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STAKING CLAIMS

A subscriber has brought to our notice some irregularities in the staking and recording of claims in Northern Ontario.

In the Diabase Lake District a group of prospectors staked out eight claims of forty acres each, not only before making a discovery upon the territory so staked, but before they had even prospected the ground. The average prospector will not interfere with areas which have been staked. Therefore this particularly vicious form of blanketing practically secures large holdings in defiance of the express and explicit requirements of the law.

In James Township, claims thrown out by the Government Inspectors have been promptly recorded by other parties, who have dispensed with the preliminary necessity of prospecting and have sworn to fictitious discovery. This last practice is far too common.

We quote the above instances because we believe that the honest prospector should assuredly have fair play. There are many men who cannot bring themselves to swear to an imaginary discovery. These men suffer for the sins of less scrupulous persons. A few prosecutions for perjury would clarify the situation.

PROSPECTORS' MEETINGS

From several quarters has come the request that we should give more of our space to the prospector. The request is fair, but the prospector himself is elusive. His elusiveness exceeds our willingness to comply with his desire. Our columns are always open to the complaints or questions of the prospector. We hold him in especially high esteem, for we know something of him.

His grievances are largely based upon those features of our mining laws which, in his opinion, militate against him. From Ontario we have had many verbal complaints —from Quebec a greater number, couched in language more vehement.

We wish to proffer a suggestion. It would be an excellent thing if, in places like Sudbury, Cobalt, Marmora in Ontario, and suitable points in Nova Scotia, Quebec, Alberta and British Columbia, gatherings of prospectors could meet and discuss the mining laws of each Province. In the laws of every Province there are bad and good features. In Nova Scotia and British Columbia the prospector has, perhaps, the fairest treatment. In Ontario, while the administration of the law is honest, discreet and equitable, yet the law itself gives rise to some anomalous and distressing complications. But the Government has openly professed its willingness, its real desire, to improve and simplify the present Mines Act. The

growling of sore-headed individuals does no good. What is needed is the clear expression of opinion from a representative gathering of prospectors.

We would suggest then, as an opening move, that during the coming fall a meeting of prospectors be held at Cobalt or Haileybury. A convenient time would doubtless be after the first fall of snow. A meeting of this kind would clear the atmosphere. Resolutions drafted by a company of bona fide prospectors would receive most respectful consideration from the Provincial Government. We predict also that at least half of the grievances now current would evaporate.

AN IRON INDUSTRY FOR BRITISH COLUMBIA.

The flotation of an organization, to be capitalized at $15,000,000, is being undertaken by British financiers. The erection of large iron and steel works, with many subsidiary plants, will follow the successful promotion of the company.

If the promoters are thoroughly in earnest—and there is no reason to suppose them otherwise—they will, doubtless, receive all possible encouragement and support from the Province. A sound and progressive iron and steel industry is more to be desired than mountains of silver and gold. To British Columbia it would impart a stability not otherwise obtainable. When our Pacific Province becomes self-supplying in the items of coal, iron and steel, she will have added many cubits to her stature.

COBALT AND OTHER THINGS

The depreciation in Cobalt stocks is significant of two movements. Firstly, the public is fast losing confidence in many of the more heinous flotations, and as a consequence the mining broker's calling and election are sure no longer.

Secondly, a strong reaction is setting in at Cobalt itself. Prospects and mines that were merely started as pretexts for profitable promotion are rapidly finding their level—and it is a low level. The sounder enterprises are pushing vigorously ahead. The true test of "results" may very fairly be applied now to all but the most recently staked properties.

Incidentally there is a most apparent tendency towards the promotion of smelters and reduction plants. Apart from plants erected by private enterprise, there are several proposed smelters whose promoters have appealed or will shortly appeal to the public. In subscribing for stock of this sort every precaution should be used. The reduction of Cobalt's ores will not be a simple process. Much time and money will be spent before their treatment will have been standardized. Therefore it is but ordinary discretion to look askance upon the large promises of any proposed smelting concern.

A PAINFUL DUTY.

The activity of promoters of mining companies, especially in Cobalt and Larder Lake, has been most pronounced of late. Strong efforts are being made to dispose of stocks whose value is problematical, if not quite negative. THE CANADIAN MINING JOURNAL believes that it will best serve the interests of the districts mentioned and of the public, if, taking available facts and prospectuses as a basis, comparisons are instituted between the promises and the performances of these promoters.

In the course of our enquiries we have discovered that many companies have either not complied with or have evaded a large number of the requirements of the Companies' Act of Ontario. These omissions we shall point out. We shall also state without fear or favor our unqualified opinion of various flotations.

It is a most distasteful duty. But a duty it most undeniably is. We owe it to our subscribers, for the benefit of whom we live and move and have our being.

The current number contains the initial article of a series, which, we hope, will lead to a new interpretation of the obligations of the promoter to the public.

EDITORIAL NOTES

Errors creep into our columns despite our honest and painstaking efforts to eliminate them. In the last issue Dr. Haanel was referred to as Director of the Mines Department. This is inexact. Dr. Haanel is Director of the Mines Branch. A letter published in this issue sets the matter right.

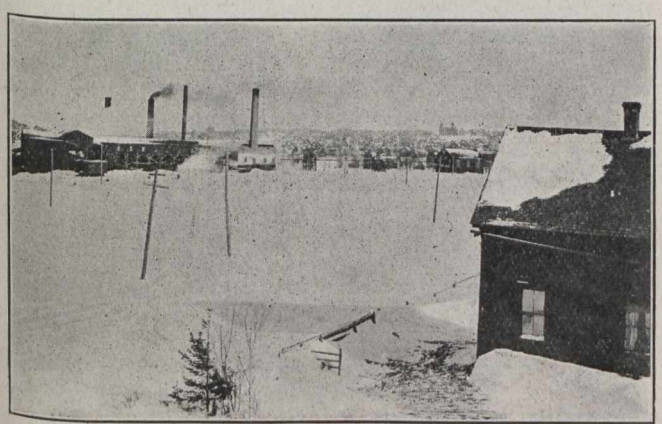
The Secretary of the Toronto Branch of the Canadian Mining Institute announces that there will be a meeting of the members of this branch on Thursday evening, October 10th. The place of meeting will be announced later. The object of the meeting is the discussion of the Mines Act and the drafting of recommendations as to changes in certain sections of the Act. The recommendations are later to be respectfully submitted to the Minister of Mines for Ontario.

The world still has a considerable supply of coal. Germany is credited with 28,000,000,000 tons, sufficient to last 2,000 years at the present rate of consumption; Great Britain and Ireland claim 193,000,000,000 tons, with an annual consumption about double that of Germany; Belgium has 28,000,000,000 tons; France, 19,000,000,000; Austria, 17,000,000,000; and Russia, 681,000,000,000. North America is believed to have 000,000,000,000 tons, more than the total of the other countries named. It is the tremendous increase in the use of coal that justifies alarm, for, while the supply of the United States would last 4,000 years at the rate of consumption in 1905, it will be exhausted within a century if the rate of increase of the last 90 years continues. No estimates of the coal of other parts of the world can be made, but Asia is known to have an enormous store.

SPRINGHILL AND ITS COLLIERIES.

W. D. MATTHEWS.

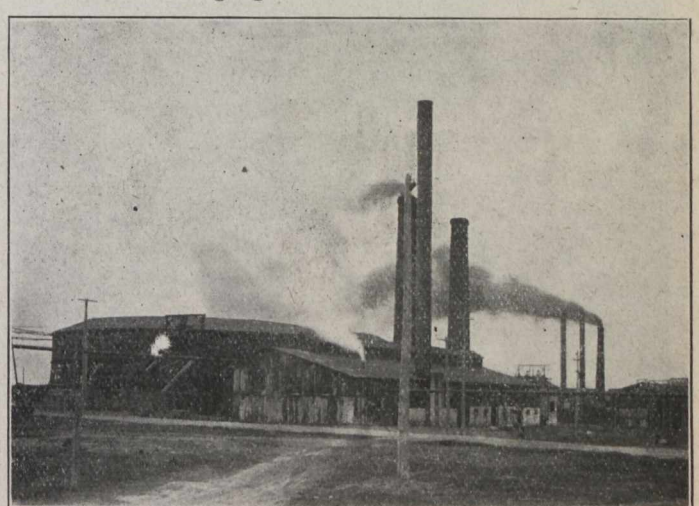
Before entering upon a description of these collieries, it may not be out of place to give some idea of the lay of the coal seams at present being worked. There are three seams, viz., north, east and west, or as numbered, 3, 1 and 2. No. 3, the overlying seam of the series, is separated from No. 1 by 300 feet of intervening strata. No. 1 is separated from No. 2 by about 100 feet of rock, No. 1 coming in between 2 and 3. The seams run parallel, though differing greatly in places, as to dip, this difference running all the way from 20 degrees to 80 degrees. The Cumberland coal field is an extensive one. Coal has been found all over the country. It is generally conceded, however, that the Cumberland Railway & Coal Company has the best of it. Outside of their holdings it is doubtful if the remainder possess any great value. Just how many seams of economic value there are in the Springhill basin is a matter of conjecture. Exhaustive prospecting has been done over this section by some of Canada's best known engineers, surveyors and geologists, and much has been written, worthy of reading, about the



No. 2 Colliery—Town of Springhill in background.

Cumberland coal fields, but the findings, so far as the writer knows, have never been particularized. The Cumberland Railway & Coal Company is operating the three known largest seams from two slopes. No. 3 seam, 11 feet high to the west of the main slope, which is split by a local stone, gradually thickens towards the east from the main slope till in two thousand feet a tunnel one hundred and fifty feet is required to connect them. No. 1 seam is similarly split to the east. The height of this seam is identical with that of No. 3. No. 2 seam is more uniform in height, varying but two feet from east to west, embracing some three miles of workings across seam. The highest, 10 feet 6 inches, which includes two-thirds of the entire length of the level.

The north, or No. 3, the overlying seam of the three, is a very excellent seam of coal, except to the extreme west of the mine. The coal is hard, clear and bright, rich in carbon, carrying a low percentage of ash with an infinitisimal quantity of sulphur. To the west this seam maintains a height of 11 feet to the boundary, nine thousand feet west of the main slope. The east lines do not reach so far. The system adopted in working this seam is bord and pillar. There is a method pursued in this mine, and in the other in a measure, not usual in mining as a rule. Levels are driven off slope at a distance of two hundred yards to the deep. The upper level is driven to the boundary, which in this case is recognized as the limit of haul. The back airway is then driven to connect with the return airway above. A pillar 30 yards thick is left to protect this air course. Then, by bord and pillar working back towards the slope, the whole lift is cleaned out, leaving but a worked-out goaf behind. This method has been very successful over some of the most difficult ground that ever confronted miners, or operators. The pitch of the seam ranges all the way from 45 degrees to vertical, with frequent faults and rolls throughout the entire section. While the upper lift is being drawn, the lower levels are being driven to the boundary. When this is reached the lift is worked back to the slope by the same system, so that there is always one or more lifts being worked back while the lower levels are being driven in. The following figures will some idea of the extent of



No. 2. Slope.

the workings in this mine. The present highest working level is 2,600 feet from the surface. It extends west 9,180 feet—seam 10 feet to 11 feet high. East levels, under seam, 2,745 feet. East level, top seam, 2,160 feet. The lift below 3,200 feet from surface level extending west 9,420 feet. East level under 2,280 feet, viz., 11 feet west and 4 feet 6 inches each of the east seams, or simply the west section of seam split by an intervening local stone.

The 3,800 foot level is practically untouched, except by the cutting of airways and haulage ways. The levels are now in over 6,000 feet. The upper level will be the main airway and drainage level. These levels are still driving. The slope in the meanwhile being sunk for a new and greater lift. It has now reached a depth of 4,500 feet, and 250 feet further is to be added before the levels are broken away. This will give a thousand foot lift. This lift with level driven to the limit of 9,500 feet gives 9,500 x 1,000 feet x 10 feet, or approximately three and a half million tons of coal in the west from the opposite or east section in this one lift.

The 2,600 and 3,200 levels west are operated by main and tailrope haulage. The haulage engines is located at 1,300 feet from the surface and steamed from the sur-

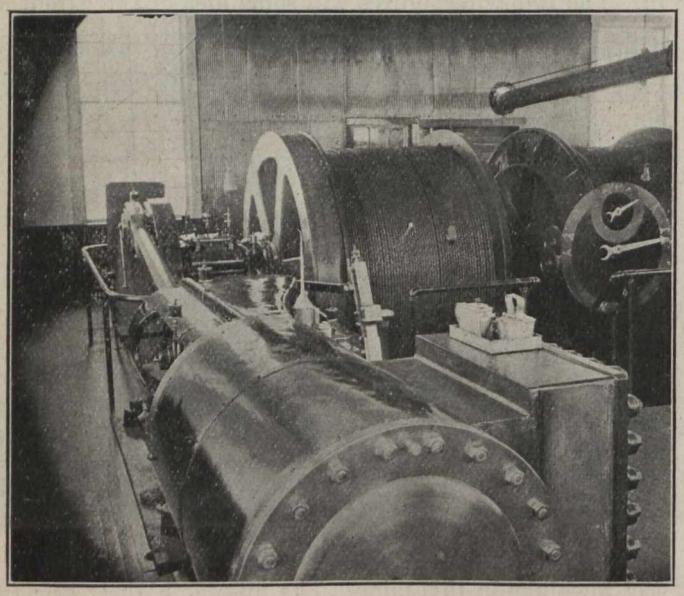
face. The east levels and west 3,800 feet are worked by horses, the number of which working at present is 22.

This mine is kept free of water by two pumps, known as the Jeansville Compound Duplex, eight hundred gallons per minute capacity, situated 1,300 feet and 3,200 feet from the surface respectively. As almost the entire drainage of the mine is caught at 3,200 feet, a small Cameron pump is used to keep the mine clear of water in the lower sinkings.

To ventilate this mine a Capell Fan 22 feet diameter, 3 feet 6 inches width of vane, with a checked capacity of 110,000 cubic feet per minute; speed, 110 revolutions, is used.

The above is the work done for ventilating purposes daily, and gives a wide margin beyond the theoretical necessities of the mine. The number of men employed is 450. The mine is not gaseous to any dangerous extent, but closed lights (safety lamps) are the rule. The Marsant is used exclusively throughout these collieries. The system of ventilating is simple but effective. No better ventilated collieries are known on the continent to-day.

The surface plant of No. 3 mine is almost perfect in its equipment. The bankhead is a model of engineering

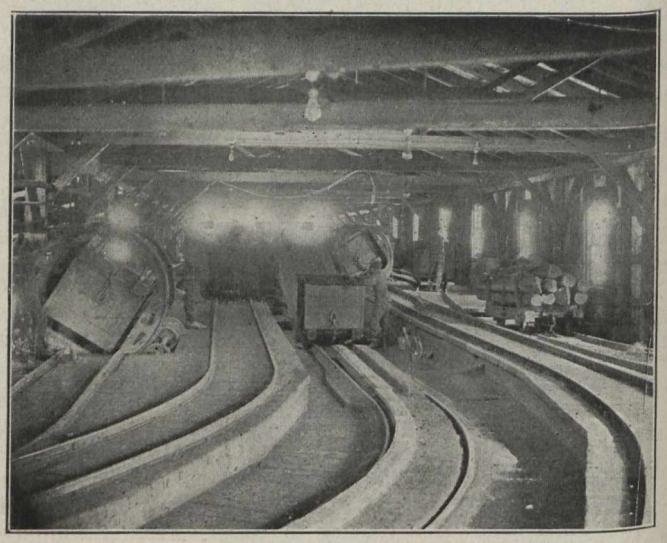


No. 2 Hoist Engine.

skill and ingenuity. There we find automatic hoists for full and empty cars, incline plants to carry the cars to certain points, automatic switches, revolving tipples, shaker screens, picking tables 450 feet in length, which carry the coal from the screens to railway cars, allowing every facility for thoroughly cleaning the coal in transit. These are capable of handling 3,000 tons per day if necessary. The whole outfit is enclosed in a corrugated iron building, and lighted by electricity. The power to move this machinery is provided by 12 boilers of the return tubular make, capable of generating 1,500 horsepower, equipped with automatic underfeed stokers, 2 Sturtevant blowers with 39 pounds pressure to the square foot. Culm is used here for firing, with good results.

No. 2 Mine—West Slope.

In the effort to describe No. 2 mine, one must needs have the bump of location very highly developed. As all the coal in seam, that is to the recognized boundaries east and west, has been extracted above the 1,900 foot lift, the visitor will find the main working bottom located 2,400 feet from the surface. The east level of this lift is worked by main and tailrope. That is, the coal from the workings is conveyed to the bottom by this method of haulage. The length of haul is 5,000 feet, the return



No. 3 Bankhead in Operation.

wheel being placed at the Aberdeen Fault, which dislocates the seam at this point, and which runs nearly parallel to the course of the main slope. Although there are two inclines, and several chutes working between the Fault and the bottom, yet the largest quantity of coal is brought by horses to the inside haulage turnout from the Aberdeen section. This section extends east from No. 5 or Aberdeen slope 400 feet to the tunnel through the fault which connects No. 2 haulage level with the Aberdeen section.

To the west of No. 5 slope the level extends 5,500 feet. Horse haulage was always employed on this level to convey the coal to connect with haulage in No. 2 slope. The quantity of coal mined east and west of No. 5 is supplemented by the coal produced in No. 5 sinking. A hoisting engine on the surface at No. 5 hoists No. 5 sinking coal to the 2,400 foot level and lands it there, whence it is hauled to No. 2 section and sent out by the rope haulage system. In the mere development of No. 5 sinking, about 500 cars of 1,800 pounds each were producer. This

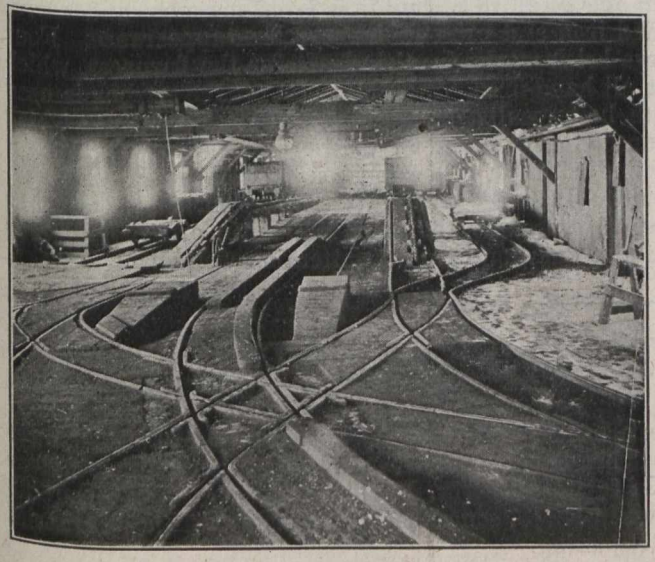
Interior of Lamp House.

coal comes from the so-called halfway level east, which extends 5,000 feet and is still being driven as a counter-level 60 feet to rise of level with necessary returns airways to 2,400 level. The lower level has been driven

from No. 5 slope some 3,000 feet. The plan of the workings is the same as above.

To the west of the halfway level is a tunnel tapping two seams. The levels extend east and west from this tunnel in each seam. The levels are being driven and other openings for ventilation are being made. This section is known as the tunnel-working halfway level. The tunnel is some 230 feet long, both seams being cut in that distance. The west lower level, No. 5, extends to No. 2 slope, 3,500 feet distant, and taps or connects with the main slope, some 200 feet from the bottom. It has lately been connected with No 2 east level by incline, by which the coal has been taken over No. 5 district and landed at the 3,600 foot bottom of No. 2 slope, a saving of haulage of two miles underground.

The clearing and sinking of No. 2 slope from the 2,400 foot level down to the present 3,600 foot level presented difficulties seldom met with in coal mines. Ffty feet below the 2,400 foot level a roll was met with that necessitated a rock cutting, after the coal was removed, of 15 feet at the highest point, and extending 200 feet down the slope. This still left the difference of grade between the length of cutting and the slope above and below it of from 8 degrees to 10 degrees. The cutting being flat in comparison, was later brought near the average grade of

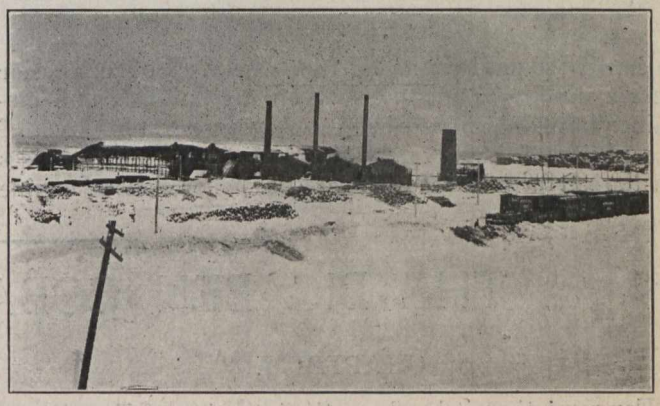


No. 3 Brow of Slope.

