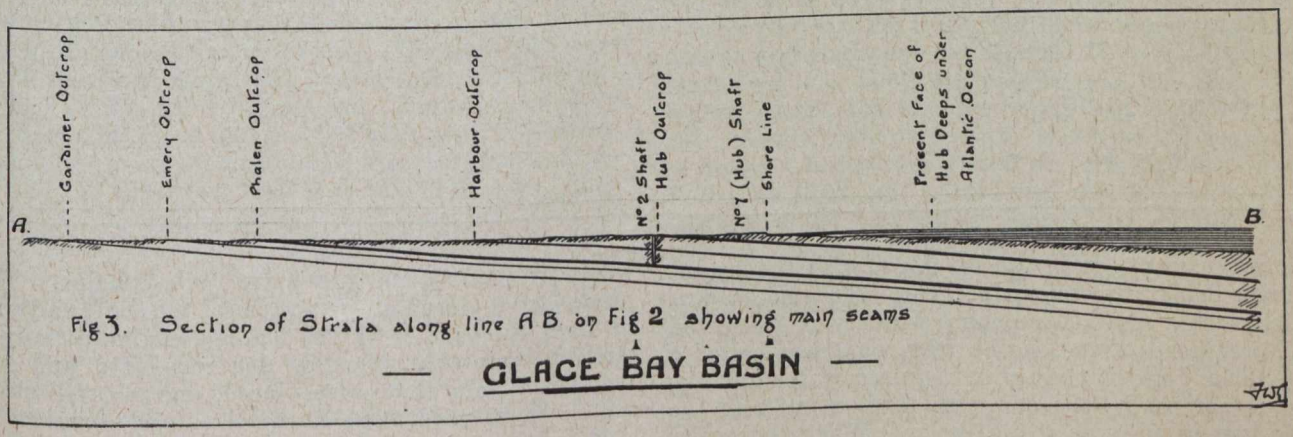


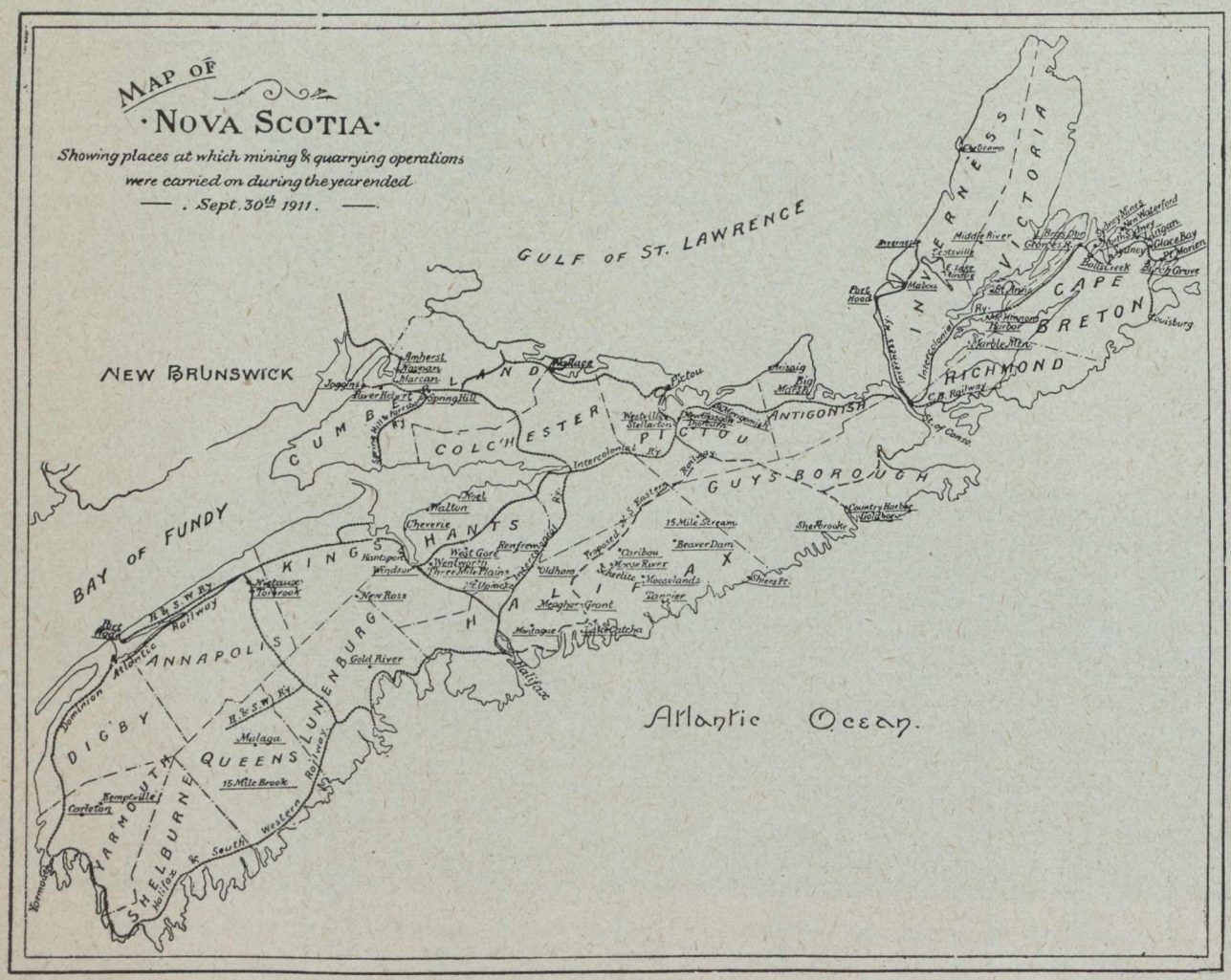
Fig 3. Section of Strata along line A B on Fig 2 showing main seams

— GLACE BAY BASIN —

weighed thirteen tons. The boiler was fed with pumps, one on each side, attched to the crosshead. The water, which ran to the pump by gravity, was carried on top of the boiler in a small tank. In this tank, at the outlet was place da valve which was opened when the boiler required water. In the working-barrel of the pump was placed a small pet cock, controlled by a lever in the hands of the driver, which was opened when the who in this case was fireman, brakesman and conductor, all in one, would jump off the engine at the top of a grade and run to the front end and give the cylinders a drink while the engine was running down grade with the steam shut off. The sand that was required for use on the rails was carried in a long narrow box which hung on the engine just over the drawbar, and from this box the fireman would spread it on the rails by

hand. If the boiler wanted water the fireman would uncouple from the train and run along the road to feed the boiler. The largest load which I remember seeing this engine carry was fourteen cars; ten of coal and four of coke. Nevertheless, she did good work and was a great improvement over the horses. It was found before the road was completed that there was not enough rails to put in sidings, so 6 x 6 scantling was put down, well spliced, and faced on the top with 2½ inch x ½ inch iron. This worked very well.

While sinking the Stone Slope a "gin" was used and, in fact, some coal was hauled by the same means until the little haulage engine was installed. This engine was a double or two single engines attached to an upright boiler and when the engine was hauling up



one trip the empty trip was let down with the brake, the drum being thrown out of gear. This boiler was also fed with a small force pump which was connected to the crosshead of the engine with what was called a "gape lever" and if the boiler required water and the trip was not ready, the arm was thrown out and the engine run so as to feed the boiler. When the boiler tubes required cleaning, which was about once each shift, the fireman had to get up on the roof of the engine-house and take off the smoke stack to get at the tubes to brush them out. But with all its shortcomings, it was a great improvement on the "gin." When the mine was opened out so that a fair output could be produced an up-to-date engine was purchased. This engine is now driving the bank machinery at No. 4 colliery. This engine, which was of the single type, with a cylinder 12 inches x 36 inches, worked splendidly and was extra well finished. As this engine only ran one way, the reversing of the drum was done with two pinions running loose on the main shaft which matched a large level spur wheel that was on the end of the arm shaft. The pinions were set in motion by a double end clutch and by changing the clutch from one to the other of the pinions, the haulage drum was reversed, and by placing the clutch in the centre the drum would be stationary and the engine could be used for pumping. Some time after the engine was installed, a shaft was sunk a little to the west of the bore holes, through which the pumping was done, and a pair of 8-inch by 4-inch pumps were installed. They were, of course, the old style force pumps. These pumps were placed at the bottom of the shaft and worked from the surface by the haulage engine already described, with what is called dry rods—two well made wooden V-bobs that were placed, one on each side of the shaft on good stone foundations and connected together with a wooden connecting rod at the top, and wooden rods or spears connected the plungers of the pumps at the bottom of the shaft with the V-bobs at the surface. The V-bobs were connected to the engine, which was about four hundred feet away, with wooden spears which were made of 6-inch x 6-inch black spruce, nicely dressed and fastened together with 4-inch x ¾-inch iron, with ten ⅝-inch bolts to each joint. The spears ran on cast iron rollers with a frame

on each end which kept them in line. These rollers were set on hook bearings which were well fastened to upright posts, the posts being set into sills which were put down in the ground about three feet. The under side of the spear was shod with flat iron to prevent the spear from cutting. A forked connecting rod with a centre guide was used at each end of the spear to allow for the revolution of the crank and the rise and fall of the V-bobs. The spears were driven by a male pinion on the end of the main shaft of the engine which matched a large bevel spurwheel; in fact, all of the wheels in connection with this engine, except the flywheel, were bevel wheels and I can only say that they gave good service. Previous to the installation of the pumps just described, the water from the Stone Slope workings was pumped by a pair of small force pumps that were placed at the lodgement in the mine and driven through two bore holes that were put down from the surface with 1¼-inch round iron rods. These rods were driven by a crank shaft and bevel gear which was at first worked by a horse, but later on a small engine was set up which drove the crank shaft with pulleys and belts. The belts were made of green-hide, the hide being cut in strips about 7 in. wide and laced together with lacing of the same material. These belts were made with the hair on them—I have seen strips of red, white, and black hides all in the same belt and it looked very funny. Owing to the high gearing to get power from the little engine, it had to run very fast. All the pulleys were made of wood and were made on the works and pine tar was used on the belts to prevent slipping. Water was very hard to get for the boiler and it was hauled with a horse and cart from Black Brook where it crosses Main Street, in the town of Glace Bay.

The same coal tubs that were used at First Slope were used in the Stone Slope, but a new kind of wheel was introduced. It was known as the grooved or double-flanged wheel. They ran loose on the axle. The axles were all made in the forge from 1½ inch square iron, the ends being swedged down to the size to suit the wheels and a ⅜ in. collar contracted on to form a shoulder for the wheel to run against, and a flat hole punched in the outer end in which a flat split key was put. A cast iron made from ½ inch square iron with an eye on each end was put on the axle outside of the wheels which kept the axle in place. The rails that were in use in the Stone Slope were known as edge rails. They were bars of 2½ in. x ⅝ in. iron. The sleepers were made from 3 in. plank and notches were sawn 1½ inches deep at the proper distance apart for the gauge of the track and the rails were drilled to take 5/16 inch plugs at every sleeper and when the rails were put down in the notches in the sleepers, a plug was passed through the hole in the rail and a staple driven over each end of it to fasten down the rail. The Stone Slope was double tracked and the sleepers ran across under both tracks. Double points were used at the slope bottom and on the bank to steer the tubs on the rails. There was only one landing, all the coal came to that landing and the trip was made ready by a bottom-man.

Electric signals were not in use in these days, but instead, the bottom-man had a large tin horn which he would blow when he was ready and the banksman would hear it and give the engineer a wave of his hand to hoist. Later on the old fashioned "rapper" was installed.

The plank first described, was used on the main horse roads in the mine, but in the rooms the tubs were hauled on the pavement and worked very well. The horses hauled the tubs with whiffle-tree and traces in place of shafts. The driver sat on the front of the tub and put his foot against the horses' rump to hold back the tub, and a large piece of leather was attached to the harness which hung over the horses' rump to keep the driver's shoes from skinning the animal. This was called a "backskinner" or "apron." At this time all pit shoes had the bottoms covered with what were then called hob nails. After a few years a new kind of track called metals were introduced. They were in 4 ft. and 6 ft. lengths, made just like the plank road but much smaller. The next change of track was something like the edge rail, but in 4 ft. and 8 ft. lengths. They worked very well, but were easily broken. Finally the wrought iron bridge rail was gotten and also the present Tee rail, and the one-flanged wheel of the present day came into general use; and I must say that it was a good improvement.

For hauling the coal up the Stone Slope, a manilla rope was used for a long time. It was about 2 inches in diameter when dry, but when it was wet and frozen, in the winter time, it was like a 3-in. pipe. The first wire rope that was used was galvanized the same as that in use for rigging on board of ships. The first sockets were the old-fashioned split socket put on with rivets. A shackle and bolt was used to connect the rope to the trip. This bolt was attached to the shackle with a piece of small chain and had a round hole punched in it through which a round leather key was put to prevent the bolt from jumping out while the trip was running. The couplings that were used to couple up the trip were made with one long link and two shackles; the long link being closed in the centre to prevent the shackles from getting separated. A leather key was used in all the coupling pins to keep them from jumping out, the keys were attached to the pins with a piece of rope to keep them from being lost.

