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The Canadian Mining Journal

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Editor:
J. C. MURRAY, B.A., B.Sc.

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THE ONTARIO PUBLIC SCHOOL TEXT BOOKS.

A small storm is raging in Ontario educational circles. Our readers will remember that eight months ago we alluded editorially to the fact that "the new Ontario Readers, excellent though they be in many regards, still conform to the outworn and artificial standards of thirty years ago. While they are probably the best school books that we have yet seen, still they fall very far short of what they should and could be." In general our editorial dwelt upon the evident paucity of descriptive and informational matter pertaining to Canada. We emphasized particularly the absence of any allusion to the industrial life of this country, and pointed out that the books contained not one reading concerning such an important industry as mining.

These animadversions the compilers answered by claiming that the school books were intended to be "inspirational" and not "informational." In this argument we can see little sense. Children derive inspiration of the proper kind from information interestingly presented. Canadian children should know something about Canada, about our forests, mines, farms, and industries. And knowledge of these things need not be acquired through pages of statistics, nor through dry didactic dissertation. In the discovery and exploitation of our mining regions, for instance, there has been developed much true romance. What could be more "inspirational" than the story of Silver Islet, or of the early labours of Canadian geologists, or the thousand and one incidents of pioneer life connected with the history of mining all over Canada! Surely it is well for the Canadian child to learn something of what Canadian citizenship means. The one crying need that faces our nation to-day is the evolution of a new brand of Canadianism. It strikes us as being rather piffing to prescribe large doses of conventional and hackneyed literature to "inspire" the rising generation.

We notice that the teachers of Ontario have given expression to their disapproval of the new books. They, and other critics, have not been answered by the Department of Education. The sole (and quite inadequate) response has come in the shape of a characteristic explosion from the impetuous Sir James Whitney. In the absence, through illness, of the Hon. Dr. Pyne, Sir James occupied the position of Minister of Education. When asked for his opinion concerning the aspersions cast upon the new books, Sir James erected himself into a volcano. This, while interesting, is not instructive. Neither is it inspiring. Vesuvius and other established centres of volcanic activity can do the trick far better.

Meanwhile we shall reiterate our former opinion to the effect that there will always be something lacking in

school books that teach the child nothing about the country in which all of us live and move and have our being.

THE SPRINGHILL SITUATION.

If we remember correctly, the number of strikes that have occurred at the Springhill collieries of the Cumberland Coal and Railway Company approximate roughly twenty-three in the last score of years. During this period the collieries have been under the management of one person.

The present strike, declared some eight months ago, had for its ostensible cause the refusal on the part of the management to recognize the U. M. W. A. In this instance the management has our entire sympathy. We believe that official recognition of the U. M. W. A. would be inimical to the interests of mining in Nova Scotia. Nevertheless we cannot but be impressed by the fact that the miners of Springhill, good and responsible citizens, have readily accepted this as a bone of contention.

Strikes are costly luxuries. They are the most wasteful means devised by man for settling industrial disputes quite irrespective of the merits of the questions involved. Moreover, strikes are distinctly bad business. Their occurrence generally argues a sad lack of tact and foresight on the part of the management. Generally also it may be safely said that the employees make unreasonable demands. But it is hard to imagine that the men are uniformly to blame. In the case of Springhill we are inclined to believe that the management is at least equally to blame. Under Manager Cowans' administration strikes have been the order of the day. Nowhere else in Canadian mining districts have industrial disturbances occurred with such regularity. We must therefore conclude that the present management is not free from blame. In fact, we can go further and state our conviction that in other hands the Springhill collieries would have been producing peacefully to-day.

We are unqualifiedly opposed to the pretensions of the U. M. W. A. This attitude, however, cannot prevent us from recognizing the failings of employers. In short, we can see nothing that can sufficiently justify the unenviable record of the Springhill collieries during the regime of the present management.

A PROTEST FROM COBALT.

The Canadian Mining Journal voiced the first protest against the inaccurate statements issued by the Conservation Commission regarding the fatality rate in Cobalt mines. Later the Canadian Mining Institute passed a resolution correcting these inaccuracies. One more protest, this time from the Temiskaming Mine Managers' Association, appears on another page of this issue of the Journal.

In an editorial published on February 15th, we referred thus to Mr. Sifton's speech:—

“In his exceptionally forceful address, delivered

at Ottawa on January 18th, Mr. Sifton covered a great deal of ground. . . . Mr. Sifton made certain specific references to mining and minerals. Several of these are absolutely incorrect, one or two are absurdly wrong, and others are tinctured with error. Before discussing these in detail, it is well to state that we are perfectly in accord with the spirit that pervades Mr. Sifton's address. It is obvious, however, that in facts and figures relating to mining some one has been leading him very much astray. For various good reasons, including strong internal evidence, we believe that Dr. Haanel is responsible.”

The protest of the Temiskaming Mine Managers' Association deals with an article written by Dr. Haanel, and published in the February number of “Industrial Canada.” In the course of the article Dr. Haanel uses precisely the same figures that were used by Mr. Sifton, and makes the same disparaging remarks concerning Canadian metallurgical practice. And, as pointed out in the Association's protest, he has made no formal correction of these inexcusable misstatements, although their erroneousness has been brought to his notice, not once, but many times.

It is appropriate here to remark that ample and prompt apology should be demanded of Dr. Haanel as Director of the Mines Branch. Gratuitous criticisms from a public official are offensive enough; but when those criticisms are based upon inaccurate information and are spread broadcast over the country, they constitute a grave breach of decorum. In the words of the Temiskaming Mine Managers' Association, the episode “has done much to undermine the faith of mining men in its statistics and suggestions.” This is literally true. How can the public be expected to place confidence in a department whose official head is permitted, without rebuke from his Minister, to discredit Canadian mining and metallurgical practice!

We are sincerely glad to have the entirely unsolicited support of the Cobalt mine managers. Our own earlier remarks concerning Dr. Haanel were written only after mature deliberation. That these remarks were not uncalled-for is now sufficiently evident.

Before leaving this painful subject we must take exception to one paragraph in the “Statement of the Temiskaming Mine Managers' Association.” While we have every reason to believe that good results are now being obtained at Copper Cliff, Thorold, and Deloro, yet we cannot accept this as proving that present processes for treating cobalt-silver ores are not susceptible of material improvement. There is nothing final in metallurgy. Improvements are being made weekly and daily. Radical changes may be introduced at any time. But these changes and improvements can only be arrived at by experienced specialists. The Mines Branch will meet with nothing but encouragement and support in any sane efforts that it makes in furthering this branch of metallurgy. On the other hand, the Mines Branch will irrevocably lose its usefulness if its official head is per-

mitted to disparage the work of men who are infinitely his superiors in technical attainments.

Incidentally, it may be well to refer to a letter, signed by Mr. Louis Simpson, that appeared without comment in our issue of April 1st. This letter illustrates admirably the evil effects that have followed Dr. Haanel's unwise strictures. Otherwise the letter calls for no special comment.

In closing we wish to state that we regret profoundly that it ever became necessary for us to attack the Mines Branch. That department is capable of good work, if it followed the footsteps of the corresponding branch of the United States Geological Survey. But as long as its energies are in any degree devoted to anything but furthering the interests of mining, just so long will the Mines Branch be a menace to the mining industry of Canada.

THE DAVIS HANDBOOK OF THE COBALT SILVER DISTRICT.

After many delays, occasioned largely by difficulty in obtaining the latest data as to each incorporated company, "The Davis Handbook of the Cobalt Silver District" has made its appearance.

Heretofore it has been a singularly arduous matter to secure without unreasonable loss of time full facts bearing upon the capitalization, directorate, management, equipment, and financial standing of any given Cobalt company. In the "Davis Handbook" all these data are set forth. Complete statistics of dividends paid, ore outputs, etc., are given in tabular form. Also, a list, corrected up to date, of all Cobalt incorporations is presented.

We know that for our own use Mr. Davis' book will prove a blessing. We believe that to Canadian and foreign investors and professional men it will be a time-saver. More especially will the overworked editor, to whom everyone looks for information, rise up and call the book blessed.

It is worthy of remark that this is the first attempt to gather into one volume all necessary facts concerning Cobalt. The Davis Handbook is the crystallized result of several years of hard work. As such it deserves the support of all interested in Canadian mining.

EDITORIAL NOTES.

The Willett Cobalt Silver Mines, Limited, is a recent incorporation. In the literature published by that company statements are made to the effect that native silver discoveries of some importance have been made on their claims. We are informed, from reliable sources, that no silver discoveries have been made on these claims. This kind of superfluous bad faith is too common. It is high time that the laws bearing on such misdemeanours were made automatic.

Many guesses have been made as to the actual motives that incited the Forget-Osler group to put up such a costly fight for control of the Nova Scotia Steel & Coal Company. In the fullness of time, no doubt, the inside history will leak out. Meanwhile the old directorate has been stirred into a state of unnatural activity.

In Great Britain the violent craze for shares in rubber companies continues unabated. The ordinarily phlegmatic Britisher is capable of wild indiscretion when once he has made up his mind to speculate. An English contemporary, after gathering statistics concerning the leading rubber properties, calculates that on nominal capital the average value of each rubber tree is only £0.31, whilst at the present market valuation the value is inflated to £2.09.

"Dr." Hugo Von Hagen, to whom we paid some attention last year, has placed his mining enterprises in the hands of a receiver. Von Hagen's action against the Colliery Guardian, of London, England, has been dismissed. The worthy Von Hagen failed to deposit security for costs. It is high time for this fakir to be placed under lock and key.

According to the annual report the Dominion Coal Company's net earnings during 1909 were \$1,113,091.09. Total dividends paid amounted to \$810,000. The carry-forward was \$394,419.42. It may be noted that the net earnings during 1908 were \$2,686,202.

Granby directors announced on April 5th that, in view of unfavourable reports being circulated regarding the condition of the Granby Mines, they have decided to engage competent mining engineers to examine and report exhaustively upon the properties. The examination will cover several months.

Available silver reserves in Bombay are reported to be much reduced. General trade is so flourishing in India that it is believed that the Indian Government will shortly make large purchases of silver for coinage.

The perennial rumour of the discovery of coal in Northern Ontario is now going the rounds. We notice that the finds are always announced when the snow is still on the ground. Yet, in the present case there appears to be more than ordinary hope. The seam of lignite that has been discovered shows an excellent analysis and a very respectable thickness. Therefore, in the absence of full facts, it is only just to say that the new discovery may mean much to the Province of Ontario.

NOTES ON PORTLAND CANAL MINING DISTRICT, B.C.

Written for the Canadian Mining Journal by William W. Rush.

The Bear River Mining district, situated at the head of Portland Canal, B. C. occupies a strip of land about 25 miles long by 5 wide, drained by Bear River. The country is rugged and but for its proximity to tide-water would be difficult of access. The Bear River bars afford a natural highway into the heart of the dis-

trict in its development. It was the Klondike excitement of '98 which attracted gold seekers to the Canal to look for placer diggings at the head of Bear River and Naas. Their search was unsuccessful, but the presence of base metals was noted, and as a result of their explorations the first lode claims of the district were staked—the



George E. Tunnel—Glacier Creek Mining Co

trict, and the Provincial Government has been generous in the matter of roads and trails. A 50 foot roadway has been cleared and partially graded for twelve miles up Bear River with tributary horse trails into the hills. Bear River has been spanned by a 1400 foot bridge and a dock has been built at Stewart, the port and distributing point for the district. A railroad and extensive additions to the systems of roads and trails are assured for the coming season.

The recurrent psychological phenomenon known and vituperated as the "mining boom" was responsible for the beginnings of the camp as it is for the latest phase

"Roosevelt" in 1899, and the "Stewart" property on American Creek in 1902. The fame of these discoveries and the explorations carried on by M. K. Rodgers and associates, attracted numerous other prospectors to the district and in 1905 important discoveries were made on Glacier Creek.

The district lies on the eastern flank of the Coast Range granites and the mineral deposits occur for the most part in slates, quartzites and siliceous limestones (or argillites). These rocks are often schistose but the schistosity is not so general or so marked as on the western flank of the granite. Diabase and other ig-

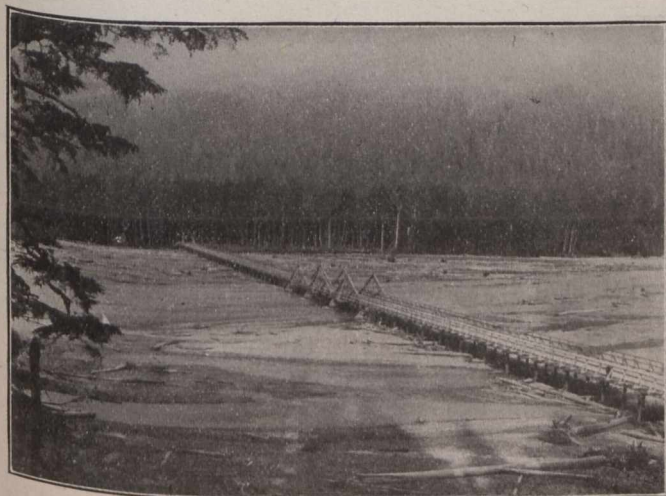
neous rocks occur but their relation to the ore bodies has not been determined. As the proximity of the Coast Range intrusives would suggest, the metamorphism of the sedimentaries is universal. No fossils have been found.

Discoveries made thus far indicate that the predominate products of the district will be silver and lead, but deposits of gold and copper are also found. The



Miner's Cabin.

most notable exception to the ordinary type of deposit is the "Red-Cliff" on American Creek, a large irregular deposit of iron and copper-iron sulphides with primary gold values. The Red Creek Mining Company after proving the existence of a large ore body is at present engaged in driving a long crosscut at a low level to work as a working adit. A compressor and machine drills are being installed. A very promising cop-



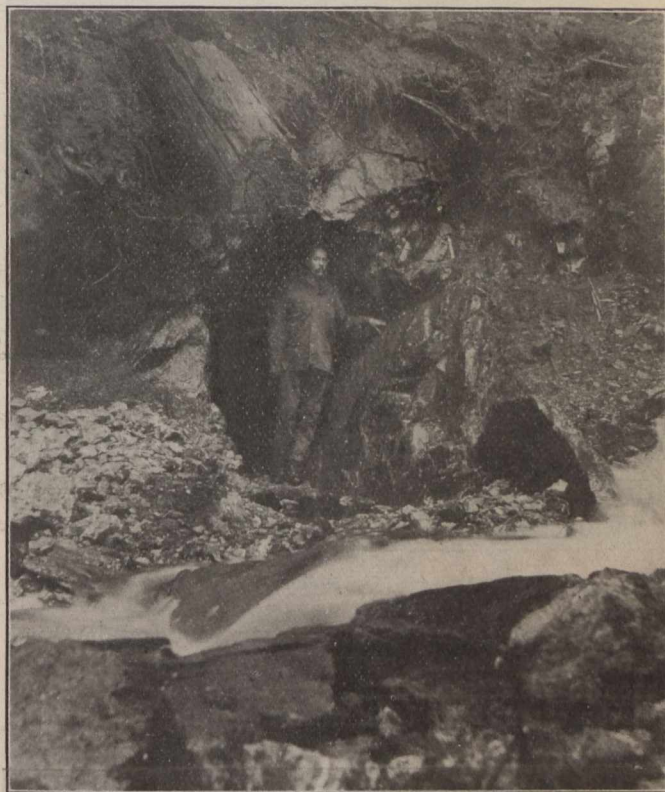
Bridge on Bear River.

per prospect is found on M. K. Rodgers' Northern Belle claims situated on the Middle Fork of Glacier Creek. Other copper locations have been made near the head of Bear River but little development work has been done.

Five miles above the "Red Cliff" on American Creek lies the Stewart property to which previous reference has been made. The mineral deposits on these claims have been described as a succession of sheer zones. At the tunnel the stains of copper carbonate and the absence of pyrite and limonite are conspicuous

features. The mineralization consists of galena and other argentiferous sulphides in a quartz gangue. High silver values are reported. This property has attracted much attention among mining men for a number of years. A company financed by D. D. Mann and associates, of Toronto, will begin its exploitation next summer.

But by far the greatest amount of prospecting and development work has been done on Glacier Creek. In this section the Portland Canal Mining Co. has opened up a strong vein following the formation along the contact between a sill of porphyry and the slate. The dip is southwest from 20° to 40°. Development has been progressing for several years on this property and there is a large quantity of ore blocked out and



Tunnel on Sunbeam Claim—Stewart Mining and Development Co.

ready for stoping. A mill and aerial tramway are in course of construction. The same vein or vein zone has been traced from the "Jumbo" and "Eurus" on the southeast to the works of the Stewart Mining and Development Co. on the northwest, a distance of 3 miles. On the latter property three parallel veins outcrop at an altitude of about 1100 feet. A tunnel is being driven on the "George E" to crosscut these veins at a depth of 180 feet. Two of the veins have been encountered thus far. The mineralization along this vein zone consists of galena, pyrite, zinc blende, argentite and native silver in a gangue of quartz and brecciated slate. Parallel blanket veins in similar geologic conditions and with similar minerals and gangue occur over a considerable area.

On the Middle Fork of Glacier Creek a series of veins occur that cut the formation at varying angles and dip vertically or nearly so. The usual vein minerals are galena, blende, pyrite, arsenopyrite, stibnite, and grey copper in a gangue of barite, quartz and sericitized rock. The Columbia-Evening Sun vein is a conspicuous example of this class. The Excelsior-Eagle

vein has a similar strike and identical vein minerals. The galena and grey copper of these veins carry uniformly high silver values. Most of the property in this section has been acquired by a syndicate organized by

the other hand in certain localities there are dangerous slides that must be reckoned with.

Several steamship companies will each provide regular passenger service between Vancouver and



Tunnel on George E.—Stewart Mining and Development Co.

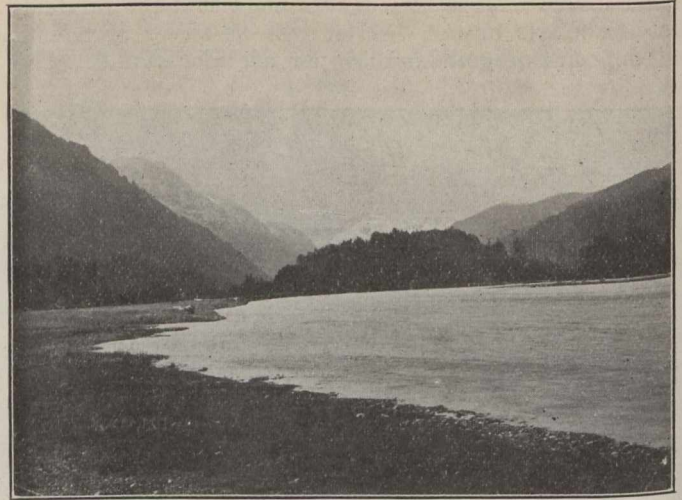
R. G. Edwards Leckie of Vancouver. It is understood that development work on an extensive scale will begin as soon as the season opens.

Seven camps have been working in the district this



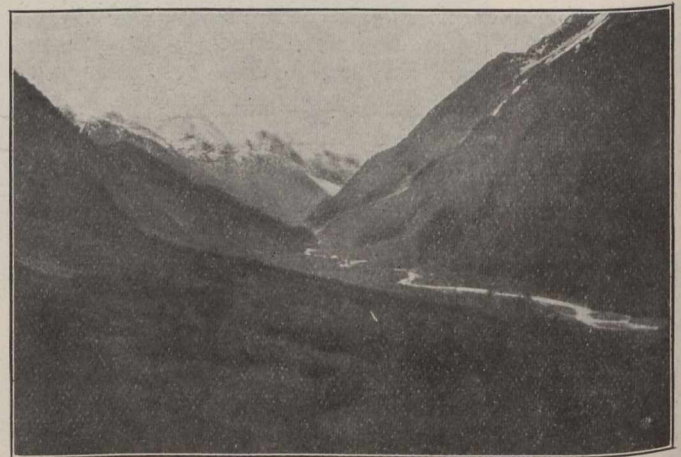
Lulu Tunnel—Glacier Creek Mining Co.

winter and of these the Portland Canal Mining Co. will be the first to emerge into the producing stage. With the energetic development that this season will bring several others will follow in close succession. Natural conditions are on the whole by no means unfavourable to mining operations. Timber and water power are abundant. Owing to the influence of the sea, winters are less severe than in many districts of the States. On



Head of Portland Canal.