32 degrees, by a further cutting of 4 feet out of the bottom, tapering out to a greater distance. This made the hoisting of heavy rakes possible. Before the work was quite finished a fire occurred in No. 1 slope, then working (1896-97), which put the pumps of No. 1 out of service. Nos. 1 and 1 being connected, the new section below 2,400 feet was submerged. Pumps were installed in No. 2 slope below 2,400 feet in short order, and the water was caught and held there for some years. In the spring of 1903 the work of pumping out and re-opening the submerged lower workings was begun. When the water was pumped out it was seen what a colossal undertaking it was. Falls were encountered anywhere from 10 to 50 feet high. The first fall encountered was about 80 feet long and 40 feet high on a grade of 32 degrees. Everything loose had to be loaded out, making the work extremely dangerous and slow. But experience, ingenuity and care, with unlimited material of the best quality, finally accomplished the stupendous task, without the loss of a single life. Pumps were installed at the 300 foot lodgement, which fortunately was found standing intact (except for a few insignificant falls, which were speedily cleaned up), and sinking at once proceeded below the 3,000 foot level. One hundred and twenty-five feet was sunk, when a downthrown fault was struck, displacing the seam by a drop of 30 feet vertical. A tunnel was driven down through the rocks at an angle of 52 degrees, striking the coal at 90 feet below the fault. Here it was found that the seam had flattened to 24 degrees of pitch, necessitating the blowing down of top rock for 250 feet, reaching the highest point midway at a distance of 30 feet. But the expenditure of time, labor and money was well warranted by the opening up of this magnificent seam of coal. The quality at this depth really available was 5,000,000 tons. The seam runs down 10 feet to 11 feet in height and clean from roof to pavement. The lower lift of this mine is now being rapidly developed with strict attention to its future. Everything is put to stay. The surface plant of this mine is equal to the limit of output.

The bankhead is built in the shape of a horseshoe, making a space of 320 feet from slope to tipples. The full cars from the mine are carried around the slight grade, there they are caught and guided to the tipples, of which there are both sorts, revolving and end tipples. The coal goes over shaker screens and is spread on moving picking tables, when it is thoroughly cleaned by a number of boys and men before being put in cars.

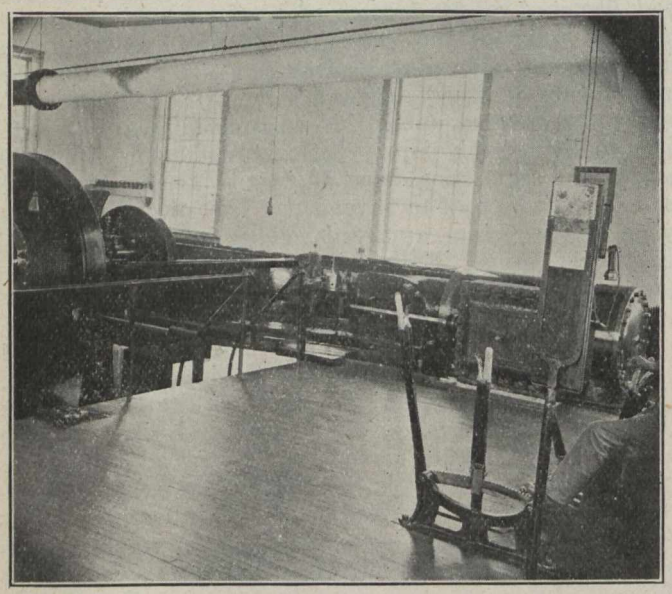
There are three such screens and tables, capable in the aggregate of handling 2,500 tons per day. The empty



No. 3 Colliery.

cars when drawn from the tipples are guided to the hoist, where they are passed to an elevator and of their own weight run by a carefully graded road to the pit brow, where the empty rake of 12 cars is made up to return to the mine. The hoisting engine is an exact duplicate of No. 3 hoisting engine, and is set well back from the bankhead buildings. This was necessary as the present is the fourth site it has occupied in making room in past years for bank extension. The engines, which are powerful looking machines, are bedded on solid concrete foundations, and appear equal to any work required. Technically described, they stand one pair 30 inch by 48 inch, direct acting, link reversing, hoisting engines, with grooved drums, 7 feet in diameter, 5 feet face each. The drums hold 6,000 feet of 1 1-2 inch steel wire rope. The fan to supply air to this mine is as at No. 3 mine, a Capell double acting blow-down with a capacity of 150,000 feet per minue, 10 inches W. G. Its size is 15 feet in diameter, 5 feet width of vane. In close proximity to this mine is the lamp station. Here 1,200 safety lamps are cleaned, oiled and tested daily by the small force of two men and a boy. Here also, steam, compressed air and electricity are brought into requisition. As a result we see the marvelous celerity with which lamps are turned out for use in the mine. The building is entirely of

brick and concrete with cement floors. The interior of the building is immaculate with paint and polish. There are but three apartments, the lamp room, repair shop and office. Within a few feet of the station is the electric power house, also a brick edifice, elaborately finished



No. 2 Engine House.

in hardwood and enameled iron works. In the interior here again paint and polish keep the building and machinery ever clean and bright. Two generators, each of a capacity of 1,200 volts, provide light for all purposes on the surface, bankheads, screens, boiler houses, engine houses, machine and blacksmith shops, all offices and places where a light is at all necessary, together with all approaches to the mines. Railway arc lights are used for the latter purpose, making the scene at night around the works a very brilliant one. Situated between the two slopes, Nos. 2 and 3, is the fire engine. It is the Northey Underwriters' pump, size 16 inches x 9 x 12 inches. It is capable of pumping 750 gallons per minute with a pressure of 100 pounds. This is, however, rendered of less consequence, now that the works system is connected with the town system of waterworks, which gives 80 pounds pressure by gravity. But nevertheless the engine is kept in beautiful order and ready for any emergency. In connection with the pump there are about the works 12 hydrants, 2 hose reels, with 2,000 feet of 2 x 2 1-2 inch hose. Some 3,500 feet of 6 inch pipe connect the various points of the works together with various smaller branches.

To move all machinery in connection with No. 2 mine (in which must be included two large and one small duplicate Jeansville pumps, one large Blake and one large Cameron pump, as auxiliary to the Blake pump) is a battery of twelve boilers, which include four Mumford, two Lancashire and six McDougall return tubular boilers, capable of generating 1,500 horse-power, all under one roof. The building is of masonry and corrugated iron and presents a very clean appearance. Four large brick stacks furnish draft for the furnaces, which are all hand-fired. The fine culm off the screens is used with best results. A telephone system is in use which connects all points of importance above and below ground with the offices and houses of all heads of departments. It takes care and strict attention to keep the system, especially the mine section, in order. But it is without question care and attention well spent.

THE BIG BEN COBALT MINES, LIMITED.

CHAPTER I.

For some time it has been the intention of THE CANADIAN MINING JOURNAL to deal with certain Cobalt and Larder Lake flotations. The difficulties in the way of doing this are obvious. At one stage and under some conditions more harm than good would result. Just now, however, circumstances have arisen which make it manifestly our duty to show the public, so far as in us lies, the difference between what they think they are buying, what they are told they are buying and what they actually are getting. We propose to take up one by one many companies operating in Canada. It will be of assistance to us if such of our subscribers as have purchased shares in mining companies will send us copies of prospectuses, and, at the same time, give us all general and specific information obtainable. Let us now to business.

(1) We have before use the prospectus of the company whose name appears at the head of this article. From this we glean the following statements: The Big Ben Cobalt Mines, Limited, was organized in Toronto on January 18th, 1907. It is incorporated under the laws of Ontario, and has an authorized capital stock of $2,500,000, divided into shares of $1 par value each; all issued as full paid and non-assessable. No personal liability.

(2) Under the caption "Financial Condition" we are told that Big Ben owns 500,000 shares of its capitalized stock, has a guaranteed working capital of $50,000, owes no debts, is not involved in any litigation and has a clear title to its property. Its property consists of about 33 acres in lot 13, concession 1, Township of Bucke, District of Nipissing.

(3) Upon farther perusal we learn that the Big Ben adjoins the Green-Meehan Mine on the east, corners with the Red Rock Mine to the southeast, the Latchford on the northeast, the McConnell on the south, and the Von Hagen on the north.

(4) Next we notice under "Engineers' Reports" that Lucky Scott, of Pioche, Nevada, described as "the well-known mine owner, operator and engineer," has recommended the property very highly. Mr. Scott enclosed in his report an assay certificate from Thos. Heys & Son, certifying that certain samples, which Mr. Scott says were taken by himself on the property, contained of silver 4,127 ounces, 15 dwts, 16 grains per ton, a value of $2,889.42 per ton. Again, R. M. Holden, M.E., "the well-known mining engineer of Cobalt, Ont., who first reported favorably upon the Green-Meehan," is quoted as saying of certain Green-Meehan and Red Rock veins, "*They must enter this lot*, and besides these veins which I have described, I can see no reason why other rich veins will not be found in other portions of *this favorably situated lot.*"

(5) The management of the company is vested in a board of nine directors, who are all active business men,

and who will safeguard in every way possible the interests of all stockholders. Active development is promised, and the Union Trust Company, Limited, of Toronto, Ontario, is specified as registrar and transfer agent.

The officers and directors are the following gentlemen:—

OFFICERS.

President—C. E. Slater, Esq., Montreal.
Vice-President—W. F. Dineen, Esq., Toronto.
Secretary-Treasurer—J. A. Goodearle, Esq., Hamilton.

DIRECTORS.

C. E. Slater, Montreal.
W. F. Dineen, Esq., Toronto.
H. C. Barker, Esq., Toronto.
D. McCall, Esq., Toronto.
J. A. Phin, Esq., Toronto.
F. B. Allan, Esq., Toronto.
P. McCool, Esq., North Bay, Ont.
F. D. Mackay, Esq., Toronto.
J. A. Goodearle, Esq., Hamilton.

Let us now consider the statements, claims and promises of Big Ben Cobalt Mines, Limited, *seriatim*:—

(1) *Capitalization.*—Big Ben owns about 33 acres of ground, upon which not one vein of high grade ore has been cut. The capitalization of the company is $2,500,000. It is therefore not unfair to characterize this as excessive, as unbusinesslike and as foolish.

(2) *Financial Condition.*—Of the 2,500,000 shares, Big Ben owns 500,000 shares, which it holds as treasury stock, and which are, at time of writing, untouched. Therefore the revenue from the shares that have been sold, apart from paying for the property, has not gone into the coffers of the company, except to the extent of $50,000. Even this is not necessarily paid in. The prospectus designates it "guaranteed working capital. We have no means of ascertaining the nature of the guarantee given, nor how much of the money has been expended in construction and development. On the other hand, it would seem to us that $50,000 out of $2,000,000 of capital placed, is an absurdly inadequate sum to appropriate for the development of a mine which is expected to give returns on such a large capitalization. We must emphasize here that the stock which has been sold is not treasury stock (the proceeds of which would naturally go to development); but the holdings of some private individuals, assigned them for reasons not specified in the prospectus. Also we must draw attention to the slender chances which the treasury stock will have when thrown upon a market that has already digested 2,000,000 shares of private holdings.

(3) Under this section are gathered the principal claims upon which Big Ben bases its capitalization, and its appeal to the public. It adjoins the Green-Meehan, it "corners with" Red Rock and in various ways it compromises itself with sundry other properties. These are all interesting facts; but hardly relevant or scarcely significant enough to warrant a $2,500,000 capitalization. Proximity to, even contact with, valuable properties is a decidedly dubious asset, especially in Northern Ontario.

(4) Fourthly we come upon "Engineers' Reports." Mr. A. W. Scott, called by his familiars "Lucky" Scott, of Pioche, Nevada, is quoted to the extent of six lines. And in those six lines Mr. Scott makes statements that have, at best, a merely speculative value and are clothed in language not commonly used in the reports of responsible mining engineers. We know nothing of Mr. Scott, professionally or otherwise. But we observe with pain that he lays himself open to grave misrepresentation. To his "report" he appends a signed assay certificate from Thos. Heys & Sons. To the best of our knowledge this certificate so placed is entirely misleading. Mr. Scott may have acted in all honesty. But the fact remains that not one high grade vein has yet been discovered on Big Ben. Therefore, until we receive further light, we must conclude that Mr. Scott was entirely ignorant (and in this he is not remarkable!) of the art of sampling. The assay returns, of course, indicate ore from a very rich vein. Thus either the sampler was ignorant or the sample was picked. The chemist has no responsibility in this. He merely analyzes and reports upon the sample given him.

A short digression may be permitted here. We have before referred to the misuse and abuse of assay returns. Let us reiterate. Such returns should be absolutely disregarded unless the whole history of the sample is given. The name of the sampler, his methods of sampling, the exact spots sampled, the conditions of shipments, all these should be specified. Neglect of these precautions at once vitiates the certificate. Usually the chemist or assayer is quite powerless to prevent the ignorant or fradulent misuse of his certificate. It is at this point that legislation is needed, and needed badly. We have had many instances of direct misrepresentation brought to our notice. Usually, however, the misrepresentation is skillfully indirect. Occasionally it is due to sheer ignorance. But in most cases it can be attributed to the clear intention of getting into the pockets of the gullible. In this respect Big Ben is by no means as bad an offender as are some other companies, whose standing it will be our duty to examine in forthcoming issues.

(5) Both the prospectus and a florid pamphlet accompanying it, dilate upon the character of the directorate. "The management," we read, "is vested in a board of nine directors." All of these are active business men "who will safeguard in every way possible the interests of the stockholders." How will these cheerful asseverations stand analysis?

Of the directors, whose names we have given above, not one is a mining man. In all charity we must allow this statement to stand unqualified.

Not for a moment would we question the integrity of any of these gentlemen. But of their knowledge of legitimate mining we are forced to entertain grave doubts. Would one of these directors lend his name to a manufacturing concern whose capital stock had been handled like Big Ben? Whose chances of making returns were as uncertain as Big Ben's? We think it hardly probable!

Also in what manner have these directors safeguarded the interests of possible shareholders? One need but glance over the previous comments to find that shareholders have little or no chance whatever to reap any financial benefit from their investment.

We are weary of reading the names of respectable merchants, lawyers, manufacturers, politicians, ministers of the Gospel and even (and this is the ultimate of indiscretion!) otherwise reputable mining engineers on promoters' literature. In any or all of these classes the willingness to become guinea pigs is indicative of gross ignorance, or of unjustified cupidity. And, conversely, it is surely time that the public realized that pre-eminent respectability of a board of directors does not constitute a mine.

In the particular case of Big Ben we believe that the members of the directorate are all honorable and responsible men of affairs. It follows then that they are identified with this promotion through ignorance of what such flotations imply. After they have thoughtfully perused this article they will no longer wish to be classed as ignorant. Therefore we may without hesitation predict that Big Ben will either go out of business or else its stock will be thoroughly dehydrated, its capitalization reduced to a sane figure, and a full account of all shares allocated and all moneys expended, given to all its shareholders.

Before concluding this chapter it is necessary to advert for a moment to the pamphlet (referred to above), which accompanies the prospectus.

To encourage the hesitating purchaser a few instances of successful Cobalt mines are given. "Temiskaming and Hudson Bay, "the pamphlet asserts, "was first offered at 40 cents per share—has paid its stockholders $92 per share in dividends and is now selling at $190."

This is perfectly true. But no more damning evidence of Big Ben's unworthiness could be adduced. The Temiskaming & Hudsoy Bay is capitalized at $25,000, of which only $8,110 is placed. Further comment would be superfluous. This and the other features emphasized, including the respectability of the directorate and the optimism of Mr. Scott are surely as undignified as they are irrelevant. A good mine need never advertise its merits.

CHAPTER II.

Another feature of company promotion and flotation to which we would like to call the attention of the public and the Provincial authorities, is the non-compliance with or evasion of the provisions of the Companies' Act.

According to the Companies' Act of Ontario, every company incorporated in this Province which has a number of shareholders greater by ten than the number of applicants for incorporation; or any company incorporated elsewhere, which has more than ten shareholders in Ontario, is required to file a copy of every prospectus issued. "No prospectus shall be used until so filed, and every prospectus shall state on the face of it that it has been so filed."

The Act further provides that "Every prospectus issued by or on behalf of a company or in relation to any intended company or by or on behalf of any person who is or has been engaged or interested in the formation or promotion of the company shall state:—

(A) The names, descriptions and addresses of the original incorporators, and the number of shares subscribed by them respectively;

(B) The number of shares, if any, fixed as the qualification of a director, and any provision in the by-laws of the company as to the remuneration of the directors;

(C) The names, descriptions and addresses of the directors or proposed directors;

(D) The minimum subscription on which the directors may proceed to allotment and the amount payable on application and allotment of each share;

(E) The time or times at which, under the by-laws of the company a further call or calls may be made upon shares subscribed for;

(F) The number and amount of shares issued or agreed to be issued, as fully or partially paid up, otherwise than in cash and in the latter case, the extent to which they are so paid and the number and amount of bonds, debentures or other securities issued or to be issued and allotted to any person;

(G) The names and addresses of the vendors of any property purchased or acquired by the company, or proposed to be purchased or acquired, which is to be paid for wholly or partly out of the proceeds of the issue offered for subscription by the prospectus or the purchase or acquisition of which has not been completed at the date of publication of the prospectus, and the amount payable in cash, shares, bonds, debentures or other securities to the vendor, and where there is more than one separate vendor, or the company is a sub-purchaser, the amount so payable to each vendor;

(H) The amount (if any) paid or payable as purchase money in cash, shares, or debentures for any such property as aforesaid, specifying the amount payable for good-will;

(I) The amount (if any) paid or payable as commission for subscribing or agreeing to subscribe or procuring or agreeing to procure subscriptions for any shares in the company or for underwriting or procuring underwriting of any securities issued or to be issued by the company or the rate of any such commission;

(J) The amount or estimated amount of preliminary expenses;

(K) The amount paid or intended to be paid in cash, shares, or debentures to any promoter and the consideration for any such payment;

(L) The dates of and parties to every material contract and a reasonable time and place at which any material contract or a copy thereof may be inspected; providing that the requirement shall not apply to a contract entered into in the ordinary course of business carried on or intended to be carried on by the company, or to any contract entered into more than three years before the date of publication of the prospectus;

(M) The names and addresses of the auditors (if any) of the company;

(N) The full particulars of the nature and extent of the interest (if any) of every director in the promotion of or in the property proposed to be acquired by the company, with a statement of all sums paid or agreed to be paid to him in cash or shared by any person, either to qualify him as a director or otherwise, for services rendered by him in connection with the formation of the company.

The Act further states that every provisional director, director or other person responsible for the issue and publication of such prospectus shall for every violation of the provisions above quoted be liable on summary conviction to a penalty not exceeding $200 and costs.

The Act further states that "Where, after the passing of this Act a prospectus or notice invites persons to subscribe for shares or debenture stock or security of a company, every person who is a director of the company at the time of the issue of the prospectus or notice, and every person who having authorized such naming of him is named in the prospectus or notice as the director of the company or as having agreed to become a director of the company, either immediately or after an interval of time, and every promoter of the company and every person who has authorized the issue of the prospectus or notice, shall be liable to pay compensation to all persons who shall subscribe for any shares, debentures or debenture stock or other security on the faith of such prospectus or notice for the loss or damage they may have

sustained by reason of any untrue statement in the prospectus or notice or any report or memorandum appearing on the face thereof or by reference incorporated therein or issued therewith, unless it is proved that having consented to become a director of the company he withdrew his consent before the issue of the prospectus or notice or that the prospectus or notice was issued without his authority or consent, and that on becoming aware of its issue he forthwith gave reasonable public notice that it was so issued without his knowledge or consent, and before allotment thereunder he on becoming aware of any untrue statement therein withdrew his consent thereto, and caused reasonable public notice of such withdrawal and of the reason therefor to be given.

The Act further specifies that the word "prospectus" shall mean any prospectus, notice, circular, advertisement or other invitation offering for subscription or purchase any shares, debentures or other securities of the company, or published or issued for the purpose of being used to promote or aid in the subscription or purchase of such shares, debentures or securities, and the word "company" shall mean any company incorporated or proposed to be incorporated.