The steam boilers in use in these days were of the cylinder type, 33 ft. long and 3 ft. in diameter, and carrying 60 lbs. of steam to the square inch. The boilers were fed with cold water. No water gauge glasses in these days, only try cocks, and only one steam gauge for all boilers and that one would be placed in the engine house. The old-fashioned single acting plunger pumps were used to feed the boilers.

Eleven hours' work was a shift and the wages ran from $0.35 to $0.60 per day for boys. and from $0.60 to $0.80 per day for labouring men. Blacksmiths, carpenters, and engineers got from $1.25 to $1.40 per day. House rent was $1.50 per month, coal was free to employees, except the haulage which was 12½ cents per load. Single men paid $0.25 and married men $0.40 for doctor. Board was $10.00 per month, tobacco $0.60 per lb., tea $0.60 per lb., and rum was $0.05 a glass.

As a rule the men worked steady, but did not care to work the first day of the month. Pay-day was always on the 15th of each month, unless it happened to be Sunday, in which case Saturday would be pay-day. I have worked in the pit for weeks in the winter time, and did not see daylight except on Sunday. In the summer evenings the young men would have a game of ball called "rounders," or lie on the grass and sing songs and tell the latest yarns, or pitch cents to pass away the time. A number of the men owned boats of their own and would go fishing. Once in awhile, a dance would be given by one of the neighbours and the young people would have a good time. This was called a "frolic." Most every person went to church on Sunday, and it was the desire of the workmen, as a rule, to assist in every way their employers, and a kindly feeling existed between the people generally and the company. So as it has ever been, "from small acorns great oaks grew."

DIAMOND DRILLING AT POINT MAMAINSE, ONTARIO.

An addition to the many valuable reports recently issued by the Mines Branch, of the Dominion Department of Mines contains a record of diamond drilling at Point Mamainse, Ont., with historical and geological notes on the district by Dr. Alfred C. Lane, of Tufts College, Massachusetts. In an introductory chapter Dr. A. W. G. Wilson points out that no systematic detailed geological study has yet been made of the Keweenawan copper bearing amygdaloids in Canadian territory, although various localities where these rocks are exposed have been visited by different geologists from time to time, and special localities have been described. Meanwhile the copper bearing anygdaloids are known to occur on the north shore of Lake Superior, forming a narrow fringe along the shore, and out-cropping on many of the coastal islands. Some excellent exposures are found on St. Ignace Island. Michipicoten Island is wholly underlain by them; the dense vegetation and the soil-cover making, however, their exploration particularly difficult. These rocks also outcrop along the east shore of Lake Superior, between Cape Gargantua and Batchawana Bay. The inner margin of the area has never been fully delineated. Dr. Wilson states that in the vicinity of Mamainse Point it lies, probably, at least five miles inland.

Possibly the first copper mining ever undertaken in Canada was carried on in this locality, and it is known that the Indians in early times collected native copper from the east shore of Lake Superior from which they fashioned weapons and utensils. None of the attempts by corporations to mine copper here in the last century were successful, and no large deposits of ore were discovered; but, as Dr. Wilson remarks, only a very small portion of the district has been explored, and that only imperfectly. In 1906 the Calumet and Heckla Mining Company secured an option on the old Pancake Bay location, near Point Mamainse, and for over a year explored the property by means of diamond drilling. The work was discontinued in 1908. Dr. Lane states that the results cannot be said to indicate that the copper does not exist in commercial quantities, though it indicated that the region was less promising than some others, and that exploration would be relatively difficult and expensive. To quote Dr. Lane briefly on the general geological structure. He says: The point is made up of a series of beds of the Keweenawan or copper-bearing series dipping towards the lake, and veering in strike from s 10 degrees e south of Mica Bay, where they begin, to s. 45 degrees e, or even more easterly as they approach Batchawana Bay. The series is mainly made up of traps and amygdaloids (melaphyres or diabases of other writers) such as everywhere make the bulk of the Keweenawan formation. But there also beds of conglomerates, and instrusive felsites or quartz porhyries. much like those that occur on Keweenaw point, but here containing more green peebles of the Keewatin series, and also granite pebbles. The total column, known in detail, is about 8,580 feet, to which perhaps, 5,000 feet should be added at the base to get the total thickness of the Keweenaw here. The mineralization is of precisely the same type as on Keweenaw point. The native copper occurs with prehnite or with calcite either disseminated in bedded lodes, or in fissures. Some of the fissures probably contain an iron carbonate. The sulphides (chalcocite especially) seem to be confined more to the fissures. The fissuers may have 5 to 7 feet disturbed, but the values seem to be concentrated in a narrow pay shoot of a few inches and are most noticeable when the conglomerate forms one wall of the vein. An easterly shade is universal. The strike generally is nearly north. Dawson describes the veins as crustified, filled with successive deposits from their sides; in several cases agatiform quartz, then quartz, then calcite, the later on the quartz (and also he says vice versa) the copper contemporaneous or even later, also later than some zeolite. The sulphides have similar relations, the copper carbonates are later still. He attributed the deposition of the copper to the electro-chemical decomposition of some soluble salt, probably the sulphate, as an aqueous deposit both in true veins and in vesicular cavities. Dr. Lane states, however, that it is more likely to have been a chloride.

Referring to exploratory work in the section, Dr. Lane after remarking that no successful mines in Michigan are working fissure veins, states that it seems to him that very possibly in this region of flat dips ore bodies are more like those around the Central mine than like those around Portage Lake, and the bulk of the copper might be found near the fissures, since if the beds were relatively flat, circulation would more naturally follow the previous features with greater inclinations. Accordingly he suggests it might be well to follow up the shoots which would be formed by the intersection of the veins and pervious beds, looking for copper either in the vein or in the fissure. The amount of copper disseminated is not dissimilar to that found generally in the Keweenawan rocks. This is shown by a series of sludge analyses.

Another expedition, making three or four that have set out this season, has just started from Ottawa in search for diamonds in Ungava. On the assurance of one of our most distinguished geologists, diamonds undoubtedly occur in Ungava, but the thing is to find them. The authority quoted likened the task to searching for a needle in the bundle of hay. But perchance a lucky man may hit on the needle, or even a careful and systematic search, scientifically conducted, may meet with its reward.

Asbestos, it is reported, has been discovered near Llano, Texas, and the property which has been acquired by the National Asbestos Company of Chicago is now being extensively developed. The outcrop is said to be 250 feet wide and 1,600 feet long, the asbestos belonging to the chrysolite variety. It is not likely, however, that Canadian producers will permit this announcement to cause them much anxiety.

As demonstrating the gross unfairness of "sympathy" strikes, and of the stoppages consequent upon outside striking, a correspondent of the *Colliery Guardian* quotes from the speech of a chairman of one of the important Welsh coal companies, who informed the shareholders at their meeting that the nominal amount of profit was due to the fact that the labour cost had increased 1s. 1.3d. per ton, attributable to a reduction in output caused by labour troubles. Thus, while only one day and a half had been lost through want of trade, no fewer than 65 shifts were lost through strikes, though not one of the disputes was local to the company. During these wanton stoppages, roads had to be maintained, officials paid, etc.; and those, with other charges, had amounted to no less than £25,000.

THE RE-OPENING OF THE GILLIES LIMIT TO PROSPECTORS.

On the recommendation of the Hon. W. H. Hearst, Minister of Mines, the Ontario Government, by an Order-in-Council, dated August 3, has removed the reserve from part of the area known as the Gillies Timber Limit, namely that to the east and north of the Montreal river, which will be open for prospecting after August 20th. The area has been added to the special mining division of Coleman, and brought under Sections 21 and 51 of the Mining Act. The requirements are: (1) The "A" claims or locations already surveyed should be staked out as such. (2) When staking out claims on the blocks which have not been sub-divided, the claims should in no case overlap the boundaries of the blocks, that is, a claim should be staked out wholly within a particular block and not include any portion of an adjoining block or blocks. (3) Claims are not to exceed 20 chains long from north to south or 10 chains wide from east to west; or a total of 20 acres.

The re-opened lands are officially described as: "Reserving therefrom in the above-described areas the right of way of the Cobalt Power Company's transmission line 100 feet wide, 50 feet on each side of the centre line as shown on plan of survey by O. L. Surveyor Homer W. Sutcliffe, dated July 12th, 1909, of record in the Department of Lands, Forests and Mines; the right of way of the Cobalt Hydraulic Company's transmission line being a strip of land 100 feet wide, 50 feet on each side of the centre line, as shown on plan of survey by O. L. Surveyor T. G. Code, dated November 17, 1908, and the right of way of the Mines Power Company's transmission line, being a strip of land 135 feet wide, 67½ feet on each side of the centre line, as shown on plan of survey by O. L. Surveyor Clayton E. Bush, dated November 1, 1909.

"Reserving also the right of the Crown to grant a right of way for a transmission line 100 feet wide, 50 feet on each side of the centre line for the purposes of a pole line and transmitting power from the water power at Fountain Falls on the Montreal river, over any portion of the above-described area.

"Reserving also one chain in perpendicular width along the northeasterly bank of the Montreal river."

"That portion of block 4 lying south of parcels A73 to A80 inclusive, and east of the Montreal river.

"That portion of block 5 lying south of parcel A72 and east of the Montreal river.

"Blocks 6, 7, 8 and that portion of block 9 lying north and east of the Montreal river, excepting therefrom mining location J. S. 32.

"That portion of block 10, lying north and east of the Montreal River.

"As shown on plan of survey by O. L. Surveyor J. H. Smith, dated November 26, 1908, containing by admeasurement 3,302 acres, more or less.

"Being all those portions of the said Gillies Timber Limit still in the Crown bounded on the south by the south limits of blocks 6, 7, 8 and 9, as shown on plan of survey by Ontario Land Surveyor J. H. Smith, dated November 26, 1908, of record in the Department of Lands, Forests and Mines; on the west by the Montreal river and the northwesterly boundary of the Gillies Timber Limit; on the north by the south boundary of that portion of the Gillies Timber Limit subdivided and shown on plan of survey by O. L. Surveyors Speight & Van Nostrand, dated July 7, 1909, of record in the Department of Lands, Forests and Mines; on the east by the northeasterly boundary of the Gillies Timber Limit. Said portions being more particularly enumerated and described as follows, that is to say:

"(1) Parcels A56, A59, A60, A61, A65, A66, A67, A68, A69, A70, A71, A72, A73, A74, A75, A76, A77, A78, A79, A80, A81, A82, A86, A87, A94, A98, as shown on plan of survey by O. L. Surveyors C. H. Fullerton, dated November 9th, 1909, containing by admeasurement 567 acres, more or less.

"(2) That portion of blocks 1, 2 and 3 lying south of parcels A80 to A100 inclusive."

THE MINERAL RESOURCES OF BRITISH COLUMBIA

At Rossland, B.C., on July 30, a valedictory banquet was given to Mr. J. S. C. Fraser, who had for 16 years been manager of the local branch of the Bank of Montreal, and was about to leave for Victoria, having been promoted to the responsible position of manager of the bank's branch in the capital of the province. One of the most important toasts of the evening was that of "The Mining and Smelting Industries," proposed by Mr. S. G. Blaylock, of Trail, assistant general manager of the Consolidated Mining and Smelting Company of Canada, Limited, which company owns, among other properties, a large group of mines in Rossland camp, and extensive copper and lead smelting works and a lead refinery at Trail, distant but a few miles from Rossland. Those selected to respond were Messrs. J. L. Warner, who is opening mining property in what is known as the South Belt of the camp; Mr. E. Hibbert, of Greenwood, in Boundary district, superintendent of mines for the British Columbia Copper Company; Mr. E. Jacobs, of Victoria, and one or two others. Only a brief summary of Mr. Warner's speech has been obtained, while no notes are available of Mr. Hibbert's remarks, nor of those made by Mr. Blaylock in proposing the toast. Mr. Jacobs prepared the following information, taking as his chief subject the mineral resources of the Cordilleran range in Canada, but as the hour was late and there were other toasts to follow, only a brief resume of the prepared address was given to the company, which crowded the banquet hall to its utmost capacity. The full address, however, contains information that will probably be read with interest, so it is printed here:

"Mr. Chairman, Mr. Vice-Chairman, Mr. Fraser, and Gentlemen: It is well known that the mineral resources of British Columbia are enormous, though as yet but little developed. I shall leave it to other gentlemen present to speak of the metallurgical side of the mining industry, and shall confine myself briefly to the mining side, or, rather, to our great mineral resources.