Stewart this summer and local boats will leave Prince Rupert almost daily. Some of the usual discomforts incident to new mining camps may be expected, but



American Creek, flowing into Bear River.

food, fuel and water are abundant and there will be no hardships comparable to those encountered by stampeders in the desert camps or in the frozen Yukon.

Many years ago, when the Woodstock mine in New Zealand was worked as an independent proposition, many pounds of cyanide of potassium were used to treat a ton of ore. It was found that in roasting the ore a considerable quantity of wood ash got mixed in the ore. As the cyanide had a greater affinity for the wood ash than for the gold, it was neutralized, and resulted in a large cyanide consumption. Lime burnt in open kilns often contains partially burned coal or wood ash, which has an adverse effect on the cyanide. Where lime burnt in retorts cannot be obtained, that fed into the cyanide plant should be in the form of a solution or as a thin emulsion. In cases where the pulp is excessively acid wood ash may become useful for neutralizing acidity. The ash should, however, be leached rather than fed into the pulp, on account of the precipitations caused by the unburned charcoal.

CANADIAN IRON AND STEEL.

By Watson Griffin.

II.

The Dominion Iron and Steel Company.

The largest iron and steel plant in Canada is that of the Dominion Iron and Steel Company, whose works are located on a site 440 acres in extent in the city of Sidney, Cape Breton, in the province of Nova Scotia. The company's deep-water frontage on Sydney harbour available for docks accommodating large vessels is 2,400 feet. The works at present include four blast furnaces, having a capacity of over one thousand tons daily, when all are in operation, ten 50-ton open hearth furnaces, two Bessemer converters in connection with the open hearth department for the purpose of shortening the process of steel making in the open hearth furnaces by the elimination of silica and some of the other impurities in the pig iron previous to treatment in the open hearth furnaces, a 36-in. blooming mill and pit furnaces, a 28-in. rail mill of 1,000 tons daily capacity, a rod mill of over 7,000 tons capacity monthly, a continuous billet mill of 600 tons daily capacity, 500 Otto Hoffman coke ovens, coal-washing, sulphuric acid and by-product plants, and a large machine shop and foundry.

The output of the whole plant has been restricted in the past owing to the fact that the capacity of the coke ovens is not sufficient to supply enough fuel for the blast furnaces. The capacity of the steel plant, taking into consideration its present equipment of coke ovens and blast furnaces, is about 300,000 tons of steel ingots per annum, but extensive enlargements and improvements are under way which will increase the capacity of the plant from one-third to one-half. The chief additions are two large batteries of Otto Hoffman coke ovens, a 300-ton blast furnace, two 50-ton open hearth furnaces, and a plant for briquetting waste metal and reducing it to a form more adaptable for use as a boiler fuel.

The capacity of the rail mill and rod mill have never been fully tested because the company has never been able to make sufficient steel owing to the cause already explained. However, about 152,500 tons of rails and 73,000 tons of rods have been produced in one year, besides about 22,000 tons of other rolled material. When the present additions to the steel-making plant are completed these figures will, no doubt, be largely increased.

In October, 1903, this company entered into a contract with the Dominion Coal Company whereby the coal company undertook to furnish the steel company with all the coal required for the operation of four blast furnaces and the conversion of this product into various forms of steel manufacture at the price of \$1.24 per ton, with four cents additional for the use of the cars, or \$1.28 per ton laid down at the works. This contract is to be in force as long as the coal company's leases from the Government, which have still over eighty-two years to run, but once in five years there is to be an arbitration to determine whether there has been any increase in the actual cost of mining coal, and the price may be increased to the extent of any increase in the cost of mining. There was a legal dispute as to the meaning of this contract, but it was decided in favour of the steel company. The relations between the steel and coal companies are now of a very friendly nature,

the steel company and its friends having become the owners of a very considerable part of the common stock of the coal company. At present the two companies are maintaining their independent existence, although they have a president, general manager and superintendent of mines in common and ultimately a closer merger of interests is likely to be brought about.

The Dominion Iron and Steel Company has immense deposits of iron ore of good quality in Bell Island, Conception Bay, Newfoundland, about 400 miles from Sydney. English mining engineers have estimated that there is enough ore in the areas already opened up by the company to supply a plant larger than that now in existence at Sydney for over a hundred years to come, and there are outer areas belonging to the company which, if the seams are continuous, as is supposed, would probably yield a much larger quantity of ore than the areas now being worked.

The ore has a good percentage of iron. It is low in sulphur, but rather high in phosphorus. It can be mined very cheaply and as the mines are close to deep water docks, while the blast furnaces of the Dominion Iron and Steel Company are close to Sydney Harbour, the ore can be transported at very low cost.

The company owns a very large limestone property in Marble Mountain, on Bras d'Or Lake, about 70 miles from Sydney, where there is a practically unlimited supply of high grade limestone available for shipment by water. There are also limestone and dolomite quarries at George's River, near Sydney.

The capital of the Dominion Iron and Steel Company is \$20,000,000 common stock and \$5,000,000 seven per cent. cumulative preferred stock. The bonded indebtedness of the company is \$13,332,000.

The directors of the Dominion Iron and Steel Company are:—Mr. J. H. Plummer, President, Sir H. Montague Allan, Geo. Caverhill, Hon. Geo. A. Cox, H. F. Dimock, Hon. L. J. Forget, Hon. Robt. Mackay, Hon. David Mackeen, Wm. McMaster, Frederick Nicholls, Elias Rogers, W. G. Ross, and Sir Wm. C. Van Horne.

The Dominion Coal Company Board is as follows:—J. H. Plummer, President, F. L. Wancklyn, Lord Strathcona, Sir Henry Pellatt, Hon. Geo. A. Cox, Hon. L. F. Forget, H. F. Dimock, James Crathern, W. D. Matthews, and Jas. Reid Wilson, with two vacancies to fill.

The Nova Scotia Steel and Coal Company.

The Nova Scotia Steel and Coal Company has works in Cape Breton Island and Pictou County, Nova Scotia. The Cape Breton Island plant, which is located at Sydney Mines, about two miles from the port of North Sydney, operates under much the same conditions as the Dominion Iron and Steel Company as regards raw materials. It has now its own coal mines close at hand and like the Dominion Iron and Steel Company it gets iron ore from Bell Island. H. Kilburn Scott, an eminent English engineer, estimated last summer that in the Wabana iron areas at Bell Island owned by the Nova Scotia Steel and Coal Company there were 206,000,000 tons of iron ore practically proved and of iron ore reasonably supposed to exist more than twice as much. Nearly all this ore is under the sea, but the company reports that it has been driving tunnels and slopes in it without any inconvenience on that account. The ore is about the same quality as that of the Dominion Iron

and Steel Company. When the ore reaches the company's docks at the port of North Sydney it is transported to the blast furnace at Sydney Mines, about two miles distant, on the company's own railway, which is also used for carrying coal to the shipping pier.

Besides the Newfoundland mine the Nova Scotia Steel and Coal Company has iron areas in Cape Breton, Pictou and Guysborough Counties in Nova Scotia, but at present none of them are being worked and the value is uncertain. This company formerly had a blast furnace at Ferrona in Pictou County, which ran successfully for some years on Pictou County ores. Wabana ore from Bell Island was also used in this furnace, but as this ore, which was practically unlimited in quantity and very cheaply mined, could be laid down at Sydney Mines much more economically than at Ferrona the Pictou County furnace was finally shut down. The company had five collieries at Sydney Mines besides the Marsh Mine near New Glasgow in Pictou County.

H. Kilburn Scott, the same English engineer who estimated the value of the iron areas of the company, estimated that its coal areas contained of coal practically proved 270,000,000 tons and of coal reasonably supposed to exist 1,068,000,000 tons. These coal areas are largely submarine. The present output is 900,000 tons per annum and can easily be increased to 1,000,000.

The limestone properties of the company at present operated are situated at Point Edward about ten miles from the blast furnace. They contain about 2,000,000 tons of limestone of very high grade, which is transported by rail to the works. This company has other extensive limestone deposits somewhat farther away but situated at a point where the limestone can be easily transported by water. These deposits are of exceptionally fine quality and are said to contain over 98 per cent of carbonate of limestone and magnesia.

The blast furnace at Sydney Mines has a capacity of 200 tons per day. There are three batteries of coke ovens of forty ovens each of the Bernard Retort type, and one battery of thirty ovens of the Bauer Retort type. The coal washing plant has a capacity of fifty tons per hour. The company has three 40-ton steel furnaces, the basic Siemens-Marten process being used. The capacity is 400 tons of ingots per day.

The works at Trenton, near New Glasgow, in Pictou county, consist of rolling mills, forges and various finishing machines for the production of spikes, bolts and nuts, polished shafting and other finished material, having a capacity of 50,000 tons of finished material per year, in addition to 50,000 car axles weighing about 15,000 tons. The fuel is nearly all obtained from the surrounding collieries at Westville and Stellarton.

The company has issued \$1,030,000 preferred stock, \$6,000,000 common stock, \$1,000,000 six per cent. debenture stock, and \$3,500,000 of five per cent. first mortgage bonds, while \$2,500,000 five per cent. mortgage bonds remain in the treasury.

The directors of the Nova Scotia Company for the past year were: Robt. E. Harris, K.C., President; Hon. James D. McGregor, Vice-President; Thomas Cantley, General Manager; J. Walter Allison, Robert E. Chambers, James C. McGregor, Hon. Robert Jaffray, George F. McKay, John McNab, Hon. J. S. Pitts and Robert Reford. A dispute has arisen regarding the recent election of the same Board of Directors, Mr. Rodolphe Forget, of Montreal, who favours a change, claiming that he and his friends control a majority of the shares.

The Canada Iron Corporation.

The Canada Iron Corporation is a merger of the interests of the following companies:

The Canadian Iron and Foundry Company, Limited.

The Canada Iron Furnace Company, Limited.

John McDougall & Company (Drummondville Works).

The Annapolis Iron Company, Limited.

The corporation has blast furnaces at Midland, Ont., Radnor Forges, Que., and Drummondville, Que., with a total capacity of over 125,000 tons of coke pig iron and 14,000 tons of charcoal pig iron per annum, while it has large foundries and well equipped machine shops at Midland, Fort William, Hamilton and St. Thomas in the Province of Ontario, Three Rivers in the Province of Quebec and Londonderry in the Province of Nova Scotia. These six factories have a total daily capacity of 70 tons ingot moulds, 115 tons castings, 150 tons car wheels, and 205 tons of cast iron water and gas pipes.

The Midland works are located on the north side of the harbour of Midland, the corporation having a large acreage along the water front, with ample room for the construction of a large iron and steel plant. The docks have a length of 2,400 feet, with about twenty feet of water.

Midland was selected partly because of its central position in Ontario, which is the chief iron consuming province of the Dominion, having a large number of manufacturing towns which can be conveniently reached from Midland, and partly because, having one of the finest harbours, on Georgian Bay, it is a convenient point for the assembling of raw materials by water from Northern Ontario and Michigan, while the rail haul from the iron mines of Eastern Ontario is short. At present there is one blast furnace in operation at Midland with a capacity of 150 tons per day, but when the new furnace now nearing completion, is in operation, the plant will have a capacity of over 125,000 tons per annum.

Coke from Connellsville, Pa., is used, and the limestone is obtained from quarries belonging to the corporation on the eastern shore of Midland Bay about five miles from the furnace.

The furnaces at Radnor Forges and Drummondville make an exceptionally fine quality of charcoal iron especially adapted for the manufacture of car wheels and high grade special castings. Local bog iron ores, which are remarkably free from phosphorus and sulphur are chiefly used although some high grade iron ore is brought from Eastern Ontario. The furnace at Radnor Forges has a capacity of 9,000 tons and that at Drummondville 5,000 tons.

The mineral areas owned by the corporation are:—The Drummond Iron Range located at Bathurst in the County of Gloucester in the Province of New Brunswick, comprising five square miles of non-Bessemer hematite and magnetic ores of good quality.

The Annapolis Iron Areas in Annapolis County in the Province of Nova Scotia, covering an area of seven square miles containing a non-Bessemer ore, low in sulphur and moderately high in phosphorus.

The Eganville Iron Mine in Renfrew County, Ontario, containing high grade magnetic ore of non-Bessemer quality.

Development work is being proceeded with at the Drummond Iron Range in connection with which the corporation is now constructing the Northern New Brunswick and Seaboard Railway from the mines to Bathurst, a distance of about 26 miles. This line will

be completed to connect with the Intercolonial Railway within the next few months and shipments of ore will then be made to Newcastle, where extensive ore docks, with facilities for handling upwards of 3,000 tons of ore per hour are under construction and will probably be completed soon after the opening of the shipping season this year.

Extensive development work has been done at the Annapolis mine and in connection with this the corporation and Messrs. Mackenzie, Mann and Company are jointly converting the dock at Port Wade, N.S. into an up to date ore handling and shipping dock. This dock will have a capacity of 3,000 tons per hour and is expected to be ready to make shipments on the opening of the coming shipping season.

The directors of the Canada Iron Corporation are:—Thos. J. Drummond, President, Edgar McDougall, Vice-President and General Manager, Geo. E. Drummond, Vice-President, Geo. Gudewill, H. Cockshutt, A. E. Dymont; London Committee of Directors,—Sir James Heath, I. Hamilton Benn, R. W. Cooper, J. R. Tennant; Secy-Treas., F. G. O'Grady; Controller A. K. Fisk.

The Londonderry Iron and Mining Company.

The Londonderry Iron and Mining Company has at Londonderry, Colchester County, Nova Scotia, a blast furnace of 100 tons capacity, an ore crushing and mixing plant, coal washing plant, and ninety-seven coking ovens with a capacity of 150 tons per day. It owns in Colchester County 30,000 acres of freehold on which are iron ranges containing large quantities of ore very low in sulphur, much lower in phosphorus than most of the Nova Scotia ores and free from titanium. There are a number of varieties, including hematite, limonite, ankerite, siderite and specular ores. At the blast furnace ankerite (limestone containing a small percentage of iron) is used as a flux and coal is brought from Springhill, in Cumberland County, and from Pictou County.

The furnace has been out of blast for some time owing to the miners' strike at Springhill.

The company has recently completed a first-class steel casting department, with a capacity of 5,000 tons per annum.

The authorized capital of the company is \$1,000,000. The officers and directors are: T. J. Drummond, president; Edgar McDougall, Vice-President; George E. Drummond, John J. Drummond, and James T. McCall; Secretary-Treasurer, F. G. O'Grady.

The Lake Superior Corporation.

The Algoma Steel Company, the Lake Superior Iron and Steel Company and the Algoma Iron Works are all subsidiary companies of the Lake Superior Corporation, which, through other subsidiary companies, also owns the famous Helen Iron Mine at Michipicoten, and other mines, extensive timber limits, the great electric power plants on both sides of the Soo, the street car lines in the Soo towns, an extensive electric lighting system, a ground wood pulp mill, a sulphite mill, reduction works, a copper-nickel converter plant and nickel matte smelter, an electric furnace, a saw mill, a veneer mill, a brick plant, the Algoma Central and Hudson Bay Railway, the Manitoulin and North Shore Railway, and a number of steamships.

The present iron and steel plant includes two blast furnaces, having a capacity of 300 tons each per day; a Bessemer steel department with two converters, having a capacity of 800 tons ingots per day; three 40-ton basic stationary open hearth furnaces, with a capacity of 300 tons ingots per day, a 34-inch blooming mill and

24-inch rail mill, with a capacity of 1,000 tons of steel rails per day; a foundry and machine shop. There are now under construction, and will be completed this summer, new blast furnaces with a capacity of 500 tons per day; one 12-inch rolling mill; one 18-inch rolling mill; three additional open-hearth furnaces of 40 tons capacity each; a rod mill, billet equipment, complete machinery for the manufacture of spikes, bolts, nuts, railway fastenings and tie plates, and two batteries of the Koppers' by-product coke ovens, with a capacity of 1,300 tons of blast furnace coke per day, with a complete by-product plant for the production of tar and ammonia sulphate. In connection with the construction of the new blast furnaces, four gas blowing engines of 2500 H.P. each, operated on blast furnace gas, are being installed to replace steam blowing engines and four gas engines of the same capacity with 1500 K.W. generators to supply electric power to operate the two new rolling mills, and power for direct current motor, 1500 H.P. which is being installed to operate the blooming mill in place of steam engine, it being the intention to have all mills operated electrically. New ore and coal docks are being constructed, equipped with the most modern ore handling and coal unloading machinery, and new machinery for the loading of steel rails on vessels. The total length of the ore docks is 2,000 feet and coal docks 1,200 feet; all being connected with deep water above the Soo rapids.

The Helen Iron Mine is about 11 miles from the Lake Superior port of Michipicoten with which it is connected by a railway belonging to the corporation. From Michipicoten the ore is carried on the corporation's own boats to the works at the Soo which are about 125 miles distant. Considerable quantities of the ore are sold to other companies in Canada and the United States. The ore bed from which shipments have been chiefly made is a hard, red hematite containing about 60 per cent. of iron, low in sulphur and containing about .125 phosphorus. Dr. Bell of the Geological Survey, some years ago said it contained at least 26,000,000 tons of ore and probably many millions more. The corporation recently drove out under Lake Boyer, adjoining the Helen mine, and struck into a body of Bessemer ore of exceptionally good quality carrying about .02 to .03 phosphorus. Development work has been begun and there are believed to be large quantities of this ore.

The works at the Soo use in addition to the Helen ore a considerable quantity of Bessemer ore from Minnesota and Michigan, which is brought across Lake Superior by boat at a very low rate. The corporation owns large areas of limestone property on St. Joseph Island and Cockburn Island, a distance of about forty miles from the works, which can be brought in by boat at a very low cost. In addition they are interested in large limestone deposits in Northern Michigan, forty miles from the works, the limestone being shipped to the Soo by rail at a low freight rate. This limestone runs about 98% in fluxing qualities. The property also contains a high grade dolomite, which is used in the open hearth furnaces. Coal has to be imported from the United States and is handled from Lake Erie ports to the works by boat during the season of navigation.

The capital stock of the Lake Superior Corporation is \$40,000,000 and its bonded indebtedness \$13,000,000. The directors are:—T. J. Drummond, President, J. Tattall Lee, W. K. Whigham, J. Fraser Taylor, T. Gibson, F. McOwen, H. M. Price, R. L. Austin, Jos. S. Dale, H. M. Coppell, John T. Ferry and J. S. Lovell.

The Hamilton Steel and Iron Company.

The works of the Hamilton Steel and Iron Company are at Hamilton, Ont. The plant includes two coke blast furnaces with a capacity of 550 tons per day, four open hearth steel furnaces with an annual capacity of 100,000 tons located on the shore of Burlington Bay at the east end of Hamilton, and puddling furnaces, rolling mills and forging department on Queen Street near the Grand Trunk Station at the west end of the city.

The coke comes from Connellsville, Pa., the iron ore from Michipicoten and the Michigan iron ranges, the limestone from Dundas, Ont., a few miles from the works.

While all the materials except limestone have to be brought from a distance, Hamilton is very favourably situated for the assemblage of coke and iron ore from outside points, having first class rail and water communication. Cheap electric power can be obtained from Niagara or from the Cataract Power Company which transmits power to Hamilton from De Cew Falls, a few miles from St. Catharines. Cheap natural gas is available, being brought to Hamilton from wells in the vicinity.

The capitalization of the Hamilton Steel and Iron Company is \$3,000,000. There are no bonds or preferred stock. The directors are: Charles S. Wilson, President; Robert Hobson, Vice-President and General Manager; William Southam, John Milne, George Lynch Staunton, Charles E. Doolittle, H. H. Champ, E. B. Osler, M.P. and W. D. Matthews.

The Atikokan Iron Company.

The Atikokan Iron Company is one of the Mackenzie and Mann enterprises. The works are located on the water front at Port Arthur, Ont., and include a blast furnace having a capacity of 100 tons per day, but so constructed that the capacity can at small cost be increased to 200 tons, 100 beehive coke ovens, with a total daily capacity of 150 tons of coke, and 16 Roberts ore roasting furnaces.