Let us see how the company with which we are dealing has complied with the provisions of this Act.

Before writing, we visited the Provincial Secretary's office and asked to be shown all papers and documents filed in connection with the Big Ben Cobalt Mines, Limited, and the Sovereign Securities, Limited, which latter company is securing from the public subscriptions to the stock of the Big Ben. We find that the Big Ben Cobalt Mines, Limited, was incorporated on the 18th of January, 1907, but up to the time of our search, namely, 27th of August, 1907, no prospectus had been filed. The Sovereign Securities, Limited, was incorporated on June the 19th, 1907, with a capital of $100,000 in shares of $100 each. The provisional directors of this company are as follows: Jno. Ernest Cunningham, Elbert Ed. Knox, and Arthur Cohen. No prospectus of either Big Ben or the Sovereign Securities had been filed by the Sovereign Securities Company.

Now let us examine how the prospectus of the Big Ben, which we have before us, and on which subscriptions have been solicited and no doubt secured from the public, complies with the requirements of the Act.

Of the fourteen specific requirements only one is complied with in the prospectus issued by the Big Ben Cobalt Mines, Limited. That one, (C), requires the names, descriptions and addresses of the directors or proposed directors. It is probably the least important and is certainly the easiest with which to comply.

The Big Ben prospectus omits some very essential information. Requirement (G) is entirely ignored. Nowhere, also, can we find mention of the amount or estimated amount of preliminary expenses. The promoters' remuneration is not specified.

The amount paid or payable as purchase money in cash, shares or debentures for the property, and the amount payable for good-will, are of very vital importance in the organization of such a company. The organizers are expressly commanded by the Act to include this information in the prospectus. Yet Big Ben's prospectus says not one word on these points. But there is no need of multiplying words. The Companies' Act, especially in its references to mining companies, was framed as a restrictive measure. *Per se* it is an excellent piece of legislation. Unenforced it is as meaningless as a collection of Limericks. Its strict and prompt enforcement will save the Province trouble and Cobalt many smirches upon her good name.

ANKYLOSTOMIASIS

"Miner's Anemia."

By F. W. Gray.

(Continued from September 1.)

Great Britain.

Since 1893 repeated cases of anemia have occurred among the miners at the Dolcoath tin mine, Cornwall, increasing in number from one case in 1893 to twenty-nine cases in 1897. The Dolcoath mine is the most important in Cornwall. The workings are very extensive, the lowest level being at a depth of 470 fathoms. The illness among the miners was at first attributed to bad ventilation, as were the cases at Anzin in France before referred to, but after an investigation in 1902 Dr. Haldane came to the conclusion that the mine was infected with ankylostome ova. Acting on this conclusion, he treated his first patient with thymol and relieved him of 260 ankylostomes. Many of the sick men suffered from itching of various parts of the skin "with urticaria-like, or pustular eruptions, called by the miners 'bunches.'" The principal focus of the infection was the engine shaft. This shaft was used as an upcast, and in consequence was very moist and warm, the temperature being about 79 degrees Fahr. The manager, Mr. Thomas, was led to associate the prevalence of "bunches" with the pollution of the mine by excrement, and he took steps to remedy this by providing privies on the surface, and warning his men against pollution of the workings. He also improved the ventilation of the engine shaft and considerably lowered the temperature. Since that time the number of cases of anemia has greatly decreased, and at the time of Dr. Haldane's visit the epidemic was considerably abated.

The migratory habits of the Cornish miner are well known, and there is little doubt that the disease was introduced by men who had lived in tropical countries, and it is very probable the disease was introduced from South Africa or some part of South America. Steps have been taken to educate the English miner on the dangers arising from the promiscuous defecation under-

ground, and free lectures have been given throughout the mining districts, illustrated by lantern slides showing the worm at different stages of development.

In many collieries steps have been taken to provide underground closet accommodation, and to improve the surface arrangements in this respect. A joint meeting of representatives of the coal owners and the miners' unions was called by the Home Office authorities to consider whether any compulsory sanitary regulations were necessary, and it was concluded that a present no measures of this character were needed, but it is not unlikely that compulsory regulations with reference to the provision of underground closet accommodation may be enforced in mines having a temperature of more than 70 degrees Fahr.

Conclusions.

From the foregoing notes it will be seen that ankylostomiasis is a dirt disease, and has its genesis in uncleanly and unsanitary conditions. Br. Bruns, a German bacteriologist who took a prominent part in the Westphalian anti-worm campaign, is very insistent in his writings on this subject on what he calls the "disposition" of a mine to receive infection. By "disposition" he designates a combination of natural conditions favorable to the reception and dissemination of infection. Many mines possess this receptivity to such a marked extent as to be practically artificial culture grounds, in every way adapted to the propagation of the parasite. The points of infection are multiplied indefinitely, and the resultant disease among those who work amidst such conditions will attain a virulence and to proportions that are probably impossible under natural outdoor tropical conditions. In mines of this character the course to be pursued is very obvious.

So far as the writer is acquainted with Canadian coal mines, this disposition is not present in any marked degree. In the large mines of the Cape Breton coal field, for example, the two necessary concomitant conditions of heat and moisture do not exist together in the same mine. The mines are damp, as is to be expected from their comparative shallowness, but they are cool and very well ventilated. Where the coal is worked at a greater depth the workings are of course much warmer, but they are so dry as to be dusty. Another feature that may possibly be counted upon as a deterrent is the composition of the mine water. The acids contained in the majority of the Cape Breton mine waters will no doubt act adversely on the recently hatched and unencysted larvae. As the mines advance under the bed of the ocean, these conditions may of course alter. It may be noted, however, that in similar circumstances the saline character of the percolated water has been found to kill the young unencysted larvae. Again, the system of coal extraction practised in Cape Breton, the thickness of the seams, combined with their low angle of dip, are features less favorable to the spread of the infection than the corresponding conditions in European coal mines. In working bord and pillar there are probably more holes and corners where deposited excreta may rest in undisturbed innocuousness than is the case in the highly inclined seams of middle Europe, where the clothes and the hands of the workmen become contaminated in climbing ladders and in descending chutes. In longwall work the goaf is obviously a convenient and harmless place for purposes of defecation. On the whole, therefore, natural conditions as they at present exist in Cape Breton would appear to ensure a comparative immunity from the incursions of the parasite. But, on the other hand, medical authorities have not yet fully determined what constitutes "disposition," and within what limits of temperature it is possible to promise complete immunity. There may be detached places in an otherwise immune mine where the conditions would favor the reception of infection. Further, and most important, considered in the light of European experiences, there is a very large foreign element in the Nova Scotian coal mines, recruited in many instances from portions of the Old World where the disease is known to be widespread. Many of these men are undoubtedly "worm-carriers," a state not incompatible with apparent robustness, and only to be ascertained by microscopical examination of the dejecta. As one German medical man pertinently remarks: "A single worm-carrier working in a mine possessing the disposition to infection is sufficient to infect the whole of that mine." That it is the contaminated condition of the underground workings that give rise to ankylostomiasis as a miner's disease is evidenced by the fact that in only two recorded cases has ankylostome infection been discovered among the wives and families of the miners in the European coal fields. In the two cases mentioned the infection was caught through contact with contaminated matter. One case was that of a boy whose duty it was to clean his father's pit boots, and the other was also a boy, who had been in the habit of eating the remains of his father's pit lunch.

While, therefore, there does not seem to be the remotest possibility of any need for such drastic and expensive preventive and curative measures as necessity has demanded in the mining centres of Europe, yet a plea for at least descent sanitary conditions is quite justifiable. The individual colliery manager is the best judge of whether his mine possesses any "disposition" to infection, and he can act accordingly. Especially can he endeavor to prevent the promiscuous deposition of faecal matter in hot, moist situations in the mine, or in places where it is likely to be disturbed and carried along by the traffic of the mine. Adequate and proper latrine accommodation on the surface is also a matter that is worthy of attention, nor would anything be lost by the provision of some place in a large pit bottom where faecal matter could be properly isolated and disinfected. Sanitation is as necessary at a colliery as at any other works where large numbers of men are employed, and some little attention to this matter would improve the morale of any colliery. In this connection it is to be feared that the closet accommodation of many colliery villages is primitive and unsanitary.

One of the leading coal corporations of Canada, which recently imported a number of Belgian miners, took the precaution of engaging only such men as were able to produce their "worm-free" certificate, showing that they were, in the opinion of some qualified man, quite free from ankylostome infection. Recently one of these men, writing home to his friends, stated that the conditions of work were admirably suited to those who had suffered from ankylostomiasis.

In conclusion we would say that any statements of an alarmist character are most strongly to be deprecated, for, as before stated, most Canadian mines lack the "disposition" to infection that in most European mines existed in a marked way, but, despite this fortunate fact, the whole subject is worthy of attention from mining engineers and mine doctors in Canada and the States, both from a sanitary and from an economic point of view.

THE LABOR SUPPLY OF CAPE BRETON.

By Our Own Correspondent.

The inadequacy of the labor supply in the Cape Breton mines is a problem of increasing acuteness, and one might almost state that it is the only problem of any real gravity from a managerial point of view that we have down here. The natural conditions under which coal is mined in Cape Breton are remarkably favorable, but the labor question is a constant disturbing factor that must be taken into account in all calculations of output. It is not a simple question, but is complicated by a combination of local circumstances and traditions, with climatic and geographical conditions of an unusual character.

Since 1890 the production of the Cape Breton coal mines has quadrupled itself, and while such a rate of progression cannot be indefinitely prolonged, yet there will be no slackening in outputs for a long time to come. On the contrary, the yield of the Cape Breton mines must increase along with the general and inevitable expansion of the whole Dominion of Canada. The total output of coal in Canada is a little over 8,000,000 tons at the present time, but in the next ten years this tonnage will probably be produced in Cape Breton Island alone, if the men can be found to produce it. The population of Cape Breton has not increased in anything like the same ratio as the increase in its mineral exports. The native miner is as efficient a workman as can be found anywhere, but he is decreasing in numbers. Every year the children of the miner show an increasing disinclination for the calling of their father. To-day the sons of Cape Breton miners are to be found scattered over the New England States and throughout the rest of the Dominion, many of them holding lucrative and responsible positions.

In the past the sheet anchor of the mines when in want of labor has been the outports of Newfoundland, but the ancient colony has also shared in the advance and prosperity of the Dominion, and to-day Newfoundland has her own growing industries. Men are not to be picked up there to-day as they were in former years.

Then over all is the lure of the West, so tempting to the adventurous sons of a Highland race, when they hear the glowing and over-wrought tales of the Western land agent. If they heard their own Cape Breton farm described by one of these same gentlemen they might possibly wonder why they ever left it. Why should all the eloquence of the Dominion be used to set forth the advantages of the West, and to encourage the emigrant to go there? Are there no natural advantages, no beauty spots in the East to invite the settler? However, after all is said, it is the destiny of our race to "go West," and this is the day of the "last West." There seems no likelihood that this drain on the Cape Breton population will lessen for some time to come.

The fact that the major portion of the product of our mines goes up the St. Lawrence, and that the season of navigation is confined to the period between say the middle of May to the end of October, or to six months out of the twelve, necessitates a considerable difference in the rate of production during the season of open water and the winter months, and it is, therefore, unavoidable that a certain portion of the mining population should be of a more or less migratory character. This circumstance limits the number of resident miners and permanent settlers in the colliery towns. This difficulty has in recent years been very largely minimized, and it will never agin be so acute as it has been in years gone by, although it can never be entirely removed.

These are some of the circumstances that have operated to bring about the present stringency, but there are other conditions that make it difficult to relieve the situation, and some of these we may enumerate.

In many respects the price of living in the industrial centres of Cape Breton is unnecessarily and inexcusably high. This is particularly true as regards garden produce and meats. Why it should be necessary to bring market garden produce all the way from Truro and further, and dressed meats from Ontario, is not quite clear. There is a population of something like 30,000 people in the Sydney and Glace Bay district, nearly all of them earning big wages, and there is not a market garden worthy of the name in all the county. Neither is there any proper means of exchanging the dairy, garden and other produce of the farmers from the country with the industrial population. Under present conditions the farmer must barter his goods to the storekeeper, who retails them to his customers, the result being two profits to the merchant, inadequate remuneration to the farmer, and increased prices to the consumer. A weekly market would remedy this state of affairs, and would bring the agricultural interests of the county into closer touch with the workers, to their mutual advantage. However, as the Town Councils in most of the towns in question are composed of tradesmen, it is not to be expected any move of this kind will emanate from them or have their support. The same conditions adversely affect fishermen, and the price of fish, which in a place like Glace Bay should be cheap, but is not. It is no wonder that newcomers to the mining districts become scared when they are asked 25 cents for a cauliflower, 10 cents for a cabbage, and a cent each for very small carrots!

The people of this Island do not receive the stranger with open arms, and there still survives here some of the spirit that regards everybody coming from beyond Canso as a "foreigner," and this is apt to frighten away the emigrant, more especially if he excites hostility by explaining how they do things "at home." The people of this Island must be known before they are understood by the stranger, and if he remains here he will learn that they can appreciate a "proper man" and that nowhere else in the Dominion are there better chances for the man who is not lazy than in Cape Breton.

Another and more serious setback to immigration here is the lying reports that are purposely set afoot by disgruntled individuals as to conditions here, and industriously circulated in the newspapers of foreign countries and also in England. Public men in our Empire betray an ignorance about this country that is surprising, to say the least. In this connection we may refer to the recent warning that emanated from Mr. Keir Hardie, M.P., the Socialist leader of the Independent Labor Party in England, cautioning men against going to Nova Scotian mines. It is said that Mr. Hardie may speak at Glace Bay at the coming labor convention, and at the risk of being tedious, we think it may be interesting to quote his letter, published in the *Yorkshire Post* lately, and a rejoinder that appeared in the *Canadian Gazette*. Mr. Hardie appears to have confused Sydney, N.S.W., with Sydney, N.S. British members of Parliament have been

known to make similar geographical blunders before when dealing with the King's Dominions over the seas, and this letter of Mr. Hardie's is a fair instance of how flimsy is the basis on which some reports gain credence. We are very glad to notice that the Agent-General for Nova Scotia took such prompt action to counteract the effect of Mr. Hardie's warning, but we may point out that the *Yorkshire Post* is one of the most influential papers in the British Provinces and has the reputation of being particularly well-informed on Canadian matters. Mr. Hardie's warning had a very extended circulation.

MINERS AND EMIGRATION.

To the Editor of the *Yorkshire Post*:—

Sir,—In every mining district of England, Scotland and Wales just now bills are out inviting miners to go to certain unspecified mines in Nova Scotia and elsewhere, where high wages are to be had, and where the cost of living is no more than it is here at home. The trick has been so often played in the past that I would beg miners to be on their guard and to make inquiries before being tempted to go abroad without knowing what is in store for them.

As showing the need for caution, I ask you to be good enough to insert the enclosed letter which I have received, and which explains itself:—

New South Wales, Australia,
Woonona, April 23, '07.

Mr. Kier Hardie, M.P.,
Leader Parliamentary Labor Party,
England.

Dear Sir:—

I have been directed to write to you as being more closely in touch with the working classes of Great Britain, and especially that class which the paid envoys of the Australian capitalists are endeavoring to induce by false statements to emigrate to this country. There has recently arrived in this State of New South Wales a number of Scotch and Welsh coal miners who were misled by the glowing reports of the constant work and the high wages to be secured, but who now find that they can scarcely make a living wage, and are practically stranded in a strange land. I desire to state that there are more men here now than can get work at decent wages. The object of the employers in flooding the country with surplus labor is apparent to all of us, and I trust that now the question has been brought directly under the notice of your party that they will take such steps as will prevent in future numbers of their countrymen being misled and fleeced of what little capital they may be possessed of. I enclose a cutting of a paper published in the *Illawarra Mercury*, also the last issue of the *Sydney Worker*. In it you will see how some of the South Africans have fared after coming here. This must be the fate of those who arrive here for some time, until those at present here get work. As to the agricultural laborers required here, there are hundreds here prepared to work at it for almost their bare tucker until something else turns up, and you can judge of the great surplus of land when there has been as high as 800 applicants for three small blocks, and good men have been waiting for years to secure a block under the present system of balloting. I will be pleased to supply you with any information concerning labor conditions in existence here at any time, and trust that you will give every publicity to the statements contained herein.

Yours faithfully,
(Sgd.) THOMAS R. MORGAN,
General Secretary Industrial Employees' Union.

Trusting this warning may not be in vain,
Yours, etc.,
J. KEIR HARDIE.

The House of Commons, July 3.

Mr. Kier Hardie, by the way, signalizes his departure for Canada by issuing to the British press a warning against a notice circulated in the mining districts of England, Scotland and Wales inviting miners to go to certain unspecified mines in Nova Scotia, where wages are high and the cost of living no more than in this country. Mr. Keir Hardie sees some trickery in all this, and warns British miners to be on their guard. We have not seen the notices to which Mr. Keir Hardie refers, but the reference is, we imagine, to the intimation which the Dominion Coal Company, of Glace Bay, Nova Scotia, gave out in the spring that they would require a large number of men for work in their mines during the six months beginning with the end of March last. This intimation, we imagine, still stands good, and that Mr. Keir Hardie and his friends may see that there is no trickery about it, we reproduce the details of the offer as supplied by the company to Mr. John Howard, the Agent-General for Nova Scotia, at the end of March last. They say:—

During the coming six months we will require a large number of men for working our mines. This class of men we want will require to have had experience in coal mines. We require shooters and loaders—that is, men who can shoot and load coal after the mining machines. They will require to have shot-firers' certificates or be in a position to pass the necessary examination before the examining board at the colliery where they will be employed. We also require loaders and drivers. This is unskilled labor, and they do not require certificates, but it would be advisable to have men who have had experience in coal mines. At this season of the year there are large numbers of mine workers leaving England for Canada, and we believe that a considerable number of those men would prefer work in the mines rather than go farming, provided they were sure of getting steady employment on their arrival here. Our mine workers are all paid on a tonnage basis, and make good wages. Shooters and loaders make from $2 to $3 per day, and loaders and drivers from $1.50 to $2 per day. Board and lodging costs from $3 to $4 per week.

It is pleasing to note that the Premier of Nova Scotia has recently announced his intention of establishing a Department of Immigration for Nova Scotia. There is plenty of work for such a department, if only in the distribution of accurate facts about this neglected Province, and the prompt contradiction of such injurious statements as that of Mr. Hardie's. Recently the writer was on the "Empress" boat at Quebec that brought 2,000 odd passengers to this country. Out of the whole of that ship's company there were not a dozen people bound east of Montreal. All the rest were "going West." The ordinary emigrant to Canada, who has studied the literature that is distributed over on the other side, knows about as much of Nova Scotia as he does of Nova Zembla. The need of a Nova Scotian Department of Immigration is pressing.

Some of the assisted emigration to Nova Scotia has not been judiciously arranged, and in the last winter the

big industries at the Sydney terminus of the Intercolonial Railway were used as a dumping ground for indigent emigrants who were brought over in large numbers in the early spring to work on railway construction in the West. Owing largely to the severity of the season these works were not ready, and there were hundreds of men out of work in Halifax in February and March of all months. The Salvation Army were to blame for a great deal of hardship. To instance one case—a man, whose only qualification for employment at the mines was that he was a general laborer, arrived in Sydney on the 7th of March with his wife and six children, the oldest of whom, as we remember, was not more than eleven years old. The 7th of March will long be remembered as the date of one of the worst blizzards on record here. Imagine the case of this man, who had to find employment, housing and food for six children and his wife. He could hardly be blamed had he said hard things about Cape Breton. It is pleasing to know that he and his family were looked after, that employment was given him, and that he is now doing well. But this is not quite the way to arrange emigration, and somebody blundered and kept on blundering during the early part of 1907. On the same train was a young man with his wife and three children, and a mixed party of men seeking employment having such varied trades as clerk, green-grocer, gamekeeper, etc., not one of them having ever seen a coal mine. There was also the case of twenty men who were stranded at Port Hawkesbury for days, who were sent by the same organization. Their plight was related in every paper in Canada and in England, the blame being put on the coal companies. Before this mischievous paragraph had finished its newspaper career it was garbled and twisted beyond recognition, but the writer is in a position to say that it very materially and adversely affected emigration to Cape Breton. We fear that unless the Salvation Army mend their ways they will miss in Canada the most magnificent opportunity that ever offered itself to a religious organization. Every summer Cape Breton becomes the happy hunting ground of the Montreal labor agent, and employment sharks of every description with Semitic names. These gentlemen are kindly assisted now and then by our railways, who run cheap excursions to the West. One that recently left Sydney took away 300 men. The *Eastern Chronicle*, commenting on this, says: "The cars were loaded with young men, every one of whom is wanted at home; there is plenty of work for each to do at home, for which he would earn more money than he will in the West. This principle, by a system of extensive advertising and cheap railway transportation, of denuding the East of young men for the sake of the West, is a national scandal." The *Eastern Chronicle* might have added that no one ever heard of cheap rates to the coal fields and the steel industries of Cape Breton on these same railways. And yet we venture to think that the coal and steel of Cape Breton are national assets as valuable and as necessary to our national welfare and advancement as the wheat fields of the West. We do not wish to disparage the West. It is not in the power of any man to disparage so great a country as the West of Canada, but when our industries in the far East languish for want of laborers, are we not entitled to equal facilities and similar consideration?