"There are many present who remember Mr. Bernard MacDonald, who, years ago was manager of some of Rossland's largest mines. At the 1903 annual meeting of the Canadian Mining Institute that gentleman read a paper on 'Mining Possibilities of the Canadian Rockies.' Now, I think, we may take it for granted that Mr. MacDonald included in his review of the mineral productions of the Rockies the whole series of mountains more correctly known as the Cordilleran series, for that is the region dealt with in Brock and Young's 'Economic Geology of Canada,' when referring to the great area of mountainous country of British Columbia, part of Alberta, and Yukon Territory. I can only give you excerpts of Mr. MacDonald's paper just now, for my time limit is too short to admit of fuller quotation. Mr. MacDonald said: 'The main source of the precious metals mined within the last three and a half centuries has been the Rocky Mountain regions. The portion of these mountains within Mexico will here be referred to as the Mexican Rockies, that within the United States as the American Rockies, and that within Canada as the Canadian Rockies. . . . The scope of mining referred to here is intended to cover the mining and production of the precious metals only.'

"**Production of Mexican and American Rockies.**—After reviewing the history and progress of mining on this continent from its beginning early in the 16th century, shortly after the discovery of America, and giving as an estimate of the coining value of the total production of gold and silver from the Mexican Rockies during 350 years to the end of 1902, an aggregate value of $5,500,000,000, or an average annual production of $15,714,285 during that long period, and an average amount of $3,142,857 for each mile of the 1,750 miles of length of the Mexican Rockies, Mr. MacDonald said, concerning the American Rockies: 'For 300 years after the production of gold and silver had been commenced in the Mexican Rockies, nothing was done toward the systematic exploration of the northerly extension of this chain of mountains, within the territory now occupied by the United States. After the discovery of placer-gold in California in 1849—53 years ago—numerous expeditions of gold-seekers started from the Eastern States and other parts of the world, for California. At this time the intervening plains—then the Great American Desert, now the most fertile country in the world—lay between, swarming with bands of hostile Indians, while beyond these plains towered the snow-clad Rockies, pathless and unknown except to the fierce tribes of Indians who contested the advance of this invasion. These natural obstacles were soon overcome by the determination of the gold-seekers, but when they reached the mines, they knew nothing about mining or metallurgy, and could not even recognize the common ores of gold and silver. In addition to this lack of technical knowledge, the regions were almost inaccessible, for there were no roads nor even trails. Under these conditions progress was at first slow. As years went by, however, mining and metallurgical knowledge was gradually being acquired and crystallized into science, in the hard but efficient school of practical experience. Transportation facilities were provided, mining machinery invented, and the production of the metals grew accordingly. From such a beginning, 53 years ago, the production of gold and silver from the American Rockies increased year by year until it reached a coining value of about $155,000,000 in the year 1902. This amount brings the total production up to $4,500,000,000 for 53 years since the commencement of mining, being an average annual production of nearly $85,000,000 or $3,461,539 for each mile in length of the 1,300 miles of American Rockies. It will thus be seen, that from a country in which the production of the precious metals was practically nil 53 years ago, the United States, in its production of these metals for 1902 has surpassed that of every other country. This has been made possible only by the vigorous exploitation of that inexhaustible source of gold and silver—the Rocky Mountains.'

"**Production of the Canadian Rockies.**—Continuing, Mr. MacDonald said: 'The Rocky mountains, in their northerly course, after passing through the States of Montana, Idaho, and Washington, enter into the Provinces of British Columbia and Alberta, in Canada, and extend northward through these provinces, and the Yukon and Northwest Territories till they pass into Alaska, or terminate on the shores of the Arctic ocean, in the neighbourhood of the mouth of the Mackenzie river. Within Canadian territory, these mountains have an approximate length of 1,600 miles, by an average breadth of 500 to 800 miles, and possess the same general structural features as they do in their southerly extension into American and Mexican territory. For this reason it is fair to assume that, as already indicated, the Rockies in Canada will yield a quantity of the precious metals equal to that produced by them in American or Mexican territory—mile for mile of their length—when equally developed. The production, therefore, that may be expected from the Canadian Rockies in the future may be seen from a study of the following table:

Country	Miles of Rocky Mountains	Average Production per Mile	Total Value of Production
Mexico	1,700	$3,142,857	$5,500,000,000
United States . .	1,300	3,461,538	4,500,000,000
Canada	1,600	103,750	166,000,000

"'In extenuation for the unfavourable contrast shown by the production of the Canadian Rockies in the past, it may be stated that climatic conditions prevailing in these mountains are less favourable than those prevailing in their extension through the countries to the south. While admitting that the climate, to some extent, hinders exploration and production, undue weight should not be given to this factor, for placer-mining operations, which are more seriously affected by cold than lode-mining, being outdoor work, are carried on successfully in the Klondike, which is practically in the Arctic Circle.

"'That the discovery of other mining camps in these mountains, equally as productive as the Klondike, waits only on the chance efforts of individual prospectors, or the systematic exploration of organized companies, cannot be denied, and no one can place a limit on the number of Cripple Creeks, or Klondikes, or Rands that lie hidden away in the recesses of the 1,600 miles of Rocky mountains now practically unexplored in Canadian territory. A comprehensive, systematic exploration extending over years, can only fully answer this. . . . The problem should be attacked systematically by a well-organized corps of prospectors, operating under the direction of trained geologists. Prospecting in this way could be done only by large private corporations, properly financed, or by the Dominion Government. The inefficiency of the desultory efforts of a few prospectors, working on their own account, to dis-

cover the mineral deposits hidden away in so vast a field will be apparent when it is borne in mind that these mountains, averaging 1,600 miles in length by at least 500 miles in breadth, cover an area of more than 800,000 square miles—eight times the total area of England, Ireland and Scotland.'

"**Some British Columbia Figures.**—Now, gentlemen, I have quoted Mr. MacDonald thus freely, for the reason that he was well known to residents of Rossland in past years, and has since been operating in a large way in Mexico. Those of you who care to do so may read much other information along similar lines in the book, 'Economic Geology of Canada,' I have already mentioned. But to come home to the mineral production of our own province—British Columbia has producted to date minerals aggregating in value more than $400,000,000. The total officially recorded was $397,696,000 at the end of 1911, and there is now the value of the production of the expired six months of 1912 to add—probably $14,000,000 or $15,000,000—so that an aggregate of about $412,000,000 has been reached. As indicating the rapid advance in production of the two last ten-year periods, the following comparative figures of value are submitted:

For all years to 1891, inclusive	$78,111,539
For ten years, 1892-1901	94,130,449
For ten years, 1902-1911	225,454,734
Aggregate value of production	$397,696,722

"**Enormous Value of Mineral Resources.**—Just to give a faint idea of the estimated enormous value of the mineral resources of British Columbia, I will direct your attention to two estimates only, which include but a small proportion of the whole of the mineral resources of this province. In the 'Annual Report of the Minister of Mines' for 1902, there is a report by the provincial mineralogist on the Cariboo district, from which this brief excrept has been taken: 'In the Quesnel 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 Company's deposit. (Note by E. J.—The Consolidated Cariboo Company recovered about ten cents a yard from a little more than 10,000,000 cubic yards of gravel.) 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.'

"**As to Coal.**—Mr. D. B. Dowling, one of the chief coal geologists of the Geological Survey of Canada, in a paper on 'The Undeveloped Coal Resources of Canada,' presented at the 1911 annual meeting of the Canadian Mining Institute, gave a table, relative to coal in British Columbia, showing 'coal areas partially examined and for which an estimate of content might be taken as approximate.' That table gave details; the totals are as follows: Area of coal-bearing territory, 1,351 square miles. Estimated coal content: Anthracite, 61,000,000 tons; bituminous, 39,674,000,000 tons; sub-bituminous and lignite, 490,000,000 tons; total, 40,225,000,000 tons. It is well known that large additions to this estimate are looked for as the result of further explorations of country for which quite inadequate estimates have hitherto been made.

"**Rossland's Considerable Production.**—Now, gentlemen, I may not further impose upon your patience by giving you still more figures in support of the view that British Columbia possesses great potentialities for wealth in its vast mineral resources, although only the margin of the ocean of information in this connection has been skirted. You will observe that I have not given particulars of the larger individual mining properties or of the different producing districts, but I feel I may ask your attention, in conclusion, just for a few moments longer while I tell you two or three simple facts that you may not have realized are available for use as evidence of the important position of Rossland camp—or to be quite accurate, Trail Mining division, though there has been little production in the division outside of your camp—in comparison with other mining camps of the province, in two particulars especially. The other day the Rossland Miner published a table showing the tonnage of ore and gross value of metals contained therein produced by Rossland mines during the 18-year period, 1849-1911. The figures our good friend Colonel Egan prepared for the Miner show a total of 3,926,278 tons of ore, having a gross value of $52,657,905. Adding the value of the production for 1912, the Miner's aggregate of $55,000,000 to the end of the current year is, in my opinion, well within the mark. But one of the facts in particular I commend to your use whenever some of your neighbours get to crowing about possessing the 'biggest free-milling gold camp in North America' is that Rossland mines have yielded nearly 60 per cent. of the total lode-gold produced in British Columbia during all years to the end of 1911. Of course I am not speaking of placer-gold, but only of lode-gold. Now, when boasters get the 'big head,' you may give them this gentle reminder—the aggregate quantity of lode-gold produced in this province to the end of 1911, as shown by the 'Annual Report of the Minister of Mines,' is 3,183,353 oz. Of this comparatively large quantity, Rossland mines have produced about 1,886,000 oz. This works out, as already said, at nearly 60 per cent. of the whole. Of course, Rossland's total production of approximately 3,300,000 oz. of silver is small in comparison with that of the Slocan, but in copper your camp has made a showing you may also take pride in, though not to the same extent as in your gold figures. The aggregate production of copper in the province for all years to the end of 1911 is 452,281,365 lbs.; Rossland's proportion of this is approximately 85,000,000 lbs., or well on toward 20 per cent. So you see, gentlemen, you are quite safe in claiming for the mines of your camp—and mainly from the small area occupied by a part of Red Mountain, not, as in the case of other districts from a more or less widely scattered and large area—the very satisfactory percentages I have just told you of. Better still, there is good reason to believe that your mines will continue to make a considerable production for years, for beside the well-founded confidence that Red Mountain mines still contain large reserves of ore that it will pay to mine and smelt, you have brighter prospects in the South Belt than for years past, and good reason to hope for substantial returns from some of the mining properties there. I feel sure that if you could only get behind the reticence of the officials of the Consolidated Mining and Smelting Company, and learn some of their secrets, you would go on in quiet content that Rossland is far

from being the 'dead one' ignorance at times brands it; rather, that it has before it years of productiveness and consequent prosperity.

"I thank you, gentlemen, for your courtesy in listening to my dry figures and other details, and I assure you that I am taking every opportunity open to me to give publicity to the main features and facts contained in what I have said to you here to-night."

THE RATE OF BURNING OF FUSE.

It is important that time fuse should have a uniform rate of burning, and in almost all blasting operations the fuse used is assumed to burn in a regular and uniform manner. When fuse has been subjected to such conditions as to produce acceleration or retardation in its rate of burning it becomes dangerous. Acceleration of the rate of burning increases the liability of a shot going off before the miner has left the face; retardation increases the chnace of the flame in the fuse progressing so slowly that the miner will be injured by a delayed shot when he returns to the working face. All conditions that bring about any marked change in the rate of burning of fuse are dangerous, and from a study of the list of accidents in mines and quarries each year injury and loss of life are seemingly often brought about by such conditions. The question has been recently investigated by Messrs. W. O. Snelling and W. C. Cope, of the staff of the U. S. Bureau of Mines, whose report is eminently informative. The conditions that are believed to be most active in bringing about either a retardation or an acceleration in the rate of burning of time fuse are classified under effects due to: (a) pressure; (b) temperature; (c) moisture; (d) mechanical injury. Under ordinary conditions nearly all types of fuse show great uniformity in their rate of burning. Practically all types of fuse examined by the investigators had a total variation in their rate of burning under normal conditions of less than 20 per cent., and all would have passed under the allowance of "no variation greater than 10 per cent. above or 10 per cent .below the average rate of burning.

Under the influence of pressure practically all types of fuse are subject to wide variation in their rate of burning. Such pressure as can readily be produced by the confinement of the gases evolved by the burning fuse itself is sufficient to increase the normal rate of burning from 92½ seconds per meter (28.2 seconds per foot) to 21 seconds per meter (6.4 seconds per foot). Thus, even confinement will cause fuse to burn from three to four times as rapidly as its normal rate. In experiments made with fuse confined by stemming of various kinds wide variations in the rate of burning were noted, and whenever lengths of fuse are confined by stemming or other materials impervious to gas, a sufficient length of the fuse should be used to allow for the increased rate of burning due to the pressure produced by the evolved gases.