The ore used is all brought from the Atikokan Iron Mine of the company on the line of the Canadian Northern Railway, about 130 miles from Port Arthur. It has been proven that there are at least five million tons of ore and the quantity available is believed to be very much larger. The ore is magnetite. There are three veins, two of which are said to contain no phosphorus, while the third contains too much phosphorus for Bessemer use.

The high percentage of sulphur in the ore was at first considered very objectionable, but it has been found that in the Roberts roasting furnaces the sulphur can be reduced from 2.5 per cent. in the raw ore to .75 in the roasted ore at a cost of less than ten cents per ton, and the moisture is expelled from the ore in the process. Experiments in roasting have been made for three years with most gratifying results and the company are so well satisfied with the success of the process that they propose in the near future to increase their blast furnace capacity, using only Atikokan ore. This Roberts roasting plant was the second installed, but there are now several in successful operation in the United States and England.

The plant can roast 600 tons of ore per day and as the blast furnace at Port Arthur cannot use nearly that much considerable quantities of the roasted ore will be sold. It has been found that it can be profitably exported to the United States in spite of the duty. Owing to the moisture having been expelled in the process of

roasting, the magnetite ore can be smelted as easily as hematite ore. A very fine quality of foundry pig iron is produced at the Port Arthur furnace from the roasted Atikokan ore.

Gas from the blast furnace is used for the blowing engines and for roasting the ore.

Coal is brought from West Virginia because it is very low in sulphur, while Kelly Island in Lake Erie supplies the limestone, low rates of transportation being secured on ore boats which would otherwise return empty, from lower lake ports to Lake Superior iron ore shipping ports.

The capital of the company is \$1,000,000. The directors are:—William Mackenzie, President, D. D. Mann, Z. A. Lash, Hugh Sutherland, A. S. White, and J. Dix Fraser, General Manager.

THE USE OF COKE-OVEN GAS AS FUEL.

Paper Read Before the Mining Society of Nova Scotia
By Thomas J. Brown, General Superintendent
of the Nova Scotia Steel & Coal Co.,
Sydney Mines, N.S.

Greater economy in the use of fuel is a question always of the utmost interest to consumers. As our coal mines grow larger, haulages become longer, shafts deeper, and the many drawbacks in connection with the extraction of coal become more extensive and expensive, this question of economy in fuel becomes each day a more important one to all concerned.

In the early history of coal mining in this country, very little attention was paid to this very important item. Particularly was this true at the different collieries; as they were producing the fuel themselves, it was natural for them not to place the same amount of importance on the question of economy in the use of fuel as other consumers who had to pay more for their fuel.

Strange to say, these conditions are greatly changed, and I believe to-day that the coal operators are doing as much as anyone, if not more, towards introducing economical methods in connection with their operations, and towards the introduction of the most modern equipment as regards their power-plants, to enable them to make use of all the heat units possible, and to consume the lower grade fuels that were at one time so generally consigned to the waste dumps.

The most up-to-date and modern water-tube boilers have taken the place of the old exterior fired, egg-end, cylindrical type. High steel stacks and forced or induced draft fans have taken the place of the old 60 to 80 ft. square brick stacks so evident some years ago. Selfstokers, travelling chain grates, feed-water heaters, economizers and all the other contrivances so well known to the modern engineer, have been introduced, all with a view of further economizing the use of fuel. And, personally, I think a still greater change has taken place in the fact that nearly all plants in the early days did not have sufficient boiler power to efficiently do the work required; and that to-day engineers see the great advisability of having more power than is necessary to do the actual work, and in this way enable them to use inferior fuel, and to do the work with greater ease and less strains on the power plants than was the custom in former days.

Not only does the engineer of to-day see this, but he has, after a great deal of opposition, been able to make the governing bodies of nearly all the big cor-

porations to-day see the advisability of the great saving to be made by making the original investment for power-plant large enough to put in place a plant of sufficient power to enable them to avail themselves of the economies to be made in this way.

If a stranger visits any of the great metallurgical centres of the United States, and particularly the State of Pennsylvania, he is at once struck by the enormous quantities of escaping gas from coke-ovens, to be seen all through the country. To the man who appreciates the power and the commercial value contained in this escaping gas it is appalling. When one thinks of the ridiculously small percentage of efficiency that is extracted from each pound of coal, and when one sees this enormous waste, one cannot help but wonder why we have not reached the point where the use of this waste gas has become more general.

It is pleasing to note that a great many of what are known as by-product coke-ovens are replacing the old form of beehive ovens, and by the manufacture of by-products some of the valuable qualities of these escaping gases are being extracted. Statistics show that the United States has yet in operation 90,000 beehive ovens, and in 1907 but 4,000 by-product ovens. The coke from the improved ovens in 1907 was valued at \$21,000,000 and the by-products at \$7,500,000. The beehive ovens in the same year produced coke worth \$89,000,000, and in this manner absolutely wasted \$55,000,000. Is it any wonder a stranger is astounded at this enormous waste, which can only be accounted for as due to the presumed abundance of their resources? Even with the modern oven as in use in Cape Breton to-day, the waste from poorly sealed oven doors, if thoroughly appreciated, should receive closer attention.

Very little coke-making was done in the Province of Nova Scotia in the early days, and any that was made was with beehive ovens. The Nova Scotia Steel & Coal Company, which had its pig-iron furnace at Ferrona, Pictou County, was the first in Canada to introduce the use of what is known as the modern retort oven. In connection therewith was also built the first washery in Canada for the cleaning of slack coal.

About the year 1900, by-product coke ovens were built by the Dominion Iron & Steel Company in Sydney, and about the same time the Nova Scotia Steel & Coal Company built at Sydney Mines ovens of practically the same type: 30 at what is known as No. 1 Colliery, and 120 at its blast furnace, which is situated about half a mile from the colliery. Instead of utilizing the waste gases from these ovens for by-product purposes, this company chose to use it under its boilers as fuel, and the object of this paper is to give the members of this society an idea of how this was accomplished and the success it has met with.

This company is rather fortunate in having, what some people would call as a whole, "a self-contained enterprise;" that is, they own their own ore, limestone, coal, and metallurgical plant. By using these gases as a fuel, the result brought about a very peculiar and unique condition of affairs. It was found that, after supplying all the power that was necessary at the metallurgical end of the plant, some surplus power was available; this power was conducted back to the coal mines in the shape of electrical current, and is now being successfully applied in the underground hauling and raising of coal, and in furnishing power for the ventilating of the mines, forming what might be termed an endless chain in the operations.

The details of this plant will no doubt prove very

uninteresting reading to a great many of our members, but, we hope, will be appreciated by persons who are directly interested in this class of work. Of course, there is no claim made by any officer of the Nova Scotia Steel & Coal Company that this undertaking was original or unique; but it is so surprising that such a small proportion of coke-makers have availed themselves of this method of treating with waste gases, that it was suggested to the writer that a paper of this nature might be of some value.

In connection with this plant, there are two independent installations of coke ovens: those near the blast furnace, known as the Bernard type, the surplus gas from these being used in connection with the production of steam for the electric power plant; the second installation of ovens of the Bauer type, located at No. 1 Colliery, the surplus gases being used in generating steam for general colliery use. These two installations are widely different in many respects, and between them they cover in many details the use of coke-oven gas under boilers.

In the case of the Bernard ovens, there are a number of small ovens situated at about an average distance of 200 feet from the boilers, so that the frictional resistance of this flue becomes an important factor when considering the amount of draft necessary. The gases pass through boilers of an ordinary fire-tube type, and here again the resistance of a number of small tubes is met with.

In the original design of this plant, the arrangement was such that the gases from 80 of these ovens were to pass through nine fire-tube boilers, and thence from a flue at the rear of the boilers to a brick stack 150 feet high, 6 feet 6 inches diameter, and with a stack temperature of 800 degrees F. a draft of $1\frac{1}{2}$ in. water-gauge was produced. This stack would not produce sufficient draft to allow the ovens to work up to their full capacity, and this condition was further aggravated if it became necessary to take one or more boilers off for repairs, and it was finally decided that it would be advantageous to install an induced-draft fan between the rear flue of the boilers and the brick stack, and at the same time a number of the boiler settings were altered so that in the present arrangement there are nine plain fire-tube boilers, 15 ft. long, 8 ft. diameter, having thirty-nine 5 in. plain tubes and sixteen 5 in. screwed stay tubes.

The setting was altered on four of these boilers by building a brick wall longitudinally under the centre of the bottom of the boiler shell, so that the gas, after passing through the tubes from the front to rear, flows from rear to front under one-half of the shell, and through a port from the front to rear of the other half, and then from the flue at the rear of the boilers through the induced-draft fan to the stack.

This fan is of the regular type used for induced draft for boilers, having water-cooled bearings. The fan wheel is 108 inches diameter, 54 inches wide, and runs usually at about 220 r. p. m., and at this speed produces a draft equivalent to $1\frac{7}{8}$ in. water gauge.

In the furnace of the boilers the draft is usually about 13-16 in., and in the main flue in front of the ovens is further reduced $\frac{1}{4}$ to 5-16 of an inch. The draft in the coking chamber of the ovens varies between $\frac{1}{8}$ and 3-16 of an inch.

The $1\frac{7}{8}$ in. draft at the fan, with the 9 boilers under steam, gives very satisfactory results; but if it is necessary to take off one or two boilers, the fan is speeded up until about $2\frac{1}{8}$ in. water-gauge is produced.

The gas from any number of boilers can be cut off by dropping a damper between the main gas flue and the boiler. This damper consists of an iron band, the centre of which is filled with fire-brick; and as it works in a slot, the outer edges of the damper and the iron band do not come in contact with the hot gases, and the whole arrangement as a damper gives complete satisfaction.

Each of these batteries of 40 ovens was designed to produce 100 tons of 48-hour coke per day of 24 hours; but their capacity has been cut down by putting in an additional 2 in. fire-brick pavement in the bottom, so that their ordinary maximum capacity is now 90 tons. They can be charged with 7 tons of washed coal, containing about 8 per cent. of moisture, when properly levelled. This coal has an average analysis of about as follows:—

Ash	5.1%
Sulphur	1.2
Vol. matter	39.2
Carbon	56.7
Moisture	10.6

Under ordinary working conditions, before the change in the setting was made, the boilers would develop about 100 h.p. each; but, after returning the gas under the lower shell of the boiler, this was increased to about 112 h.p.

As a direct result of the use of the gas from two batteries of these ovens, the steam necessary for generating the electric power of the entire plant is produced, amounting to an average of some 260,000 k.w. hours per month, with engines of high-speed Corliss type having a steam consumption of about 16 lbs. of steam per 1 h.p.

At the Bauer coking plant the ovens are much larger and are located alongside the boiler-house, so that the gas flues are comparatively short, and the gas is used under Babcock & Wilcox water-tube boilers, offering very little resistance to its flow. These boilers are also fitted with an induced draft fan and discharge the gas into a stack 110 ft. high, 5 ft. diameter. In this case it is only necessary with three boilers on to produce a

draft of $1\frac{1}{4}$ inches water-gauge; but if the gas is used under two boilers only, it is necessary to have a draft of $1\frac{1}{2}$ inches.

With the same coal used for coking purposes, a test run on one boiler gave the following results:—

Average h.p. per hour	331
Maximum h.p. per hour	436
Minimum h.p. per hour	179
Coal charged into ovens during test..	804,000 lbs.
Number of ovens charged	15
Evaporation from and at 22° per pound	
coal charged into the ovens.....	1.18 lbs. water
Coal charged into ovens per boiler h.p. . .	29.23 lbs.

The operation of this plant is giving very good results. And as these boilers have each 3,140 sq. ft. of heating surface, and generally the flue temperature at rear of boilers is between 600 and 700 degrees, it would seem that this proportion of about 9.5 sq. ft. of heating surface per h.p. developed, is about right for this class of fuel.

The electric power thus generated is used to operate lifting cranes at the blast furnace, trolleys that convey coke from the ovens to the blast furnace, electric coke-oven pushers, open-hearth cranes for handling all material for open-hearth purposes, electric open-hearth furnace charging machine, all the power necessary in the foundry, machine and car shops, electrically driving the coal washery plant, crushers, etc., ventilating No. 1 and No. 5 Collieries, operating haulage plant north and south at No. 5 Colliery, knocking screens and picking-belts at the collieries, lighting the whole plant, and in the many various ways that electric current can be used about a plant of such nature.

When one considers that this power only a few years ago was allowed to escape into the air, and at too many places is still allowed to escape, and when one considers the enormous amount of work that is being done by this power at the small plant described above, it is no wonder that the question of the utilization of this power is forcibly appealing to the engineers of to-day.

MINING AND SMELTING CONDITIONS IN BRITISH COLUMBIA.

On March 22nd Mr. Thomas Kiddie, a metallurgist long and favourably known in the Northwest, was the guest of honour at a luncheon of the Canadian Club of Vancouver, British Columbia. There was an attendance of about 130, including many men prominent in financial, mercantile and industrial circles in the City of Vancouver. The chair was filled by Mr. Ewing Buchan, manager of the Vancouver branch of the Bank of Hamilton, president of the Vancouver Board of Trade, and vice-president of the local Canadian Club. Other invited guests interested in the progress of the mining industry were Mr. E. Jacobs, mining journalist, and secretary of the Western Branch of the Canadian Mining Institute, and Mr. Robert R. Hedley, formerly manager of the Hall Mines smelting works, at Nelson, B.C.

After the toast of "The King" had been honoured, the chairman called upon Mr. Kiddie, who on rising to address the meeting was given a very hearty reception. He read the following address:

Mr. Thomas Kiddie's Address.

Mr. Chairman and Gentlemen: The mining industry of British Columbia is a subject to which it is not possible to do even scant justice within the limited time at my disposal in which to address you to-day, so that what I shall say to you will be more in the nature of a brief review of this important subject that in any way a pre-emptive to you of the facts and figures necessary to adequately convey an idea of the very considerable advances made in mining and smelting in this province during the last ten years, and the proportions to which mineral production has attained.

Of the present condition of mining many here are fully cognizant from personal experience, from long residence on the coast, and from a general knowledge of the subject.

Those of you who have graduated from the school of experience in mining recognize at once its great possibilities, its attractiveness, its fascination, and its extensive

scope for the acquisition of wealth. In order to realize this we have but to visit any of our western cities to see the monuments of successes achieved in mining, to see the business blocks, banks, hotels and residences built with money made by men interested in mining, to be convinced of the very substantial results which follow the successful pursuit of mining. These successes are primarily due to a class of men whom we may well stop to honour—the prospectors. These men, after years of persistent effort, generally under the great disadvantage of insufficient means, are in too many instances rewarded only by a pittance of the actual worth of their mineral discoveries. You, gentlemen, who represent the financial end of mining, would do well to foster the acquaintance of the prospector, and see to it that he gets a just reward for his work, protecting him against his possible ignorance of the many ways in which his property may slip through his fingers, always remembering that every mine was once a prospect, and that without the prospector the expansion of mining, in this or any other country, would speedily come to an end.

Conditions Affecting Mining.

As to the conditions affecting mining operations, you are all aware of the fact that the physical and economic conditions prevailing in the districts in which our mining operations are carried on are important factors in realizing on the value of an ore. It is therefore important to note some of the great advantages we enjoy in this direction.

First, the coast between Vancouver and Alaska is cut into by rivers, inlets and canals, stretching far into the interior, and giving easy access to the different mining centres; so that by means of aerial tramways the products of the mines are easily and cheaply transported to tidewater, where, with storage bunkers, even large vessels may be quickly loaded. Transportation by water ensures delivery of the ores to the different coast smelters at the lowest cost, or the tramways may deliver the ore direct into the mills to be treated by concentration, smelting or other processes, the product of these mills in the form of concentrates, matte, or bullion, to then be delivered by water transportation to the nearest railway.

The larger the cargoes handled, the cheaper the freight rates are, and I think we only realize this great advantage fully when we compare this free trade by water transportation with railway transportation, even under its best conditions. As an illustration, I may mention the fact that copper ores are being freighted from Alaska to coast smelting points, a distance of 1,000 miles, at \$1.50 per ton.

Water Powers Being Utilized.

Another physical advantage which we enjoy is the numerous smaller water-powers usually found in our mining regions. These are being more and more conserved and utilized for mining and smelting purposes. Electrical energy generated from these water-powers is readily and cheaply distributed from the generating stations to the various points where power is required for mining, milling or smelting purposes, and once installed, power is provided at a minimum of cost, without the vexations attending the production of steam for steam power plants.

In due time we hope to see more of our larger water-powers on the coast utilized for industrial purposes other than mining.

The achievements in electrical engineering have been so rapid and the results so astounding that it may be no idle fancy to predict that the wireless transmission of

high tension electricity may be an accomplished fact in the not too distant future. What such a consummation would mean for power, manufacturing, and lighting purposes, is well nigh beyond comprehension.

Great Areas of Coal.

Another prominent asset which we possess toward favourable mining and smelting conditions, and indeed toward all our industrial conditions, is our great coast coal areas. The established coal industry of Vancouver Island has been especially successful, both as regards development and management. On that island to-day prospecting for more coal is being vigorously carried on, no less than eleven diamond drills being at work for this purpose.

The development of the coal and coke industry of the province has been marked by a steady yearly increase, beginning with 81,547 tons in 1874, to a gross production of 2,400,000 tons in 1909. This satisfactory progress is largely due to the fact that the industry of coal mining has been carried on on better business principles than that of lode mining; in other words, it has not been the victim of such frenzied finance as has characterized so many of our metal mining ventures. Further, we have the fact that the coal areas are larger, more constant, and less subject to change than lode mines are.

In addition to the Vancouver Island coal measures, we have another great coal area on one of the Queen Charlotte Islands, which, ere long, will rank as one more of our valuable assets. The time appears to have arrived when the coal measures on Graham Island, of the Queen Charlotte group, will be developed to their fullest extent, to meet the growing demands for coal for steamship, locomotive and general industrial purposes, consequent upon the increase of business which will follow the opening up of the interior of the province by new railway systems now being established, and the increase of population by immigration.

Production of Coal.

The coal mines of the province have produced in all (1836 to 1909) about 30,000,000 tons of coal, valued at nearly \$92,000,000, and rather more than 2,000,000 tons of coke, valued at \$11,000,000, or in round figures a total value of \$103,000,000. The net production of coal for 1909 was about 2,000,000 tons, and of coke 250,000 tons, together valued approximately at \$8,500,000. A substantial proportion of this was from the coal mines of the coast district.

In addition to these coast coal resources, Mr. D. B. Dowling, of the Geological Survey of Canada, estimates that the coal areas of the Crow's Nest Pass district, southern and northern portions, contain the enormous quantity of 36,600,000,000 tons of workable coal.

Large Deposits of Iron Ore.

Following the coal, we also have large iron ore deposits, though as yet undeveloped. The recent sale of the Iron Mine, on Texada Island, with its estimated 33,000,000 tons of ore, to Duluth capitalists, and the prospective building of an iron and steel plant on this coast in the near future, are matters for congratulation as tending toward the establishment of an industry such as in other countries is taken as the index of industrial progress. What the successful introduction of iron and steel making means to the coast and the province generally, you, gentlemen, are well qualified to judge.

In addition to these coal and iron resources, we have prospective new mining camps to the north, and judging from public and private reports from Portland Canal district, we will have a large mining camp there, for already the ore veins have been proved to a depth

of 300 feet, the ores being of two kinds, lead-silver and copper-gold.

Injurious Effects of Wild-Catting.

While I am optimistic as to the future of Portland Canal district, we must not blind ourselves to the probability, almost the certainty, that the wildcatter will be there in all his glory. Already he is gathering in his victims while the snow covers the ground to a depth of ten feet. Those of you gentlemen, who had the pleasure of listening to an able address in this hall two weeks ago, will recall the remarks of Mr. J. G. Colmer, when he said that while British capitalists appreciate "Canadian investments" they do not want "Canadian wildcats." The mining journals of this and every other country are constantly exposing wildcat mining schemes, and I venture the opinion that this same wildcatism has done as much to damn legitimate mining enterprise in this Province as anywhere else.

Insufficient Cash Capital.

Another cause of the failure of so many of our mining ventures—I refer especially to the orthodox \$1,000,000 mining companies—is the lack of cash capital subscribed to do the necessary and actual development work, and provide the machinery requisite to make the enterprise a commercial success.