What one might term the human element plays no small part in the matter of a labor supply. Men who come out to a new country may do well financially and have every advantage, but sooner or later there comes the inevitable homesickness, the "Heimweh," that is not to be denied. This feeling is intensified by the isolated and monotonous life the newcomer must live. Many of the men who arrive here, particularly men from the Old Country, have been members of some church or other, and have found a great deal of their social life in chapel teas, meetings, etc. This is particularly true of the Nonconformist, and the dissenter predominates among the miners in the United Kingdom. We suggest that if the clergy were at more pains to follow up the newcomers their church membership would benefit, and more men would become permanent settlers.

We have before referred in these columns to the insane liquor laws of this Province, and to the lack of technical education or intelligent amusement for the workingman, and need not dwell on these matters now. All the same, they are matters of the greatest importance in having and holding industrial population.

While the miner and the miner's son find underground employment natural and not irksome, the man who has never descended a coal mine is apt to balk when asked to do so, even with the temptation of big wages. In actual fact, work in a modern well-ventilated mine is less trying than work on the surface, where men are exposed to the vagaries of the weather. However, the ordinary man, not being a miner, prefers to work above ground. Some nationalities take more kindly to pitwork than others. Italians, particularly the northern Italians, make good miners after a while, but permanent workmen are best obtained in other mining centres. Generally speaking, the problem is very different to the ordinary labor question, and the class of men required are limited in numbers.

The following is a presentation of the major factors in the labor problem, some of which it is difficult to express. The remedy for some of the difficulties enumerated is fairly obvious, and we take it that a general solution would involve many small adjustments of existing conditions, which, though insignificant in themselves, would total up to a good deal. In other words, the situation must evolve its own remedy, but it can be assisted in many ways. There are many matters with which we have not dealt, such as the attitude of the P.W.A., the nationalities best suited to Cape Breton industries, wages and housing, systems of coal working, etc., which must be left to a later issue.

The fire-damp detector of M. Hardy, a Frenchman, is an ingenious application of the microphone. Two pipes of equal pitch—one in the mine and the other above ground — are sounded simultaneously, and the sound waves impinge on microphones connected in series with a telephone. If both pipes are in pure air a clear note is heard in the telephone. If the pipes are in air of different density, beats are heard, and these give warning of the presence of fire-damp in the mine.

The following are the British newspapers whose representatives are invited to inspect the mineral resources of the Province of Ontario: Times, Telegraph, Morning Post, Standard, Tribune, Daily Mail, Financial News, Financial Times, Yorkshire Post, Birmingham Post, Liverpool Post, Manchester Guardian, Economist, Statist, Globe, Pall Mall, Financier.

MICHIPICOTEN ISLAND.

A. B. Willmott.

It may be of interest to your many readers to have a little information concerning Michipicoten Island and the recent silver find reported there. Mr. Gordon Michael and partner have been prospecting on the island since early in the season, and recently came to Sault Ste. Marie to record their claims. He exhibited a specimen of native silver over a quarter of an inch in thickness which he had taken from a vein on one of his properties. Other specimens showed considerable native silver in a calcite gangue, and still others native copper. The silver vein is not wide, varying from one to three inches, and runs about at right angles to the direction of the copper bed. The matrix of the copper is not a vein, but a bed, following the strike of the formation, and from one to three feet in width. An analysis of an average sample of this bed is said to have yielded 2.6 per cent. in native copper. The news of the discovery spread through the Soo, and numerous prospectors have started for the island. It is reached by means of the steamers of the Dominion Transportation Company, sailing from here twice weekly. The island embraces in the vicinity of 45,000 to 50,000 acres, of which a considerable part is not even surveyed. The Jones location of 6,400 acres on the west end, and the Bonner location of the same size across the centre are the two main holdings on the island. Eight more properties of small acreage have been patented, and three mining claims recorded, so that not more than 15,000 acres of the island have yet been alienated from the Crown. Quite an additional acreage was at one time applied for, but applications have lapsed.

Geology.

Geologically the island is very similar to the formation on the south shore of Lake Superior as exposed at Keweena Point. As shown on Irving's map, in his work on the "Copper-bearing Rocks of Lake Superior," it is the lower part of the Keweenaw formation which occurs at both places. He writes, page 347: "The facts given above . . . establish then a complete identity between the Michipicoten Island rocks and those of the typical cupriferous districts of the south shore of Lake Superior."

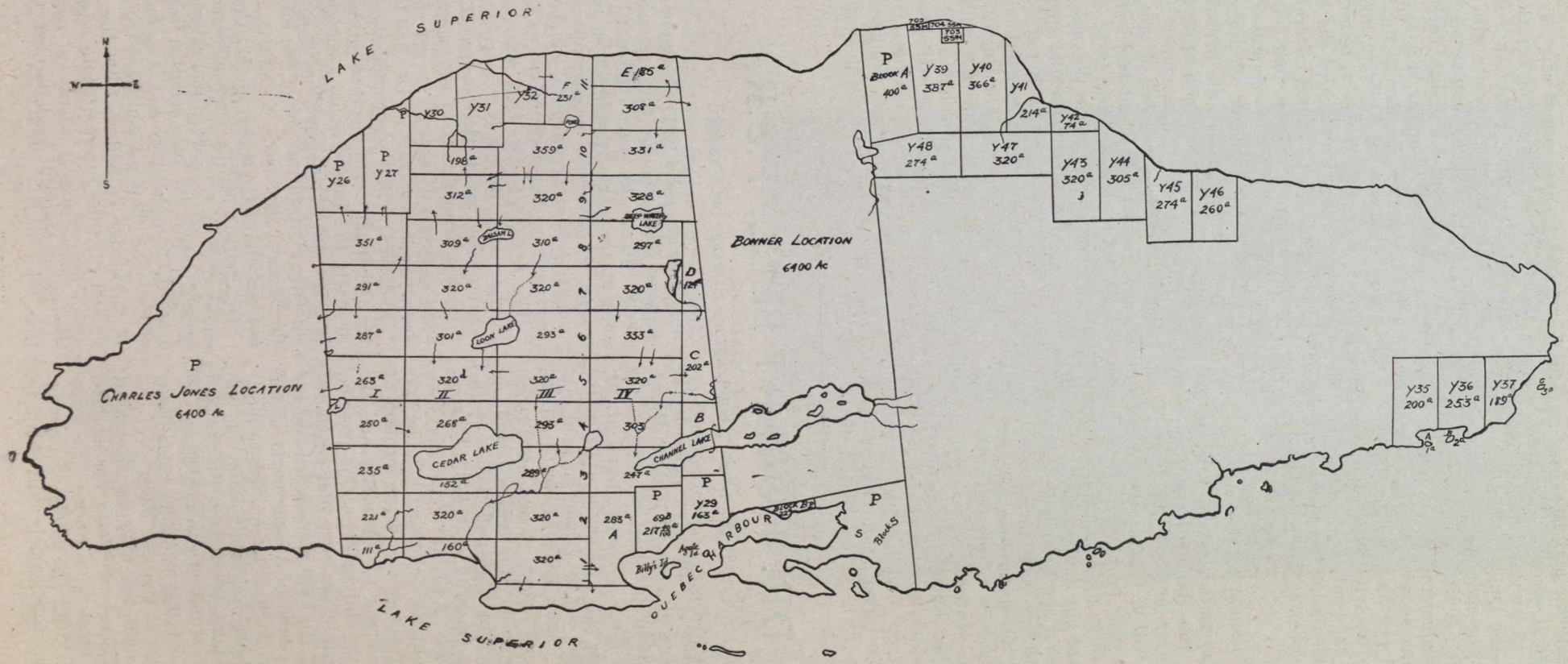
The Canadian Survey has made almost no survey since 1865, when it was reported on by McFarlane in the report of 1863-66. The following paragraphs are published in the 1863 report:—

"Towards the west end of the island, the rocks present a low surface for a breadth of four or five hundred feet, and then rise into a cliff two or three hundred feet in height, in which the greenstone is marked by druses containing analcite and quartz. A soft amygdaloidal bed holding native copper is traceable for some miles along the shore, sometimes beneath the surface of the water in the bays, and again running a little distance inland. In this bed in the north bay an attempt was made, a few years since, to work a remarkable deposit of native copper and silver, which were found disseminated in grains through a green hydrous silicate of nickel. The ore being stamped, the nickel, whose value was not suspected, was washed away from the residue of native metals, which gave in one trial twelve parts of silver and eighty-eight of copper. A shaft was sunk here to a depth of 70 feet; but after a considerable outlay, the working was abandoned. Nothing very definite is known as to the mode of occurrence of this curious metallic deposit, which is stated, however, to have been associated with calcspar. From the same mine were said to be obtained the specimens of mingled arsenides of nickel and copper, which, with the preceding nickeliferous ore, are noticed on page 506, and again on page 737. At a point near the west end of the island, and seven miles from the workings just mentioned, the cupriferous stratum again appears, and fragments of the native metal are scattered along the shore. Mining operations on a small scale were undertaken here ten years since by the Quebec Mining Company, and a shaft was sunk at a little distance from the shore, by which the copper-bearing beds were reached at a depth of forty-five feet. The mine is now leased to Mr. Hugh R. Fletcher, who is engoged in working it, and has kindly furnished the following particulars. Beneath the principal copper-bearing bed is a soft argillaceous rock, known as an ash bed, which is six feet, and perhaps much more, in thickness, and is underlaid by a massive greenstone. The ash bed itself contains from one-half to one per cent. of disseminated metallic copper, which it is supposed can be economically extracted by crushing and washing the soft rock. Upon this reposes the principal copper deposit. The metal is found in a bed of greyish amygdaloid of from eight to eighteen inches in thickness, and an overlying bed of sandstone of from twelve to twenty-four inches; the united thickness of the two being on an average about three feet. The proportion of copper is the same in the two rocks, and averages two and a half per cent. The copper is in larger grains in the amygdaloid, and is sometimes surrounded by calcspar; while in the quartzose sandstone it is in fine particles, or in filaments. Small specimens of the sandstone are occasionally found containing ten or fifteen per cent. of copper. The bed is overlaid by a massive compact greenstone, to which succeed amygdaloid and conglomerate. The dip of the copper-bearing stratum is about three feet in a fathom. Three shafts have been sunk upon it, one to sixteen fathoms, one to twelve and a half, and a third to eight and a half fathoms. From 300 to 400 tons of two and a half per cent. ore have been raised; and in the spring of 1863 it is proposed to commence operations on a larger scale, with proper machinery. Small portions of native silver and of vitreous copper ore have been found in this vicinity; and according to Mr. Wilson native copper occurs in a second band of amygdaloid about a mile and a half south of Mr. Fletcher's mine, and 200 feet above the surface of the lake. Vitreous copper ore is also found with calcspar and sulphate of barytes on the eastern extremity of the island, in a reddish phorphyritic rock, near which occurs a pitchstone phorphyry, and pitchstone with veins of agate."

History of the Work.

The first work of any consequence was done about the years 1860-61 by Mr. H. Fletcher on behalf of New York parties with very encouraging results. Financial difficulties caused the property to be abandoned. In 1875 the Quebec & Lake Superior Mining Association made extensive explorations, and erected buildings on the Jones location. About the same time Phillips explored on the adjoining locations to the east and sunk several shafts and found good copper in all. In 1880 the Michipicoten Native Copper Company was formed, and began work on a very extravagant scale, which soon brought them into difficulties.

Later the property passed into the hands of Mr. Joseph Cozens, of Sault Ste. Marie, who interested parties con-



MICHIPICOTEN ISLAND

nected with the Standard Oil, and this location (the Jones) has passed into their control. The bulk of the work done has been on an amygdaloid bed similar in character to the lode of the Quincy Mine of the south shore of Lake Superior. The main shaft is 520 feet deep, and the Batler shaft 360. A little over a mile west of the main workings, a conglomerate bed was discovered, on which a shaft was sunk showing the pay streak two feet wide and carrying 5 per cent. copper.

The Bonner location, after lying idle for a long time, passed this summer into the control of some Sault Ste. Marie parties who interested some Chicago parties in it, and a diamond drill has been at work for some months with encouraging results.

Ore Possibilities.

All parties who have examined the island do not hesitate to compare it with the similar formation on the south shore of Lake Superior, and in consequence to expect that copper of value will be found. Indeed, the surface indications have been most promising, and had more skill and more economy been used in the development operations there is no doubt but that a successful copper mining company would long ago have been established. As to the silver possibilities, the question is a very uncertain one, as we are forced to reason almost entirely from analogy. Specimens of native silver are of frequent occurrence on some of the south shore properties, associated with the native copper, but no large amounts have yet been taken out. Similar association of the silver with the copper is found on Michipicoten Island, and whether it will be found in larger amounts than on the south shore one cannot say. Certainly rich specimens of it do occur, so rich that had they come from the vicinity of Cobalt there would be a stampede at once. It is to be noted that the diabase with which everyone admits the silver of Cobalt is connected, is probably of the same age as the enormous diabase intrusions found on Michipicoten Island. Further, it is to be noted that the arsenides of nickel are common to the two districts, though so far as discovered not yet in large amount at Michipicoten. One must, however, be guarded in inferring that because diabase eruptive of the same age occur at both places, and that the nickel minerals associated with silver are found in both places, that both places will be equally rich. The similarity is, however, excellent ground for the careful prospecting of Michipicoten Island for silver, although perhaps the probabilities are that native copper will in the long run prove the more remunerative. In searching for native copper, it is well to remember that there are two classes of ores, the one found in the conglomerate and amygdaloid beds, and the other found in the veins crossing these beds. No copper is found in the acid eruptives, nor in the massive portions of the diabase; it is the upper vesicular portions of the lava flows in which the copper is found. Epidote, chlorite and prehnite are the most frequent mineral associates of the copper. Calcite veins are usually poor in copper. Where veins are found they usually widen in passing through the soft rocks like amygdaloid and narrow off in the massive diabase; the contacts with the softer rocks are more likely to prove metal-bearing. In the conglomerates it has been found that the thinner beds near the diabase sheets are the more likely to be productive.

DR. ROBERT BELL, F.S.R.

Chief Geologist, Geological Survey of Canada.

Dr. Robert Bell, the present Chief Geologist of the Geological Survey of Canada, is a son of the late Reverend Andrew Bell, an amateur geologist of note in the early days of the Survey, and a personal friend of Mr. (afterwards Sir William) Logan. After the death of the senior Bell, his son was sent out by Logan on field geological parties under Mr. James Richardson. In 1859, when he was not more than 17 years of age, young Bell was given independent work on Manitoulin Island, on the southern shore of Georgian Bay and thence in the country southward to Lake Ontario. In 1860 he accompanied Mr. Alexander Murray, Assistant Provincial Geologist, to Lake Superior; but the following year he was given charge of a party of his own. In the autumn of 1863 he was appointed Professor of Chemistry and the Natural Sciences in Queen's University. This position he filled for five sessions and at the same time continued his field work each summer. In 1869 he resigned and the same year was employed as chief of a large party in the Thunder Bay District and in making a topographical and geological survey of Lake Nepigon. Later he was on the Government expeditions to Hudson Straits and Bay, on the Steamships Neptune, Alert and Diaga, as geologist and naturalist. On the first two expeditions he also acted very acceptably as medical officer.

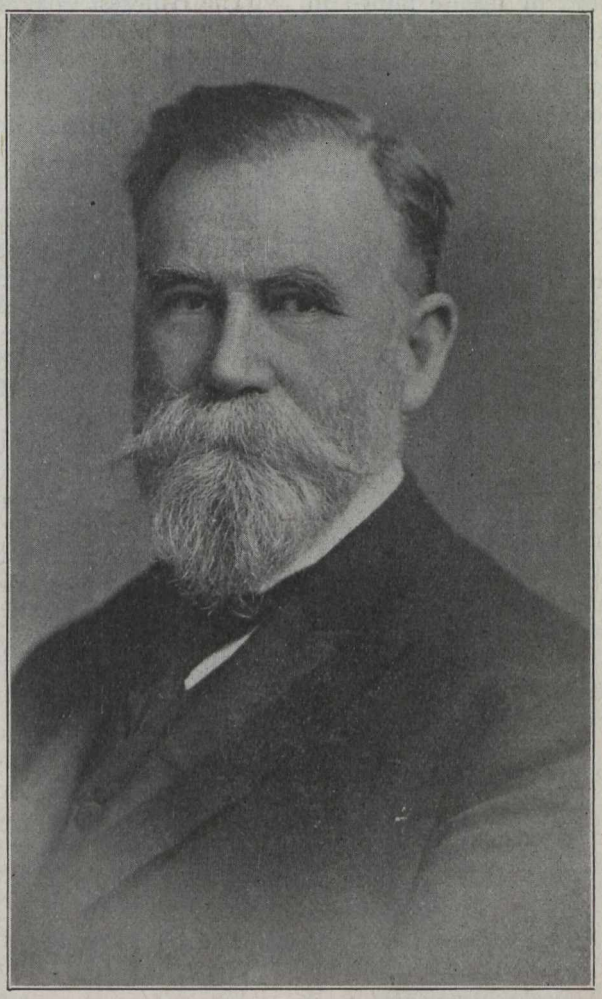
Dr. Bell has now been connected with the Geological Survey for fifty years. His robust health has enabled him to accomplish a large amount of work. The scene of his labors includes practically the whole of Canada.

Dr. Bell has always been particularly interested in obtaining the collections of economic minerals and useful mineral products for the various international exhibitions. From the year 1863 until the Survey officially took up the work, he voluntarily procured and prepared statistical and other mining information. It was on his invitation that the removal of the headquarters of the Survey from Montreal to Ottawa in 1881 took place.

For five years Dr. Bell was Acting Director of the Survey, and during that period the volume of work accomplished was largely increased. Indeed, one has but to glance through any of the publications of the Survey for the past half century to get some conception of the variety and excellence of Dr. Bell's labors.

In 1903 Dr. Bell was commissioned as a delegate from the Dominion Government to proceed to Vienna in order to invite the International Geological Congress to meet in this country. Before this, in 1888, he was selected by Sir Oliver Mowatt as one of the Royal Commissioners on the Mineral Resources of Ontario, and he wrote important sections of the report of that Commission.

Dr. Bell's scientific accomplishments are not, however, confined to geology and mineralogy. He has published several brochures on Canadian forestry. He has also studied the archæology and ethnology of the native races of Canada. This pre-eminence in these emdite branches of knowledge is evident from the position he holds as President of the International Congress of Americanists, which held a highly successful meeting at Quebec last September and will hold its next meeting in Vienna in 1908.



DR. ROBERT BELL

As an explorer and geographer Dr. Bell has done most notable service to his country. The traveller in sub-Arctic regions encounters many evidences of this in the nomenclature of striking topographical features.

Last year the Council of the Royal Geographical Society recognized the value and extent of his explorations by awarding him the Patrons' Gold Medal. In January of the present year the Council of the American Geographical Society voted him the Cullum Gold Medal, and about the same time the Duke of Argyll sent him a very valuable gold medal "in admiration of his services to geology in Canada."

Dr. Bell is the possessor of a phenomenally large number of degrees. Not only is he a graduate B.Sc., a D.Sc. and a M.D.C.M., but he also can boast a long list of honorary degrees. In 1897 he was elected a Fellow of the Royal Society of London, a high distinction; but a few years ago there was conferred upon him the Companionship of the Imperial Service Order "for faithful service."

In closing this necessarily incomplete and scanty account of Dr. Bell's long career, it may be added that from him a large number of young geologists have received their first lessons in field geology.

COAL MINING IN ALBERTA IN 1906.

From the annual report of the Department of Public Works of the Province of Alberta some significant facts and figures are to be gleaned concerning the progress and present condition of coal mining in that new Province.