High temperature causes a marked retardation in the rate of burning of fuse, and storage for even a short period of time near boilers, or wherever the temperature may be high, is sufficient either to cause "misfires" or to retard the rate of burning of the fuse so much as to greatly increase the liability to "holdbacks," delay shots, etc. It is probable that many of the difficulties that are sometimes encountered in regard to fuse burning too slowly and causing delayed shots are due, in part at least, to such fuse having been kept in too warm a place. Fuse that is not intended for use in wet places (cotton fuse, etc), does not suffer marked change in its normal rate of burning by reason of the effect of high temperatures, whereas the more completely waterproofed types of fuse show increasingly great effects from heat. Even exposure to comparatively low temperatures for considerable lengths of time causes marked retardation in the rate of burning of such fuse, and exposure to a fairly high temperature for even a short length of time may cause certain types of fuse to burn from three to five times as slowly as their usual rate. To insure the best results, fuse should always be protected from extremes of temperature.

Climatic conditions affect to a considerable extent the rate of burning of the less waterproof types of fuse. Damp fuse burns more slowly than normal fuse, and fuse that has been wet and then thoroughly dried tends to burn at a rather slow rate, and may even cause delayed shots by smouldering for a considerable time. Fuse containing several wrappings of tape saturated with tar or asphalt resists moisture to a considerable extent, and may be used for firing shots under water, provided the fuse is not allowed to remain too long a time in contact with water before the shot is fired.

It is, of course, evident that when these waterproofed types of fuse do become wet, whether through storage for a long time in a damp place or through exposure to water after the protecting layers of asphalt or guttapercha are mechanically abraded or injured in any other way, they are more difficult to dry out than are other types of fuse, and are more liable to burn at a rate slower than the normal rate.

Fuse that has been subjected to actual mechanical injury particularly to hammering or pounding, or the blows of falling rock, etc., has a greatly increased rate of burning, and sometimes burns so rapidly as to be almost instantaneous in its action. The mere bending, coiling, and twisting of fuse, such as would be brought about by forcibly placing within a bore hole a length of fuse considerably greater than the depth of the bore hole, does not produce any marked change in the rate of burning, but pounding or direct abrasion of fuse greatly increases that rate. Fuse that has been injured by severe abrasion or by too great pressure from any cause should not be used in any work where adjustment of the rate of burning is desired.

As a final summary it may be stated that ordinary fuse may under some conditions burn as fast as three seconds per meter (one second per foot), and under other conditions it may burn as slowly as 745 seconds per meter (227 seconds per foot). The former rate is more than 200 times as fast as the latter, and each is widely removed from the normal rate of burning of similar brands of fuse. Hence, the condition and past history of any roll of fuse is an important matter, and in mining and blasting operations the safety of the miner demands that only fuse that has been carefully stored and kept from unfavourable conditions shall be used.

OBITUARY.

The death occurred at Houghton, Mich., on the 6th ultimo, of Capt. William A. Dunn, at the age of 71 years. The deceased was born at Glengarry, Ont., but going to the United States some forty years ago, became prominently identified with the copper industry in the Lake Superior region.

Mr. R. B. Nickerson, a member of the Canadian Mining Institute for many years, and recently manager of the Mikado and Laurentian mines in the Manitou district of Ontario, died in California on the 14th ultimo.

CURRENT TECHNICAL LITERATURE

ORE DRESSING.

Pebbles for Tube-Milling.—Mr. A. W. Allen contributes an article to the Mining Magazine for July on this subject. Gold and silver ores are reground or slimed by means of pebbles or stones; and the highest efficiency is obtained where hardness is combined with toughness in the grinding medium. Water-worn flints, imported from Europe, generally meet the case; but there are numerous instances where the cost is prohibitive and where recourse must be had to a local stone. It may be said that the quality of the stone used for grinding is immaterial as long as it contains metal in remunerative quantities. One point, however, must not be overlooked; the fact that the quality of the stone selected should bear some ratio to the degree of grinding required. A soft stone will chip or fracture to an extent that will make "all sliming" an impossibility. So much stone will require to be added to keep the mill supplied with a normal load of pebbles that the classified under-size will increase on the over-size; and the result will be obvious. There are cases where an ore of the same class as that being milled can be used for re-grinding purposes; but it is doubtful whether this is practicable where the whole of the ore, together with the added stone, has to be reduced to slime in the mill. In the latter case the highest duty can only be obtained by the use of the best grinding medium. For testing stone that may be locally available, the author describes an apparatus employed by Mr. E. J. Lovegrove in rock testing for this purpose. "The testing apparatus consisted of three rotating cast iron cylinders driven by a gas engine through a counter shaft and bevel gearing, enabling three samples to be tested simultaneously. The cylinders are 11-inch internal diameter, with three 1-in. by 1-in. angle iron ribs bolted lengthwise in the inside at equal distances apart and parallel to the axis of rotation." The machines used resemble miniature tube mills with Komata lining. The samples are broken to a 2-in. gauge, numbering about 16 stones, and weighing about 4 pounds. The number of revolutions recorded by the counter is confined to 8,000, and the speed to 20 revolutions a minute. Tests of each class of stone were made under both wet and dry conditions and the percentage of chips and dust produced, as compared with the original weight, was used to estimate a value for the particular stone. As a result of certain tests, quartzites, would seem to hold the premier position. Other experiments made in the United States, indicated that porphyries and porphyrites were in view of their hardness and toughness, superior to all other rocks. It may be stated that an attempt to make use of quartzite for fine grinding at a mine in Ontario proved unsuccessful.

TUNGSTEN.

The Tungsten Mining Industry in New South Wales.—An admirable monograph has been issued by the Geological Survey of New South Wales, by Mr. J. E. Carne, assistant Government Geologist, on the above subject. In addition, however, the report contains much information of a general character and of wide application. In this regard the chapters on the concentration of tungsten ores and on the genesis, and mode of occurrence of tungsten deposits are notably valuable. In dressing the News South Wales practice differs somewhat from the American. Heavy stamps (1,000 to 1,250 lbs.), are employed for crushing. The discharge screens of the stamper boxes are wire-wove, and uniformly 64 holes to the square inch. Concentration is effected with Wilfley, Card, Woodbury, Krupp, and Ferrari's tables, and Frue vanners; concave buddles, and blanket tables or launders. The buddles are dead or stationary; trailing chains or extemporarized brushes are used to form circular riffles, or keep the surface of the sediment even.

Tungsten occurs in New South Wales as scheelite and wolfram, and also in rarer form. The scheelite ore has been proved over an area of approximately four miles in length by two miles in width, though the actual value of the mineralized belt is said to be very patchy. According to one authority numerous veins of scheelite occur in the gneissic granite, and near its contact with the spotted slates of the locality. At times the occurrences appear to be true fissure veins, at others they appear to fill contraction fissures in the granite. Dykes of varying composition and texture at times accompany the scheelite. The reefs, as shown by a study of these dykes, appear to be referable to at least two periods of vein formation, one set originating not long after the consolidation of the upper granite mass, another forming a secretion from a magna producing a later set of dykes. Another writer states that the scheelite occurs in true fissures, both in granite and slate. Dykes of various degrees of basicity (chiefly intermediate) often accompany the reefs. The reefs apparently owe their existence to the action of this dyke series, which cuts alike both the granite porphyry and the diorite of the district. The igneous rocks appear either: (1) To have caused vigorous circulation of water by heating through the older granite porphyry, thereby causing segregation of the contained scheelite; (2) or to have caused a hydrated excretion to be given off by a deeply seated magma, whose earlier differentations resulted in the dyke formations themselves. This hydrated excretion would contain the scheelite.

New Application of Tungsten and Molybdenum.—Prior to their production in ductile form, the two metals tungsten and molybdenum had but two applications each; in steel making, and in electric lamps, the tungsten for filaments, and the molybdenum for filament supports. This last use is even better served by the drawn wires, and the majority of the tungsten lights now made in this country contain drawn filaments.

The tungsten or molybdenum-wound electric furnace has proved both cheaper than and superior to the platinum-wound furnace, both because of higher temperatures and quicker heating. Both metals form good substitutes for platinum, platinum-iridium, or iridium, in various contact-making-and-breaking devices. That this is the case, is the result of the good heat conductivity of the ductile forms of these metals, their relative cheapness allowing the use of comparatively large masses, both of these factors preventing the formation of a heavy non-conducting oxide coating, while under the conditions existing in these contacts the thin oxide coatings are conductors.

In the Rontgen tube tungsten has opened up a new field. Owing to its higher melting point, as compared with platinum, tungsten gives the Rontgen ray operator an indestructible target, upon which the cathode rays may be more closely focused, resulting in sharper definition and shorter exposure.

The use of wrought tungsten for projectiles is being carefully considered. Its high specific gravity, 19.3, as compared with lead, appears to give it the theoretical advantages of a flatter trajectory and longer range. Its hardness and high tensile strength should give it high penetrating power. Its high melting point will prevent fusion due to the heat from the charge and consequent erratic flight. Against this, however, is the possibility that the smaller tungsten bullet of the same weight as a copper-nickel-jacketed lead one will possess in an aggravated degree the disadvantage of the latter —unless it hits a man in a vital spot it doesn't stop him.

COAL.

Miner's Electric Lamp.—There is a growing tendency to employ portable electric lamps for underground work in collieries in Great Britain, and a number of new types are being placed on the market. One of the latest is of the accumulator type, and provision has been taken against danger from accidental sparking of short-circuiting. The two cells are connected by a fusible wire which melts immediately when the two poles are connected by a short circuit, and so prevents the possibility of a fire from this source. The fusible wire is completely covered and protected from acid. In the terminals the conducting wire is brought into direct contact with the lead lug of the plates, and held firmly against it by the screw stopper. The socket into which the screw stopper fits forms a complete protection of this junction, and the spot where connection and disconnection is made, and where consequently sparking may occur, is completely enclosed. The stopper may be used to switch the current off or on, and may also be removed for changing batteries in any mine with safety. The lamp itself is constructed to focus about half of the light to illuminate objects at a considerable distance, and diffuse the other half over a wide area for nearer objects.

Gold in Coal.—Mining Science states that an interesting feature about the coal mined at Cambria, Wyo., U.S.A., is that it is claimed to be gold-bearing. Some of the coal has contained as much as $2 per ton in gold, and the coal was sold for only $1.50 per ton. When coke made at Cambria was selling for $3.50 per ton, samples were taken from 31 cars during a period of three weeks and assayed. The samples showed an average of $1.50 per ton in gold and 0.25c. in silver. The explanation offered for the presence of gold in this coal is that the sands which submerged the old peat bog and now form the roof of the coal bed were derived in part from gold-bearing alluvium. While the sand was being deposited the gold worked down into the underlying bog, and is now found in the coal.

GOLD.

The Domes of Nova Scotia.—Replying to a comment on his paper, "The Domes of Nova Scotia," recently contributed by Mr. T. R. Rickard to the Institution of Mining and Metallurgy and to the Canadian Mining Institute, the author states: "It has been assumed by earlier investigators that the granite was extruded after the gold veins had been formed, and that the enrichment of the quartz bears no relation to the existence of the granite. At Forest Hill, near the Strathcona mine, a narrow apophysis or thread-like protrusion of granite is seen (along the surface of the ground), between the bedding planes of the slate. It is bordered by small veins of quartz, apparently intermittent, but actually continuous, although dwindling in places from a maximum of 2½ inches to a mere thread. This quartz shows mica, while the granite is quartzified, so that they tend to resemble each other; in some spots it is difficult to differentiate, at others the distinction is readily obvious.....The quartz extends into the granite in places and is evidently of later origin. Other structural conditions also indicate that the quartz was formed after the granite, for the evidence does not favour the idea that the granite penetrated pre-existing quartz and split a small vein so as to divide it equally. The order of formation obviously was: slate, granite, quartz, gold. Thus the precipitation of the gold was probably a sequel to the thermal activity that ensued upon the irruption of the granite. Eleswhere in the vicinity the granite contains quartz identical in appearance with that of the bordering veins, and this quartz in the granite exhibits a tendency to form a connected series of impregnations such as would constitute a vein. According to J. C. McDonald, of Forest Hill, a vein 5 ft. wide containing chalcopyrite and mispickel traverses the granite at County Harbour.

SILVER-LEAD.