According to the best authorities on the subject, it is estimated that only three per cent. of the \$1,000,000 capital is used for the actual development and equipment of a mine. In other words, the sum of three cents is expected to pay ten to twenty per cent. interest on one hundred cents.

It is almost a consensus of opinion among mining men, that the want of capital with which to prosecute the initial stages of mining is the most prolific cause of failure, and just why mining stocks should be sold for five or ten cents on the dollar is as incomprehensible as why a man should seriously invest in mines without any personal knowledge of the subject, professional advice, or knowledge of the character of the men at the head of the promotions. Let us hope the time is not far distant when these pitfalls in mining will be remedied either by common consent or by law.

Prospects of the Mining Industry.

Of the prospects of mining in the coast district, I invite your attention to the fact that some of the older mines on Texada Island continue to ship ore regularly with profit to their owners, and that the ore bodies which a few years ago were considered "pockets" have been proved to a depth of 1200 feet, and, in one case—that of the Marble Bay Mine—there is enough ore blocked out to last three years without doing any more development work. At Hidden Creek, in Portland Canal district Mr. M. K. Rodgers, has opened large bodies of copper ore, and it is fairly safe to say that his mine can at any time enter the list of shipping mines while in other directions along the coast some very promising properties are also being brought forward.

As to the prospects of mining in the upper country, the large additions made, or to be made, to the smelting works at Trail, Grand Forks, and Greenwood, will undoubtedly result in a substantial increase over last year's production as regards both mining and smelting.

Improvements in Smelting and Other Conditions.

It would be entirely out of place at this time for me to go into the technology of this subject, so it must suffice that I point out that substantial progress has

been made in smelting during the past ten years. This advancement is seen most clearly when it is considered from the financial standpoint. An example of a copper ore that was sold to a smelter ten years ago is an illustration. The ore contained 6.3 per cent. copper, it yielded just \$1 per ton to the seller after having paid a smelting charge of \$6 per ton. To-day this ore would net \$8.60 per ton, the smelting charge now being \$2, and other deductions in proportion. A second case was where an ore assayed 6.3 per cent. copper; it was charged \$7.25 per ton for smelting, which left a deficit of 25c per ton. To-day, owing to much reduced smelting, refining and other charges, this ore would net the mine owner \$9.74 per ton. I think, gentlemen, these actual examples forcibly explain and illustrate the metallurgical advances which have taken place in smelting during the past ten years.

These improvements are due entirely to the metallurgist and the smelting companies, and the benefits derived from this advance have been applied to a reduction of the smelting charges, and so entirely to the benefit of the mine owners, as it enables them to ship at a profit low-grade ores which ten years ago would have been thrown on the dump as waste, or as a concentrating ore, to be treated at some more convenient season, after the requisite facilities shall have been provided. In view of the reduced cost of smelting, it follows that probably many of the prospects which ten years ago could not be made to pay would yield profits under our present more favourable conditions.

Improvements in ore dressing and concentration have also made great strides toward higher recoveries, both of the precious and the base metals, as well as reduction in operating costs.

Higher Percentage of Metals Recovered.

I remember, in 1890, when a recovery of 50 per cent. of the value of an ore was an average quantity. To-day, by means of improved methods, an average of 80 per cent. recovery is not at all uncommon.

In addition to the higher mineral values being recovered to-day as compared with the past, the time may not be far distant when other metals, such as zinc, which heretofore have been looked upon as an impurity and a detriment, will become sources of revenue. Already the Provincial Government has done a great deal toward a solution of this problem, while the Dominion Government now has under consideration a practical investigation of the subject of zinc separation. The latter, if successful, will add materially to the value of the mineral output of the province, and to the profit of the mine owners, who instead of being penalized \$2 per ton for 12 per cent. zinc as at present, will receive a fair value for their zinc as they do to-day for their gold, copper and lead.

Relative Importance of the Mining Industry.

At the present time, more especially in the coast cities, the abnormal activity in real estate appears to overshadow mining and other legitimate industries, which go to develop the natural resources of the province, but it is only reasonable to presume that capitalists must sooner or later turn their attention to the further exploitation of these resources, which, aided by modern means of transportation have built up the Province of British Columbia until the combined annual value of its timber, minerals, fish and agricultural products amounts to \$82,500,000. As still further proving the intrinsic value of the mining industry to the Province, I have only to point out that its production

almost equals that of the lumber, fishing and agricultural industries combined.

Figures of Comparative Production.

In order that you may better realize that great progress has been made, and that the average annual value of the mineral production of the province during recent years has been quite large, I submit the following facts and figures:—

British Columbia's mineral production in the year 1885 was of a total value of only about \$2,000,000. Reviewing the increase in periods of five years each, during twenty years, 1889 to 1908, inclusive, the following results are obtained:—

Five Year Periods.	Average Annual Value.	Percentage of Inc.
1889 to 1893 inclusive.....	\$3,700,000	85%
1894 to 1898 “	10,750,000	190%
1899 to 1903 “	17,500,000	62%
1904 to 1908 “	24,000,000	37%

It should be noted that lode mining did not begin to be of importance in the province until the second five year period above shown.

The aggregate value of the mineral production of Canada for 25 years to the end of 1909 was 1035 million dollars. For the first year of this period, namely 1885, the total was approximately \$10,000,000; for last year, (1909,) it has been estimated by the statistician of the Dominion Department of Mines, at \$90,000,000. During all years to date the aggregate production of minerals in British Columbia is of a value of \$350,000,000. During the 25 years period above mentioned British Columbia has contributed about \$285,000,000, or nearly 28 per cent. of the aggregate for the whole Dominion. The production of this province in 1909 constituted in value rather more than 25 per cent. of that of the Dominion, so that, notwithstanding the large increase recently made by Ontario, British Columbia continues to well maintain a prominent position in regard to its proportion of the mineral production of Canada.

In conclusion, gentlemen, it is not so much what we think of our province and its immense possibilities, but what those on the outside think. It is well to “see ourselves as others see us,” to which end I quote the opinions of a Canadian, an American, a Welshman, a canny Scot and an Englishman, each of whom is highly qualified to give an opinion. The following are the comments of prominent visitors who were on this coast with the Canadian Mining Institute Summer Excursion party in September, 1908:—

By Mr. J. McLeish, statistician, of the Dominion Department of Mines, Ottawa: “Perhaps the most vivid impression left with the writer will best be expressed by the words ‘magnitude’ and ‘possibilities.’ By ‘magnitude’ I do not mean so much the absolute magnitude of our mineral production, although it is an important feature of our industrial economy, but rather the vast extent of the country throughout which mineral production and prospecting is being carried on, and the still greater area not yet even prospected; and this vast extent of territory at once suggests the great future possibilities of the mining industry which must unquestionably accompany the growth of population. As an illustration of this idea we saw..... in British Columbia the great copper deposits of the Boundary district, the gold-copper ores of Rossland, and the silver-lead and zinc ores of Slocan and East Kootenay, which are but the forerunners of an enormous mineral development that will extend throughout the length of the

province from the United States boundary, on the south, to the far Yukon, on the north. At Frank, Coleman, Fernie, Bankhead, and Nanaimo we saw great coal-mining operations.....enormous areas of fuel resources. What may not be the future of these, as well as those other coal areas of whose values we are only just beginning to learn—the Brazeau, the Peace River, the Bulkley Valley, the Queen Charlotte Islands, and the coal fields of the Whitehorse district in Yukon Territory.”

By Dr. Heinrich Ries, Professor of Economic Geology, Cornell University, U.S.A.—“No one thing or feature of the trip can be singled out for emphasis, for I was impressed from beginning to end with the wonderful mineral resources which we passed in review, and the intelligent energy with which they were being developed, factors, all of them, insuring a great future for the territory which we visited.”

By Mr. Roger Beck, Swansea, South Wales:—“At Rossland and Phoenix, not blessed with rich ores, it was particularly noticeable how ingeniously the management of the mines and smelters had combatted the poorer grade by cleverness of appliances dealing with it. The automatic competing with labourer, and water with fuel in motive power. Wherever the conditions were unfavourable, ingenuity had done and was doing all possible to counterbalance.”

By Mr. Sam Mavor, member of the Institution of Mining Engineers, Glasgow, Scotland:—“Canada has a great place, present and potential, as a mineral producing country. In addition to the minerals now in sight is the certainty of other similar discoveries, and beyond these lies the vast expanse of unprospected and even unexplored territory. The features which most forcibly strike the observer are the modernity of the important mineral industries, the energy and rapidity with which the great coal, iron, and copper mines are being developed, the courage exhibited in attacking low-grade ores, and the technical and administrative skill which have established sound industrial concerns upon low-grade ore bodies.”

Mr. Hugh E. Marriott, at Vancouver (luncheon to C.M.I. party) Sept. 25, 1908:—“After all, what do you know of your own country? You know intimately the history of each camp that is now established and you can size up their chances more effectually than can be done by the stranger though he spend months of investigation instead of days. But when you look at these known spots on the map, they are but a very small section of that great stretch that remains unknown alike to you and me.....it must not be considered for a moment that your pioneers have chanced upon the only valuable mines or even the best. There must be hidden beneath that carpet of peat and verdure many a mineral deposit waiting the lucky chance of the prospector's pick or shovel. The question is; how are these to be found, so that at the earliest opportunity they can be made to assist in the building up of the nation and in advancing the prosperity of the land?”

After a hearty vote of thanks to Mr. Kiddie, whose address was listened to with close attention and frequently applauded, the proceedings terminated.

The average cost of diamond drilling per foot with the drills operated by the Department of Mines of Nova Scotia was, during 1909, 79 cents; the corresponding cost per foot for calyx drills was \$2.17.

OUR LONDON LETTER.

The Colliery Situation in Great Britain—Profits Still Falling, but not yet Below the Ante-Boom Level—Gas Perception Training for Colliery Firemen—British Miners Discuss the Royal Commission on Mining — Streamers in Cornwall — Rhodesian Shares on the London Market and the Revival in Chartered — Lessons of the Transvaal Complete Year.

London, March 18th, 1910.

A survey of colliery profits in this country shows extraordinary fluctuations in net profit figures comparing the last two years' accounts, and also urges upon the attention of the observer that the coal industry is one confronted with many difficulties. In the first place there has been no slackening in the fall in prices which commenced in 1908 after the last boom. In some collieries there has been a decline of thirty per cent in price, whilst the average decline of values in the export trade has been over ten per cent.

On the top of everything else has come the Miners Eight Hours Act considerably increasing the cost of production, and causing all kinds of delays pending the adjustment of working conditions to the new situation last year. Of course, the act was only in partial operation both as to time and districts in 1909, and it has further to be borne in mind that what is usually meant in the coal trade when a restriction of production is spoken of is that it has not increased at so rapid a rate as would have been the case if there had not been parliamentary interference.

A survey of the accounts of fourteen collieries, mainly in South Wales, shows that nine companies are worse off than previously, three are better, the remaining are showing no change. The Albion Steam Coal Company drops in the two last years from a net profit of \$129,000 to a loss of \$105,000, and of course passes its dividend. Andrew Knowles & Sons show a net profit reduction from 251,000 to \$119,000, and the Cambrian Collieries' net profits fell from \$835,000 to under \$200,000. The Powell Duffryn Steam Coal Company shows a reduction in net profits from \$1,350,000 to \$921,000. These are typical of the losses.

The few companies which show increased net profits cannot compare in any way with these figures. Of these three companies one maintains its dividend unchanged, one advances it from 12 1-2 per cent to 17 1-2 per cent, and the other actually dropped from 10 per cent to 5 per cent, but slightly increases its carry forward. From these average results the result is arrived at that the aggregate profit is down about 40 per cent as compared with twelve months ago, and 50 per cent as against two years ago. In that year 1907, however, it has to be remembered distributable earnings went up nearly 90 per cent on the previous year, so that all these concerns are still comfortably above the level of the period immediately preceding that extremely remunerative season.

Whilst on the coal question mention might be made here of a rather important meeting of the National Association of Colliery Managers held at Manchester University on March 4th. The chief business was the description by Mr. George H. Winstanley of apparatus designed to meet the recommendation of the Royal Commission on the need for some means of training colliery firemen in accurately estimating the presence and quantity of gas. Mr. Winstanley said the development of deep mines meant high temperatures and con-

siderable dust, and it was from the presence of dust that danger of disastrous explosions arose. There was one certain way of avoiding explosions of gas, that of full ventilation. The improvement of ventilation had reduced explosions of gas to very small affairs, but there was considerable danger of those small affairs leading to explosions of dust far more disastrous than the biggest gas explosion on record.

The experiments at Northallerton had shown that a small explosion of gas made it easier for an explosion of dust to occur, and it was with the desire to prevent the small disturbances that he had arranged an apparatus which supplied a known amount of gas to an ordinary safety lamp. It was easy for any one to take observations of the "cap" to the flame formed by the combustion of gas, but under ordinary conditions the varying power of different individuals to distinguish colors made accurate estimation of the quantity of gas very difficult. When known quantities of gas were supplied, however, a few experiments gave the power of judging very accurately what percentage of gas gave a given "cap" to the flame.

Leading representatives of the workmen's side of the British mining industry met in special convention in London on March 15th to consider the report of the Royal Commission on Mining. The conference was held with closed doors, but an official report issued declared that the conference was in complete agreement on the questions which were discussed. It was generally agreed that the sittings of the Royal Commission on Mines should be continued, and that their investigations should be specially directed to the dangers attending upon coal dust and the use of electricity in mines. It was stated that the special representatives of the Miners' Federation appointed to attend the inquiry into the West Stanley colliery disaster, by which 160 lives were lost, had reported that in their opinion this disaster was attributable to the use of the electrical installation.

On the important questions which the Royal Commission have already reported the conference was agreed in supporting the claim of the colliery enginemen for a statutory eight-hour day in the same way as the underground workers, and also in their demands that all enginemen filling these responsible positions should hold certificates of competency. It was stated that the responsibilities of the enginemen had been enormously increased by the deeper working of the pits and by the larger number of men employed. The working in some of the pits of two and three seams of coal at different levels, with the requirement to control the engine working at the various levels, has made the work more difficult, the slightest error involving the loss of human life. It is thus felt that no man should be employed in charge of the engines who has not previously obtained a certificate of competency. With the heavy demands now made upon the enginemen they should have the same statutory protection as the miner of a legal eight-hour day. At present some of the enginemen work eight hours, while others work longer.

A curious small mining industry in this country is carried on in the Cornish tin district on the Red River. There a class of individuals called streamers are at work recovering black tin. Each streamer holds a section of ground. The waste tailings and slimes from the Camborne mines pass into the river and leave a concentrate of black tin, with its attendant minerals, of which it is

the business of the streamer to recover as much as possible from his holding. There are sixteen different firms or individuals at work, and these recover about 800 tons of black tin annually. The residuals pass into the sea, to be still further concentrated by wave action, and at low tide these concentrates are collected by the streamers. Nature, therefore, acts as a more complete concentrator than the elaborate machinery of the mines, and proves the need for greater efficiency to prevent this loss to them of valuable metals.

The mining market in London has been endeavoring in recent weeks to obtain a share of the speculative activity aroused in the first place by the extraordinary boom in rubber shares. The Rhodesian section has made progress but not enough to satisfy that faithful following which has been hoarding Rhodesian shares for years past, in the hope that one day they will get back to the prices they originally paid for them. All the same it is truly surprising to find Chartered again over \$10 a share. This share is the mining description in which the average British mining investor is more fully interested than in any other. Its present authorized issued capital is nearly \$31,000,000. In the great old palmy days of Cecil Rhodes, most of these shares were unloaded on the public here at all kinds of high figures up to \$40 per share—a share having a face value of \$5. After years of decline the bottom was reached two years ago, when the shares were quoted no higher than \$2.50.

The figures now to hand dealing with the complete mineral production of the Transvaal for last year are calculated to revive any flattened interest our investors may have had in South African Gold Mines. The gold yield of the Witwatersrand does not show so great an increase as was anticipated a year ago, but, production was hampered by the abnormal rains which fell in the early months, and by an insufficiency of native labour in later months. Nevertheless, it must be admitted that the advance in the gold output is both substantial and satisfactory, and when the details of the work are examined there is little room to complain of the future prospects of the industry.

The salient features of the year's work are a larger tonnage crushed by a larger number of stamps and tube mills operated by practically the same number of persons, though a larger proportion of whites to colored were employed in 1909 than in 1908, according to the December returns for each year. A higher average stamp duty of 52 tons per stamp per day was obtained from an increase in the average number of stamps operated of 567, and an increase of 45 in the average number of tube mills.

The average value of the tonnage treated throughout the year for the Transvaal was twenty-nine shillings and one penny per ton as compared with thirty-one shillings and sixpence per ton for 1908, a decline of two shillings and fivepence per ton, while for the Witwatersrand the figures read:—1908, thirty-one shillings and fivepence; 1909, twenty-eight shillings and elevenpence, or two shillings and sixpence per ton less for last year. It has been frequently explained that the continuous fall in grade is very largely intentional through the reduction in working costs, bringing rock previously classed as unpayable, and hence allowed to remain untouched, into the payable margin. This fall in the grade of ore treated will naturally follow the fall in working costs, for that is the sole factor which governs the economic position. As an illustration of the gradual decline in the value of the ore treated, the figures

for January show that the average value of rock sent to the mill on the Rand was twenty-nine shillings and ninepence per ton, while for December it was no more than twenty-eight shillings and fivepence per ton.

The total Transvaal working profit for 1909 was \$60,371,510, a slight decrease on the previous year, but notwithstanding this the mines were able to set aside a bigger sum for dividends, distribution for the two periods being, for the whole of the Transvaal, \$47,523,105 in 1909 as against \$43,756,410 in 1908. In face of the fact that the total working profits for 1909 were \$1,250,000 less than the preceding year, it is a distinct tribute to the improved efficiency and economy with which the mines have been worked that \$3,750,000 more has been returned by the Transvaal in dividends and the still larger sum of \$3,865,000 more by the Rand.

It may very properly be objected that there is a limit to the reduction of working costs and to the improvement in efficiency of treatment plants, as well as the quantity of ore to be won at a profit. But so far these three factors have not yet been determined. Nearly all competent authorities agree that working costs still offer a reasonable margin for attack; that treatment plants, notwithstanding that the latest installed have reached a high pitch of excellence, leave room for still further improvement; and that the quantity of payable ore yet to be exploited is not calculable, in other words, is unlimited.

STATEMENT BY TEMISKAMING MINE MANAGERS' ASSOCIATION.

An article by Dr. Eugene Haanel, Director of Mines Branch, Department of Mines, Ottawa, in the February number of "Industrial Canada," reflects disparagingly on the mining and metallurgical industries of the Cobalt region. The Temiskaming Mine Managers' Association makes the following specific comments on Dr. Haanel's statement:—

The statement "and in the Cobalt region . . . the mortality was simply astounding, the death rate per 1,000 men employed being 24.8," is absolutely without foundation or fact. Its incorrectness was known by those responsible for it, two months previous to its publication in the above periodical.

Notice of their error has still more recently been brought to their attention, both publicly and by the Ontario Department.

In issuing no formal correction, those responsible for the statement are to be condemned for their silence and for their defensive attitude.

The official figures on fatality, as determined by the Ontario Bureau of Mines, are:—

	Per thousand.
Cobalt producers, underground	12.
Cobalt producers, underground and surface.	5.38
Cobalt area (proper), underground and surface.	5.25
Area tributary to T. N. O. Ry., underground and surface	5.45
Province of Ontario, underground and surface.	5.2

The figures given for Cobalt, in the report for 1909 of the Ontario Bureau of Mines, refer only to producing mines. We cannot see why Dr. Haanel has seen fit to divide the number of underground fatalities in the entire area tributary to the T. & N. O. Ry. by the number of men working underground in the Cobalt producers, and officially announcing the resultant 24.8 as the astounding rate of fatality in the Cobalt region.

The statement, "The cobalt-silver ores certainly

need investigation, with a view of discovering a more rational method of treatment than is at present practised," is based, not on personal observations, but "on the report of a manager some years ago," and is entirely unwarranted, in view of the splendid results now being obtained at Copper Cliff, Thorold, and Deloro.

In making the above statements Dr. Haanel has falsely put the Province of Ontario in an unenviable position as regards her mining and inspection laws, which are well known to be the most rigorous and complete on the continent.

Recent criticism of the Mines Branch, in connection with the above statements, has done much to undermine the faith of mining men in its statistics and suggestions.