In the year 1901 the total output of coal for the Northwest Territories, Alberta and Saskatchewan was computed to be 346,649 tons. During the years 1902, 1903 and 1904 the output stood at 510,674 tons, 622,939 tons, and 782,931 tons, respectively. But the year 1905 saw Alberta alone raise 811,228 tons, and in 1906 the figure of 1,385,000 tons had been attained, or almost exactly four times the output of 1901, and an increase of 70.73 per cent. over the 1905 output.

The report classifies the coal raised thus:

Lignite coal	602,780 tons.
Bituminous coal	546,623 tons.
Anthracite coal	235,597 tons.
Coal used in coke production	103,936 tons.
Coke produced	69,844 tons.

On account of the large amount of lignite mined in the Province, the recent step taken by the Railway Commission in prohibiting the use of this fuel on railways, on account of its high percentage of volatile combustibles, and its liability to cause locomotives to emit sparks, will have a very serious effect upon the Province.

If the figures representing the coal used in coke production and the coke produced are correct, they imply that a yield of over 67 per cent. coke has been obtained in bee-hive ovens from Alberta bituminous coals. This speaks well for the coals and for the management of the ovens.

Accidents.

In proportion to the coal raised, the percentage of accidents was slightly higher than in the United States. For each 138,500 tons, one person was killed, 1.1 persons seriously injured, and 2 persons slightly injured. Nova Scotia, in this respect, holds the world's record—250,000 tons of coal for each fatal accident; Great Britain comes next with 210,800 tons, then France with 200,000 tons, the United States with 165,000 tons, and Germany 154,-773 tons.

In the past year, then, in the coal mines of Alberta there were 10 fatal accidents, 11 persons were seriously injured, and 20 slightly injured, making a total of 41 accidents. Of the fatalities, five resulted from falls of coal, rock or clay.

In commenting upon those casualties, it must be remembered that most of Alberta's coal mines are in the first stages of development. The average number of employees for each mine is much smaller than in older countries, and operations are spread over a very large area. Hence rigid inspection is difficult, and many precautions valuable in more developed mines are either inoperative or positively harmful at present. Under these conditions, the list of accidents is not excessive. It by no means follows that improvement is not possible. The Albertan Government has proved itself alive to the requirements of its thriving coal industry, and, we doubt not, each year will reduce the percentage of fatalities and accidents.

Coal Mines Opened and in Operation.

There are 61 coal mines in operation in the Province in 1906. Sixteen of these were opened during the year. Two mines also were abandoned during 1906, one at Edmonton and one at Frank. Among the principal producers are the following:

The Pacific Coal Co., Bankead, has an output of 1,200 tons per day. An electric plant operated at the mine supplies the towns of Bankhead and Banff with light. The main tunnel has a length of over 3,000 feet from the mine mouth. The system of working is breast and pillar. A one-unit briquetting plant, built under the patent of the Zwoyer Fuel Company, N.Y., was installed during the year. It has a capacity of 200 tons per day. One marked feature of this camp is the fact that the company runs a large and well equipped skating and curling rink for its employees.

At the International Coal and Coke Company's mines at Coleman, ninety new return ovens were installed, together with a Bradford coal braker and slate picker to crush and clean the coal from No. 4 seam.

The Canadian-American Coal and Coke Company have installed a modern tipple plant, capacity 1,000 tons per day, placed about a quarter of a mile from the mine mouth. The coal is hauled that distance by means of a main and tail rope haulage.

The Hillcrest Coal and Coke Company, Hillcrest, operate three seams, having thicknesses of 14 feet, 12 feet and 8 feet, respectively. The system of working is pillar and room.

Two mines are operated by the West Canadian Collieries, of Blairmore—the Bellevue and the Lille. At the latter mine the slack is washed and coked in a battery of Bernard ovens.

The following companies are actively developing their properties and are producers already or are about to produce: The H. W. McNeill Co., Canmore; the Breckenside and Lund Coal Co., Lundbreck; the Alberta Railway and Irrigation Co., Lethbridge; the Diamond Coal Co., Lethbridge; the Reliance Coal Mining Co., Taber; and the Canada West Coal and Coke Co., Taber. One of the companies mentioned above, the Alberta Railway and Irrigation Company, of Lethbridge, have installed a Rand B. 2 duplex non-condensing compound air compressor plant, capacity 2,848 cubic feet of air per minute at sea level. This is the largest compressor of its class made by the Canadian Rand Drill Company. Here also is installed a 200 k.w. generator manufactured by the Allis-Chalmers-Bullock Company, and driven by a 20x 20 direct coupled engine of the Robb Engineering Company's manufacture.

Considerable trouble is reported in the introduction of safety lamps in the Crow's Nest Pass mines. Satisfactory arrangements have now, however, been made. The scarcity of fire-boxes is remarked. The ordinary miner can make more money than the fire boss who is paid $3.50 per day. The average coal miner's wage, mining coal on contract, varies from $75 to $180 per month.

The general wages for day labor is as follows:

Inside Men.

		No. hours.
Fire bosses	$3.50	8
Shot lighters	3.00	8
Bratticemen	3.00	8
Bratticemen helpers	2.50	8
Timbermen	3.00	8
Timbermen helpers	2.50	8
Drivers	2.50	8
Drivers, wet places	2.75	8
Team drivers	3.00	8
Machine men	3.50	8
Machine men helpers	3.00	8
Tracklayers	3.00	8
Tracklayers' helpers	2.50	8
Rock miners	3.50	8
Miners	3.00	8
Miners, wet places	3.50	8
Laborers	2.50	8
Switch boys	1.50	8
Door boys	1.00	8
Hoistmen	2.75	8

Outside Men.

Pithead men	2.50	10
Slate pickers, men	2.00	10
Slate pickers, boys	1.25	10
Blacksmiths	3.50	10
Blacksmiths' helpers	2.50	10
Mine carpenter	3.50	10
Outside laborers	2.00	10
Machinists	3.20	10
Lampmen	2.50	12

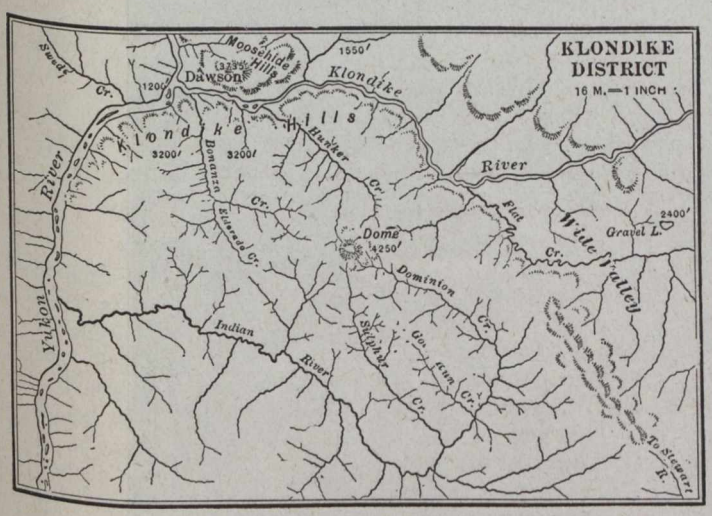
CONCENTRATION OF GOLD IN THE KLONDIKE.

J. B. TYRRELL.

The study of the origin of ore deposits is one of the most fascinating subjects of investigation which the mining engineer or geologist can undertake. The results of his investigations are, in most cases, sufficiently indefinite to escape final conclusions, but at the same time they constantly bring together new groups of facts and ideas which tend towards definiteness and raise hopes of conclusive results.

The uncertainty which hangs over our knowledge of the origin and mode of deposition of ores is especially marked in connection with the consideration of veins or lodes, but the mode of formation of many placer deposits is also not clearly understood, and the source and method of concentration of the gold or other valuable mineral has not been definitely determined.

In the midst of this uncertainty it is interesting to consider briefly the conditions that prevail in the Klondike district, Yukon Territory, Canada, a country of exceedingly rich gold-bearing placers, where the origin and processes of deposition and concentration of the gold into its present position are quite easily recognized and interpreted.



Map of Klondike District.
(Courtesy of Economic Geology)

The Klondike gold-bearing district lies in the basin of the Yukon River, just south of north latitude 64 degrees, and about fifty miles east of the 141st meridian which forms the boundary line between Canada and Alaska. It is more or less rectangular in shape, with a greatest diameter in a general east and west direction. Its total area as considered in this paper is about eight hundred square miles.

It is a well-defined physiographic unit, consisting of a mountain mass separated from all the surrounding mountains of the Territory, except at its extreme south-eastern angle, by deep and wide valleys, from which the land rises in easy slopes to a highest point near the centre of the area. The greatest relief is 3,050 feet, this being the difference in height between the bank of the Yukon River at Dawson, with an approximate elevation of 1,200 feet above the sea, and the summit of "The Dome" with an approximate elevation of 4,250 feet above the sea.

The district is bounded on the west by the valley of the Yukon River, which is one of the largest streams on this continent; on the north by the equally wide valley of the Klondike River; on the east by a great valley much wider than those just mentioned, that extends along the southwestern base of the Ogilvie Range of the Rocky Mountains and constitutes one of the principal topographic features of the Yukon Territory. On the south the valley of Indian River, a tributary of the Yukon, forms the boundary for the greater part of the distance, the exception being a narrow ridge at the south-east corner of the area, connecting these mountains with those to the south.

These mountains are not rugged pinnacles and ridges like the Rocky or Coast mountains to the north and south, but their summits are well rounded and their sides descend in gentle slopes into the valleys that radiate in all directions from the highest points. The bottoms of the valleys, too, both small and large, have very regular grades, and the streams that flow in them are not interrupted by either lakes or waterfalls. Some of the north-flowing streams have rather steeper and more gorge-like channels cut to depths of two or three hundred feet into and below the bottoms of the old flatter valleys, but even in these the grades are regular and continuous.

Bank of White Gravel.
(Courtesy of Economic Geology)

The country is largely underlain by schistose rocks which take their distinguishing characters from the presence of sericite, chlorite, graphite or quartz. They are all very old, geologically speaking, dating probably from Precambrian or Cambrian times, and have been very much folded, crumpled and twisted, and consequently they have been greatly altered from the eruptives or sediments as at first formed or deposited.

These schists are cut by many narrow veins, stringers and lenses of gold-bearing quartz, and while these veins, etc., are more numerous and probably more highly mineralized in some places than in others, they would seem to be present everywhere in these schists although in no place have they been found sufficiently closely aggregated, large or rich to pay for mining in themselves. However, they are very interesting and important, as the gold collected in the placers in the bottoms of the valleys was derived from them.

In a few places around the margin of the Klondike district outliers of sedimentary rocks of Eocene age occur. During this period the land would seem to have been lowered so that the present four thousand feet contour line

was at or near the level of the sea, for at this elevation the remains of a vast peneplain can be traced on the hills, not only of the Klondike district itself, but over great expanses of the Yukon Plateau which stretches away to the south and west, the rounded tops of the mountains, as seen from any of the higher summits, extending away to the horizon like billows on the ocean. The summit of the Klondike mountain mass evidently formed part of this old peneplain, though some of the largest depressions around and near it were undoubtedly marked out at that time. Assuming that this portion of the peneplain sloped down into the surrounding valleys, which were then submerged, the general elevation of the Klondike mountain mass, taking present sea level at a datum, was about 3,500 feet.

After the land was raised well above the level of the sea atmospheric agencies began the decomposition of the rocks, and the breaking apart and liberation of the rock particles one from another, while the rain and the smaller and larger streams cut out the valleys, dissolved parts of the rock, and washed the undissolved particles from the higher to lower levels. The very heavy particles, such as the grains and nuggets of gold, would settle close to the places from which they were derived, while the lighter particles would be carried farther away.

The process of decomposition and erosion, with transportation and separation of the eroded material, went on continuously from year to year and from age to age until the land had been reduced almost to its present level, and the bottoms of the wide and relatively shallow

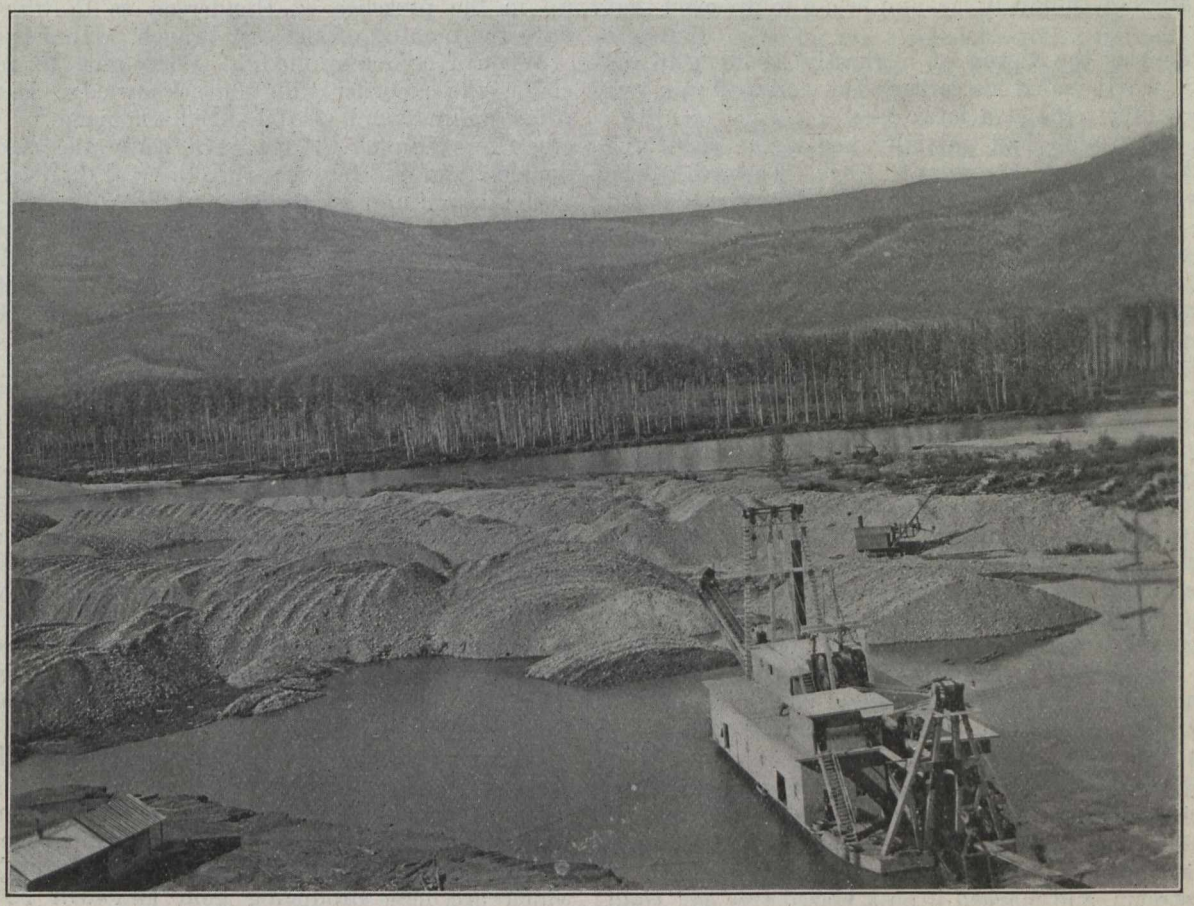
View from Bonanza towards Gold Hill and the Town of Grand Forks.

At or shortly after the close of the Eocene period the land was raised above the sea, and it has not since been submerged, so that ever since then it has been continuously subject to decomposition by meteoric agencies, and to subaerial and stream erosion, the streams having assumed and retained normal courses outwards from the centre of the mountain mass.

The district lies in the unglaciated area between the glaciated Ogilvie Range of mountains to the north-east, and the much more severely glaciated Chilcat or Coast Range of mountains to the south-west, and while there is a possibility that during the glacial period it may have had some local glaciers of its own in the higher portions of its valleys, none of the glaciers from the north or south reached it, and there was no transportation of material to it from any outside source. Its problems of erosion, transportation and concentration are therefore entirely confined to itself.

valleys had been filled with coarse pebbles and cobbles of the harder and more resistant kinds of rock, though chiefly vein quartz, that had been slowly washed down from the adjoining hills. Mixed with these larger masses of rock were the smaller but heavier nuggets and grains of gold, which had been washed out of the same hills, but on account of their weight had not been carried away with the rock particles of the same size. The beds of quartzose gravel thus formed are locally known as the "white gravel" or "white quartz wash."

After these gravel beds were formed the northward-flowing streams were accelerated and given greater cutting power in some way, probably by a tilting of the land from the south northward, consequent on the continued rising of the mountains near the Pacific Coast. These streams therefore cut narrower valleys, with steeper sides, through the "white gravel" and into the underlying rock, leaving terraces of the "white gravel" on one



Ladder and Bucket Gold Dredge on Flat of Klondike River near mouth of Bear Creek.

or both sides of the valleys, and reconcentrated into their beds the gold from the gravel which they had cut through and washed away, as well as any gold that may have been in the rock cut through below the older gravel.

These two sets of gravel deposits have together produced to date about six million fine ounces of gold, and it is not improbable that there are still four million ounces remaining in the placers, making a probable total gold content for these Klondike placers of ten million fine ounces of gold.

As has been shown above, this gold was concentrated by the rills and streams from the whole of the rocky material washed down from the Klondike mountain mass, and it probably represents a considerable proportion of the gold originally contained or included in the rock.

In reference to the quantity of rock that was so washed down by eroding and transporting agents acting continuously through a long period of time, only approximate data are obtainable, but the following statement is believed to represent with a reasonable degree of accuracy the conditions as they existed during the erosion period.

As stated above the mean elevation of the land when active denudation began at the close of the Eocene period was 3,500 feet, taking the present sea level as a datum. The mean elevation of the district at present is about 2,600 feet above the same datum, from which it would appear that the thickness of rock removed from the surface between the end of the Eocene age and the present time is equal to a thickness of 900 feet over the whole area. Adopting the ordinary time scale of 4,000 years for the removal of one foot of surface, 3,600,000 years would be the time required for the removal of this 900 feet of surface, and such, according to this computation, would be the length of time since the close of the Eocene period. A thickness of 900 feet over an area of 800 square miles would equal a mass of 136 cubic miles or 1,600,000,000,000 tons of rock. This is therefore the quantity of rock that was removed by denudation, and from which 10,000,000 ounces of gold was washed and concentrated into the Klondike placers, and it represents an average gold content of 0.003 grains or 0.013 cents to the ton of the original rock in place.

It is thus seen that the Klondike district owes its phenomenally rich placers not to the wearing down of highly mineralized gold-bearing veins or lodes, but rather to the favorable conditions of long continued and uninterrupted concentration from a great mass of rock that contained only very minute quantities of gold.

THE DISCOVERY OF THE KLONDIKE.

By Major Henry J. Woodside.

Robert Henderson, discoverer of the Klondike, was born in Pictou, Nova Scotia, about fifty years ago. At the age of fourteen he ran away to sea, sailed around the world, and mined in Australia, California and Colorado.

In July, 1894, he arrived at Ogilvie Post, at the mouth of Sixty-mile River, Yukon. He outfitted with Joe Ladue, and contrary to advice, started with one companion, Collins, up the Indian River. They prospected on Quartz and other creeks, and late in the autumn had a dangerous and starving trip back to Ogilvie.

During the winter Henderson started alone with a sled load of supplies for Quartz Creek. He mined there until March, but found nothing. In the early spring,

through ice and slush, he moved his scanty outfit to the upper waters of Indian River, and began to prospect that district.

Here he was the victim of a ghastly accident to his leg which nearly ended his career then, and again on two perilous winter trips at a later date.

When the wound had partially healed, he spent the rest of the summer in his planned work. Toward fall he ran down to Ogilvie for supplies, and returned with Redford. They began extensive miner work on Quartz Creek, preparatory for general sluicing next summer.

After another visit to Ogilvie, Henderson spent the winter alone on Quartz Creek, working every day in "burning" holes through the frozen gravel to bedrock and drifting tunnels in search of the pay streak.

In the spring he washed up about $600 in gold. Then he crossed the ridge separating the Indian River and Klondike River basins, and found good prospects on Gold Bottom Creek (a branch of Hunker). He at once returned to Quartz Creek and induced some visiting prospectors to accompany him back. Four of them remained, and they began regular minerlike work, ground sluicing, etc. He crossed over the ridge between Gold Bottom and Hunker branches, and staked on what is now called Hunker branch.

When food began to fail, Henderson went via Quartz Creek back to Ogilvie. With a loaded boat he could not ascend Indian River, and was compelled to return via the Klondike.