East Kootenay, British Columbia.—The June number of Economic Geology contains an article by Mr. S. F Schofield of very considerable interest at the present time, in view of the developments now taking place in this section of British Columbia. It discusses the origin of the silver-lead deposits of East Kootenay, but refers more particularly to those of the Sullivan Mine at Marysville, and of the St. Eugene Mine at Moyie. It is common knowledge that the latter is rapidly approaching exhaustion, if not exhausted; on the other hand, the Sullivan, under the management of the present owners, has within the last year or so assumed a more important position among the productive silver-lead mines of British Columbia than at any previous time in its history. This is shown in the statement that the mines' total output from 1894 to June 30, 1911, represented 126,175 tons, containing 1,040,369 ounces of silver and 52,840,751 pounds of lead, with a total gross value of $2,566,449. While for the year only, ending June 30, 1911, the production was 34,065 tons of crude ore, containing 258,375 ounces of silver and 14,187,354 pounds of lead, having a total gross value of $635,223, or practically 25 per cent. of the total production covering a period of fifteen years. After describing the geological relations, the author states that the ore-body of Sullivan is a conformable replacement of fine-grained argillaceous quartzites by fine-grained galena zinc blende and iron sulphides. The gangue minerals are often in idiomorphic crystals and free from sulphides. Also, the small cracks in the gangue minerals are filled with a mixture of pyrite pyrroholite, zinc blende and galena. It is, therefore, concluded that the gangue minerals have priority in formation. The passage for the ore solution which formed the Sullivan deposit is believed to be the well-defined bedding planes of the quartzitic strata. From several such channels the solutions replaced the country rock within their sphere of influence. The deposit of the St. Eugene, which yielded to June 30, 1911, silver-lead to the gross value of over ten million dollars, occurs in a zone of fissuring which cuts across the axis of a northern plunging anticline composed of argillaceous quartzites. The ore-bodies are replacement deposits in the heavy-bedded purer quartzites and are restricted to the fractured area between the two main fissures. The ore consists mainly of coarse-grained galena with zinc blende, pyrite, pyrrhotite, magnetite and chalcopyrite

in subordinate quantity. Magnetite was the first mineral deposited, and was followed by the gangue minerals. The presence of the diagnostic minerals, garnet, diopside, actinolite and muscovite, which are entirely restricted to the ore deposit and absent from the surrounding quartzites, suggests that the deposition of the ore took place in the deeper vein zone under conditions of temperature and pressure, comparable to those of contact metamorphic deposits. Comparison is made between these deposits with those of the Coeur d'Alenes, by which the genetic relationships are still more clearly established.

RUSTING OF IRON.

Influence of Painting on the Rusting of Iron.—It is a general belief that good painting will afford an efficient protection against rusting, provided the paint be itself non-corrosive, uniform, impermeable to moisture, and non-porous; but, according to a statement published by Messrs. Erik Liebreich and Fitz Spitzer, of Berlin, one coat of paint or varnish may protect iron, but the application of several coats will actually promote rusting. This pronouncement is made after intensive experimentation. Potential differences were observed between iron wires coated with paint (consisting of linseed oil and sane oxide) and the bare iron wire, when both wires were dipped into salt solution. In a paper read before the Schiffbontechnische Gesellschaft in 1905, Ragg had already demonstrated that all paints show a potential difference against iron.

PERSONAL AND GENERAL

Mr. L. E. Ives has resigned as an associate editor of the Engineering and Mining Journal, to become mining and assistant engineer editor of the Iron Trade Review.

Mr. H. E. Jones, a mining engineer recently in charge of mines in Rhodesia, visited the Cobalt and Porcupine districts last week.

A general committee representing the engineering societies of the British Empire and of the United States of America has been formed to carry into effect a proposal for the erection in Westminster Abbey of a memorial window to the late Lord Kelvin, and contributions to the fund are invited. The Canadian members of the committee are Messrs. W. F. Tye, H. Holgate, H. H. Vaughan, and C. H. McLeod.

Mr. F. G. Stevens, mining engineer, Kingston, Ont., was in Toronto on business on August 1.

Mr. W. E. H. Carter, of Carter & Smith, mining engineers, Toronto, is on a lengthy professional tour of North-western Alberta.

Messrs. J. B. and K. D. Woodworth, of the O'Brien mine, Miller Lake, are accredited with the honour of being the first to journey to Elk Lake by triumphal motor car, the road being now sufficiently passable for slow driving. Except for an encounter with a large black bear, an experience, alarming alike, it is said, to the occupants of the car and to the animal, the journey was without incident.

Mr. Ivan Delashmutt has succeeded Mr. W. Leete as superintendent of the Hobson Silver-Lead Company, at Ymir, B. C.

Mr. J. J. Drummond, when in St. John, N. B., recently, stated that the conditions were such as to indicate that a modern steel works would be established at Courtney Bay in the near future.

Mr. Thomas Graham, chief mine inspector of British Columbia, recently returned to Victoria from attending the annual convention of the United States' Mine Inspectors' Institute, held in Columbus, Ohio.

It is a matter of congratulation that the Porcupine camp will not lose Mr. C. H. Poirier as a resident (as has been reported) at least until September. He may then resume general consulting work in New York, where he has always retained an office. In that event he will be retained by the Porcupine Gold Mines in a consulting capacity.

After opening the recording office at Porcupine and remaining in the camp for two years and seven months, Mr. E. D. Bruce has resigned that position to accept a post under Mr. J. F. Whitson, commissioner of colonization in Northern Ontario. Mr. Bruce has ever earned a title for impartiality and efficiency in his position, which make his resignation appear a great loss to the Porcupine district.

Mr. R. B. Watson, general manager, and Mr. Hugh Parks, superintendent of the Nipissing mines, have returned to Cobalt from Appleton, Wis.

Mr. A. W. Anderson, a member of the Hollinger mine's staff, at Porcupine has undergone an operation for appendicitis.

Mr. Charles Fergie returned to Montreal on August 5th from Lethbridge and left a week later for Halifax to spend a brief holiday.

Mr Fraser Reid, mill superintendent at the Coniagas mines, Cobalt, has gone to Fort Wayne, Ind., on a short visit.

Mr. Charles N. Henrotin has resigned the superintendency of the underground work at the Dome mine, Porcupine, to assume new duties at Copper Cliff.

Dr. W. G. Miller, Mr. R. W. Brock, Mr. R. G. Brigstoke and Mr. T. Denis were in Montreal on August 2nd in order to be present at a special meeting of the Council of the Canadian Mining Institute, held on that date.

Mr. R. O. Sweezey, of Quebec, recently visited the Harricana district. He states that the gold so far discovered there occurs in very small veins, but that nevertheless the indications in the district are not unpromising.

Mr. Kirby Thomas, consulting mining engineer of New York, is visiting nickel properties in the Sudbury district.

Mr. P. A. Robbins, manager of the Hollinger mines, was in Montreal last week.

Dr. R. A. Daly is leaving the Massachusetts Institute of Technology to occupy the Chair of Geology at Harvard.

Sir William Meredith, appointed a Commissioner by the Ontario Government to take evidence and otherwise secure information preliminary to the framing of Provincial Workmen's Compensation Act, leaves shortly for England to study the operation of the British law in this respect. He expects to complete his report upon his return to Toronto later in the year, and a bill will probably be introduced to the Legislature at its next session.

Mr. Elias Rogers, president of the Crow's Nest Pass Coal Company, when in Victoria recently, stated in a press interview that he feared the effect of the use of oil as fuel on locomotives would be serious so far, at any rate, as it concerned the collieries in the Crow's Nest. Already, he said, there was evidenced a noticeable decrease in the demand for coal, amounting to 1,200 tons a day, from his own company. On the other hand, the demand for coke for metallurgical purposes is steadily maintained, while with the activity now prevailing in the Kootenays, this demand is likely to steadily increase.

Mr. J. B. Cleveland, formerly manager of the West Dome mine, at Porcupine, is now manager of the Hudson Bay-Porcupine.

Mr. G. J. Kapteyn has removed from Swastika to New Year, Montana.

Dr. E. M. Kindle, of Washington ,D.C., has been appointed to the office of invetebrate paleontologist on the staff of the Canadian Geological Survey.

Mr. A. E. Hall, of the staff of the Dome mine, Porcupine, is in New York.

Mr. Arthur A. Cole, mining engineer for the Temiskaming and Northern Ontario Railway Commission, was in Montreal in the last week of July on official business.

Mr. O. E. LeRoy is in the Boundary district, B.C.

Mr. T. Walter Beam, of Denver, Colorado, was in Nelson mining division, British Columbia, during July.

Mr. W. M. Brewer, of Victoria, B.C., has been in San Francisco, lately, whence he has taken to Alaska a two-stamp mill.

Mr. D. J. Browne, of Rossland, has taken charge, in the capacity of acting superintendent, of the Van Roi Mining Company's silver-lead mine, situated near Silverton, Slocan Lake, B.C.

Mons. J. J. Fleutot, of Paris, France, has been in British Columbia lately, in connection with some mining investments in that province, of himself and associates.

Mons. A. Fournier, of Kaslo, has been appointed liquidator of the Selkirk Mining Company, which several years ago acquired the Cork mine and concentrating mill, on the south fork of Kaslo creek, and for some time operated them.

Mr. Thomas Graham, chief inspector of mines for British Columbia, has returned to Victoria from visiting the testing station of the United States Bureau of Mines, Pittsburgh, Pennsylvania, and some representative coal mines in Illinois, following attendance at annual convention of American Mine Inspectors, held in Columbus, Ohio, a few weeks ago.

Mr. F. C. Greene, general manager for the Graham Island (British Columbia) Coal and Timber Syndicate, which has been boring for coal on Graham Island of the Queen Charlotte group, was down from the north in July, and spent some time in the Coast cities.

Mr. J. Cleveland Haas left Spokane, Washington, late in July, on a visit to mining property in California.

Mr. E. Jacobs, of Victoria, B.C., has been spending six or seven weeks in the Boundary and Kootenay districts of British Columbia. At the end of July he attended, as an invited guest, the meeting of the Spokane section of the American Institute of Mining Engineers, held at Republic, Washington.

Mr. F. C. Languth is in charge of the Motherlode Sheep Creek Mining Company's 10-stamp mill and cyanide plant which in June commenced operations in Sheep Creek camp, Nelson mining division, British Columbia.

Mr. Douglas Lay, superintendent of the Van Roi Mining Company's mine and mill in Slocan district, B.C., has gone to England, with his wife and child, on a three months' holiday visit.

Mr. O. E. LeRoy was in the Boundary district of British Columbia in the last week of July, in connection with the preliminary work of arranging for the visit to that district next year of delegates to the International Geological Congress, Toronto.

Mr. David Little, formerly in charge of the Second Relief mine and stamp-mill at Erie, Nelson mining division, B.C., went to Republic camp at the end of July to look into conditions there.

Mr. David W. Moore, for years ore-buyer for the smelting works at Trail, B.C., but afterward resident in Victoria, died on July 13 at Revelstoke, when in that district, in connection with the work of obtaining information, relative to the mineral and timber resources of the Big Bend of the Columbia country, he had undertaken for the provincial government.

Mr. A. R. Nickels, a graduate of the "Boston Tech." has gone to Greenwood, B.C., as assistant to the superintendent of the British Columbia Copper Company's smeltery.

Mr. Sidney Norman, who about ten or twelve years ago was operating in the Slocan district of British Columbia, and afterwards was connected with the American Mining Review, Los Angeles, California, now has his headquarters in Spokane, Washington.

Dr. Heinrich Ries, of Cornell University, has been on the Coast of British Columbia lately, continuing his investigations relative to the clays and clay deposits of western Canada, for the Canada Department of Mines.

Mr. Ernest Waterman ,of Princeton, Similkameen, B.C., general manager of the Princeton Coal and Land Company, was in Spokane, Wash., and West Kootenay, B.C., on a business trip, in July.

Mr. H. E. T. Haultain and Mr. Geo. A. Guess have formed a partnership and have opened an office with the firm name of Guess and Haultain, mining and metallurgical engineers, 306 Stair Building, Toronto. Both Mr. Haultain and Mr. Guess are too well-known to our readers to require further introduction.

Mr. Sydney Smith, of Haileybury, Ont., has gone to Juneau, Alaska, where he will probably reside for some time.

Mr. J. D. Kendall, consulting mining engineer, of London, England, is visiting his son, Mr. Cosmo Kendall, who is in charge of the Bell graphite mine at Buckingham, Que.

The Jeffrey Mfg. Co. have moved their Chicago headquarters and offices from the Fisher Bldg. to the McCormick Bldg., which is considered the most modern and up-to-date fireproof office building in Chicago.

Mr. S. S. Shive, sales engineer, is the district manager in charge of the Chicago office, and Jeffrey customers and friends will find a welcome on the 17th floor where the Jeffrey offices are located.

The Jeffrey Mfg. Co. maintains fourteen branch offices in the United States and over one hundred agents in the leading commercial centres all over the world.

ALASKA COAL AND THE PACIFIC COAST FUEL SUPPLY.

In a paper read recently before the Association of American Geographers, on the subject of "Geography in the Development of Alaskan Coal," Mr. Alfred H. Brooks, chief of the Alaska division of the United States Geological Survey, presented certain information respecting the coal resources of Alaska that may well be taken into account in the consideration of the fuel industry of the Pacific Coast, by which of course, is included British Columbia. At present as is well known a very considerable proportion of the production of the Vancouver Island collieries is marketed in Puget Sound, and although, in recent years, oil has in a large degree replaced coal for all purposes other than domestic in San Francisco, once the principal market for the coals of Vancouver Island, there is still a considerable exportation to that and other industrial centres on the American seaboard. Heretofore there has been no western competition, but coal from so far distant as Australia has been sold at competitive rates in San Francisco with the British Columbia product.