H. PARK,
President.
J. G. SHEWAN,
Secretary.

CANADIAN MINING INSTITUTE.

The following gentlemen were elected to membership of this Institute at the regular April meeting of Council, held on the 1st instant:—

Ex-Officio Members.

Dresser, John A., Geological Survey, Ottawa, Ont.
Frechette, H., Department of Mines, Ottawa, Ont.
Lindeman, E., Department of Mines, Ottawa, Ont.
Malcolm, W., Geological Survey, Ottawa, Ont.
Malloch, G. S., Geological Survey, Ottawa, Ont.

Members.

Carmichael, H. Graham, 515 Wellington St., Montreal, Que.
Chambers, A. R., Nova Scotia Steel & Coal Co., Trenton, N.S.
Gaul, Alfred J., 34 Yonge St., Toronto, Ont.
Hoffman, Bertram F., Cobalt, Ont.
Howell, Edgar N., Box 996, Cobalt, Ont.
Leslie, James, Supt. Cobalt Central Mines, Ltd., Cobalt, Ont.
McKay, Robt. B., Cobalt, Ont.
Plate, H. R., Box 474, New York City, U.S.A.
Raynor, Geo. W., Thorold, Ont.
Robinson, A. H. A., 497 Gilmour St., Peterborough, Ont.
Smith, W. H., Mgr. Bell Asbestos Mines, Thetford Mines, Que.
Sproule, Gordon St. G., 106b Stanley St., Montreal, Que.
Williams, Percy, 524 Mineh Block, Vancouver, B.C.
Wilson, Eugene B., Scranton, Pa., U.S.A. (Ed. "Mines and Minerals.")

Associates.

Graham, Robt., Giroux Lake, Ont.
McGregor, D. M., Junior Turf Club, 3 St. James St., London, S.W., Eng.

Student.

Cumming, James D., 114 Bedford Road, Toronto, Ont.

PERSONAL AND GENERAL.

Mr. T. Jones, representing the Buffalo Mine interests, has purchased one Nissen stamp for installation at Poreupine.

Mr. James Hargreaves, formerly superintendent of the Alberta Consolidated Coal Company, near Taber, Alberta, is in Toronto.

Dr. Richard V. Mattison has resigned from the Board of Directors of the Amalgamated Asbestos Corporation, Limited. Dr. Mattison is president of Bell Asbestos Mines.

WORKING COST COMPARISONS.

At the annual meeting of the Mine Managers' Association held at Johannesburg the following reference was made by the President to working costs on the mines of the Witwatersrand:—"Our present basis of comparison between mine and mine and month and month—namely, the 'cost per ton milled,' which is dependent on so many factors, such, for instance, as whether or not it has been possible to keep the mill supplied with rock; whether the first day of the month happens to fall on an early or late day of the week, for on this depends whether more rock has been crushed in relation to the quantity mined or vice versa; and whether or not the machinery has run well. There is another grave disadvantage in this basis of comparison and that is the inducement to bring down costs illegitimately by the carrying of stopes wider than need be for maximum profit, or the skimping of sorting, and the hundred and one other things on which good mining really depends, merely to be able to show low working costs. If a system were generally adopted whereby a comparison of profit derived from areas exploited were made the basis of comparison, we would, I know, show higher cost per ton crushed, but the Rand would also, I believe, show a greater profit per area denuded of its valuable product, and that, I feel sure, is the thing we are all, or should all, be striving for. The scheme outlined above is, I understand, being introduced into the Corner House mines at once at the suggestion of Mr. H. F. Marriott, and we may therefore hope that before long the bogey of 'cost per ton milled' will have permanently scotched, to be replaced, as a 'divisor' by the much more accurate 'square fathom exploited.' But when all is said and done as regards basis of comparison the main thing to remember is that no two mines, or even the same mine at different periods, are really similar conditions, and that therefore comparison on a cost or a profit basis is most dangerous, except to those fully informed of the circumstances of both, and that the financial inclusion of two mines under one control does not of itself make comparison possible where conditions remain dissimilar."

The Engineering and Mining Journal, April 9, 1910.

—In the course of a very sane editorial entitled "The Coal Miners' Demands" strong exception is taken to the miners' request that coal be paid for on a run-of-mine basis. This "from every standpoint, and especially that of economy and safety, . . . is to be severely condemned. For years coal has been paid for on a screened-coal basis, and this has been an incentive to the better preparation of the daily output. To go back to a mine-run basis would encourage shooting from the solid, with its resulting waste and dangers."

The Mining World, April 9, 1910.—"The 'Factor of Safety' in Mine Sampling" is the text of a symposium of opinion published in the current number of our contemporary. In response to questions put before them by Professor Arthur J. Hoskin, of the Colorado School of Mines, expressions of opinion were elicited from certain students, and in these opinions there is much diversity. That arriving nearest the truth, and nearest also the average of what each is driving at, is one opinion that concludes thus: "No general rule can be followed in discarding exceptional assays, including them as they stand, or applying to them a factor of safety. It is safe to say, however, that the wise course to follow is to take all possible precautions and then trust to common sense."

THE FIXATION OF ATMOSPHERIC NITROGEN AND THE FOOD SUPPLY.

LEO FRANK GUTTMANN,

In 1896 when addressing the British Association for the Advancement of Science, Sir William Crookes drew the attention of the entire civilized world to the question of food supply. He first of all pointed out that the increase in populations was so rapid that in a few years there would not be sufficient land available to grow the wheat required to feed them. In order to feed the coming millions, it would be necessary to increase the yield of wheat per acre, by the use of artificial fertilizers containing nitrogen. But the main supply of these, the sodium nitrate or Chile saltpetre beds of South America could not last forever, in fact their exhaustion was predicted in a short number of years, say 40 to 50, and where would we be then? The importance of this question can best be illustrated by quoting from Sir William's presidential address, the facts adduced in 1898 requiring little alteration for present purposes.

"The present acreage devoted to the world's growth of wheat is about 163,000,000 acres. At the average of 12.7 bushels per acre, this gives 2,070,000,000 bushels. But thirty years hence the demand will be 3,260,000,000 bushels, and there will be difficulty in finding the necessary acreage on which to grow the additional amount required. By increasing the present yield per acre from 12.7 to 20 bushels, we should, with our present acreage secure a crop of the requisite amount. Now from 12.7 to 20 bushels per acre is a moderate increase of productiveness, and there is no doubt that dressing with nitrate of soda will give this increase and more.

"The action of nitrate of soda in improving the yield of wheat has been studied practically by Sir John Lowes and Sir Henry Gilbert on their experimental field at Rothamsted. This field was sown with wheat for thirteen consecutive years without manure, and yielded an average of 11.9 bushels per acre. For the next thirteen years it was sown with wheat, and dressed with 5 cwt. of nitrate of soda per acre, other mineral constituents also being present. The average yield for these years was 36.4 bushels per acre—an increase of 24.5 bushels.

"At this rate, to increase the world's crop of wheat by 7.3 bushels, about $1\frac{1}{2}$ cwt. of nitrate of soda must annually be applied to each acre. The amount required to raise the world's crop on 163,000,000 acres from the present supply of 2,070,000,000 bushels to the required 3,260,000,000 bushels, will be 12,000,000 tons distributed in varying amounts over the wheat-growing countries of the world.

"If we assume a liberal estimate for nitrate obtained from the lower-grade deposit (the Chile saltpetre beds are meant), and say that it will equal in quantity that from the richer quality, the supply may last, possibly, fifty years, at the rate of a million tons a year; but at the rate required to augment the world's supply of wheat to the point demanded thirty years hence, it will not last more than four years."

One other illustration, from French statistics, to illustrate the vital importance of the problem. The crops harvested in France abstract annually 600,000 tons of nitrogen from the soil. It is proved that the nitrogen returned as stable manure, supposing it were all taken back to the fields, would not amount to more than 327,000 tons. Now France consumes only 230,000 tons of Chile saltpetre per annum, representing 31,200 tons of

nitrogen, whilst the deficiency is 273,000 tons. The amount imported is thus only 11 per cent, of the deficiency produced by the removal of the crops.

The address of Sir William Crookes having called general attention to a vital problem, inventors at once set to work to obtain this necessary nitrogen, and turned to the enormous amount of nitrogen in the atmosphere for their source of raw material. The amount of nitrogen in the air over a field of nine acres is about 280,000 tons, i.e., the same amount which is contained in the 1,740,000 tons of Chile saltpetre exported in 1907. The practically inexhaustible supply of nitrogen in the air totals about 4,041,000,000,000 tons.

In their classical researches on the constitution of air, Priestley and Cavendish in 1775 caused oxygen and nitrogen to combine by passing an electric spark through the mixture for a continuous period of about forty hours. The nitrous acid thus formed, was absorbed in a solution of caustic soda, forming nitrate and nitrate of soda. Over one hundred years later, in 1897, Lord Rayleigh and Sir William Ramsay isolated the new gas, argon, by treating large quantities of air in a glass vessel, with the electric spark. Priestley had treated 100 cubic centimetres of air (about 7 cubic inches) for forty hours with an electric spark, obtained by turning an induction machine by hand. Rayleigh and Ramsay "sparked" twenty litres, two hundred times as great a quantity, in an hour by means of an automatic induction coil. On this principle the modern method of fixing nitrogen as nitric acid is based, but enormous quantities are involved, the work situated at Notodden in Norway treating 75,000 litres, (nearly 3,000 cubic feet) of air per minute.

The principle having been established, practical means had to be devised. Of these, I shall only mention five. The problem in the combination of nitrogen and oxygen is twofold, the mixed gases have first to be heated to as high a temperature as possible, up to 3,500° Centigrade (6300° Fahrenheit) by passing through an electric flame, and they have then to be cooled as rapidly as possible, to minimize the decomposition which unfortunately sets in at an intermediate temperature of about 600° C. (1080° F.). To accomplish this, Bradley and Lovejoy at Niagara Falls, devised an ingenious apparatus consisting of a cylinder studded internally with platinum points, inside of which revolved another cylinder, studded externally with platinum points. Each cylinder was connected to the electric circuit, and the effect of the arrangement was to produce a countless number of small electric arcs, an arc being formed each time two platinum points came in contact. About 414,000 arcs per minute were thus produced in an apparatus using only a small amount of electric energy, and thus a large volume of air could be successfully subjected to the effect of the electric spark. Although a fair yield of nitric acid was obtained, this process did not prove a commercial success.

The other processes to be described, make use of the electric arc instead of the spark. If a current of air is rapidly blown through an electric arc, the oxygen and nitrogen combine, but the yield thus obtained is small, the concentrated heat of the arc offering only a small

surface of action to the gases. Means had therefore to be devised to increase the area of the electric arc, and this problem seemed almost impossible of solution, till Birkeland and Eyde in Norway, showed how it could be done. They took an ordinary electric arc, of enormous energy (up to 1,300 horsepower) and allowed it to play in a space set equatorially, i.e., in a plane at right angles—to the poles of a powerful electro-magnet. The effect of this is to spread out the electric arc to an enormous flat disc of flame, the actual electric flames used being 7-12 feet in diameter. Each flame is surrounded by a chamber of fire-brick, forming a furnace, and resembling a huge cheese standing upright. Air is blown in through perforations in the brick lining at the rate of 1,000 cubic feet a minute, and withdrawn laden with oxides of nitrogen through another opening. The arc electrodes are of copper, cooled by circulating water through them, and the working potential is 5,000 volts with a current of 200 amperes. The flame, when burning, emits a loud noise, but requires very little attention to keep it in good order. The subsequent treatment of the air laden with oxides of nitrogen, will be described further on. The Birkeland and Eyde process is at work at Notodden, Norway, where large amounts of water power or "White coal," are available at the cheapest rates in the world. The yield of the process is good, and the price of production low enough to compete with Chile saltpetre. The power at present used in Notodden amounts to 30,000 horse power.

Another commercially successful process is that of H. and G. Pauling, worked by the Saltpetersaure Industrie Gesellschaft. Their works are situated at Patsch near Innsbruck, in the heart of the Tyrol, and utilize 15,000 horse power. I had the privilege of spending three days last summer in this charming spot, investigating the process. The factory lies in a little valley, surrounded by high and picturesque mountains, the Brenner railway passes over a viaduct on the other side of the valley, the river Sill runs through it. The water is taken from the Sill, conducted through a canal six miles in length, and utilized at a fall of 600 feet. In this process air with a high velocity is blown through a nozzle between two horn-shaped iron electrodes, these being water-cooled. The effect of this is to blow out the electric arc into a great roaring sheet of flame, over 3 feet long, and thus offering a large surface of contact between the flame and the air. The sight of this huge flame is terrifying but harmless. The flame plays inside an ordinary brick furnace, the air laden with oxides of nitrogen being drawn off by a fan to the absorption towers. This process was working on a manufacturing scale at a time when the Birkeland and Eyde process was still in the experimental stage.

It is exceedingly difficult to obtain any accurate information regarding the actual yields and working costs of the various systems described, these being kept secret, but it may be mentioned that the Birkeland and Eyde, the Pauling process and the Cyanamide process have been proved to be successful on a large manufacturing scale; and sums of \$50,000 for an option on the process in a particular country with royalties of upwards of \$100,000 a year, seem to tell the same tale. The Pauling process is exceedingly simple and the yields are said to be as good as those obtained by the more complicated Birkeland Eyde process. Factories utilizing 50,000 horse power are in course of erection. The treatment of air, carrying oxides of nitrogen being the same in these processes, and in that of Schonherr (see below) will be described at this point. The air is cooled by suitable means, and passed up 3-5 large towers, 6 feet in

diameter, 30 feet high, built of granite or volcanic lava, and filled with quartz pebbles, over which trickles a continuous stream of water. In contact with the water, the oxides of nitrogen are converted into nitric acid, and by constantly circulating the water, nitric acid of 30 to 40 per cent. strength is obtained. To be made into a merchantable product this has to be concentrated. Concentration at 60 per cent. is easy, further than that it is very difficult, and yet the chief consumer of nitric acid, the explosives industry, requires acid of 99 per cent. strength. It is this that constitutes the weak spot in all these processes. At the Notodden works the nitric acid is treated with limestone, and the resulting nitrate of lime sold as an excellent fertilizer, competing with Chile saltpetre. But freight charges are heavy. In all the processes the final absorption of the oxides of nitrogen is made with sodium carbonate solution, or milk of lime, nitrate of soda, or nitrate of lime respectively, being obtained. But the market for nitrate of soda, is exceedingly limited, the world's total consumption being about 2,000 tons. Incessant attempts are being made to obtain more useful products, and will doubtless prove successful.

The most recent process of this class is that due to Schonherr, of the Badische Anilin and Soda Fabrik. He forces the electric arc to take a spiral path, and thus increases its length to six feet and more, the air blown in being made to travel along the arc. The yields of this process are very good, the subsequent working up of the products being as already described. An amalgamation has taken place recently between the Birkeland and Eyde, and Badische companies, joint works will be built and in a short time 400,000 horse power will be utilized in the fixation of atmospheric nitrogen by these processes.

We will now consider a process of quite a different type, that of Professors Frank and Caro, of Berlin. If atmospheric nitrogen, freed from Oxygen, be passed over calcium carbide heated to about 600° Centigrade, (1,100° F.) absorption takes place, no further heating being required, and a compound called calcium cyanamide is formed. The reaction is simple, requires very little heat expenditure, and calcium carbide is a cheap electrical product now manufactured on a large scale. This calcium cyanamide contains fixed nitrogen, and contains about 22 per cent of this element, that is, about the same amount as is present in ammonium sulphate. And of ammonium sulphate 600,000 tons were manufactured in 1907, in England alone, for use as a fertilizer. It remained to be seen whether calcium cyanamide could be directly utilized as a fertilizer and large scale experiments were made on spring wheat, winter wheat, winter rye, oats, Indian corn, potatoes and sugar beet. In every case the fertilizing effect of calcium cyanamide was proved to be equal or superior to that of ammonium sulphate or Chile saltpetre. All three, of course, produce very much greater crops than when no manure is employed. The product has been manufactured on a large scale for several years, and is sold under various names: e.g., nitro lime, lime nitrogen.

Nitro lime was not at first manufactured for direct use as a fertilizer. It can readily be split up chemically into ammonia, or salts of ammonia, and it was intended to use these salts of ammonia as an equivalent for the rapidly-diminishing amounts in sight. The idea, however, occurred to the inventors to let these chemical changes take place directly in the soil, instead of in the laboratory, and to use calcium cyanamide as a fertilizer, with the excellent results quoted.

The manufacture is simple. Thanks to the genius

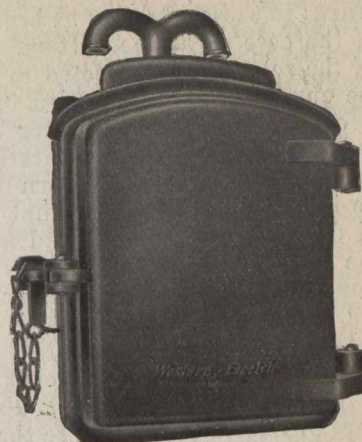
of a Canadian, T. L. Willson, of Ottawa, the prime material, calcium carbide, is now obtainable in unlimited quantity and at a low price, he having been the first to make the manufacture of carbide a commercial success. The calcium carbide is ground fine and heated in a furnace, whilst nitrogen is passed in. Absorption is complete in about forty hours, and since the reaction is an exothermic one, very little heat is required to keep it going when once started. The finished product is ground, and when packed in suitable sacks, is ready for the market. The nitrogen required has been obtained in various ways; originally nitrogen was obtained by systematically fractionating liquid air manufactured according to Claude's of Linde's patents. Patents have now been taken out for the manufacture of nitrogen from producer gas, and by burning petroleum residues in air.

The utility of nitro lime does not stop here. It can be converted into sodium cyanide, and large quantities of this material are already manufactured from it, and exported to the Transvaal and other gold-producing countries. The process has proved a commercial success and this is again shown by the large prices paid for options and manufacturing licenses. In brief, the process consists in fusing the calcium cyanamide with coke and salt, thus obtaining a mixture of calcium chloride and sodium cyanide. This mixture is sold as a "surrogate," and claimed to be cheaper and more efficient than pure sodium cyanide. To obtain cyanide, the mixture is treated either with sulphuric acid or with sodium bisulphate, and the prussic acid distilled off and absorbed in caustic soda. On evaporating, sodium cyanide is obtained. It is manufactured in the form of briquettes, which are more readily soluble than fused cyanide, and is sold as 125 per cent. cyanide on the potassium cyanide basis. Calcium cyanide can also be converted into numerous other products, such as urea and its derivatives, ammonia, etc. It is the most formidable competitor of the Birkeland Eyde Badische Pauling systems, and we shall see why. All these latter require much larger quantities of electrical energy at a very cheap rate, and the works have therefore to be located in Norway. You can thereby manufacture cheaply, but freight charges are heavy, and the product on that account can barely compete in European markets with Chile saltpetre. This Norway saltpetre will, however, ultimately be the substitute for Chile saltpetre. Calcium cyanamide however, seems destined to replace ammonium salts, and works aggregating 160,000 horse power are in course of erection, not in out of the way places, but wherever needed. 40,000 tons of nitro lime are at present manufactured yearly, and about 5,000 tons of sodium cyanide.

To sum up, for our rapidly-diminishing stocks of nitrate of soda or Chile saltpetre, we have as a substitute, fixed nitrogen from air, in the form of calcium nitrate or Norway saltpetre. For a like purpose, and as a substitute for the limited amount of ammonium salts at present available industrially, we have calcium cyanamide or nitro lime. All these products being manufactured by the aid of a power at present unutilized, the "white coal" of the world's waterfalls which will last as long as the sun gives us light, no apprehension need now be felt as to the world's food supply failing for lack of a fertilizer. A little reflection will show how gloriously Canada is provided with the acres to grow the world's food, and with the "white coal" wherewith to fertilize them. The warning uttered ten years ago by Sir William Crookes, has been heeded, and remedies devised in the incredibly short time since elapsed.