Where Dawson now stands he found George W. Carmac, with his Indian wife and her relatives. He invited Carmac to come up and stake on his new find, then poled his loaded boat up the Klondike to the mouth of his own stream, and marked it on a blazed tree as "Gold Bottom" Creek. When he arrived in camp he found Carmac, "Skookum Jim" and "Tagish Charlie" there. After they had staked and Carmac was leaving, Henderson strongly urged him to test the gravel on Rabbit Creek (now Bonanza), and if he found anything, to send one of the Indians back and he would be paid. Carmac promised.

They camped on what is now called Discovery Claim, Bonanza Creek, just below the forks of Bonanza and Eldorado branches. While Carmac slept Skookum Jim panned gravel and found coarse gold. Next day they panned out $13, staked claims, and, forgetting Henderson, left for Dawson and thence to Forty-mile. Carmac's story was not believed at first, as he was neither prospector nor miner. Later a stampede set in, Bonanza and Eldorado Creeks were staked to their source, but for some weeks no one knew that the claims were of any value, and rich ones were sold for a trifle.

Be it observed that Carmac did not record his claim on his first visit to Forty-mile, but a month later, when as a result of some work, the richness of the ground was being shown. The regulations in those days allowed sixty days between staking and recording claims. By this means a new find could be tested before it was necessary to make a tedious journey to the recording office.

When Bonanza and Eldorado were being staked, two of the lucky ones, Andrew Hunker and Johnson, started over to see what Henderson had found. They went too far along the divide, and dropped down the wrong, or eastern branch of Gold Bottom, and testing the creek as they went, finally staked three claims below Henderson's stakes. They washed out $23 of coarse gold, and then hunted up Henderson's camp to show their prospect. The discoverer made the remark that they had found better prospects than he had. Recognizing that the name of the main creek was Gold Bottom, they tossed up in the presence of Henderson as to which should have the naming of the east branch. Hunker won.

When Hunker applied at Forty-mile to record his claim, the recorder did not acknowledge Henderson's prior staking, and also changed the name of the main creek to "Hunker." He gave Andy the discovery or double claim, entirely ignoring the real discoverer.

Henderson and his four companions divided up about $700 of gold among them, and when, still well within the sixty days regulations, he applied at Forty-mile for the record of a discovery claim made on Gold Bottom, one on Hunker, and an ordinary claim on Bear Creek, he was told that he could record only one claim in the "locality" (that is, one out of five staked). Having no recourse in those days from the recorder's decision, Henderson chose the half of his discovery claim on Hunker branch. It is now known as No. 3 above on Hunker. It and its mate have produced up in the hundreds of thousands of dollars' worth of gold.

But before its richness became known, the yearly representation work came due, and Henderson, still weak and penniless from a surgical operation and winter of sickness, could not get a reasonable extension of time, and was compelled to sacrifice it for $3,000 (equivalent to $500 outside) to Alexander McDonald, "King of the Klondike." He is from Nova Scotia, and had known Henderson in Colorado.

Owing to official carelessness and delay, Henderson also lost his claim on Quartz Creek.

He continued to prospect on the Klondike, on the Indian River, and on the Stewart River. He was the first to prospect "All Gold" and "Henderson" Creeks, which are now producing gold and will be valuable dredging propositions.

The Department of the Interior have by letter recognized the wrong done the discoverer by the recorder's refusal to record his properly staked claims, but has done practically nothing to compensate him.

The grim irony of a pioneer or discoverer's reward is seen in the despatch from British Columbia, that the Provincial Government have settled an annuity of $600 on Miss Fraser, the daughter of the discoverer of the Fraser River. As Miss Fraser is said to be dying, the generosity of the bequest is quite apparent.

Mr. Wm. Ogilvie, Yukon pioneer and ex-Commissioner of that territory, in giving Henderson the credit for the discovery, added that Carmac nearly lost the credit of being the accidental discoverer of Bonanza Creek. Two days after Carmac had staked, a party of miners searching for Henderson's new strike prospected and staked on Bonanza, several miles below the present discovery claim.

The attempt on the part of Seattle newspapers to give Carmac the credit for the discovery of the Klondike is due to the fact that he settled in that city with his easily gotten money. Robert Henderson, on the contrary, continues his work of exploring the mineral resources of Yukon.

As already pointed out, all the Governors and Acting Governors of Yukon, and all the leading pioneers, have by letter or by affidavit given Henderson the credit for the discovery. Mr. R. G. McConnell, the well-known geologist, who has personally looked into the matter, also calls him the discoverer. His work has added over $150,000,000 worth of gold to the world's supply, and has given Canada a wide and enduring advertisement. Personally, he is a fine type of pioneer and man, and he deserves well at the hands of his countrymen.

LONDON LETTERS.

ALEX. GRAY.

TEMPORA MUTANTUR PRO TEMPORE!

Whoever said mortals could stand everything but continual prosperity, anticipated that prevalent conditions in financial power houses are a species of "rest cure," a hiatus inherently heroic, essential to progression toward greater activity and vigor. "New business" is not being entertained; clearance sales can be made only at very great sacrifice; mining flotations are decidedly taboo; those who have funds are holding on to them; those who have no surpluses are unable longer to carry their deck loads of adversity. If you reverse the order, and instead of taking Medicine Hat forecasts of weather conditions the impasse here is accepted as index to the strains which all markets are subjected to, Canadian industrialism will be in less risk of really serious trouble such as envelops investment as well as speculative lines. There are sorrowings, but few borrowings without abundantly commensurate collaterals, and those seeking fresh capital realize more than ever the force of what Cecil J. Rhodes remarked to "Chinese" Gordon about the futility of "large ideas" when the wherewithal to demonstrate them is absent. Possibly the volume of home trade; the status of American affairs apart from Wall street; the monthly output of Witwatersrand gold, and the earnings of Canadian railways, Canadian bank clearances and what they represent are truer tests than the tapes in brokers' offices. Nevertheless there are so many disconcerting elements, it behooves the *Canadian Mining Journal's* clientele to revise their open transactions, to avoid hazardous commitments, unless liquid assets are certain not to congeal. The world's supply of paper is out of proportion to available funds in circulation, capital expenditure and issues have attained to the point where structural defects in one department threaten marvellous creations of the past ten years. Canada is no inconsiderable incident to the expansion. To preserve Canadian integrity, however, requires that the present reverse in speculative centers shall not result in a dibacle endangering what is merely the preliminary basis for the future exploitation of the natural resources of the Dominion.

Statistics of exports and imports are unimpressive when the banker curtails credits, the small shopkeeper complains of collections, and shrinkages in values become alarming. The economics are sadly askew. Never has London been so disconsolate, consequently so indifferent, to colonial representations. Somehow the investor has been alienated. What he has has the handicap of restricted markets; so we have the *Banker's Magazine* likening a valuation of stock exchange "securities" to "a survey of a district which has been afflicted with some devastating calamity." War wastes aggregating £300,000,000 are comparatively infinitesimal "when compared with the hundreds of millions lost even during the last two years by the depreciation of securities." What has been communicated to *The Canadian Mining Journal* therefore is justified. To be admonitory rather than trench upon the prerogations of the mining promoter who offers scip at a concession that will no longer be obtainable "next week," is preferable, when this carefully edited journal has the following:

[In normal times a net movement of fifty millions one way or the other in the list of 387 representative stocks usually reflects a substantial appreciation or depreciation, as the case may be, but already this year there has had to be chronicled for one month (March) a decline of 125 millions sterling, and now, for the month of August—a month not usually associated with violent fluctuations—there is a depreciation to record of no less than 136 millions, the exact figures being as follows: Aggregate value of 387 representative securities on 20th July, £3,633,717,000; ditto on 20th August, £3,498,130,000—a decrease of £135,587,000.]

Without elaborating these figures to the entire lists dealt in on 'Change in London, to say nothing of New York, Paris and Berlin, they are sufficient deterrents to financiers. Nor is there a compensatory feature beyond concurrent necessity. Where there might have been sanity—in the manner of intramural transportation facilities—a surfeit of official and unofficial competition has created nothing but debit balances, or so reduced profits that dividends are microscopic or are passed. London, for instance, went motor mad, while its underground railways and tubes confess to carrying millions for less than shareholders would receive if they held consols at to-day's prices. The horse omnibus being no longer the fashion, the promoter and motor manufacturer catered to the popular desire, without profit to shareholders, because of ruinous rivalries. Nor is the initial outcome of the latest flotations astonishing when the balance sheet of the London General Omnibus Company for the half year ended 30th June—published to-day—shows a working loss of £52,413. In the period reviewed, 99,836,805 passengers were carried, as against 108,341,451 in the corresponding 1906 period, and the average receipts per passenger per omnibus per day was £2:4:1, as compared with £2:6:2. And this concern is affiliated with the potent name of Lord Rothschild! "Inclement weather and increased competition," are causes assigned. Co-operation in the maintenance of higher fares underground and at surface is now proposed, but fixed charges are more apt to increase than decrease, as has been the case with the steam railways, the chairmen of which are unanimously lachrymose; hence this gloomy contrast btween prices of 1896—the year in which the American movement began—and to-day's quotations:

DEBENTURE STOCKS.

Company.	Mean price, 1896.	Yield. £ s d	Pres'nt price.	Yield. £ s d
Caledonian, 4 pc.....	157	2 11 0	113	3 11 0
Great Central, 4½ pc..	164	2 15 0	119	3 15 6
Great Eastern, 4 pc....	154	2 12 0	111	3 12 0
Great Northern, 3 pc...	119	2 10 6	86	3 10 0
Great Western, 2½ pc..	99	2 10 6	72	3 9 0
Lancs. and Yorks, 3 pc.	119½	2 10 0	85	3 11 0
Lon. and N.-West., 3 pc.	120	2 10 0	88	3 8 0
Lond. and S.-West., 3 pc.	121	2 9 6	87	3 9 0
Lon. B. & S. Coast, 4 pc.	156	2 11 6	110	3 13 0
North British, 3 pc....	116	2 11 6	85	3 11 0
North-Eastern, 3 pc....	119	2 10 6	85	3 11 0
South-Eastern, 5 pc....	192	2 12 0	133	3 15 0
Taff Vale, 3 pc.....	115½	2 12 0	84	3 11 6

PREPERENCE STOCKS.

Company.	Mean price, 1896.	Yield. £ s d	Pres'nt price.	Yield. £ s d
Caledonian, 4 pc.....	152	2 12 6	111	3 12 0
Great Eastern, 4 pc....	149½	2 13 6	106	3 15 6
Great Northern, 4 pc...	154	2 12 0	106	3 15 6
Great Western, 5 pc....	191	2 12 6	137	3 13 0
Lancs and Yorks, 4 pc. Gtd.	154	2 12 0	112	3 11 6
Lon. and N.-West., 4 pc.	155	2 11 6	113	3 11 0
Lon. and S.-West. 4 pc.	155	2 11 6	110	3 13 0
Lon. B. & S. Coast, 5 pc.	189	2 13 0	125	4 0 0
North-Eastern, 4 pc....	154	2 12 0	111	3 12 0
South-Eastern, 5 pc....	186½	2 13 6	127	3 19 0
Taff Vale, 4 pc.....	148	2 14 0	103	3 18 0

An advance of about 40 per cent. in the return upon these securities, with money less valuable, would be quite satisfactory were it not for disparities in market prices clearly indicating that the British buyer of to-day is more discriminating than he was a decade ago. These depreciations are arguments in favor of colonial securities and industrial shares yielding higher rates; yet they denote the impotence of purchasing power crippled beyond the patence of those who thought home rails as good as "Goschens." In reality there is little difference, because "Goschens," while indicating a drop of 25 per cent. in market value, are paying 3 1-20th per cent. on current prices, as against 2 3-10th per cent. in 1896. This correlation might be extended indefinitely to prove that public issues, though "gilt edged," are too slow an asset to suit the investor who cannot afford to create a reserve fund against all contingencies. It is contended that as India 3½ per cent. are 20 points; Liverpool 3½, 34 points; London County Councils, 28 points lower, this is "the investor's opportunity." Perhaps it is, but if shrinkages here and in other directions are taken to account, it will be easier to understand the hesitancy of monied people when confronted by municipalizations galore and pro-socialistic legislation ad lib. In the eight months of this year the 387 stocks dealt with by the *Bankers' Magazine* record a loss in market value totalling a third of a billion pounds sterling—111 millions being debited to American rails, 48 millions to British funds, and 36 millions to English railway ordinary issues. American disparities, as enumerated, are only a fraction of losses sustained. South African Mining and Exploration Company shares in August added another 25 per cent. in gall and wormwood to the cup. Not many of these months would spell ruin. Nor have bank shares escaped, since consols on the toboggan were certain to drag all else with them. It could not very well be otherwise where the one tonic available—the Witwatersrand gold—is threatened, and onslaughts are aimed at the public purse and private enterprise by those who maintain the State owes them special benefits as compensation for studied improvidence.

When Lot's wife became concretedly saline, her offence lay in reprehensible retrospection. The old world and a part of the new is nursing many petrified hopes. Canada has less bad debts in her books and a wider range of opportunity, so moralizing yonder may be relegated to futurity, pending the provision of capital to enable it to state terms rather than supplicate for them. What the Mother Country does not know in detail of the Dominion will be learned intelligently. Better so than to have it unlearned in manner and form akin to American land grabs, granger railroads and credit mobilier episodes. To indiscriminately press forward mining and land ventures ahead of transportation and essential economies is to invite activity at the cost of a reputation worth fostering. Taking South African balance sheets of two or three years ago as "horrible examples" of what Lord Milner characterized as "incorrigible optimism," there is need of that prudence which asserts the consciousness of Canada's potentialities and the desire for something other than market rigging. Over-capitalization, gross errors of estimation, bequeathed to South Africa as a heritage of distrust, Canada has the "large ideas" of Rhodes, and the money for them will come along in natural order if the public domain is conserved and the public interest is promoted. South Africa's "Golden Calf" has a "gamey" flavor approaching putridity. Canada is at the portal leading to prosperity. I offer the following as a picture of what is sticking in London's mind's eye:

"The state of things on the Stock Exchange is probably without parallel in the history of that institution. Hitherto the slump has mostly hit the smaller men, but although there have been no hammerings, the careers of two really large firms have been closed since last account, and a number of other quite important houses are known to be facing the situation with haggard anticipations. One wealthy firm in the mining market is discharging its clerks and retiring in disgust and despair from the so-called "business." It is really too bad that the Stock Exchange Company and the Stock Exchange Committee should sit like so many Turks with folded hands and uplifted eyes without attempting anything to "stay the rot." At any rate, an official scale of brokerage, forbidding rebates, would help the commission houses to pay their expenses."

London, August 27th, 1907.

CANADA'S OPPORTUNITY.

Liquidation variously attributed to the slump in American shares, depreciation of consols, and political programmes provocative of uneasiness in big financial houses, combine to deter investors from further commitments. Several Canadian tansactions of moment have been shelved as a consequence, mining ventures are at a discount, banking privileges are restricted, and a period of dearer money is inevitable.

No section of the London and Continental markets concerned has escaped the gruelling incident to operations of late. Probably Canadian corporations and projects have more genuine sympathy, where that element counts for substantial contributions when the spirit of liberality pervades the city; but no secret is made of the fact that large movements are now accompanied by hazard, and will be until Western crop movements are completed. The Rooseveltian crusade against gargantuan combinations is more clearly defined, and the outlook as to the indispensable yellow metal output of the Witwatersrand is less obscure. Canadian industrial undertakings, bona fide and not too precarious, necessarily suffer because of all these complications, but the postponement of impending flotations should not be detrimental. To the contrary, the willingness with which financiers enter into British North American promotions, when properly vouched for, is the very best assurance that your hoizon of hope is broadening; all that is required is a revival of general confidence and fresh demonstration of Canada's capacity. Money is the decisive factor as always. The shrinkage in credits throughout, and the inadequacy of the world's supply of capital for the stupendous volumes of business, are disconcerting to unprecedented degree. With it all, clamorous democracies in various ways are pressing for measures equivalent to modified confiscation of property rights; hence no immediate relaxation in funds is expected. Money has added purchasing power, but sustained losses in so many directions are accepted as admonition all-sufficient by financiers and underwriting syndicates to leave those who sow extremist sentiments to reap remorse.

Were it not for the scrip "jam" there would be more receptivity toward Canada, although Cobalt promotions will have to wait. Consols at 81½ and a "no bottom here" look about South African shares, together with the apprehension reflected in the prices obtaining for home rails, adversely affect the attractions Canadians offer. The "silly season" suggestion that consols be made legal tender at par, despite the readiness of holders to part with them at 82 or 83, is symptomatic of all that is transpiring. To disguise the causes without adopting

remedial policies is to invite topsy-turvitude; so there will have to be universal readjustments—and Canada is specially fortunate in having fewer open accounts.

South Africa is in a woeful plight. Dissension and despair and the impossibility, without cheap labor, of winning gold at a pace to pay interest on share and debenture issues distributed at inflated prices, are argument against mining ventures. Parent company paper represented by cash, cash assets, and fixed property, are worth less than at any time during the late Boer War. A lopping off of £200,00,000 in "Kaffir" market values, minimizing credits closely related, much more than that dissipated in the American dibacle, all conduce toward the distrust reflected in the weakness of consols and British railways. Perhaps Canada has not attained to that pretentious position where it can command capital despite adversity elsewhere. It is well understood that money is a pressing Canadian prerequisite. Your needs can be supplied if the tactics of promoters are directed to the permanent welfare of the Dominion rather than to immediate realizations on forced market opportunities. As one creditable Canadian remarked to an underwriter or overwriter the other day when asked if a "market is at once to be made for certain debentures," "No, sir; that is not my business. You are getting 4½ per cent. debentures at a low price; the flotation promises more than is represented in the prospectus, and if you do not care to hold the security you must make your own market."

To say this involved moral courage. When Canada applies this principle more generally financiers will be less prone to assume that all mining ventures "look alike to me," and that the prospectus is not merely a preliminary to summary offloading by vendors.

When revising a former letter, the impression formed was that the views recorded were doleful, probably to an extent at variance with Canadian perspective. Upon going through the London dailies a day later, I find I have erred on the side of conservatism of statement. The Express, whose financial editor is on intimate terms with an influential section of city men, is the dispenser of the following, the conclusions being well founded, apart from those involving Mr. Roosevelt, who has simply emphasized the evils according to Harriman:

"The financial sky is still gloomy, and before markets sail into smooth waters some dirty weather will probably be met with. Kaffirs have been killed by the Liberal party, and the American market has been assassinated by President Roosevelt—just at the wrong time of the year. A general holocaust of values has been in process, and the absolute certainty of a 5 per cent. bank rate—at least—at an early date is assured. Under these circumstances, to revert to the original metaphor, speculators for the rise may be strictly enjoined to keep off a lee shore and rid themselves of as much top hamper in the way of contango stock as possible while riding out the storm. Fortunately, there never was a time when open accounts in the House were of smaller volume than now, and the bank position is sound enough. For these reasons no panic is to be expected, and there is nothing to justify the jettisoning of good stuff which has been paid for and taken up."

The writer is rather alarming. He is not alone in this, for the financial editor of the Chronicle simultaneously says:

"It is still impossible to discern any encouraging symptoms of a coming improvement in markets. Liquidation continues in various directions, and the stream is by no means dried up. It is no secret that many firms have experienced the greatest difficulty in keeping their heads above water; that many were assisted at the recent settlemnt; that some are still receiving help, but it is to be feared that such troubles cannot be permanently removed except by a sustained and considerable appreciation in prices. Unhappily, such a prospect is not visible as yet, and this patching-over of difficulties cannot remove the anxieties they have created. If we could look for some alleviation from New York, markets might be able to cherish a few hopes, but all authorities agree with what we said yesterday—Wall street must face further liquidation. Professionals tried to cheer each other up yesterday by declaring that the worst of the liquidation is over, but things looked most cheerless all the same. In a very sluggish gilt-edged market Consols were comparatively firm, with a gain of 1-16 to 81 11-16."

Bad weather ahead, succeeding similar weather, justifies the attitude of capitalists. Presently, with a little patience, Canada should, and will no doubt, have its opportunity.

PERSONAL AND GENERAL

The Hon. Robert Drummond, editor of the Maritime Mining Record, has been appointed one of a Commission of four, to report upon the feasibility of old age pensions, for the Nova Scotian Government.

Mr. Louis J. Abrahams, of Ely Place, London, England, left Toronto for New York and England on September 5th.

Mr. J. W. Rawlins, chief chemist of the Canadian Copper Company, Copper Cliff, Ont., is spending his holidays in Toronto.

Mr. A. A. Hassan, mining geologist and consulting engineer, has opened Canadian offices at 25 Toronto street, Toronto, Ont. Mr. Hassan has organized the "Hassan Exploration Company of Canada, Limited." The prospectus of this company was regularly filed in the office of the Provincial Department of Mines.