Mr Brooks estimates, meanwhile, that Alaska contains 150,000 million tons of coal, or about 4½ per cent. of the total estimated tonnage of the United States, or about a third more than the original coal supply of Pennsylvania. Much of this, however, is low grade and the whole very widely distributed. Hence to afford a more precise means of guaging the economic importance of these resources, he divides the coal fields into three economic provinces based on geography. The first is the Pacific slope, which comprises the mountainous area drained to the Pacific ocean. This province as a whole is readily accessible and its resources may be considered an asset of the present generation. It contains about 40 per cent. of the known coal resources of Alaska. Some of this coal is of grade and favourably situated for export. The coal of the second province is shown to have value only as a local population and industries develop; while that of the third province namely the Arctic slope, will not be drawn upon until that future time when the more accessible coals of the world approach exhaustion.

The estimated reserves of the Pacific slope fields are placed at 60,000 million tons, much of which can be made readily available by the construction of railways. The position of these coals relative to transportation is favourable. There are large quantities of lignitic, with some sub-bituminous coals, which are on or close to tidewater. The fields of high grade coals can be reached from open ports on the Pacific by railways from 30 to 200 miles in length. From the coastal terminals of these railways to Puget Sound ports the distance is about 1,200 to 1,400 miles and about 2,000 miles to San Francisco. The coals, it is argued, are, therefore available for the use of the Pacific Coast States, whose five million people are the natural customers for that surplus of high grade coal which cannot be locally consumed, yet must be mined to warrant the establishment of the mining industry on a profitable scale. In other words, as Alaska now uses only about 100,000 tons of coal annually, an export trade must be established to warrant the large investments needed to develop the coal fields.

DETERIORATION OF COAL IN STORAGE.

The United States Bureau of Mines has issued a preliminary report on the deterioration and spontaneous heating of coal in storage. In view of the very general opinion that the heat units in the volatile part of coal are lost by the storage of coal under conditions where it is exposed to the atmosphere for any length of time, the result of tests made by this bureau are interesting, as to a large degree disproving this theory. The coal tester was in 20 lb. samples and represented a variety of types from widely separated fields. Each sample had been broken in the mine to fragments, each of about half an inch, and these were at once placed in glass bottles for consignment to the laboratory. At the laboratory the accumulated gas was withdrawn and the volatile products were permitted to escape at atmospheric pressure and temperature. Although several coals evolve methane in large volumes, especially in the early period after mining, the coals tested lost in one year from this cause only 0.16 per cent. at most of their calorific value. More elaborate tests were undertaken at the instance of the U. S. Navy Department, to determine the total loss possible in high-grade coal by weathering; and the extent of the saving to be accomplished by water submergence as compared with open-air storage, as well as to ascertain whether salt water possessed any peculiar advantage or disadvantage over fresh water for this purpose. The result of these tests showed that certain coals suffered practically no loss of calorific value after a year's exposure. others, however, notably a sub-bituminous coal from Wyoming, deteriorated in heat value 5.3 per cent. during storage for two and three-quarter years, and more than 2.5 per cent. in the first three months. But this was an extreme case. It was found that storage under water unquestionably preserves the heating value and the physical strength of coal, fresh or salt water serving equally well. But such storage practically makes necessary the firing of wet coal, and consequently the evaporation in the furnace of added moisture varying in amount from 1 to 15 per cent., according to the class of coal. Submerged storage is an absolute preventive of spontaneous combustion, and on that account alone it may be justified when the coal is particularly dangerous to store and when large quantities are to be stored; but unless the storage period is to be longer than a year, there seems to be no ground for storing coal under water merely for the sake of the saving in calorific value to be obtained by the avoidance of weathering.

The report, however, proceeds to state that losses of value from spontaneous heating are a much more serious matter than the deterioration of coal at ordinary temperatures. Thus oxidation proceeds more rapidly as the temperature rises. When the storage conditions are such as to allow warming of the coal to a temperature of about 100 C., the rate of oxidation becomes so great that the heat developed in a given time ordinarily exceeds the heat dissipated, and the temperature rises until, if the air supply is adequate, the coal takes fire. Spontaneous combustion is brought about by slow oxidation in an air supply sufficient to support oxidation, but insufficient to carry away all the heat formed. The area of surface exposed to oxidation by a given mass of any one coal determines largely the amount of oxidation that takes place in the mass; it depends on the size of the particles and increases rapidly as the fineness approaches dust. Ideal conditions for such heating are offered by a mixture of lump and fine coal, such as run-of-mine with a large percentage of dust, piled so that a small supply of air is admitted to the interior of the pile.

The following suggestions are offered on storing coal:

1. Do not pile over 12 feet deep, nor so that any point

in the interior of the pile will be over 10 feet from an air-cooled surface.

2. If possible, store only screened lump coal.

3. Keep out dust as much as possible; to this end reduce handling to a minimum.

4. Pile so that lump and fine are distributed as evenly as possible; not, as is often done, allowing lumps to roll down from the peak and form air passages at the bottom of the pile.

5. Re-handle and screen after two months, if practicable.

6. Do not store near external sources of heat, even though the heat transmitted be moderate.

7. Allow six weeks' "seasoning" after mining and before storing.

8. Avoid alternate wetting and drying.

9. Avoid admission of air to the interior of the pile through interstices around foreign objects, such as timbers or irregular brickwork, or through porous bottoms, such as coarse cinders.

10. Do not try to ventilate by pipes, or more harm may be done than good.

CANADIAN MINING INSTITUTE.

At a special meeting of the Council of the Institute held on the 2nd inst., the following new members and associates were elected: Mr. G. H. F. Adams, Hollinger Gold Mines, Timmins, Ont.; Mr. Philip E. Billinghurst, 1236 Howe st., Vancouver, B.C.; Mr. H. E. Cawley, Cobalt, Ont.; Mr. J. D. Fraser, Atikokan Iron Co., Port Arthur, Ont.; Mr. Russel R. Grant, 961 Gerrard street east, Toronto; Mr. Winthrop K. Harding, 207 Somerset Building, Wininpeg; Mr. Wm. B. Hargraves, Schumacher, Ont.; Mr. Charles M. Henrotin, Dome Mines, South Porcupine, Ont.; Mr. P. S. Hopkins, Schumacher, Ont.; Mr. George E. Leighton, Montreal, Que.; Mr. Robert Livermore, Kerr Lake Mine, Cobalt, Ont.; Mr. Alexander Mackay, 18 Meadow Road, Pinnes, Middlesex, Eng.; Mr. Richard S. McCaffery, University of Idaho, Moscow, Idaho; Mr. Thos. Morrison, Bancroft, Ont.; Mr. Noble W. Pirrie, 152 Trounce Alley, Vancouver, B.C.; Mr. J. R. Rutherford, Hollinger Gold Mines, Timmins, Ont.; Mr. A. L. Sharp, Garson Mine, near Sudbury, Ont.; Mr. N. M. Yuile, Diamond Flint Glass Co., Montreal. Associates: Dr. H. M. McNeill, South Porcupine, Ont.; Mr. Wm. H. Merrill, 27 Maitland st., Toronto, Ont.

INDUSTRIAL NOTES.

The Canadian Car and Foundry Company, Limited, has distributed the tenth quarterly dividend of 1¾ per cent. on the preference shares.

The cement works of the Keystone Portland Cement Company at Blairmore are nearing completion, and manufacturing, it is expected, will commence in the course of the next few months. Already orders have been booked ahead for a year's output, or over 300,000 barrels.

Mr. J. D. McDonald, general superintendent of the West Kootenay Power & Light Company, is reported as stating that in anticipation of the electrification of the Canadian Pacific Railway's line between Rossland and Castlegar next year, it is proposed to at once increase the capacity of the Power Company's plant at Bonnington Falls.

MINING ACCIDENTS IN QUEBEC IN 1911.

Mr. J. H. Valiquette in his report to the Quebec Department of Mines on mining accidents in the province during 1911, notes that the number of men employed in the industry was 7,846, of which 3,686 were employed in metalliferous (including asbestos and mica) mines, and 4,160 in quarries, clay-pits and brickyards. As compared with the returns for 1910, the fatalities in 1911, of which four are recorded, show a decrease. Of the fatal accidents, three occurred in asbestos mines and one in a stone quarry. The percentage of fatal accidents in mines is therefore 0.077; and in stone quarries and clay pits, 0.024.

Mr. Valiquette states that there has been a marked improvement in the methods of handling, using, and storing explosives, although attention is directed to carelessness in certain directions. Thus the methods of blasting in the asbestos mines is criticized on the grounds that the shot-lighters fire the holes after the morning shift without giving the miners sufficient time to get away. It is therefore advised that blasting be delayed for fifteen minutes after the end of the shift, and to ensure against misfires that an inspection of the holes be regularly made at not less that three-quarters of an hour after the shots have been fired.

THE CLAY AND SHALE DEPOSITS OF THE WESTERN PROVINCES.

The preliminary report of Messrs. Heinrich Ries and Joseph Keele on the clay and shale deposits of the Western Provinces, has just been issued by the Geological Survey of Canada as Memoir No. 24-E. It is a work of considerably over two hundred pages, profusely illustrated with photographs, maps and diagrams and is a valuable addition to the literature of the economic resources of the Dominion. The author's note that the results of their investigations, even though not detailed, have shown that the Western Provinces contain a wide variety of clays and shales adapted to the manufacture of firebrick, coke-oven brick, sewer pipe, fireproofing, paving brick, pressed and common brick, and drain tile. Many of these deposits, it is added, still remain undeveloped, but it is hoped that the present report will be the means of calling attention to them and of leading to their utilization. In this connection, it may be mentioned in passing that Dr. Heinrich Ries is admittedly the leading geological authority in America on clay deposits, and the survey is to be congratulated on having secured his services for the work in question.

The report is divided into ten chapters, of which the first six are devoted to descriptions of the clay and shale deposits inspected in the Provinces of Manitoba, Saskatchewan, Alberta, and British Columbia. Chapter VII deals with the clay-working industry, chapters VIII and IX with methods of testing clay and tests of brick; and chapter X with the origin and nature of clay. This last chapter is intended to serve as a guide to those who have no technical knowledge of the subject and is a most useful addition to the report.

Mr. C. A. Stewart, writing in the Mining and Scientific Press, calls attention to the resumption of operations in the South Belt at Rossland, and suggests that experience in the older mines of the district should be considered by those engaged in developing claims in this section. Exploration should, therefore, be undertaken with the expectation that lean stringers and bon-

anzas will alternate here as in the north; in fact, the value of the ore may be even more irregular than in the older mines, for the composition of the quartzite will vary from bed to bed, and may have an influence on the width and richness of the veins. The South Belt properties are about two miles south of the present producing mines, and include both prospects long idle and newly discovered croppings. They differ from the veins north of the town in having quartzite for wall-rock in several instances, and in containing galena with high silver content. These occurrences Mr. Stewart remarks present two geological problems : (1) The explanation of the presence of the galena, which is so much more abundant here than in the north, and (2) the probable effect of the quartzite on the permanence of the veins. He is not, he states, inclined to regard the galena as the result of any form of surface alteration, nor does he believe that its occurrence will be directly related to depth.

NATIONAL WASTE IN MINING.

At the annual meeting of the Royal Society of Queensland, the president, Mr. J. B. Henderson, Government analyst, took as the subject of his address that of "National Waste." In respect to waste in mining, he remarked that the history of many mining companies is a succession of managers, each of whom points out that his predecessor knew nothing of his business and straightway proceeds to demonstrate that he also does not know how to solve the problems. And so we have the capital that should have been applied to making the mine a wealth-producing business squandered in useless and often absurd methods. This statement although referable to Australasian conditions would apply with equal truth to conditions in other countries, of which Canada is no exception. Again, lying in many places over Australia, including Queensland, are huge heaps of ore residues, all waste products. They represent a very considerable monetary value, but for lack of a little knowledge—knowledge of a process by which these values should be economically extracted, these residues are at present waste. An example is given in the case of the Mount Morgan works, where over 600 tons of sulphuric acid is daily dissipated. This enormous sulphur loss, the speaker stated, is much more marked in America than it is in Australia, but the problem of its utilization is receiving close attention in the former. The waste in coal mining was also the subject of comment. First of all, with present mining methods, about one-third of the coal is left in the seams and can never be recovered. Of what is extracted that used in producing power by steam is mostly wasted—some of the waste being inherent to the methods, much of it due to unsuitable boiler construction, dirty tubes and plates and bad firing. It has been estimated that of the energy actually obtainable from the original coal in a coal seam less than ten per cent. is utilized by steam engines. With coal used for domestic purposes, probably less than 1 per cent. of the original energy of the coal seam is utilized. As a means of effecting a huge saving in this wasteful method of producing energy, the speaker advocated the establishment of large power stations in coal mining centres, where practicable, for the generation of electrical energy from waste coal and from waste gases from coke ovens. Electrical power generated on a large scale from such waste fuel would, it is estimated, be produced at a cost not exceeding 8 cents per unit; while the by-products from the distillation of the coal would also yield a return in ammonia, phenols, etc.