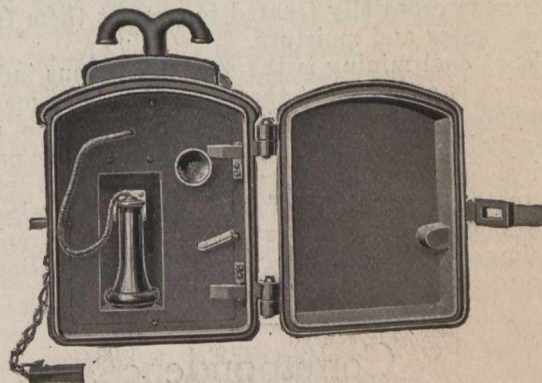
NEW MINE TELEPHONES.

The accompanying illustrations are views of newly developed telephone sets designed especially for use in mines. This apparatus is the result of many months of careful experimenting and testing on the part of expert engineers. The announcement of this new apparatus

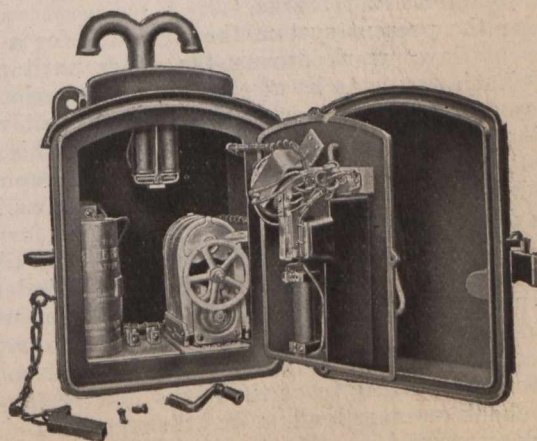


comes at an appropriate time, as the many disasters of the past year in underground shafts have focussed attention upon the problem of safeguarding life in the mines.

Working in co-operation with mine operators and officials, the Western Electric Company in the design



of this new equipment has been careful to meet all the requirements of mine service. The quality standard of the "Bell" telephones, all of which have been made by this company, has been observed in the design of these new mine sets. The telephones are of two types—



No. .336-E, a metal set, and No. .337-E, a wooden set.

Three views of the metal mine telephones are shown in the accompanying illustrations. The wooden sets possess the same general features of arrangement and

operation. The cuts demonstrate the compactness and convenient arrangement of these telephones. All of the apparatus inside the case is accessible, yet at the same time it is carefully protected. The parts are easy to get at with a screw-driver. No soldering irons or torches are necessary in maintenance work.

The line wires to these sets may be brought in either at the top of the case or at the bottom. A feature in the wiring of the sets when connected to the line from the top is the curved connector shown in the illustrations. This connector prevents water and moisture from following the wires into the apparatus. It will be readily seen that as the wires come down to the set they make a curve into the connector, so that any moisture or water will drop from this point and not follow the wires into the set. When the line wires are brought into the bottom of the set the curved connector is not necessary, and the opening for it is closed by a suitable plug provided for the purpose.

The gongs used with these telephones give a loud, clear ring, which can be heard a long distance in the mine. They are protected by a hood, so that it is impossible for a falling body to injure them or interfere with their action.

Each set is equipped with the No. 48 5-magnet generator, recognized as the most efficient hand generator for telephone use on the market. Transmitter and receiver are of the familiar "Bell" grade type. Windings of receiver, ringer, induction coil and generator have been especially treated to protect them from acid fumes, gases and moisture.

That coal mining is the most hazardous industry in America is a statement that has often been made. The telephone, though nothing new for mine use, has recently been urged as imperative for proper protection against fires, and has always been found an invaluable aid to the conducting of business in the mines. The new telephones are important in that they represent a development through many tests and applications in the attempt to arrive at the complete instrument.

Correspondence.

The Editor, "Canadian Mining Journal."

Sir,—In your issue of April 1st I notice a paper by Mr. James Rennie treating of "Claims Assessment Work in the Province of Ontario." The question raised is a timely one, and if your space will permit I should be glad to add a few remarks.

Under the present system the Act calls for a given number of days' work during the years until patent issues. Each day is to be of eight hours duration, and it is assumed that an honest day's work will result. Provision is also made for the inspection of this work by the Recorder. It is, however, manifestly impossible for the Mining Recorders to inspect all the claims in the various divisions, and I believe any inspection for work is rare. From a variety of causes then, it is possible to evade the just requirements of the Act. Under the system proposed by Mr. Rennie the claim holder will be required to record actual work performed, expressed in cubic feet. In short, the system of the present calls, in effect, for the putting in of time: the new system proposes a check on mere loafing, and dishonesty, and calls for work expressed in cubic feet—if not in foot-pounds.

Anyone who has travelled extensively through the northern part of Ontario will realize that the Mines Department is, in too many cases, being cheated of its moderate requirements in the way of assessment work.

Many capitalists are letting out their assessment work on the contract plan, and though they are not getting their properties developed in any true sense, the system answers their purpose, because the contractor makes affidavit of the performance of the work, and thus the requirements of the Mining Act are fulfilled, too frequently at the price of a false affidavit! There are many honest contractors, it is true, but these are largely put out of competition by their dishonest brethren who assume the responsibility at a price which manifestly precludes the possibility of supplying honest days' work.

I recall, in particular, a case where I was asked to look over five claims. Sixty days' work was supposedly done on each claim, by one of these enterprising contractors. The owners had paid a ridiculously low price for the work, and they got in return a total of about thirty days' actual work distributed over all the claims. Even this total was hardly to be considered effective work since it consisted mainly in pulling moss from the rock outcroppings. Apparently this gentle exercise had grown monotonous, for the contractor appears to have found relief in a little light trenching. Needless to add that the properties were quite valueless and the owners perhaps rather innocent. The point is, that the contractor recorded the days put in and received his cheque on production of the Recording Office papers.

The instance I have cited is a particularly bad one, but there are many similar cases and it is high time the matter was looked into. The premium upon false affidavits should be removed, and the suggestions of Mr. Rennie, along these lines, are worthy of study and further elaboration. The recording of actual work would tend to systematize effort, destroy graft, and render the mere shovelling of snow non-effective.

I observe that Mr. Rennie has not given us any standards of what should constitute a day's work, but no doubt it was at the back of his mind, since the system is capable of elaboration to the point of fixing suitable, and equitable standards. Thirty days trenching, for example, may eventually be expressed as so many cubic feet and perhaps finally recorded in that way rather than as thirty days' work.

It may be objected that many prospectors are not capable of measuring up their work, and recording it in the prescribed form. The retort is, that similar plans are now required for the purpose of recording claims—the proposed requirement is no more complicated than the old.

Any valid objections that might be urged against the adoption of Mr. Rennie's proposals would probably be prompted by a fear of too great elaboration. Moderation is, of course, assumed, for it is easy to foresee that such regulations might be carried to the point of becoming a burden, and a cause of mere vexation.

It is to be conceded that the "wild-catter," and the legion of the "blanketers" and schemers would find the passing into law of Mr. Rennie's proposals very burdensome in their most simple form; it is just this fact that makes them so valuable and altogether desirable.

JOHN HANDLEY,

Mining Engineer,
New Liskeard.

From Oct. 1st, 1908, to Feb. 18th, 1909, inclusive, the Government paid the Dominion Iron and Steel Company and the Nova Scotia Steel and Coal Company sums aggregating \$40,908, in bonuses on coal used in the manufacture of iron and steel in the province.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

Glace Bay.—The Coal Conspiracy Case.—The walking delegate from the United States must often put his tongue in his cheek and smile to himself at the complacency with which Canadians allow their country to be plundered and its peace to be disturbed by the itinerant apostles of discord sent here by the international labor unions. One of the most glaring instances of the undefended state of our industries in this regard is the so-called coal conspiracy case, in which the Grand Jury of the Supreme Court of Nova Scotia found "no bill." It is almost inconceivable that such a judicial farce could have been enacted. In Nova Scotia we are more largely dependent on the coal industry than on any other, as from it we derive much of the provincial revenue, and large industrial populations are entirely supported by it. In the best market for our coal product, namely, the St. Lawrence ports, our coal exports have to face an unrelenting competition from United States coal, which the protective duty alone enables us to meet. Simultaneously with great activity on the part of the United States coal operators in the St. Lawrence markets, there appears in Cape Breton great activity amongst emissaries of the United Mine Workers of America. This body allows a specially low rate to enable that district to send coal into Canada. The United Mine Workers then call a strike, without rhyme or reason, to embarrass the largest coal company in the province. The strike is not successful, and then the United States organization, which is doing the work of the United States coal operator, commences to prosecute the Canadian coal operator for attempting to sell his coal at too high a figure, and uses the powers of the law to compel the Canadian operator to produce in court for the edification of the world at large, and the United States sales agent in particular, his most valuable and guarded private data. The coal companies were asked to publish their mining cost sheets, and their sales price-books, their freighting costs, their profits and their correspondence. All this was done at the request, not of citizens of the province, but of alien agitators engaged in injuring the business of the men they were using the machinery of the Canadian law to prosecute. Not a tittle of evidence was adduced which proved the justice or accuracy of the information laid against the coal operators; the money to defray the legal costs of the prosecution came from the U. M. W. treasury at Indianapolis, and the whole business was evidently a vexatious persecution instituted without serious hope of success or adequate grounds, and was intended to be a lever to compel the Dominion Coal Company to abandon its prosecution of the U. M. W. leaders for libel. It is extraordinary that our courts of justice can be employed by aliens in this manner. The city of Halifax is to have the pleasure of paying witness fees amounting to some \$2,00 in connection with this case. In Cape Breton it has long been recognized that the U. M. W. A. is a dangerous menace to our prosperity and progress. Eventually it may dawn upon other parts of the province that the U. M. W. A. is a nuisance, although it is probable that Halifax obtained fully two thousand dollars worth of amusement from the protracted enquete, and it is only fair that they should pay for the diversion.

The Dominion Coal Company have recently obtained a number of Aekroyd & Best's safety lamps, fitted with Messrs. Cunningham & Cadman's asbestos attachment for detecting fire-damp in mines. These lamps are of the usual magnetically locked and electrically lit type, but are of peculiar construction, inasmuch as the body of the lamp is of aluminium, while the oil attachment has been explained in the Transactions of the Institution of Mining Engineers and in the columns of the "Colliery Guardian." It consists of a small piece of asbestos blue-board, so constructed that it can be lowered on to the flame. The asbestos is treated with a solution of hydrochloric acid and soda, which gives a clear and easily defined cap in a

mixture of gas and air. A perpendicular meter is attached to the asbestos graduated in tenths, by means of which the exact percentage of gas in the air can be estimated. The lamp can be used by the examiner in the ordinary way, and will give exact results without the necessity of carrying a specially constructed testing lamp such as the Pieler lamp. A great deal of attention is being devoted at the present time in England to more exact methods of testing for gas in mines, and to the construction of safety lamps.

The Workmen's Compensation Act, which has been introduced as a Government measure by the Nova Scotia Government, is not favourably viewed by the members of the Colliery Relief Societies. It is recognized that a measure like the Compensation Act, particularly the very crude draft which is now before the Nova Scotia Commons, brings with it many penalties, one of which would be the extinction of the Relief Societies and the benefits at present obtained by the miners through the operations of these self-supporting bodies. Some interesting figures have been presented to the committee which is dealing with this proposed measure as to the dissection of the disbursements of the Relief Societies. It may surprise many people to know that 54 per cent. of the benefits paid out by these societies is for sick relief, and that only 35 per cent. is disbursed for accident relief. The Relief Society gives its members protection all the time, and is in fact the miner's sheet-anchor. Probably the weakest feature of these societies is the small payment at death, but here again the Relief Society operates most beneficially where the family left is largest. The widow receives a monthly payment for one year, but for each child she receives a monthly payment until they attain a certain age, generally thirteen years. Under the operation of the Compensation Act the dependents of a man killed at work would receive a comparatively large sum in one payment, often with a disastrous result to the recipients, who are unused to the possession of much money at one time, and do not know how to use it to best advantage. The Relief Societies are supported by contributions from the workmen, the Government and the companies, and this mutuality of support and control works for the best interests of all concerned, and is an admirable check on that bugbear of the Compensation Act, namely, malingering. The accumulated funds of the Relief Societies at the mines of the Dominion Coal Company alone amount to over \$45,000, but these funds are not invested to the best advantage, only earning the ordinary 3½ per cent. paid by the banks. Properly invested, these funds should bring in at least twice the amount of interest they now earn. The members of the Relief Societies do not like any interference with their independence, but it could easily be arranged that a "merger" of the general funds should take place, without interfering with the individual management of each society. The collieries are so inter-related, and their workmen move about from one mine to another in such a way, that a common fund for the reserve or surplus would net at least \$1,500 per year additional interest. The conclusion arrived at by the commission which investigated the Relief Societies some time ago seems to be confirmed by the present attitude of the members, namely, that the best and most beneficial method of providing relief for the victims of accident and disease around the collieries is by an enlargement and consolidation of the present Relief Societies, which even in their present state have been probably the most powerful influence for good around the colliery villages. The Relief Societies afford relief to those who need it most and are also most deserving. They protect the miner in sickness as well as in the event of accident, while at the same time they discourage malingering. The Compensation Act, however, tends to drive the weakest to the wall, and enforces upon the employers in self-protection the necessity of dispensing with all aged or defective employees, while at the same time it puts a premium on malingering, de-

stroys the independence of the employees, and causes endless litigation.

Glace Bay.—The output of the mines of the Dominion Coal Company for March was 243,763 tons, or an average daily production of 9,370 tons. There are two new producers, namely, No. 15 and No. 6 Collieries. No. 15 is the newest mine, and is situated on the Lingan seam. No. 6 mine has not worked for about a year, owing to the pleasantries of the United Mine Workers, but during April it will become a perceptible addition to the steadily increasing total output of the company. Under the rules of civilized warfare, no blockade is recognized that is not effective. How ineffective the U. M. W. A. strike is as a blockade of the company's operations at Glace Bay may be judged from the comparative figures of monthly outputs for the first quarters of this year and last, which are as follows:—

	1909.	1910.
January	200,176	212,073
February	209,656	204,521
March	253,622	243,763
	663,454	660,357

The men employed daily at the mines alone (all subsidiary and transportation employees excluded) number 4,300. The number of men now out on strike is 1,200, about 500 men having returned to work since the strike commenced. These figures should carry their own significance. New men are arriving at the mines every day, and by the opening of navigation, barring serious accidents, the absolute failure of the strike will be apparent even to the most biased sympathizer with the U. M. W. A.

In face of the foregoing facts, it is amusing to read an interview which the local president of the U. M. W. A. gave to the Halifax Herald recently. It was gravely stated that the number of men who came out on strike last July was 5,000, of which number 2,000 had gone West, leaving 3,000 men on strike at the mines. The funny part of the matter is that the Coal Company never employed more than 5,000 men in their mines, and that the number of men belonging to the Provincial Workmen's Association who remained at work at the time the strike was called outnumbered the strikers by two to one. It is a little late in the day for the leaders of the U. M. W. A. to rehash all their stock misrepresentations, but there seems no limit to their mendacity. At one time, before the public were properly informed, there was some purpose to be served by their lies, but to-day, when the general untruthfulness of these men has been exposed, it is but foolishness on their part to persist further, as it merely serves to confirm the public in their suspicions that the U. M. W. A. is an untruthful organization, and that its officers will stick at no amount of misrepresentation to serve their own ends.

ONTARIO.

Cobalt.—The majority of cases against the Cobalt high graders have been held over till May, when those implicated will again come up for trial. The information in all of the charges has been changed, so that now the defendants are charged with having ore in their possession which is the legal property of the Crown. This is to conform to the statute that declares that any ore for which an owner cannot be found lays in the name of the King. By this means it is hoped to get around the old law, which throws the onus of proof of ownership on the complainant.

A few days ago the ore-house at the Trethewey Mine was broken into and 200 pounds of nuggets, valued at approximately \$1,000 was stolen. So far, no trace has been found of the stolen ore.

The new mill at the Silver Cliff is now ready to run, and all the machinery has been turned over, and is in good working order. It is estimated that there are about 18,000 tons of ore on the dumps and in the stopes. The work done below tunnel level has proved up the veins, to a depth of at least sixty feet,

and the values in the bottoms of the workings are very encouraging.

Work has been resumed on the Silver Lode property, which lies to the east of Cross Lake. A new shaft-house is being built, and as soon as power can be obtained the shaft, which is at present down 120 feet, will be sunk to greater depth. There is a vein of calcite and cobalt showing in the bottom of the working.

Good ore is now being obtained from the new shoot opened up on the Ophir property. The vein shows about eight inches of calcite and smaltite, and carries some native silver.

The Nipissing has declared the regular dividend of 5 per cent., with a 2½ per cent. bonus, payable April 20th, to shareholders of record April 1st. The La Rose has also declared a 2 per cent. dividend, payable April 20th. Up to date for the present year Cobalt companies have paid and declared dividends amounting to \$2,324,527. This does not include the profits returned to the owners of the private corporations, the O'Brien and the Drummond. During the month of April six companies will disburse to their shareholders dividends amounting to \$970,293. The companies that have declared dividends for the present year are as follows:—

Nipissing	15%	\$900,000
Crown Reserve	30%	530,644
Kerr Lake	10%	300,000
La Rose	4%	300,000
Buffalo	8%	80,000
McKinley-Darragh	5%	112,346
T. & H. B.	600%	46,566
Right of Way	2%	29,971
Haileybury Silver	50%	25,000
		\$2,324,527

The Haileybury Silver is paying the dividend out of money raised by the sale of the south half of its property to the Haileybury Frontier Company. This latter company recently struck high-grade silver ore on the 65-foot level on what is supposed to be a continuation of the Keeley vein.

The famous Cobalt Gem nugget has been purchased by the Ontario Government for the sum of \$5,054. This nugget, which is the largest piece of float ever found in this district, was discovered on the property of the Cobalt Gem Mining Company, a Philadelphia organization, and with the exception of a few small pieces of float, constitutes all the ore that has been taken from the claim. The nugget weighed 1,640 pounds, and was 40.62 per cent. pure silver, containing 9,715 ounces. It now forms part of the collection of the Bureau of Mines at Toronto.

The Lewisohns, who control the Kerr Lake Mine in Cobalt, have made the second payment on their option of the Wettlaufer Mine in South Lorrain, thus giving them the control of this property. The Wettlaufer is the best known and most important property in the South Lorrain district, and has been the bonanza mine of that camp, having had high grade ore from the grass roots down. Since the Lewisohns took an option on the property, development work has been pushed, and the results obtained were most satisfactory. The ore on the lower levels was found to be fully as rich as nearer the surface. Although several shipments have been made, no stoping has been done, all the ore having come from development work. The mine is equipped with an up-to-date plant, but it has been found insufficient to carry on the work, so a new twelve-drill power-driven compressor has been ordered. The Mines Power Company will have power in there some time this summer.

The Hargraves Mine has entered the list of shippers, having sent out 21 tons of high-grade ore. This is the first time this company has shipped since it was reorganized. In the early days of the camp one 28-ton car was shipped with ore taken from the surface.

As the winter roads into Elk Lake are now impassible, it is probable that there will be no more shipments made from Gowganda until next winter. The tonnage that came from there is in

excess of what was estimated, and the shipments were also exceedingly high grade. As was expected, the Blackburn or Millerett was the heaviest producer, sending seven cars, containing an aggregate of 198 tons. The Reeves-Dobie shipped 62 tons, the Boyd-Gordon 30 tons, the Miller Lake O'Brien 11 tons, the Welsh 1¼ tons, and the Burke-Remy 2 tons, the two latter being sample shipments. The amount of ore that has come from this district is very creditable, considering the difficulties under which mining operations are carried on, and has done much to restore public confidence in the future of the camp. A new discovery has been made at the Boyd-Gordon, and the ore is reported to be almost pure silver. The Bishop Mine has four veins showing silver and an ore shoot carrying about 1,000 ounces has been opened up at a depth of 70 feet. S. D. Epplet has found a vein carrying good values in silver on one of his properties near Hanging Stone Lake. He now has 40 men working on the different claims. As a whole, the district is looking better than formerly, and all indications point to a renewal of activity this summer. At present things are hung up on account of the early break-up, and it is stated that there are nearly fifty cars of supplies of various kinds at Charlton that it will be impossible to send in.

The Elk Lake district has also helped to swell the list of shippers, the Lucky Godfrey having sent out a twenty-ton car of high grade ore. This camp has suffered in comparison with Cobalt and Gowganda, but has notwithstanding made a very good showing. There are practically a dozen mines in that section that have pay ore, and as they will be more actively developed than formerly, better results may be expected.