Mr. Frank Loring has resigned his position as consulting engineer of the Trethewey mine, and will henceforward make Toronto his headquarters. Mr. Loring has done clean and effective work in Cobalt. His advice has been sought by many of the more important interests there, and he has reported upon many of the larger properties. The McKinley-Darragh and Foster were examined and reported upon by him. Mr. Loring, as a citizen of Cobalt, as an employer of labor, and as a mining engineer, has exercised a strong and healthy influence. We wish him all success in his new sphere of activity.

Captain D. J. Kennelly, of Louisburg, died on the 28th of August at the Brooklands Hospital, Sydney, after an operation for cancer, at the age of 76. Captain Kennelly was for many years manager of the Sydney & Louisburg Coal and Railway Co., and resigned his position when that company was merged in the Dominion Coal Co. For many years Captain Kennelly has been a well-known figure at Louisburg, in the historic history of which place he was deeply interested. He inaugurated a movement for the preservation of the ruins of the French occupation there, and endeavored to create a fund for the Louisburg Memorial to the dead of both the nations who fought so gallantly for the possession of this island.

Captain Kennelly had an adventurous and varied career, having witnessed active service in the Indian Mutiny. He was a man of varied attainments, being a barrister of the English bar and a K.C. of this Province.

He was a gentleman of an old school, and a link with the days when our Empire was passing through stirring times. His death removes one of the most interesting figures connected with the earlier days of the Cape Breton coal trade.

EXCHANGES

Technical Literature, August, is replete with information. The leading article is on Canadian hydraulic canal locks.

The Mining Journal, August 17, concludes an editorial article on American and German demand for British iron with the assurance that a brisk autumn trade in most branches of the iron and steel industries is practically certain.

From The South African Mines, Commerce and Industries, July 13, we learn that of the sixty-two Rand companies which earned profits in May, exactly one-half made less than ten shillings per ton. "A considerable proportion of the £780,000 profit which the mines made in May was derived from these ores, which yield profits of less than 10 s. per ton."

The Colliery Guardian, August 16, editorially discussing the timbering of coal mines, alludes to falls of side and roof both in working places and roadways. The Guardian claims that too close observance of the special rules laid down by the British inspectors is one of the causes of these accidents. Although the maximum distance between supports, as fixed by the special rules, is not too great for ordinary conditions, yet the mere existence of a legal limit tends to deter the miner from using his discretion.

The Mining Reporter, August 22, presents an article on a Chamber of Mines recently organized at Los Angeles, California. The Chamber will employ two staffs of inspectors, commercial and technical. Upon payment of certain fees, certificates will be granted to reputable mining companies. The Chamber's certificate and registration seal can, however, only be used subject to certain restrictions. The plan has been tried before without success. But there is no reason why, under present conditions, it should not be successful.

The Mining World, August 24, contains a thoughtful article on Cobalt by Mr. Ralph Stokes, the World's travelling correspondent. In its editorial columns the Mining World expresses the opinion that the needs of initial equipment for Cobalt mines is typically light. A considerable amount of mining has been done with a minimum or very light equipment, but the producing mines have respectably large plants. The irregularity of the veins and the fact that the rock encountered is hard to drill, make the compressed air requirements larger than usual. Another consideration is that on much of the ore shipped only silver values are paid for.

The Iron and Coal Trades Revew, August 16, comments upon the recent advances in colliers' wages. Since June, 1906, for instance, South Wales colliers' wages have advanced from the minimum to nearly the maximum. "What is now earnestly desired," remarks the Review, "is an increased output. . . . Nearly all the principal collieries have paid a dividend of 10 per cent. for the first half of the present year, in addition to having expended large sums in the improvement of plant and machinery, opening out new workings, etc., for the sole purpose of increasing their output. The probability of a bill being passed during the next session of Parliament for limiting the hours of colliers' labor underground has had something to do with this, for as the output per man must necessarily be reduced, a larger number of men must be employed to maintain even the present demand, and foreign consumers may apprehend in this move another advance in the price of coal."

The Monthly Mining Report of the Chamber of Mines of Victoria, Australia, for May, contains an account of the recommendations of a late Royal Commission on State forests and timber reserves. The Commission strongly recommended, among others, the following propositions:

Independent control of the forest reserves and the withdrawal of the administration from ministerial control.

The dedication in perpetuity of "Reserved Forests," which term will include all permanent reserves for the growth of timber, or for climatic reasons, or for both purposes.

The demarcation on the ground of all "Reserved Forests" which have hitherto not been surveyed within a fixed period.

The protection of the reserves and Crown lands from the misuse or careless use of fire.

The encouragement of tree planting in bare, treeless districts.

An unusually luminous editorial is that on "Crystals and Water in Veins," in the Mining and Scientific Press, August 17. After appreciating Waldemar Lindgren's essay on "The Relation of Ore Deposition to Physical Conditions," our contemporary mentions and emphasizes one factor in the distribution of ore in lodes—the water zone. "It is pretty clearly ascertained, especially among mining engineers and others in daily touch with underground operations, that there is a definite layer of water, the *top* of which has long been known as the 'water-level.' The bottom of this zone of water has not been recognized, simply because the sinking of shafts tends artificially to depress it; for the lateral workings of a mine, by draining the adjacent area, cause the shaft to act as a pump. Miners know that at a certain level they get below the maximum seepage, and in large mines the pumps are placed so as to 'take up' that water . . . Below the water zone the lode becomes dry, even dusty, so as to imperil the health of miners."

In the Engineering and Mining Journal, August 24, Mr. Joseph Daniels writes interestingly on "Methods of Paying Miners' Wages." Constant readjustment between the operator and the miner has resulted in a number of systems of payment of wages based on local economic conditions. Day's pay is the simplest and most universal method, and is applied largely to unskilled labor. In the contract system both quantity and quality of work count. In most American coal mines coal is paid for by weight at the bank-head scales, although narrow work is paid for by yardage; the price of yardage being computed on the average number of tons of coal in a cubic yard. In metal mines development work is usually paid for per foot or yard of advance. Under the "Hole Contract" system payment is made at a certain rate per foot drilled. Firing and loading are not included in the contract. The tribute system, in which payment is based on the value of the mineral extracted. The Colorado lease system is based upon the old Cornish tribute system, but it has eliminated many of the latter's uncertainties and disadvantages.

The Chemical Engineer has moved its office of publication from Philadelphia to 355 Dearborn street, Chicago, Ill. The editor's office is still in Nazareth, Pa. The July number of this monthly has a paper by Dr.

Charles B. Dudley, entitled "The Enforcement of Specifications." Dr. Dudley traces the evolution of the specification: "In the early days of specifications they were little more than attempts on the part of the consumer to tell the producer what he wanted. Especially after it became the custom to consult the manufacturer in making the specification, it took on a new meaning. At first it was a demand; it now became an agreement. . . . Testing was never intended to be a device to bring about the acceptance of inferior material, but quite the contrary. . . . Is not the time near at hand when engineers and their principals will be compelled, if not legally, then by force of public opinion, to acquire by the establishment of laboratories and means of testing, by the making and enforcement of specifications, such knowledge in regard to the materials they are putting into structures as will give the public greater security than it now has against disaster."

CORRESPONDENCE

Ottawa, Sept. 5th, 1907.

Dear Sir,—

As the new Department of Mines has been so lately created, and as there seems to be some misunderstanding concerning the authorized status of its branches and chiefs, the Acting Deputy Minister has instructed me, in order to prevent further misunderstanding, to call your attention to certain inaccuracies that have crept into your articles in regard to Mr. A. P. Low and Dr. E. Haanel.

In the first article it is stated that Mr. Low is "Director of the Geological Survey, now officially designated the Department of Mines." The sentence should have read that Mr. Low is Deputy Minister of the Department of Mines and Director of the Geological Survey.

In the second article, Dr. Haanel is made to appear Director of the Department of Mines. That gentleman is Director of the Mines Branch of the Department of Mines, which with the Geological Survey combines to form the new Department of Mines.

In the second article it is also stated that the office of the Mines Department "has been removed to the Thistle Building in Ottawa." This statement is rather misleading. The office of the Mines Department is in the Geological Museum Building, Sussex street, and the Mines Branch has temporary offices in the Thistle Building, Wellington street.

Yours truly,

PERCY H. SELWYN,
Secretary.

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

BOOK REVIEWS

SHAFT SINKING UNDER DIFFICULT CONDITIONS—BY. J. RIEMER. TRANSLATED FROM THE GERMAN BY C. R. CORNING AND ROBERT PEELE. ILLUSTRATED WITH EIGHTEEN ENGRAVINGS AND NINETEEN FOLDING PLATES. NEW YORK, JOHN WILEY & SONS. LONDON, CHAPMAN & HALL, LIMITED; 1907; pp., 176; 8 VO. CLOTH, $3.00.

This timely treatise is divided into four sections:—I. Shaft-sinking by Hand; II. Shaft-sinking by the Boring System; III. The Freezing Process; IV. Drop Shafts.

I. Section one is prefaced by a statement that may not be accepted by mining men on this continent. The author asserts that no mechanical process of sinking has as yet successfully displaced sinking by hand, "which, when at all applicable, still maintains its predominance over other methods."

In this section reference is made to the use of hanging scaffolds, by means of which masonry lining may be put in place simultaneously with the actual sinking operations. The use of and improvement of the old Cornish pumps, steam sinking pumps and Tomson's method of bailing by means of the permanent hoisting engine are outlined. Stationary pumps are now no longer customary for shaft-sinking.

Records of German shaft-sinking are given and a comparison is instituted between the boring, freezing and drop shaft systems and ordinary hand work. "Sinking by hand will have the preference, both because of its efficiency and lower cost, in every case where it can be used at all, even though the flow of water be considerable." There are, of course, conditions where the flow of water is so great that hand work is impossible.

II. Shaft-sinking by boring an entire shaft in a single operation, carried on under water, is outlined in this section. Originally the procedure was merely an extension of that followed in sinking artesian wells. The adoption of the plan of drilling an advance bore, by a small tool or trepan, from one-third to one-half the full diameter of the shaft, facilitated the removal of drillings and kept the shaft plumb. The method is applied only after a portion of the shaft has been sunk by hand labor and ordinary pumping, and when no further progress by these means can be made. In cases where large quantities of water are anticipated, the use of the boring system would usually be a foregone conclusion. The plant required is large and costly. The trepans used are huge affairs, a smaller size weighing 22,000 pounds and a larger one 52,800 pounds. A full description of the process and its limitations is given in this section. Complete data of actual operations are included in narrative and tabulated forms.

III. The Freezing Process, brought out by F. H. Poetsch in 1883, had been used in Wales in 1862. In Siberia the severe climate permits of the alternate freezing and excavation of the shaft bottom.

The process is applicable to soft and unstable ground, containing large quantities of water, in which ordinary hand-sinking cannot be carried on. The modern improvements of the process are touched on and operations are adequately described in this portion of the volume. Logs of shafts sunk in Germany, Belgium, the United States, Holland, France, England and Austria, are tabulated.

IV. The Drop-shaft method for sinking in sand or loose water-bearing soils is one of the oldest in use. The method originally consisted in erecting a strongly framed rectangular wooden casing and allowing the casing to sink slowly into the shaft as it was being sunk. The wooden casing was succeeded by a circular walling of masonry, first with a wooden, afterward with an iron, shoe. A plate iron cylindrical lining and, later, a cast iron tubing with machined joints superseded this. Drop-shafts were first sunk by their own weight; then by loads of earth, stone or iron; and eventually by the use of jack-screws and hydraulic jacks. In modern practice a large number of hydraulic jacks are connected with an accumulator, weighted for exerting a constant pressure on the drop-shaft.

The weaknesses and causes of failure in this variety of shaft-sinking are well illustrated by another series of working instances. As in the preceding sections, precise and exact data are included.

The volume is supplemented by a series of folding plates.

As the scope of Canadian mining is increasing, conditions must arise more frequently under which shaft-sinking in loose and watery soil will be necessary. A book such as this contains a mass of information invaluable to the mining engineer who must sink a shaft under such circumstances.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

SPRINGHILL.—The strike in Springhill still continues. It is to-day wearing its most serious aspect. Many may wonder what has caused such a condition of affairs. The local papers have done much to muddle the public as to the cause of the present trouble. A certain number of miners in a section of the mine demanded an increase on the price per box, for which the management considered they were already receiving top prices. The management refused the advance. The men referred the dispute to a Board of Conciliation under the Lemieux Disputes Act of 1907. The management were very willing to allow the matter to go before the Board. The Board was therefore legally appointed. Two cases were given the Board to decide. The Board sat for three days, giving ample time to bring forward all possible evidence from both sides. The Board at its final sitting awarded one case to the men, and the other, including the increase of price per box, was awarded in favor of the company. In the meantime the men made reference to another Board for settlement of a difference. This also was accorded them. The men, however, previous to this had got notice of the awards of the former Board, and at a meeting of the lodge repudiated the finding of the Board, and further notified the management that if their demands were not conceded in full they would strike on August 1.

The new Board met on July 31 and the miners presented their side of the question. The court adjourned to meet the following day. On the evening of the 31st July a meeting of the lodge was held, with two hundred and fifty present out of nine hundred members, one hundred of whom were disqualified as voters on account of non-payment of dues. A secret ballot was taken amongst those qualified to vote, which resulted in ninety (90) voting for strike and sixty (60) against. By such a small majority were the town and works plunged into all the loss and anxiety of this disastrous suspension of work. According to adjournment, the new Conciliation Board met on the morning of August 1 to continue the investigation; but as the men were on strike on the finding of a former Board, the Chairman (Judge Patterson of Pictou County), after expressing his regret at the action of the men, quietly adjourned the Board to meet again when needed or called for.

Many of the men have left the town for other localities, a few temporarily. Many of those not in favor of the strike have found jobs as near at hand as possible, waiting for the works to start again. A few of that class who care little whether they work or play are hanging around and working odd days on the streets. A system of alms-giving has been established by the labor organization to which these men belong, and it does not say much for the manhood of our Nova Scotia miners when they prefer that to an average wage of $3.34 per day made by honest work, even in the places where this increase was demanded. It is to be regretted that the law-abiding element which we know really exists among the men, is not more in evidence. Were it so, law and order would prevail, and much suffering be averted. The management in not conceding the workmen's demand in this instance is simply upholding law and right.

W. D. M.

SPRINGHILL, Aug. 27.—The strike still continues. All of the horses are taken out of the mines. The officials and a very few laborers are working to keep the mines in running order. The mechanics—engine men, pump men, etc.—are still at work, although it was thought at one time that they also would join the strikers. However, the wiser element prevailed.

The company has placed weigh scales on Nos. 2 and 3 bankheads for the purpose of weighing the coal as it comes from the mine. Hence a new era will be established in the method of paying miners for their work. Previous to the strike the coal cutters were paid by the car; hereafter they will be paid by the ton.

There is nothing as yet to indicate a breaking of the strike. The strike itself is remarkable for the very quiet manner in which it is being carried on. There is some newspaper skirmishing going on however.

Quite a number of men have left the locality, some going west, but the majority scattering to the neighboring mining localities. These latter intend to return as soon as a settlement is reached.

Some places of business have closed their doors. Others are open, hoping for peace in the near future. All are anxious, as the situation is becoming desperate for the town and its people.

HALIFAX.—At the Annapolis Iron Company's Torbrook mines, No. 2 shaft is down 150 feet. The Dominion Atlantic Railway extension to the mines is nearing completion. No. 1 shaft will presently be reopened. It was closed down whilst the Londonderry furnace was under repair. The furnace will very soon be put in blast again, and ore shipments from No. 1 shaft will then be resumed.

No. 2 shaft is being sunk on a superb body of high-grade hematite. The ore is holding in quality and quantity as sinking proceeds. Levels will be driven at 80 feet, 160 feet and 240 feet. Thirty-five men are now employed in this shaft.

September 9th is the date set for resumption of work on No. 1. The management will then need about seventy-five men.

Recently Mr. T. J. Drummond, of Montreal; M. Woodward, of Paris; and Mr. W. F. C. Parsons, the mining engineer of the company, inspected the mines and visited several places near Annapolis, where they examined proposed sites for shipping piers for the company. The shipment of ore to domestic and foreign consumers is part of the plans of the company. At present the Londonderry Iron and Mining Company's blast furnace at Londonderry, Colchester Co., is the only user of Torbrook ore.

SYDNEY, N.S.—The executive of the Dominion Iron and Steel Company has decided to make Wabana iron ore a source of revenue. Larger installations will be put in and ore will be mined for sale and export. Moreover, the company's coal areas are to be developed. Both of these moves are wise.

QUEBEC.

LABELLE.—Mr. E. A. Howarth, of the Morgan Crucible Company of London, England, visited the Labelle Mining Company's mine on August 19th. Mr. Howarth was exceedingly pleased with the showing of graphite and the quality of the mineral. His inspection was made with a view to purchasing the property for his firm.

The Northern Mines, Limited, controls the surrounding country and has a prospect that thoroughly warrants development. It is situated one mile from the C. P. R., and a spur line to its mine is nearly finished. The district here is well worth investigating.

BRITISH COLUMBIA.

THE KOOTENAYS.—The scarcity of coke, that commodity which is so essential to the mining and smelting industry of this district, reached an acute stage a fortnight or so ago, resulting in the partial suspension of mining and smelting operations and the temporary laying off of many mine and smelter employees. Shipments of ore were cut down and many of the blast furnaces were "blown out." However, the general public accepted this condition in a philosophical spirit, and everyone felt that a few weeks would see things much changed for the better. These hopes have been realized to a limited extent; coke has been coming into the district a little more freely; but still there is more or less of a shortage. Ardent overtures have been made to the Government and at the present moment Mr. R. F. Tolmie, Deputy Minister of Mines, is in this territory investigating the coke question. Much complaint is heard of the Crow's Nest Pass Coal Co. shipping large quantities of coke to smelters on the American side, contrary to the terms of its charter, when the coke is really required in British Columbia. Exception is made to the Northport smelter, which treats the ores of Le Roi mine, Rossland. It remains to be seen what foundation there is for this cry. It is stated there are two sides to the story.

There is a marked shortage of labor along the Crow's Nest Pass Line of the C. P. R., and many of the employees of the coal mines have gone to work in the fields. This lack of help is likely to continue until after harvesting is over.

There is also more or less shortage of cars throughout this country, but relief is expected in this quarter in a short time.

The decided drop in the price of copper has naturally thrown a shadow across the bright path which the copper propositions were following.

At Rossland the Consolidated M. & S. Co. have cut down their ore shipments and are devoting their attention to development work. Le Roi is not shipping ore, with the exception of about 680 tons on Aug. 30th, which had accumulated in the bins during development which they are carrying on. The mine on the 1650 level is in good condition, the important work they have had in hand there now being nearly completed. The Northport Smelter is closed down completely, but coke is accumulating in their bins and operations will be resumed, it is stated, in a couple of weeks at most. The Trail smelter of the Consolidated people is running light, coke being scarce with them too. Development work is being actively prosecuted at the Le Roi 2, Limited; Giant-California, Jumbo and White Bear. Le Roi 2, Limited, and White Bear are on the shipping list. Rossland ore shipments were 3,485 tons for week ended Aug. 31st.

In the Boundary Country the coke shortage has affected them more or less. At the present writing ten out of fourteen blast furnaces there are in operation, but it is nip and tuck to keep them going. Granby are operating five of their furnaces, B. C. Copper Co. two, Dominion Copper Co. three. The usual mining operations have been carried on.

The big consolidations seem to have great faith in Phoenix camp, and affairs with that town look bright. The Granby, B. C. Copper Co., and the Consolidated people have each bonded a number of claims and are prospecting them with a view to purchasing those which prove of value. The shipments of ore from the Boundary amounted to 22,811 tons for the week ended Aug. 31st.

Diamond drilling is being done on the B. C. Copper Co.'s Oro Denoro property. The Granby Company is placing an order for coke in the East to insure a plentiful supply. The Granby has a force of about twelve doing development work on its Independence property in the Similkameen. Boyles Bros. have just finished doing 1,000 feet of diamond drill work on the Boundary-Elkhorn Company's property.

The recent cave-in at the Granby's Brooklyn Mine, Phoenix, has disclosed a hitherto unsuspected ore body.

At the Consolidated Company's St. Eugene property at Moyie more men are now employed than have been for some time. The usual output of ore is being produced and special development work under way.

The Sullivan, Rambler, Krao, Payne and other mines in Slocan and East Kootenay districts are working steadily along the usual lines.

With a plentiful supply of coke, sufficient labor, and a reaction in the price of copper, mining affairs here and in the Boundary would brighten up materially.