The time is unquestionably approaching when the titaniferous ores of both Quebec and Ontario will be marketable. Much experimenting with various alloys of steel has, of late, been carried on by rolling mill operators to produce a rail that will give more satisfactory service than the ordinary rail now in use. One of the principal metals used in these experiments is titanium, from which the best possible results have been obtained. In the United States last year over 250,000 long tons of rails were rolled from steel in which ferro-titanium had been added, and certain steel makers are now advertising titanium steel, which, it is claimed, is markedly superior in quality, especially as regards hardness, to high grade steels in which this alloy is not incorporated. So far as we are aware machinery manufacturers have not as yet experimented in this direction; but it would certainly appear that for machinery, subject to specially hard usage and wear, such, for example, as crushers, the employment of titanium-steel in the manufacture of parts, at least, would be decidedly advantageous.

The July issue of the American Mining Congress' Monthly Bulletin contains the text of a statement that has been sent to every United States senator, urging that the scope of the work of the United States Bureau of Mines be extended to include "the metal mines of the public land states." The circular intimates that the organization of mine safety work in the metal mining districts has not been entered upon, and is greatly needed, for "the loss of life in these districts is almost as great as in the coal mines." It is further pointed out that there has been a considerable decrease in the production of precious metals, from the Western States, and notably Colorado, in the last five years; and submitted that a solution of the problem of the economical treatment of low grade ores is the one method through which this great fundamental industry can be revived; that this problem is too formidable for private enterprise, and that when improvements are discovered by private effort the results are not made public. On these grounds the assistance of government is sought to engage in concentration experiments. To clinch the argument a comparison is made of conditions in the United States and those of Canada to indicate the relatively greater interest taken by the Canadian Government in the welfare of the mining industry. Thus it is shown that while the mineral production of the United States is nearly thirteen times that of Canada, the appropriation for mining and geological investigation in the United States, averaging about $18,000 per million population, is not quite three times that of Canada, whose appropriation in this regard represents about $88,000 per million population. To many, no doubt, this statement will come as a revelation. We have more to be thankful for than we knew.

It is claimed that the temporary reduction in cement duties has had the desired result of relieving the market situation, especially in the west. During June of this year the importations of cement represented 171,395. as compared with 55,646 barrels imported in June ,1910. The increase in importations in this month was, therefore, 115,750 barrels, or 208 per cent. Of this quantity, 107,000 barrels were imported by the Western provinces. It is stated, moreover, that Canadian manufacturers are more than maintaining the rate of production. Conse-

quently the measures taken by the Government would appear to have had a certain beneficial and no injurious effect as regards industrial conditions.

It is announced that arrangements have been made to extend the White Horse Pass and Yukon Railway, a distance of a hundred and twenty miles, from White Horse to Yukon Crossing, to open up the Tantalus coal fields. This may have an important effect in leading to the establishment of a smelting industry at White Horse, the copper ores from which district are at present consigned several hundred miles to the smelter at Tacoma, Washington, for treatment. Provided suitable fuel could be delivered at White Horse at a reasonable cost the main difficulty in the way of the local reduction of the White Horse ores would be removed. The Tantalus coals yield according to laboratory tests, a firm coherent coke, although somewhat high in ash.

The report of the Cape Asbestos Company for the year 1911 indicates that asbestos undertakings elsewhere than in Canada were affected last year by unsatisfactory industrial or rather market conditions, although perhaps to a less serious degree. The Cape Company was at least able to pay a dividend of 5 per cent. on its preference shares and to place a considerable sum to the credit of its reserve fund,—a very much better showing than was made by the majority of the Canadian concerns. The company has, meanwhile, established a new factory in Italy, and its future prospects would appear to be promising.

COMPANY NOTES.

International Nickel Company.—The report of this company for the year ending March 31st, shows net earnings of $5,019,703 by the constituent companies, and other income, $69,263. After deducting expenses and depreciation, there was available for dividends $3,581,960. A distribution was made of 6 per cent. on the preferred shares and 18 per cent. on the common, the sum of $903,799 being placed to reserve, which now represents $3,938,093.

QUEBEC NOTE.

It is reported that the Dominion Graphite Company at Buckingham, Que., has gone into liquidation. It is hoped, however, that the financial difficulties will be shortly overcome and that the company will be re-organized on a new basis.

SPECIAL CORRESPONDENCE

ONTARIO

COBALT, SOUTH LORRIAN

THE LIMIT.—The Ontario Government has thrown open 4,000 acres of the Gillies timber limit to prospectors. Ever since the first prospectors streamed into Cobalt in 1904, the limit has lain virgin and undisturbed in the very centre of the mining vortex. To the northwest of it is Coleman, the richest silver township on the continent; to the east is Lorrain township, at one time overrun with treasure seekers; to the south, South Lorrain. For years the limit was regarded as pregnant of possibilities as Alladin found the Cave of the Forty Thieves to be. There was not a Cobalt prospector that had not his fabulously rich vein covered up until such time as the limit should be thrown open, and if anything can revive the sinking industry of the prospector in Northern Ontario it will be this throwing open of the Gillies Limit.

In 1909, when the fervor of silver seeking had deserted Coleman for the Montreal River and Gowganda the Ontario Government held a sale of lots. The prices were very low at the first auction and but few of the twenty acre lots were sold. Two of the purchasers were J. H. Waldman, of Montreal, and a syndicate of Montreal business men, prominent among whom was Mr. Milton Hersey, of Montreal. Waldman found a most spectacular vein of silver on his property, and it was traced across the line on to what was afterwards known as the Wyandoh mine.

Waiting until the fame of these discoveries had time to spread, the Government held another sale and the lots went at bargain counter prices. The highest price paid for twenty acres was $35,000 by a Montreal syndicate, of which Mr. W. A. Fraser was a member, and there were many lots sold for over $25,000. The Ontario Government should have received, if all the payments had been made, between $400,000 and half a million dollars, and most of the money was paid. A thousand men were at one time employed prospecting on the limit, and on the Waldman, the Wyandoh and the Cleopatra expensive plants were enacted. Beyond the discoveries on the Waldman and the Wyandoh nothing of any importance was found and the veins on the former claims were found to be faulted.

To date the Gillies Limit, or as much of it as has been thrown open, is quite barren of profitable results. It was, therefore, less than justice for the Ontario Government to throw the remainder of the limit open to prospecting and staking in the ordinary way, as very remarkable ore bodies will have to be discovered to reimburse the public for the amount of money that has been paid to the Government for the privlege of prospecting and for the development that followed the purchase. A year ago so apathetic was the interest in non-producing Cobalts the privilege would have failed to draw many men from the Porcupine gold fields, but the silver camp has become fashionable once again and, no doubt, every claim will be taken up.

MOVES TO COBALT.—The Preston East Dome Mining Company has at length relinquished all hope of making good in Porcupine and has determined to use the remainder of the treasury in developing the Silver Bar property, which they have lately acquired. This property, which lies between the Savage property and the Gillies Limit was worked four years ago, and some rich ore taken out of a shaft sunk in the centre of the property where the conglomerate is shallow. The values were lost at the contact and nothing of importance has been discovered since and the mine has for years stood idle. Now it will be developed under the management of Mr. Stewart Thorne.

KERR LAKE CONTINUES.—The Kerr Lake Mining Company has declared its regular quarterly dividend for the third quarter of 1912. It is payable on September 16th. The disbursement amounts to $150,000 and the company has now paid a total of 139 per cent. or $4,-170,000.

T. H. & B.—The forty-first dividend of the Temiskaming and Hudsons Bay Mining Company was paid on July 30th at the usual rate of 300 per cent. This is the fifth dividend to be paid this year. The New Liskeard Mining Company has now returned to shareholders 21,100 per cent. on the issued capital, or $1,637,571.

MORE RESUSCITATION.—It is understood that the Cyril Lake Mining Company, which now owns the old Airgoid claim near the Nova Scotia, will begin work again soon. A shaft ninety feet deep has been sunk and it will be dewatered and sunk to the hundred-foot level before crosscutting is attempted.

PENN LEASE.—A considerable amount of success is attending the operations of the Penn Silver Mining Company at the Cobalt Central. A carload of ore, mined from the old workings, is ready for shipment and another carload is in sight. In addition to the stoping out of the old vein left by the old management, a considerable amount of development is being carried out.

THE ELK LAKE ROAD.—With the aid of a $6,000 grant the mine owners of Gowganda have patched up the road between Elk Lake and Gowganda. All bad spots have been corduroyed and the logs well covered. The first automobile, belonging to the Miller Lake-O'Brien mine, passed over the road last month without any serious mishap. The laying of steel on the Elk Lake branch from Earlton is making good progress and trains should be running before the first fall of snow.

PORCUPINE AND SWASTIKA

SWASTIKA.—There has been a recrudescence of activity in the Swastika section since the discovery on the Tough and Terry claims. The Tough claims have now been optioned to Mr. C. A. Foster, of Haileybury, and he has a few men on them doing some prospecting. It is understood that sampling on the small rich vein shows that some good assays can be obtained from the conglomerate as well as in the vein itself.

At Swastika itself the Lucky Cross is doing better. Two hundred feet west of the shaft a vein has been cut at the hundred-foot level, showing a good width of quartz and carrying good values. At the Swastika mine itself, reports are not so satisfactory, but excavations for the foundations of the small mill are proceeding rapidly.

PORCUPINE.—In Porcupine, the practice at the four mills running has given warrant for statements as to production which would have been thought far too optimistic some months ago. Both the principal mills of the camp are making such a close extraction that the amount lost will be negligible. The designers of the Dome Mill guaranteed an extraction of over 95 per cent., and the mill is now making a saving of nearer 98 per cent. After a series of disappointments with the tube mills, the whole mill is now running very smoothly and, during the month of August, will almost obtain a duty of ten tons per stamp, or 400 tons per day. The grade of ore, too, is highly satisfactory, being well over $10 per ton. Underground development is also proceeding apace. Connection between the raise to the mill tramway and the hundred-foot level will be made in a few weeks. The crosscut to connect the main shaft with that near the Golden Stairways vein is making good progress, but there is yet 200 feet to proceed.

While it is known locally that the Dome mill is producing satisfactorily, there can be no outward or visible sign of it until the company considers it expedient to allow it to be known what bullion is being produced and shipped. The same policy has been adopted at the Hollinger mill. At the Hollinger, after actual practice, it has been demonstrated that a saving of over 95 per cent. can be obtained with the aid either of amalgamation or concentration and it is, therefore, likely that both the tables and the pan-amalgamators will stand idle for some time at least.

THE McINTYRE FLOURISHES.—At the McIntyre the little ten-stamp mill is much more than paying the running expenses of the mine. The clean-up each week now amounts to over $5,000, though this amount has only been reached recently. In July the bullion from the mill realized $12,000, in August $14,500. Practice at the Hollinger has convinced the mangement that cyanidation will obtain better results than amalgamation and concentration and a plant has been ordered which will bring up the capacity of the mill to a hundred tons a day and upwards. At the Vipond about eighty-five tons a day are being crushed and when the tables can take care of it, the daily crushing can easily be raised to 100 and 125 tons per day. Both the Hollinger and the Vipond have made shipments, but no figures are available.

After prospecting the Hunter claims with the diamond drill the Porcupine Lake Mining Company has ordered a plant and it will be installed with all speed. The drilling of the property was very systematically undertaken and it is the general belief that the Hunter claims may prove that operations in the Township of Whitney are not altogether unprofitable.

Prospecting on the South Dome claims has shown a little ore and a pit is to be sunk to further develop the find. The claims are now owned by the Montreal syndicate that is meeting with success on the Dome Lake properties.

Work is still proceeding with vigor on the Dome Extension. A drift along the contact between the slate and the quartz porphyry has been pushed for 200 feet without much success so far. In another crosscut to locate the ore body to the east several stringers of quartz enriched with visible gold have been cut. Altogether 3,000 feet of underground development stand to the credit of the company.

BRITISH COLUMBIA

On July 25th there was shipped from the Granby Consolidated Company's mines at Phoenix, Boundary district, the large quantity of 4,500 tons of ore, which was hauled over the railway lines of the Canadian Pacific and Great Northern Companies, both of which have branch lines connecting with the Granby smeltery at Grand Forks. While it is not known to the writer of these notes whether or not this quantity constitutes a record for a single day's ore shipments from these mines, it is quite probable it does.