The Large property, situated on Cross Lake, which has been in litigation for two years, was purchased by the Valentine Mines, Limited, immediately upon the settlement of the case in the courts. As soon as sufficient money is raised by the sale of stock, development work will be started.

The T. & H. B. has declared another dividend of 300 per cent., or \$3.00 per share, this making the third dividend for 1910. When this last dividend is paid, the company will have disbursed to its shareholders \$160.00 per one dollar par value share in dividends.

The City of Cobalt is now having its dump treated at the rate of 50 tons of ore a day, and it is estimated that there are about 14,000 tons available. The Northern Customs Concentrator, which has the contract for milling the ore, is now running by electric power throughout.

The long-heralded compressed air has at last reached Cobalt, the Mines Power Company having begun giving commercial service on April 4th. There had been air in the pipes at different times for a week before that date, but the service was not continuous. They are also supplying electric power, and several plants are now in operation. A good many other plants will be using this same air and electricity in a few days, because a number of mining companies would not sign a contract for their supply until they saw which power company was first in the field. The Hydraulic Power Company is rapidly getting in shape to turn the water down the shafts. There is, however, a certain amount of work to be done, and it is hard to say just when they will be ready to deliver air. The Cobalt Power Company is giving electric energy to some plants, but this is from a unit that has been installed at Ragged Chutes, at the plant of the Hydraulic Company. Their main plant will soon be ready,

as they are now installing the last of the machinery.

Porcupine.—The early break-up of the winter has caused consternation in many parts of the district, because as it was not expected for about a month, many companies will now be unable to get in their supplies. The roads are now impassible for teams, and men going in or coming out have to do so on foot. Fortunately the principal operating companies managed to get in the greater part of their supplies and machinery. The biggest deal that has yet been made in Porcupine claims was consummated a short time ago, when the famous Wilson and Edwards properties passed into the hands of a syndicate of which Mr. A. Montell is the head. Some of the people who are heavily interested in the Buffalo Mine in Cobalt belong to this syndicate. The original Wilson claim is generally conceded to have the most sensational showings of free gold of any in the district, but so far practically no work has been done on it. The owners received many flattering offers, but did not seem at all anxious to dispose of their claims until Mr. Montell's syndicate entered the field. A complete plant, including two 60-horsepower boilers and a six-drill compressor, was ordered, and it is understood is now on the property. As the roads were getting in very bad shape, a special train with fifteen teams was sent up from Cobalt to help rush the supplies in. There were, all told, about seventeen carloads of supplies and machinery, and a large gang of men is at work. In order to test the values on the surface, shots were put in in different places, and with one or two exceptions, all the broken rock showed free gold. The Scottish Ontario Gold Company are installing machinery, which they expect to have running soon. Their shaft is now down about 35 feet, and the values in the bottom are exceptionally good. The ore is being carefully sampled, and the samples sent to Scotland to be tested in the company's laboratories. The Higginson veteran claim has been purchased by a New York syndicate, and a gang of men is being sent in to open it up. Machinery will be installed later, as it was impossible to get it in before the break-up. The Timmins have their buildings up and are installing the plant, which includes a six-drill compressor. They have sunk two shafts, one of which is down 60 feet, and has free gold in the bottom. They are also getting more sulphides with depth. A sample car has been shipped from this property to a mill in New Jersey, in order to have a test run made. Care has been taken to make the car as representative as possible. The Crown Chartered Company, which purchased the Reamsbottom claims, has part of its plant on the ground. They are putting up a small saw-mill, and expect to cut lumber for other concerns as well as their own. The Foley-O'Brien properties are looking well, and free gold has been struck at the bottom of the shaft. They are operating on the Wright and Forneri claims, and also have a veteran claim near the south end of Porcupine Lake. During the coming summer there will be three compressors in operation and probably six plants. When these are working it will be possible to sink the shafts to greater depth, which is, of course, necessary to determine the extent of the deposits. Arrangements have been made to run a line of boats on the lakes as soon as the ice is gone, which will be a great aid to transportation in the summer months. The greatest need, however, at the present time is for a summer road. The Government has been petitioned to build this, but so far has shown no decided inclination to carry it out. Several roads are projected, but these are as yet up in the air.

GENERAL MINING NEWS.

NOVA SCOTIA.

North Sydney, April 5.—The Nova Scotia Steel Company's steamer Wobun sailed from North Sydney on April 5th for Montreal with 2,450 tons of coal. The Wobun is the first coal steamer to go up the St. Lawrence this season.

The steamer Kronprinz Olav, Captain Neilson, sailed yesterday afternoon from the Dominion Coal Company's pier, coal laden, for Montreal. The Kronprinz will be the first ship to sail up the river with coal cargo from the Dominion Coal Company for 1910.

Halifax, N.S., April 8.—The bill to amend the Nova Scotia Steel Company's charter passed the Legislative Council yesterday with the directors' residential clause eliminated, and was sent down to the House of Assembly last night in that form.

This morning the House Committee gave a hearing on the bill and was addressed by Mr. H. A. Lovett, K.C., representing the upper provincial interest, and Mr. Mellish, K.C., and Mr. Cantley, of the Scotia directorate, in favour of the bill.

Mr. Lovett urged that shareholders who invested money in stock on the face of the charter had rights and interests to be considered. There was no necessity of an amendment to permit an increase of capital. The company now has one and a half million in bonds, so an increase could be of no immediate necessity, and, if so, the shareholders' wishes can be learned at ten days' notice. He claimed that the clause would be capable of becoming effective for other purposes. Any directors wishing to retain office could, the day before the annual meeting, count up the list and if things did not look favourable, create three millions of new capital and subscribe for it themselves or have friends do so, and thus it could be voted on at the meeting.

Mr. Mellish submitted that it was not a general practice in the Legislature to restrict an issue of additional stock in the manner suggested, as statutes showed. Nor was it the general policy to restrict the power to issue new stock to majority shareholders. The chairman of the committee asked if the present directors were unanimous in favour of the bill. Mr. Lovett said some were not.

Hon. Mr. Rogers said that under the by-laws it was not necessary to notify those outside the province of meetings to be held. The concern has been managed by resident directors.

Mr. Lovett said that under the by-law recently made, no matter how many directors reside outside the province, the president can call a meeting without notice. Four is then a quorum and could authorize the introduction of a bill.

Mr. Cantley said in regard to a quorum that the question of the by-law was not a recent one. Directors in the province were all in favour of the act. The management of the concern had been left entirely to the efforts of those directors.

Reference has been made to outside interests in the company. At the recent New Glasgow meeting the present management had the support of 27,830 votes, representing 537 shareholders; the opposition had 9,480 shares, representing 75 holders. Allowing them six shareholders in dispute, they had 81 as against 537. The province is vitally interested in underlying securities. At this moment the province holds 85 per cent. of debentures and \$2,750,000 of bonds. Upper Canada took \$700,000 out of \$3,500,000 bonds. When the first bond issue was made the company looked to Nova Scotia for money and was not disappointed.

Halifax, N.S., April 1.—In the Supreme Court to-day in the action brought by the U. M. W. A. against Messrs. J. R. Cowans and Alex. Dick, charged with conspiracy, the Grand Jury reported no bill, thus ending the coal conspiracy cases.

ONTARIO.

Cobalt, April 7.—After many vexatious delays the Government have at last signed the royalty reduction agreement with the Chambers-Ferland. All the other reductions concerned companies paying tribute to the T. and N. O., and they have been

ratified a long while ago. The Chambers-Ferland pay direct to the Ontario Government. The old royalty was on ore at the pit's mouth, 25 per cent, of the output, the new rate is 25 per cent on the profits.

ALBERTA.

Lethbridge, April 7.—J. N. Greenshields, of Montreal, has purchased the controlling interests in the Lethbridge collieries. The original owners, among whom were Hon. Colin Campbell, of Winnipeg; Jos. Griffin, of St. Thomas, Ont.; Isaac Cockburn, of Winnipeg, and the late George Rogers, of Lethbridge, will retain their interests. It is understood that the Grand Trunk Pacific is behind the deal, and will spend \$400,000 in development.

BRITISH COLUMBIA.

Fernie, B. C. April 2.—The general strike ordered in the bituminous coal districts in the United States is not liable to cause any disturbance among the miners of the Crow's Nest District or Southern Alberta coal field. Neither the mine workers' officials nor those of the coal companies are looking for more trouble here. The year's agreements which were entered into a year ago have been giving general satisfaction, while in those camps where no agreements have been arrived at the feeling is mutually conciliatory and in no place is there any friction of consequence.

At Frank, where the Canadian Coal and Coke Company operates, the agreement expired yesterday, and the men are out as a result of the company refusing to discuss a new agreement, except on conditions that a reduction of five cents per ton be allowed on pillar work, together with the discontinuance of the closed shop principle, and that the jurisdiction of the United Mine Workers of America is not to include men working in and around the shaft house. There are from 175 to 200 men involved in the dispute.

The output of the Crow's Nest Company's mines for the month of March made another record, totalling 112,000 tons, the first time in its history when the hundred thousand mark was passed. The same conditions prevail at all the camps and the demand is always for more.

The total tonnage for the district from Taber to Fernie is now fully 10,000 tons per day, the Fernie mines furnishing fully one-quarter of the amount.

Rossland, B. C.,—A second strike has been made in the War Eagle mine at Rossland, B. C., now the property of the Canadian Consolidated company. Like the last it is an entirely new ore body, hundreds of feet north of the War Eagle vein proper, and like it, too, is exceedingly rich.

The first big strike was made about a year ago in a crosscut 500 feet to the north from the 11th level, 1650 feet from the collar to the shaft. The ore shoot then found has been tapped on both the ninth and tenth levels, and has been found so far to have a height of 375 feet, a length of 400, and a width approximating 50. Aside from its size, its most notable feature is the high grade of ore it contains, shipments for months past having averaged \$40 per ton in gold, and about four per cent copper, much higher values than were ever obtained for a similar tonnage from either LeRoi or War Eagle mine during the days of bonanza production.

MINING NEWS OF THE WORLD.

GREAT BRITAIN.

Early reports of the mineral production of the United Kingdom show that the coal output for last year was 263,758,562 tons, as compared with 261,512,214 tons during the previous

year. Oil shale figures went up from 2,891,564 tons to 2,966,937 tons; iron ore output stood at 9,713,284 tons; black tin ore at 7,381 tons of dressed ore. Ores of copper declined to 3,678 tons; lead ore increased slightly, showing an output of 29,688

tons; zinc ore dropped almost 40 per cent., returns showing an output of 9,902 tons. Tungsten ores increased to 368 tons, the previous year's output being only 229 tons. Arsenic increased from 1,919 tons to 2,865 tons.

The Miners' Conference resumed its sitting in London on March 30th, for the further consideration of the proposals for the settlement of the South Wales dispute. Mr. Enoch Edwards, M. P., again presided over the 150 delegates present, and Mr. Isaac Mitchell, of the Board of Trade Labor Department, also attended.

The employers had stipulated that a definite answer should be given to their proposals before noon on March 30, and in case the reply was favorable contracts were to be continued from day to day until 9th April, in order to allow a ballot to be taken.

The conference sat for nearly four hours, and at the end the official report stated that the following proposition was submitted to the conference on behalf of the Executive Council:—

"After having carefully considered the whole position in South Wales, we strongly urge the conference to advise the workmen to accept the terms of settlement put before the conference as the outcome of the negotiations between the coal owners and the miners' representatives, as we do not think the points of difference are sufficient to justify either a sectional strike in South Wales or a national struggle, with all the tremendous issues involved. This not to be taken as committing other districts of this federation to support an amendment of the Eight Hours Act."

A long discussion ensued upon this being proposed and seconded on behalf of the council, in which representatives from nearly all the districts in Great Britain took part, after which the resolution was carried.

Mr. T. Richards, M. P., in the course of an interview, stated that the owners had agreed not to press the clause with regard to abnormal places, but were prepared to leave matters as they stood at present on condition that the rest of the proposals were agreed to.

Mr. Alfred Onions, one of the leaders of the South Wales miners, stated that it was now the intention to take the ballot of the miners immediately. This ballot, he said, will be confined to the workmen in the South Wales coal fields.

AUSTRIA

A special report furnished from Vienna to the "Frankfurter Zeitung" sets the position of the Galician oil industry in a very unfavorable light, and in fact points to the tactics of the Standard Oil Company in that country having been crowned with so full a measure of success that the very existence of the home industry is seriously threatened.

"The Austrian petroleum industry," says the writer of this report, "is to-day literally fighting for its very existence. While the Vienna Bourse has been dreaming of an understanding being come to, not merely within the ranks of the home industry, but also between the groups contesting the pre-eminence in the world's markets, competition has become more acute than at any previous date. The Standard Oil Company has gradually depressed both wholesale and retail prices in Germany to such a low level that the Austrian export refineries are only getting an average price of 3¼ marks, as compared with 5 or 6 marks of a year or two ago. At the same time, in Austria, the Vacuum Oil Company and the refineries attached to it are attracting buyers more and more by offering their product at prices entailing a loss at present prices of crude oil, which is appraised at just the same value as the finished product. The Vacuum Oil Company is now in a position to meet about 20 per cent. of the Austrian consumption of petroleum. Allied with it is the French refinery in Limanova, and it is becoming more probable every day that the "Austria," also with its refineries in Mahriseh-Schonberg and Drohobycz, is also controlled by the Standard Oil Company.

"It is not believed that the 'Austria,' which is not very

strongly capitalized, could afford to lose 2 to 3 kronen per cwt. on the refined oil it is selling—as both it and the Vacuum Oil Company are actually doing—unless it had the Standard Oil Company at its back."

"Already," continues the report, "some of the large refineries have considerably reduced the number of their hands, and this gives colour to the statement made recently that the Austrian oil export trade would be now restricted on a systematic plan. Of course, refineries and plant generally had been erected on a scale to facilitate the largest possible export, but now, in view of the continued policy of depressing prices both for oil and all bye-products indulged in by the Standard Oil Co., increased exports only mean increased losses. This development shows how short-sighted was the policy of the Austrian Government, which was entirely based upon a rise in prices. It has only been playing the game of the Standard Oil Company, which on account of its boundless pecuniary resources can sacrifice millions for a series of years with equanimity if it can thereby either drive the Austrian petroleum industry from the international market or make it merely a vassal of its own. It is suspected that an alliance of the various oil districts in the European Petroleum Union against the Standard Oil Company is under discussion, and this may be joined up with the establishment of a Government monopoly in Germany. All this, however, can only be a long way off, and at the present moment the actual situation and the prospects of the Galician oil industry are perhaps the most unfavourable yet recorded in its annals, which have been rich enough in critical occurrences."

SOUTH AFRICA.

Johannesburg.—Mr. J. G. Hamilton, presiding at a recent meeting of the Chamber of Mines, said that the State Mining School would be discontinued, and instead of it fifty youths, under ordinary contract conditions, would shortly be instructed at the Wolhuter mine under State supervision. The chairman remarked on the improvement in the supply of native labour, and stated that February's recruiting was a record. He announced that a miners' phthisis sanatorium would be established immediately.

Johannesburg.—Strenuous endeavours are being made by the principal members to continue the existence of the Transvaal Coal Owners' Association in order to prevent serious price-cutting and the disappearance of profitable operations. In order to allow of further negotiations to that end the placing of the contracts for the supply of coal to the Eckstein group of mines has been postponed for a week.

Speeches at recent company meetings have been chiefly noteworthy for disclosures of further record schemes of development and announcements of large increases in the tonnages to be milled. On the Simmer Deep crushing is to be increased to 72,000 tons monthly, its ore reserves totalling 1,300,000 tons worth 5.2 dwts. The Jupiter crushing is to be increased to 48,000 tons monthly, the ore reserves totalling 1,215,000 tons worth 6 dwts. Knight Central's crushing is to be increased to £90,000 in hand. The Geduld Proprietary expect to raise the monthly crushing to 17,000 tons.

The crushing by the Vesta mill, on the Black Reef, has resulted in a recovery of 8 dwts. per ton, whilst the resulting sands and slimes are expected to produce other 4 dwts. The management express themselves as highly satisfied with these figures.

Natal.

The output of coal from the Natal collieries during the year 1909 amounted to 1,786,583 tons—the highest figures reached since the start of the industry. In the year 1889 the output was only 25,609 tons and in 1908 the amount mined was 1,669,774 tons. During 1909 vessels replenished their coal bunkers at Durban to the extent of 835,496 tons, while 404,322 tons were exported from Durban by sea. The output for January last forms another record, the amount being 192,145 tons. Durban is

rapidly establishing itself as one of the leading coaling ports of the world, and additional rolling stock has been forwarded to the colony to meet the growing requirements of the port.

UNITED STATES.

Nederland, Col., April 8.—The activity among tungsten miners will be augmented by the recent rise of 50 cents per unit and the fact that the output of the past few months has at last attracted the attention of General Manager Hayes, of the Denver, Boulder & Western road, who has submitted plans to run the road from the Sulphide spur into town, to be put into operation within 30 days.

While mine owners generally assert they cannot operate their own properties to advantage at less than \$11 per unit, leasers are doing well.

Marquette, Mich.—The great ore fleet is beginning to fit out for the year's work. The vessel owners have a big job to do, and are bestirring themselves. They plan to move 50,000,000 tons of ore before the ice again locks up the lakes. This is by all odds the biggest contract the lake carriers have ever undertaken, and the big fleet of ore-carrying ships will soon be in trim to start on it. It must be accomplished between the middle of April and the first of next December—seven months' time—so there are no days to be wasted.

In Marquette and at every port on the lakes there will soon be bustle on the decks and in the holds of the ore carriers. The first motion was noticeable in the local harbour fully two weeks ago, when the advance guard of men arrived and began the work of fitting out the Pathfinder and Warner, which have laid in the

harbour all winter. Additional arrivals since have swelled the crews. Those now at work are connected with the engineering department of the ships, and some of the superior officers. They are overhauling the machinery, making other minor repairs, and thoroughly examining the vessels so there will be no hitch when they are about to take on their first cargo.

It is the intention to have these boats ready in time to be loaded and start out as soon as the insurance takes effect, April 15. The ships at the lower lake ports and at the head of the lakes are also getting ready, and will be waiting at the Soo locks prepared to pass through as soon as they are given opportunity.

The ore fleet numbers between 200 and 300 big ships, owned by the Steel Corporation, the Cleveland Cliffs Iron Company and several other companies and individuals. The Steel Corporation owns 102 of these vessels, and is the heaviest ship owner in the world, as well as the largest owner of iron mines and iron works.

Goldfield, Nev., April 4.—Preliminary estimates, issued Saturday afternoon by Manager Finlay of the Goldfield Consolidated the gross value of the ore at \$1,015,000. The recovery value is Mines Company, bearing upon the production for March, places placed at \$950,000, and the net profits at \$730,000. During the month the mill treated 26,717 tons, thus establishing a new record. It will be recalled that March a year ago was the heaviest month of that period.

The annual report of President Lockhart of the Goldfield Florence Mining Company, accompanying the dividend checks just mailed shows the last year's profits to have been \$232,050. The company paid two dividends totalling \$210,000.

COMPANY NOTES.

DOMINION COAL COMPANY, LIMITED.

Report of the Board of Directors to be Submitted at the Annual General Meeting of the Shareholders on the 12th April, 1910.

To the Shareholders of the Dominion Coal Company, Limited:

Your Directors submit herewith a statement of the affairs of the company as at 31st December, 1909, and of the earnings of the year then closed.

The year opened with great promise, but early in July a strike was called by the United Mine Workers' Association, an American organization which had recently sought to establish itself in Nova Scotia; the object of the strike being to obtain recognition. The refusal of your Directors to grant this was sustained by a Board of Conciliation held under the Lemieux Act.

A large proportion of the company's employees were members of the provincial organization, and these, with many others, have remained steadily at work. The reduction of output consequent on the strike, the increased cost of mining, and the direct expenses incurred for police protection, etc., all had a serious effect on the company's earnings for the latter half of the year, but the output is now nearly normal, and it is hoped that the additions which are being weekly made to the company's working force will place its operations on their usual level by the opening of navigation.

The output of the collieries for the year 1909 amounted to 2,734,774 tons, as compared with 3,555,068 tons in 1908.