ONTARIO.

WABIGOON.—A party of directors and stockholders of the Victory Gold Mine, accompanied by Enrique Tonceda, C.E., M.E., made a lengthy examination of their mines and areas. The Paymaster, the Detola and the Laurentian Mines were also visited.

COBALT.—The bulk of Cobalt ore shipments still go across the border. Of the 1,237 tons shipped during August only five cars went to Copper Cliff, one to Toronto, and one to Swansea.

At the Coniagas, 3,000 feet of cross cutting and drifting has been driven. The concentrator will be in commission some time in September.

Diamond drilling exploration is being carried on actively at the Trethewey. Almost full shifts are worked at this mine.

The Drummond Mine is operating once more. It has a fair complement of men and drills.

The Imperial Cobalt, otherwise and better known as the Evans Mine, was the first shipper from Portage Bay. Mr. J. W. Evans, after whom the mine takes its name, was one of the pioneers of the Portage Bay district, and his mine was the first to make a shipment. The shipment, consisting of about 20 tons of high grade Cobalt ore, was made some eight or ten weeks ago. The Evans is a cleanly handled, well-equipped mine. It is distinctly encouraging that on the Edison Mine, in the same district, a six-inch cobalt silver vein has been discovered. The Portage Bay district is now put on a more promising footing.

The stamp mill on the McKinley-Darragh is running. Ore from the dump is being crushed. This is the first ore reduction plant to be put in commission in Cobalt.

The Cobalt Lake Mining Company is soon to ship three or four cars of ore. Superintendent Fralick has sunk No. 4 shaft to a depth of 110 feet, and drifting at the 85-foot level is progressing. When the shaft has attained the depth of 150 feet drifting will be commenced under the lake. The possibilities of drifting at the 85-foot level are limited. At that depth a drift would cut into the lake if continued too far.

Night Hawk Lake is situated about 90 miles, as the crow flies, north of Cobalt. But a much longer distance must be travelled before the prospector who leaves Cobalt with the lake as his objective point, reaches his destination. Night Hawk Lake is at the head waters of Frederickhouse River, which joins the Abitibi to the north. It is reached from MacDougall's Chute on the T. & N. O. Railway (about 100 miles north of Cobalt). A short paddle on Black River (a tributary of the Abitibi) until the Abitibi is reached. Ten miles down the Abitibi, at Iroquois Falls, a landing is made. After Bartlett's Camp (six miles on a wagon road) is reached, a portage of over a mile is taken to Wilson Creek, then Frederickhouse River is entered, Frederickhouse Lake, and at last Night Hawk Lake. Night Hawk is about 13 miles long and seven miles in width.

On Saturday, 31st August, the new compressor on the Right of Way was started. The new hoist has been shipped and Supt. Houston will soon have his full complement of men at work.

The "Rothschilds" Mine has been closed down. On the Rochester, which it adjoins, good finds have been made recently. Three shafts have been sunk to a depth of about forty feet each on the Rothschilds, but all the work has been carried on without much system.

La Rose shaft is now down 340 feet. On the three levels about 1,800 feet of drifting has been done. Most of this is on

the first level. Fully 1,000 feet of cross cutting also has been performed. The old La Rose shaft on J. B. 4 is to be made the main shaft. Work has been started on it.

The Foster Mine shipped a carload of cobalt ore to Swansea, South Wales, and one of No. 1 ore to the Copper Cliff Smelter, about August 21st.

The reported finds of gold at Night Hawk Lake are attracting many prospectors. Two Swedes are said to have found a ledge.

SAULT STE. MARIE.—After operating for two years without cessation, the plant of the Algoma Steel Company was closed down on August 21st. The rail mill, the capacity of which is 500 tons per day, is in need of repairs, and blast furnace No. 1 is to be relieved. Operations will be resumed early in September.

The Helen Mine, which has in its short life shipped over one and one-half million tons of high grade iron ore, will this summer increase its shipments by about 50,000 tons. The plant of this mine, which was last year destroyed by fire, has been replaced by very modern equipment and buildings. Mr. Seelye, the efficient superintendent, has worked the mine with a high degree of sound economy.

The newly organized Canadian Smelting and Refining Company hopes to have its new smelter completed within six months. It is announced that Otto Stalmann, of Salt Lake City, is to be general manager. The plant is to have a capacity of 125 tons of ore, and will treat Cobalt and other ores. It is doubtful if construction can be completed as rapidly as the directors hope.

GENERAL MINING NEWS

BRITISH COLUMBIA.

Victoria.—Mr. Tolmie, Deputy Minister of Mines, left Victoria on August 23rd for the Kootenay district. Mr. Tolmie is to report to the Executive Council upon the present situation and the future outlook of the coke supply. The Government is prepared to act decisively in this direction.

Kamloops.—Mica, of good quality, has been discovered near Tete Jaune Cache, Cariboo. Mica has already been mined in the district.

Cranbrook.—The Payroll mine has begun shipping its rich telluride gold over to Trail.

Ashcroft.—The Slocan-Cariboo Mining & Development Company, operating on Canadian Creek, has suspended work for the season on account of difficulties with water in the shaft.

Princeton.—Coking coal has been found on the north fork of Granite Creek, four miles from the town of Granite Creek. A 200 foot tunnel has been driven.

Nicola.—The Nicola Coal & Coke Company, whose workings are on the Coldwater, are shipping coal steadily. Developments promise a much increased output before the end of the year.

The Diamond Vale Coal & Iron Company are sinking a second shaft. They will soon become producers.

Mount Sicker.—The Tyee Copper Company is conducting diamond drill prospecting on the 500 foot level of the X. L. Mine.

The Lenora Mine is storing ore in bunkers. Shipments will be made when the railroad work is finished.

Coast District.—The Britannia Mine, situated on Howe Sound, and connected with the shore by an aerial tramway 3 1-2 miles in length, has struck a large chute of payable copper ore on the new Jane tunnel. The mine is located on Britannia Mountain, 3,500 feet above sea level. The plant is entirely operated by water power.

Atlin.—The Atlin Consolidated Mining Company is handling a large amount of gravel by means of steam shovels. The company reports good clean-ups for the summer. The North Columbia Gold Mining Company is enlarging its hydraulicking outfit.

Slocan District.—The American Boy Mine, last year a considerable shipper of lead and zinc ore, has been leased to J. P. McGuigan for eighteen months.

The Hewitt Mine, including a group of claims covering about 400 acres, on Four Mile Creek, three miles from Silverton, has been acquired by Olcott Payne and a syndicate of his associates. The price is reported to have been $250,000, of which $75,000 was cash. Approximately 9,00 feet of development has been done, including a series of tunnels, which open the mine to the 700 foot level.

Fernie.—The Crow's Nest Pass Coal Company is laying out a townsite at Michel. The company has announced that it will sell the lots cheap to bona fide miners, in order of application, and employes of the company. The agreement will require the man to whom the lot is sold to build a dwelling house on the lot within a reasonable time. An important part of the agreement also is a clause prohibiting the sale of liquor upon the premises.

Rossland.—To put a stop to the exportation of coke, the advisability of an imposition of an export duty is being seriously discussed. Advocates of this measure recommend a duty of $2.50 per ton. This would certainly keep British Columbia's coke output within the Province's borders and would tend largely to relieve the shortage.

Boundary.—Ten stamps are dropping at the Cariboo-McKinney mill. Ten more are under repairs now and will very soon be dropping.

ALBERTA.

Lethbridge.—The Diamond Coal Company, whose collieries are situated on the north bank of the Belly River, six miles from Lethbridge, owns 1,924 acres of surface rights, 5,134 acres of mining rights and a townsite comprising 320 acres. The bankhead, power houses, etc., are now under construction. The main tunnel of the workings is now over 1,000 feet in length. A small quantity of coal has already been mined and marketed.

YUKON.

Dawson.—The Guggenheims are installing three dredges on Humble Creek. Among the Hunker mills, the Temperance, Delhi, Whisky, Nugget, Australian and some others are not included in the Guggenheims' concession.

MINING NEWS OF THE WORLD

GREAT BRITAIN.

On August 10th the Conciliation Board for South Wales and Monmouthshire granted the miners an advance in wages of 5 per cent. Three months ago, Lord St. Aldwyr awarded an advance of 11 1-4 per cent. The wages rate now stands only 2 1-2 per cent. below the maximum. Other advances of wages have been conceded in coal mining districts.

In the month of May of the current year the copper smelters of the Urals produced 663 tons of copper.

Important new discoveries of platinum have been made in the Northern Urals, on the Koiva river.

AFRICA.

Mr. Walton gave notice in the Cape House of Assembly on August 19th that he would move for the imposition of a profit tax of 10 per cent. on diamond and copper mining companies earning over £50,000 per annum.

MEXICO.

Electric power is to be transmitted from Guadalajara to Etzatlan and Hostolipaquillo districts. The price fixed is about $100 per horse-power per annum.

STATISTICS AND RETURNS

British Columbia copper ore shipments for week ending August 24th:—

Boundary Shipments:—Week, 22,415; year, 761,798.

Rossland Shipments:—Week, 5,313; year, 173,872.

Slocan-Kootenay Shipments:—Week, 3,007; year, 85,193.

The total shipments from the mines in the above districts for the past week were 30,738 tons and for the year to date 1,020,863 tons.

Following are the figures of copper ore output of the Boundary, B.C., district, for July, 1907:—

From Granby mines	80,216
From Mother Lode	21,040
From Emma	350
Oro Denoro	4,556
From Brooklyn	6,799
From Rawhide	9,421
From Idaho	1,913
From Sunset	5,153
From Mountain Rose	514
From Snowshoe	20,840
From Providence	30
From Skylark	20
From Sally	25
Total for July	150,873

CROW'S NEST COAL.

The output of the collieries for the week ending August 23rd was 19,199 tons; daily average, 3,200 tons.

COBALT ORE SHIPMENTS.

The ore shipments for the week ended August 24 totalled 315 1-4 tons. It is understood that one of the Coniagas cars was of high grade ore, but that they are withholding shipments until the new smelter gets running. The shipments in detail were: Nipissing, 126 tons; Coniagas, 61 1-4 tons; Townsite, 33 tons; Foster, 33 tons; Kerr Lake, 32 tons; Buffalo, 32 tons.

DOMINION COAL COMPANY.

Outputs, August, 1906, and 1907:—

	Tons. 1907, approx.	Tons. 1906, actual.
1	44,670	45,825
2	58,610	54,741
3	32,910	38,464
4	43,100	50,886
5	60,700	54,977
6	19,830	9,933
7	.....	11,891
8	21,380	24,566
9	27,700	35,959
10	7,730	4,274
	316,630	331,716
Shipments	371,982	343,789

COBALT ORE STATEMENTS, WEEK ENDING AUG 31ST.

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

Buffalo—Week ending Aug. 31, ore in pounds, 100,000; since Jan. 1, ore in pounds, 1,618,830.

Coniagas—Week ending Aug. 31, ore in pounds, 160,500; since Jan. 1, ore in pounds, 4,368,820.

Kerr Lake (Jacobs)—Week ending Aug. 31, ore in pounds, 61,000; since Jan. 1, ore in pounds, 373,780.

Nipissing—Week ending Aug. 31, ore in pounds, 65,140; since Jan. 1, ore in pound, 3.764,441.

Trethewey—Week ending Aug. 31, ore in pounds, 65,000; since Jan. 1, ore in pounds, 1,411,018.

The total shipments for the week were 451,640 pounds, or 225 tons.

The total shipments since Jan. 1, 1907, are now 17,016,460 pounds, or 8,508 tons. In 1904 the camp produced 158 tons, valued at $136,217; in 1905, 2,144 tons, valued at $1,473,196; in 1906, 5,129 tons, valued at $3,900,000.

The total shipments for the month of August amounted to 1,237 1-2 tons, or about 34 tons less than in July. There were thirteen shippers, the leaders being the Nipissing, with 468 1-2 tons, Buffalo next with 180 tons, and Coniagas third with 123 3-4 tons. Shipments in detail were:—La Rose, 2 cars, 42 3-4 tons; Nipissing, 16 cars, 468 1-4 tons; Nova Scotia, 1 car, 33 tons; O'Brien, 1 car, 30 1-2 tons; Drummond, 1 car, 21 1-4 tons; Buffalo, 6 cars, 180 tons; Silver Queen, 3 cars, 88 tons; Coniagas, 4 cars, 123 3-4 tons; Kerr Lake, 2 cars, 62 1-2 tons; Trethewey, 1 car, 32 1-2 tons; Foster, 2 cars, 62 tons; Townsite, 1 car, 33 tons; total, 1,237 1-2 tons.

Cobalt's shippers for the first eight months of 1907 have been:

	Tons.
Coniagas	2276.34
Nipissing	1893.74
O'Brien	1277.46
Buffalo	949.62
Trethewey	680.24
La Rose	405.84
Silver Queen	326.28
Kerr Lake (Jacobs)	187.60
Foster	158.18
Townsite	101.11
Green-Meehan	98.39
MacKinley-Darragh	94.60
Temiskaming	86.04
Cobalt Central	77.33
Right-of-Way	65.55
Temiskaming Cobalt	59.91
Temiskaming & Hudsoy Bay	49.67
Nova Scotia	48.00
Colonial	40.28
University	30.69
Drummond (is storing its ore)	22.00
Silver Leaf	21.76
Red Rock	20.00
Imperial (Evans)	18.96
Total output for 1907 (8 months)	9989.59

or an average monthly output of 1118 tons.

COBALT ORE SHIPMENTS.

Following are the weekly shipments from Cobalt camp:—

Buffalo—Week ending Aug. 24, ore in pounds, 60,000; since Jan. 1, ore in pounds, 1,518,830.

Coniagas—Week ending Aug. 24, ore in pounds, 128,140; since Jan. 1, ore in pounds, 4,208,320.

Foster—Week ending Aug. 24, ore in pounds, 64,000; since Jan. 1, ore in pounds, 256,350.

Kerr Lake (Jacobs)—Week ending Aug. 24, ore in pounds, 63,780; since Jan. 1, ore in pounds, 312,780.

Nipissing—Week ending Aug. 24, ore in pounds, 247,055; since Jan. 1, ore in pounds, 369,301.

Townsite—Week ending Aug. 24, ore in pounds, 66,000; since Jan. 1, ore in pounds, 150,078.

The total shipments for the week were 628,975 pounds, or 314 tons.

The following are the figures of German consumption of foreign copper for the months January-July, 1907:—

	Tons.
Imports of copper	73,732
Exports of copper	4,969
Consumption	68,763

as against consumption during the same period in 1906 of 68,659 tons.

Of this quantity 57,532 tons were imported from the United States.

New Dividends

The directors of the Granby Consolidated Mining & Smelting Company have declared the regular quarterly dividend of 2 per cent. and 1 per cent. extra, payable Sept. 30th. Books close Sept. 13th and re-open October 1st.

METAL, ORE AND MINERAL MARKET.

Aluminum, No. 1 grade ingots—45 to 47 cents per lb.
Antimony—8 1-2 to 11 cents per lb.
Arsenic, white—7 1-2 to 7 3-4 cents per lb.
Barytes, crude—$11.25 to $14.75 per short ton.
Bismuth, metal—$1.50 to $1.75 per lb.
Cadmium, metal—$1.30 to $1.35 per lb.
Carbons for drills—$75 to $85 per carat.
Carborundum, powdered—8 cents per lb.
Chromium, metal pure—80 cents per lb.
Cobalt, f.o.b., Cobalt, Ont., unrefined—25 to 40 cents per lb.
Corundum—7 to 10 cents per lb.
Feldspar, ground—$12 per short ton.
Flourspar, lump—$10 per short ton.
Graphite, domestic—$50 to $150 per short ton.
Gypsum, lump—$4.50 per long ton.
Infusorial earth, ground—$15 to $30 per ton.
Lead—5.25 cents per lb.
Manganese, pure metal—75 cents per lb.
Mica, ground—$50 to $80 per short ton.
Mica, scrap—$15 per short ton.
Molybdenum, pure—$1.70 per lb.
Molybdenite ore, 90 per cent. pure—$4.50 to $5.00 per unit.
Nickel, metal—45 to 65 cents per lb.
Platinum, scrap—$21.50 to $22.50 per ounce.
Pyrite—38 to 45 per cent. sulphur, lump ore, 10 1-4 to 11 1-2 cents per unit.
Quicksilver—$40 to $41 per 75 lb. flask.
Sulphur—$23 per long ton.
Talc—$18 to $25.00 per ton.
Tungsten, pure metal—$1.28 per lb.
Tungsten ore, 60 per cent. pure—$9 per unit.
Tin—37 cents per lb.

MARKET NOTES.

Spelter.—Light demands still continue. Prices are falling. New York, 5.45 cents per lb.; London, £21 7s. 6d. per long ton.

Lead.—Market fixed. New York, 5.25 cents per lb.; London, £19 10s. for Spanish lead.

Tin.—Market shows steadiness and upward tendency. New York, 37 cents per lb.; London, £168 5s. for spot.

Copper.—The official price of copper has been reduced to 18 cents. Some transactions are closed at even lower price. New York, electrolytic, 17 1-2 cents per lb.; lake, 18 1-8 cents per lb.; London, £74 10s for spot standard.

Silver.—Aug. 15, 69 1-8; Aug. 16, 69 1-8; Aug. 17, 68 7-8; Aug. 19, 68 5-8; Aug. 20, 68 1-8; Aug. 21, 68 3-8; Aug. 22, 67 7-8; Aug. 23, 67 3-4; Aug. 24, 68 1-4; Aug. 26, 68 1-4; Aug. 27, 68 3-8; Aug. 28, 68; Aug. 29, 67 7-8; Aug. 30, 68 1-4; Aug. 31, 68 3-8; Sept. 3, 68 3-8; Sept. 4, 68 1-4.

Mexican dollars, 52 1-2 cents. Sterling exchange $4.862.

Pig Iron.—Pittsburg—Bessemer pig, $22.90; No. 2 foundry, $22.25.

Iron Ore.—Bessemer, old range, $5; Bessemer, Mesabi, $4.75; non-Bessemer, old range, $4.30; silicious, non-Bessemer, $2.50.

Quicksilver—$40 to $41 per 75 lb. flask.

THE MINERAL ROD.

A curious survival is the "Mineral Rod." There are still extant "practitioners" of the art of discovering mineral deposits by means of the bifurcated rod. Their methods are various and peculiar. The "diviner" usually claims to have some compound of virtue so signal that by its aid he can detect the presence of the precious metal under any conditions. Several of the older school assert that the delicacy of the rod permits of their differentiating as to the character of the mineral lode. These men, more often than not, are firm believers in their own ability to carry out their boasts. Hardly can they be convinced by failure and never can they be enlighted by argument.

Many years ago, a mineral rod man in an Eastern Province of Canada was put to the test. The manager of a gold mine questioned him concerning his powers, and asked him specifically if he could detect the presence of gold in quantity within the mine office. The diviner assured the manager that there was no limit to his powers. Thereupon the manager stumbled against a chest from which came a metallic jingle. The noise and the apparent confusion of the manager convinced the "rod" man that gold was hidden in the chest. He therefore seized his rod, which immediately responded to a powerful current of influence from the chest. Bit by bit, as the diviner circled the room the attraction of the chest became more pronounced. At last, with an exclamation of triumph, he declared that the gold was hidden there.

At once the manager opened the chest. Within it was a piece of brick placed in a capacious toilet vessel. The "metallic" sound had emanated from these.—The "diviner" still divines; but he shook the dust of that particular mine from off his feet.

There are many who believe that the phenomena accompanying a mineral rod demonstration are merely the result of the unconscious contraction of certain muscles in the fore-arm of the practitioner. Others think that there is a sub-stratum of virtue in the rod, but that its functions are over-estimated by its followers. However, there is but scant ground to attribute to the rod any virtue beyond that of causing men to dig. Occasionally they dig, at the bidding of the rod, and in spite of it they make a find. This apparently happens often enough to keep the dying belief in a state of flickering life. Sooner or later, like the mammoth, the mineral rod and its believers will have become the shadow of a name.

Always throughout the history of our race men have been searching for short cuts to wealth. Providence, however, has so disposed the hidden wealth of earth that men must work to win it. It is altogether a beneficent dispensation that this is so. Canada in developing her mines will also develop a breed of men, strong, self-reliant, unboastful and competent. Unboastful they will be because men who wrestle with elemental nature learn rapidly the absurdity of loud speech; competent they must become, because our standards of efficiency are every day growing higher and higher. In this process of growth superstition and ignorance will be sloughed as an old and clumsy garment. Mining will be, is now, the vocation of men, of strong men and above all honest men.