LARGE OUTPUT OF BOUNDARY MINES.—Recently the output of ore from the Granby Company's

mines at Phoenix reached an aggregate of 8,000,000 tons, all of which was smelted at the company's works at Grand Forks. While exact figures of the total quantity of foreign ores, also smelted there, and the quantities of all metals produced to date, are not just now available, a rough estimate may be made, as follows: Total quantity of foreign ore treated to date, say 250,000 tons. All metals produced, that is, from the above-mentioned 8,250,000 tons of ore, say: Gold, 456,000 oz.; silver, 3,150,000 oz.; and copper, 190,000,000 lbs. Although this is given as a rough estimate, it is evident it is a reasonable one, for the company's published figures to the end of its fiscal year to June 30th, 1910, were as under:

Granby mines ore smelted	6,263,091 tons.
Foreign ores smelted	214,544 tons.
Foreign matte smelted.....	13,514 tons.
Metals produced from ores, etc., as above:	
Gold	389,589 oz.
Silver	2,589,213 oz.
Copper ....161,168,537 lb.	

A very approximate valuation (gross) of these metals gives an aggregate of $40,000,000. It may be that if value were calculated at the exact average prices of the several metals year by year a greater amount, or possibly a smaller sum total, would be arrived at. Without any claim to reliability for the aggregate sum given above, it seems quite reasonable to assume that, for general purposes, it may be said the gross value of the metals produced by the Granby Company is about $40,000,000, this including, as well, the value of metals recovered from foreign ores. But the before-mentioned total sum by no means represents the whole of the value of the output of Boundary district mines, for there are several others to be taken into account. Of these, though, the British Columbia Copper Company's Mother Lode mine is the only one the production of which will be stated here. The aggregate output of that mine to date may be placed at about 2,500,000 tons of ore, having a gross of $8,000,000 to $9,000,000.

If to the value of ore from the mines of the Granby and British Columbia Copper Companies be added that of the Snowshoe, the several mines in Phoenix camp of the New Dominion Copper Company, and those in Summit camp that were also producers, not to say anything of numbers of shippers of comparatively small quantities of ore, it would appear to be quite reasonable to claim for the whole Boundary district, east of the Okanagan, an aggregate output of a gross value of well on toward $60,000,000.

Bearing in mind that Boundary mines are still producing large quantities of ore — it is estimated that in the Granby mines alone there still remains about 5,000,000 tons of developed ore—it will not be surprising to find that eventually an aggregate gross value of $100,000,000, as the output of that district, will be reached.

SOUTH BELT, ROSSLAND CAMP.—Several mining properties, situated in what is known as the South Belt of Rossland camp, are again being worked, these including the Blue Bird, Richmond group, Lily May, and Phoenix. The Curlew shaft was recently unwatered for examination preliminary to determining what further development shall be done.

Of the before-mentioned properties, the Blue Bird was, until a few weeks ago, the only one from which ore had been shipped in quantity. To date, seventeen carloads, containing some 400 to 500 tons, have been shipped to the smeltery at Trail during the period Mr. Lyman Carter has been manager of the mine. When the property was visited on August 2nd, the eighteenth car was being loaded. For the last year or two lack of funds had prevented the owners from providing sufficient power equipment to admit of needed development work being done. This difficulty was recently overcome by the organization of the Rosalia Mining Company, Limited. Now, there is a small but efficient power plant, and the shaft is being sunk from the 200 to the 300-foot level. This plant comprises two vertical steam boilers, together 50 h.p.; a Canadian Rand Company's four-drill compressor and an air receiver; a double-cylinder hoist; pump; two machine drills, etc. A crosscut tunnel connects with the shaft at the 94-foot level, improving ventilation and facilitating disposal of the water by the steam pump. There are five veins on the property, and the shaft has been sunk on the middle one, which has also been opened by a drift, 70 feet in length, extending westward on the 94-foot level. It is intended to crosscut south to cut another vein on the same level.

Besides the Curlew, already mentioned, there are other properties in the near vicinity of the Blue Bird, among them the Homestake and Mayflower, but both are unworked at the present time. About a mile to westward are the Lily May, Hattie Brown, Richmond, and other mineral claims, these having been acquired by the Richmond Consolidated Mines, Ltd., of which Mr. J. L. Warner is manager. It is stated that there are on this group of claims five well-defined veins—three having an easterly and westerly and two a northerly and southerly course. In the ore of the former, silver and lead are the chief metals; that of the latter contains gold and copper. During several recent months much exploratory work has been done near the surface, and it is stated that some showings of gold ore have been uncovered. Quite lately the Lily May, which was the first claim located in Rossland camp, dating back to 1889, was added to the Richmond group, and as there is on it a shaft of a depth of 200 ft. or more, it is intended to put in machinery and work the property from this shaft. On the occasion of the valedictory banquet given to Mr. J. S. C. Fraser on July 30, Mr. J. L. Warner, who for some time past has given much attention to the South Belt, said, in part: "As a result of exploratory operations for some months in the South Belt, I have become convinced that we are working in formations identical in character to those of Red mountain, on which are situated the Le Roi, Centre Star-War Eagle group, Josie and other well-known productive mines. The same dikes cross the series of parallel veins in both North and South Belts, but the greater depth of decomposed surface rock in the latter makes exploration of veins on the surface more difficult. New places show gold-copper ore, but this class of ore, which is similar to that occurring in the North Belt, is being exposed in proximity to the strongest dikes. There exists evidence for my opinion that the prevailing galena ores —a type of vein-filling with the associated volatile metals, arsenic, antimony and zinc, in the iron croppings of the South Belt veins) are but the emanations from the deeper ore bodies of gold-copper pyrrhotite ore. One indication of their origin is seen in the changing character of ore in all east and west veins near their junctions with the prominent dikes. I can express my absolute confidence that all the South Belt needs to disclose large ore bodies, of the same character of gold-copper

ore as the North Belt is now producing, is deep development."

The Phœnix claim, situated only a short distance from one of the residential parts of the town of Rossland, has lately been attracting much notice locally. Years ago three prospecting shafts were sunk on this property, to respective depths of 80, 36 and 30 ft., and assay returns as high as $40 per ton in gold were obtained from samples of the ore. Water was troublesome, however, so when Mr. M. Trewhella determined upon exploration work higher up the hill, under his two years' lease of the property, he appeared to have adopted a wise course, for he has discovered a vein not previously developed and has made several openings on this. When visited recently it was seen that there was about two feet of good-looking gold-copper ore in the bottom of a prospecting shaft then only 18 ft. in depth. Some 30 tons of ore has been shipped to Trail, and more is being taken out for shipment. The Phœnix certainly looks to be a promising claim, the ore being of a similar character to much shipped from the Le Roi and other mines on Red mountain, so the lessee is much encouraged to proceed with development to a fair depth.

STATISTICS AND RETURNS

COBALT ORE SHIPMENTS.

Cobalt Aug. 10.

Ore shipments this week are nearly double those of last week with the high-grade predominating by five cars to one of low grade. Nine mines sent out 19 cars, with the Coniagas leading with seven cars of high grade.

Only two mines sent out bullion during the week, but the totals are large, considering the few shippers in this grade.

Bullion shipments were as follows:

	Ounces.	Value.
O'Brien	1,936.61	$1,113.77
Nipissing	45,263.00	27,158.34

The shipments of ore total twice that of last week, the feature being the total of 16 cars of high-grade to three of low grade. There are the same number of shipping mines in the list with the amount shipped far in excess of last week.

Ore shipments are:

	Cars.	Grade.	Pounds.
Coniagas	7 h	..	415,879
Nipissing	...	31	227,652
McKinley	2 h	..	137,036
La Rose	2 h	..	169,552
Buffalo	1 h	..	63,000
Trethewey	1 h	..	53,700
Cobalt Lake	1 h	..	65,700
Townsite	1 h	..	61,000
Timiskaming	1 h	..	63,704
Totals	16 h	31	1,262,220

The bullion shipments from the camp to date for the present year are: 2,951,604.14 ounces, valued at $1,735,407.39.

The Cobalt ore shipments for the year to date are 25,286,917 lbs.

B. C. ORE SHIPMENTS.

Week ending August 3rd.

Boundary.

	Week.	Year.
Granby	25,602	729,209
Mother Lode	6,892	220,396
Napoleon	390	4,014
Rawhide	5,507	126,217
Lone Star	664	2,022
Unnamed	315	6,920
Surprise	153	2,790
Nickle Plate, milled	1,500	45,000
Other mines	....	17,559
Total	41,023	1,154,127

Nelson.

Queen, milled	300	7,200
Mother Lode, milled	350	3,100
Molly Gibson, milled	300	3,000
Granite-Poorman, milled	250	8,000
Molly Gibson	81	30
Hudson Bay	30	30
Queen	28	352
Other mines	....	8,851
Total	1,339	32,060

East Kootenay.

Sullivan	715	18,967
Monarch	84	609
Monarch, milled	425	4,850
Other mines	....	6,625
Total	1,224	31,051

Slocan and Ainsworth.

Bluebell, milled	175	625
Standard, milled	400	10,000
Van Roi, milled	1,100	36,100
Whitewater	136	179
Standard	136	5,163
Bluebell	99	99
Rambler-Cariboo	33	777
Richmond-Eureka	31	823
Rio	31	31
Other mines	....	6,673
Total	2,141	60,470

Rossland.

Centre Star	3,155	93,402
Le Roi	846	28,136
Le Roi No. 2	212	16,157
Nickle Plate	28	28
Le Roi No. 2, milled	300	4,100
Total	4,541	141,823

Granby Smelter Receipts.

Grand Forks, B.C.

Granby	25,602	729,209

B. C. Copper Co.'s Receipts.

Grand Forks, B.C.

Mother Lode	6,892	220,396
Napoleon	390	4,014
Rawhide	5,507	126,217
Lone Star	664	2,022
Unnamed	315	6,920
Other mines	....	14,784
Total	13,768	374,353

Consolidated Co.'s Receipts.

Trail, B.C.

Centre Star	3,155	93,402
Le Roi	846	28,136
Sullivan	715	18,967
Le Roi No. 2	212	16,157
Surprise	153	2,790
Whitewater	136	179
Standard	136	5,163
Bluebell	99	99
Monarch	84	609
Molly Gibson	81	1,537
Rambler-Cariboo	33	777
Richmond-Eureka	31	823
Rio	31	31
Hudson Bay	30	30
Nickle Plate	28	28
Queen	28	352
Other mines	....	9,689
Total	5,798	178,769

SHARE MARKET.

(Courtesy of J. P. Bickell & Co.)

August 12th, 1912.

New York Curb.

	Bid	Ask
Braden	6.75	7.25
B. C. Copper	5.25	5.50
Butte Coal	....	....
Giroux	5.00	5.12½
Green Cananea	9.87½	10.12½
Inspiration	19.00	19.12½
Yukon Gold	3.62½	3.75
Goldfield Con.	3.75	3.87½
Nevada Hills	2.00	2.06¼
Miami	29.50	29.75
Tonopah Mining	6.87½	7.12½
Ray Con.	20.75	21.00
Chino	34.75	34.87½
United Copper	.50	1.00

Cobalt Stocks.

	Bid	Ask
Bailey	2¾	3
Beaver Consolidated	44½	45
Buffalo	140	150
Chambers-Ferland	20½	21
City of Cobalt	22½	23½
Cobalt Lake	28¾	29¼
Coniagas	730	775
Crown Reserve	330	345
Great Northern	7	8
Gould Con.	..	..
Gifford	3½	4½
Green Meehan	1	1⅛
Foster	15	20
Hargraves	..	5¼
Kerr Lake	270	295
La Rose	305	315
McKinley-Darragh	178	179
Nipissing	770	795
Ophir	7	10
Otisse	1¼	1⅜
Peterson Lake	7¼	8
Rochester	2½	3
Right of Way	5½	6
Silver Leaf	3¾	4½
Silver Queen	3	6
Temiskaming	37	38
Tretheway	40	46
Wettlaufer	43	46

Porcupine Stocks.

	Bid	Ask
Apex	2¼	3
Dobie	20	35
Crown Charter	8¾	9
Dome Ext.	14¼	15
Eldorado	..	..
Foley-O'Brien	18	22
Hollinger	1245	1265
Jupiter	27	27¼
N. Ont. Exp.	200	250
Pearl Lake	18	19
Porcupine Imperial	2	2½
Porcupine Tisdale	1½	2
Moneta	5	7
Preston East Dome	3¼	4
Rea Mines	25	35
Swastika	9	9¼
Standard	..	1
Vipond	28	28¾
United Porc.	1	2
West Dome	10	20

Sundry.

	Bid	Ask
American Marconi	725	750
Canadian Marconi	500	562½
Island smelters	3	4

SILVER PRICES.

	New York cents.	London pence.
July 20	60½	27⅞
" 22	60¾	27 15/16
" 23	60¾	27 15/16
" 24	60⅝	27⅞
" 25	60⅝	27⅞
" 26	60⅝	27⅞
" 27	60½	27 13/16
" 29	60½	27 13/16
" 30	60	27⅝
" 31	60¼	27¾
Aug. 1	59⅞	27 1/16
" 2	60	27⅝
" 3	59⅞	27 1/16
" 5	59⅞	....
" 6	60	27⅝
" 7	60⅛	27 11/16

MONTHLY AVERAGES, 1912.

January	56.260
February	59.043
March	58.375
April	59.207
May	60.880
June	61.290
July	60,654