Collieries: Plant.—Your Directors are pleased to be able to report that, notwithstanding the disturbances caused by the strike, the collieries are in good condition. Development work is still well in advance of mining operations, and the plant and machinery throughout have been well maintained. The new collieries in the Lingan district are being steadily pressed for-

ward to completion, and full mining operations are now in progress at No. 12.

Sydney and Louisburg Railway.—Your Directors have caused application to be made for an Act to incorporate a railway company, to which the valuable railway property belonging to and now directly operated by the company, may be transferred. Your Directors are of opinion that this railway can be more successfully carried on by an independent company operating under the railway laws of the province, and will ask you to sanction an arrangement which, while retaining full control in the hands of your company, will place this part of your business on an independent basis.

Relations with Dominion Iron & Steel Co., Ltd.—The arrangement proposed by your Directors for a settlement of the matters in dispute with the Steel Company, mentioned in the last Annual Report, was duly carried out. The contract of October 20th, 1903, has been reinstated, the excess cost of coal received under the temporary contract repaid, and within the last few weeks a friendly settlement was reached as to all other matters in dispute between the two companies. The balance at credit of Profit and Loss Account, which was largely created by the payments from the Steel Company, was drawn on for this settlement, as appears from the accompanying statements.

Negotiations respecting the new price of coal are proceeding satisfactorily. The cost of mining and delivering coal, during the periods which govern in fixing the new price, has been ascertained by Messrs. Marwick, Mitchell & Co. on behalf of your company, and their figures are now under examination by the Steel Company's accountants.

Proposed Merger with Steel Company.—It is understood that a plan to unite the interests of the shareholders of the Coal and Steel Companies is under consideration, and will shortly be submitted to their respective representatives. Your Directors will

promptly consider and report to you on any scheme that may be placed before them.

Changes in the Board.—In December last the President, Mr. James Ross, sold 50,000 shares of the common stock of your company, which were acquired by the Dominion Iron & Steel Company, Limited. Mr. Ross subsequently resigned as President and Director, and at the same time Messrs. R. B. Angus and Graham Fraser retired from the Board.

Mr. J. H. Plummer, the Honourable L. J. Forget and Sir Henry M. Pellatt were elected Directors in their stead, the first named becoming President in place of Mr. Ross.

Of the other members of the Board, Mr. W. B. Ross, K.C., and Mr. J. Kerr Osborne, having sold their shares in the company, have ceased to be Directors, but their places have not been filled.

Management and Staff.—In January, 1910, Mr. G. H. Duggan, 2nd Vice-President and General Manager, resigned his office, and Mr. M. J. Butler, C.M.G., was appointed in his stead. Mr. John Mackay, Secretary and Treasurer, also retired from the service of the company, and Mr. C. S. Cameron was appointed to both these offices. Mr. D. H. McDougall was added to the staff as Assistant General Manager, with special charge of the practical work of the company. All these officers reside in Cape Breton.

Mr. F. L. Wanklyn having accepted an important public office, will be no longer available for the duties he has hitherto performed, but the changes made in the administration of the company's affairs will enable your Directors to divide his duties among the other officers.

Your Directors have pleasure in bearing testimony to the zeal and energy with which the general staff of the company have performed their duties during a trying year, and in expressing their confident belief that the shareholders may look for continued loyal and efficient service from the company's officers and employees under the new management of its affairs.

On behalf of the Board of Directors,
J. H. PLUMMER, President.

Montreal, April 4th, 1910.

Profit and Loss Account for the Year Ending 31st Dec., 1909.

Net earnings from operations after payment of all expenses and current repairs	\$1,113,091.09.
Appropriation for depreciation and renewals	350,000.00
	<u>763,091.09</u>
Interest on Bonds	\$281,652.93
Interest on Loans	30,912.37
	<u>312,565.30</u>
	450,525.79
Balance from previous year, viz., amount shown at credit of Profit and Loss—	
Account 1st January, 1908	4,253,471.03
Appropriations in 1907-8 not now required	50,422.60
	<u>4,303,893.63</u>
Less amount due Steel Company as since settled	3,550,000.00
	<u>753,893.63</u>
	\$1,204,419.42
Less:	
Dividends on Preferred Stock 2 half-yearly payments of 3½% each	210,000.00
Dividends on Common Stock, 4 quarterly payments of 1% each	600,000.00
	<u>810,000.00</u>
Balance carried forward	\$394,419.42

Balance Sheet, December 31st, 1909.

Assets.	
Properties and Investments	\$24,562,611.16
Current Assets:	
Inventories	\$660,557.93
Accounts Receivable	568,041.59
Cash on hand and at credit	450,748.63
	<u>1,679,348.15</u>
Deferred Charges to Operations:	
Insurance, Taxes and Steamship hire paid in advance	20,164.98
	<u>\$26,262,124.29</u>
Liabilities.	
First Mortgage 5% Bonds: Total Issue	\$6,175,000.00
Cape Breton Real Estate Debentures:	
Total issue	\$480,000.00
Less matured and paid	319,835.52
	<u>160,164.48</u>
Dominion Rolling Stock Debentures:	
Total issue	\$480,000.00
Less matured and paid	272,516.33
	<u>107,483.67</u>
Mortgages	50,000.00
	<u>Total Bonds and Mortgages</u>
	6,492,648.15
Current Liabilities:	
Accounts payable, royalty on coal, etc.	334,302.32
Bond Interest accrued	51,450.01
	<u>385,752.33</u>
Dominion Iron & Steel Co., Limited:	
Balance of claim as settled	800,000.00
Reserve Accounts:	
Accrued dividend on Preferred Stock	87,500.00
Sundry Reserves	101,804.39
	<u>189,304.39</u>
	<u>7,867,704.87</u>
Capital Stock:	
150,000 Shares of Common Stock \$100.00 each	15,000,000.00
30,000 Shares 7% Preferred Stock \$100.00 each	3,000,000.00
	<u>18,000,000.00</u>
Profit and Loss Account	394,419.42
	<u>\$26,262,124.29</u>

Certified correct,
R. GORDON, Comptroller.

NOVA SCOTIA STEEL & COAL COMPANY—PRESIDENT'S ANNUAL REPORT OF PROGRESS.

“In moving the adoption of the report of the directors and of the accounts which have been laid before you, I wish to avail myself of the opportunity to make a few remarks upon the business of the company. Throughout the greater part of the year 1909 the iron and steel business was anything but satisfactory, looked at from the standpoint of the shareholders. Prices in many cases with us were lower than they have been at any time during the past twenty-five years. Fortunately during the last quarter there was some improvement, which, I am pleased to say, still continues.

“The shareholders may, I think, congratulate themselves upon the fact that the profits of the year have amounted to \$907,949. This is a large sum to make in a year such as I have spoken of, and it has required the greatest care and foresight on the part of the management and our official staff to produce this satisfactory result.

"In this connection I want to say that I think we are particularly fortunate in having such a careful and competent man as Mr. Cantley in charge as general manager, and also fortunate in having under him a competent staff working harmoniously for the best interests of the shareholders. It is perhaps opportune that I should at this time call your attention to the growth of this company during the past five years.

"I became president of the company in March, 1905, and all of the present board (with two exceptions, were then directors. In the previous year, 1904, the earnings were \$501,337.24. For 1909 they were \$907,949, an increase of over 50 per cent. In 1904 we mined and shipped from Wabana 246,022 tons of ore, and in 1909, 460,387 tons, an increase of 67 per cent. In 1904 the total coal raised at Sydney mines was 476,521 tons, and in 1909, 613,000 tons, an increase of 70 per cent. In 1910 we expect an output of 900,000 tons, an increase of 423,459 tons over 1904, equal to 88 per cent. In 1904 the output of pig-iron was 31,567 tons; in 1909 it was 58,676 tons, or an increase of 85 per cent.

"In 1904 the open hearth plant produced 30,000 tons of ingots; in 1909 the output was 64,240 tons, an increase of 114 per cent. In 1904 our cogging mill rolled 30,223 tons of ingots; in 1909 the output was 64,240 tons, an increase of 114 per cent. In 1904, our finishing mills and forge department made and shipped 25,958 tons; in 1909 the product was 56,515 tons, an increase of 126 per cent. During this period we acquired the submarine iron ore deposits at Wabana and very extensive coal areas, and have largely developed the iron ore areas. The acquisition of the submarine iron ore and coal areas and the development of the iron ore property have added many millions to the assets of the company, which do not show in our statement of assets because we have only added the bare actual cost of the areas and the amount actually spent in their development. From two collieries in 1904 we have now five well equipped, and we are well prepared to look after the expanding coal trade of the company. We have erected a new forge at New Glasgow, and have also greatly increased the capacity and efficiency of our mills there. From an output in 1904 of 30,223 tons to 52,931 tons in 1909 is a large increase, and further extensions now being made are expected to give us next year an output of, say, 70,000. When it is considered that during all the period under review the company suffered from insufficient working capital, and that all the property I have spoken of was acquired and the extensions and betterments of plants were effected without any new capital available, I think the board can properly claim some credit for having carefully, wisely and successfully administered the property committed to their hands by the shareholders. As the accounts show, our finances are in a very satisfactory condition. I am, however, pleased to be able to tell you that since the report was distributed, we have disposed of a further \$1,500,000 of our bonds in London on favourable terms, and we have now ample funds on hand to provide for all improvements and extensions to our plant at New Glasgow, Wabana and Sydney Mines, contemplated for some years, and have, as well, ample working capital, for the company, as regarded from a financial point of view or from the standpoint of its physical condition, was never better than it is at the present time.

"The remaining \$1,000,000 of bonds the directors consider it unnecessary to sell, as the money is not now required. In addition to this \$1,000,000 of bonds in the treasury, we have power to dispose of \$6,000,000 of debenture stock if and when it is required for future developments or extensions or other purposes of the company. During the past few years when we were developing our coal and iron areas we were handicapped by not having any securities in the treasury which could be issued to provide for such capital expenditure. Having experienced this difficulty, your directors determined when reorganizing the finances of the company that ample provision should be made for its future requirements. The importance of this cannot be over-estimated. Another very gratifying feature of our

report is the fact that we have not added one dollar to our property account by reason of the premiums paid on the redemption of our old bond issues nor the discount on the sale of the 3,500,000 of debenture stock disposed of and referred to in the report.

"The substitution of the new 5 per cent. fifty-year bonds with a sinking fund of one-half per cent., in place of the previous bond issues upon which we were paying 6 per cent. interest and 2 per cent. sinking fund, will effect a large saving in interest has given us a large capital for further developments of our property and provided us with ample working capital, and, notwithstanding the additional capital thus secured, our fixed charges will not be materially increased. In 1904 the company sold its consolidated 6 per cent. bonds at 87½ per cent. of par, so that the company then paid interest at the rate of 6.86 per cent. for its money. In 1904 our 5 per cent. fifty-year bonds realized 94 per cent. of par, making our interest rate 5.32 per cent., or a little over 1½ per cent. less than on the loan made in 1904. You are all aware that during the year we issued to our shareholders a stock bonus of 20 per cent., thus compensating for the dividends which we considered it unwise to pay out during the years when we were using so large a proportion of our earnings for capital expenditure.

"I feel that you are to be congratulated on the improved financial condition of the company, and the prospects for the future. There has been a marked improvement in the iron and steel business in Canada, and unless something unforeseen happens, we believe that 1910 will be the best year in the company's history. The development of the submarine iron ore properties at Wabana has verified our expectations in regard to it, and there is no longer any doubt as to the enormous value of the areas.

"With regard to the important question of future dividends on the common stock of the company, I can see no reason, in view of the present financial position of the company and the power we possess to issue securities to provide for any extensions of our business, why a reasonable proportion of the earnings of each year should not be paid to the common shareholders.

"The board have already declared a dividend of 1 per cent. for the first quarter, and if the earnings of the company for the balance of the year prove to be as large as they now promise I think a substantial increase should be made before the end of the year to the present rate of dividends on the common stock. I do not think there are any other matters in the report which call for further remarks from me at this time, and I therefore move the adoption of the report and financial statements."

NIPISSING ANNUAL.

The annual meeting of the Nipissing Mines Company will be held in Augusta, Me., on April 25th, at 2 p.m.

On April 1st the Buffalo paid 5 per cent. to its shareholders and will pay a bonus of 3 per cent. on May 16th. These disbursements will make total return to shareholders of 73 per cent. of the capital stock.

DOMINION IRON AND STEEL.

The output of the Dominion Iron & Steel Company for the month of March was very heavy, and the shipments also were heavy for that month.

The March figures follow:—

	Tons.
Pigs	22,320
Ingots	25,809
Blooms	22,870
Rails	13,680
Rods	7,730
Shipments	25,180

STATISTICS AND RETURNS

STATISTICS AND RETURNS.

The shipments of the Hill Crest Coal & Coke Company for March amounted to over 16,000 tons. Mr. Brown, the new manager, is on the way to take charge of the property.

COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending April 8, and those from January 1, 1910, to date:—

	April 8.	Since Jan. 1.
	Ore in lbs.	Ore in lbs.
Buffalo	52,900	522,528
City of Cobalt		300,445
Chambers-Ferland		58,000
Cobalt Central		295,186
Cobalt Lake		132,000
Colonial	43,000	107,260
Coniagas		434,096
Crown Reserve	62,500	1,507,570
Drummond		664,200
Hargraves		41,800
Hudson Bay		123,695
Kerr Lake	240,190	1,919,079
King Edward		134,506
La Rose	146,400	2,147,570
McKinley-Darragh		725,441
Nipissing	252,817	2,953,004
O'Brien	61,700	453,006
Peterson Lake		170,450
Right of Way	61,178	509,717
Silver Cliff		66,010
Temiskaming		238,300
Trethewey	61,673	254,650
Waldman		63,992

Ore shipments for week ending April 8 were 982,958 pounds, or 491 tons.

Total shipments from Jan. 1 to April 8 were 15,066,984 pounds, or 7,533 tons.

The total shipments for 1909 were 30,098 tons.

TRAIL SMELTER.

The Consolidated Mining & Smelting Company of Canada, Limited, report ore receipts at Trail Smelter for week ending April 2nd and year to date, in tons, as follows:—

Company's mines—		
Centre Star	4,775	50,198
St. Eugene (concentrates)	128	4,775
Snowshoe	3,298	49,676
Richmond-Eureka	58	1,278
Sullivan	108	2,270
Other mines	1,257	23,554
Total	9,624	131,751

B. C. ORE SHIPMENTS.

The ore shipments for week ending March 26th are slightly below the average this week owing to decline in tonnage from the Granby mines. Appended are the details:—

Boundary.

	Week.	Year.
Granby	23,582	308,838
Mother Lode	8,000	106,805
Oro Denoro	360	3,480
Snowshoe	3,240	46,378
Wellington		11
Other mines	11	152
Total	35,193	465,664

Rossland.

Centre Star	3,822	45,423
Le Roi No. 2	708	7,312
Le Roi	259	3,277
Le Roi No. 2, milled	300	3,600
Other mines		248
Total	5,089	59,860

Slocan-Kootenay.

St. Eugene, milled	2,775	33,300
Whitewater, milled	600	7,200
Van Roi, milled	800	9,600
Bluebell, milled	1,000	12,000
Kootenay Bell, milled	10	840
Granite-Poorman, milled	250	3,000
Queen, milled	420	5,040
Nugget, milled	110	1,320
St. Eugene	369	4,647
Richmond-Eureka	76	1,220
Blue Bell	183	1,054
Whitewater	86	613
Rambler-Cariboo	23	250
Emerald	19	1,092
Molly Hughes	20	161
Sullivan	245	2,162
Silver King	61	965
Utica	20	57
Second Relief	16	37
Lightning Peak	21	21
Other mines		5,327
Total	7,164	89,906

SMELTER RECEIPTS.

Granby	23,582	308,958
Consolidated Company	9,559	122,125
B. C. Copper Co.	8,360	110,285
Total	41,501	541,368

MARKET NOTES.

New York, April 8.—The foreign visible supply of copper during March showed a falling off, the decreases totalling 4,524,000 pounds, making the foreign visible as of April 1, 249,625,600 pounds. For the preceding 10 consecutive months the visible supply increased monthly, beginning at 114,068,800 pounds, as of May 1, 1909, and reaching the high mark of 254,150,400 pounds at the end of February.

The decrease in the foreign visible permits of an increase in the United States stock for March of 4,500,000 pounds without

changing the statistical position of the market.

Exports for March were larger than the earlier government figures indicated, totalling 43,771,840 pounds. It is expected that the producers' statistics for March will show at least 45,000,000 pounds shipped to the other side, which improves the prospects for a small decrease in the United States stocks, provided production declines and domestic deliveries are up to expectations.

SHARE MARKET.

(Courtesy of Warren, Gzowski & Co.)

Miscellaneous.

Amalgamated Asbestos	28	28½
Dominion Coal Company	68½	69
Dominion Steel Company	67	67¼
Nova Scotia Steel	83½	84½
Granby	42	44
Consolidated Smelting	82½	86
Crows Nest Pass		86

Cobalt Stocks.

Amalgamated	.06%	.06%
Beaver Consolidated	.36%	.36%
Buffalo	2.75	offered
Chambers-Ferland	.38½	.39½
City of Cobalt	.33	.34¼
Cobalt Central	.12½	.15
Cobalt Lake	.28½	.28½
Coniagas	5.20	5.60
Crown Reserve	3.45	3.55
Gifford	.11¾	.12
Foster	.23¾	.24½
Green Meehan	.07	.08
Great Northern	.09¼	.09¾
Hudson Bay	105.00	109.00
Hargraves	.39¾	.41
Kerr Lake	8.62½	8.87½
La Rose	4.25	4.35
Little Nipissing	.24½	.24¾
McKinley-Darragh-Savage	.93	.94½
Nancy Helen	.11½	.12½
Nipissing	10.07	10.25
Nova Scotia	.40½	.41¾
Otisse	.07	.08
Peterson Lake	.26	.26¾
Rochester	.18½	.19
Silver Leaf	.09	.09½
Silver Bar	.10	.13
Silver Queen	.14	.18
Temiskaming	.74½	.75
Trethewey	1.38½	1.39½
Watts	.11	.13
Ophir	.47	.65
Wettlauffer	.98	1.01

New York Curb.

Boston Copper	17	19
British Columbia Copper	6¾	6½
Butte Coalition	22	23
Chino Copper	13¼	13¾
Davis-Daly Copper	23½	25½
Ely Consolidated	1¼	1¾
Gila Copper	6¾	7½
Giroux Mining	8	8½
Goldfield Consolidated	7¾	7 13-16
Greene-Canadian	8¾	9

Inspiration Copper	7¾	7¾
Miami Copper	23¾	23¾
New Baltic Copper	7	9
Nevada Con. Copper	20¾	21
Ohio Copper	3¾	3¾
Rawhide Coalition	29½	30
Ray Central	3 3-16	3 7-16
Ray Consolidated	19½	20
Union Mines	1¾	1 13-16
Yukon Gold	4 5-16	4 7-16

SILVER PRICES.

	New York.	London.
	Cents.	Pence.
March 22	52½	24
" 23	51¾	23¾
" 24	52	23 15-16
" 25		
" 26	52¾	24½
" 28	52	
" 29	52¼	24 1-16
" 30	52¾	24½
" 31	52½	24 3-16
April 1	52½	24½
" 2	52½	24½
" 4	52½	24½
" 5	52¾	24 1-16
" 6	52¾	24 1-16

TORONTO MARKETS.

Metals.

April 8.—(Quotations from Canada Metal Co.)

- Spelter, 5¾ cents per lb.
- Lead, 3.70 cents per lb.
- Antimony, 8 to 8½ cents per lb.
- Tin, 34.50 cents per lb.
- Copper, casting, 14.10 cents per lb.
- Electrolytic, 14.10 cents per lb.
- Ingot brass, 9 to 12½ cents per lb.

April 8.—Pig Iron—(Quotations from Drummond, McCall Co.)

- Summerlee No. 1, \$23.50 to \$24.00 (f.o.b. Toronto).
- Summerlee No. 2, \$23.00 (f.o.b. Toronto).
- Midland No. 1, off the market.
- Coal, Anthracite, \$5.50 to \$6.75.
- Bituminous, \$3.50 to \$4.50 for 1¼-inch lump.

Coke.

- April 6.—Connellsville coke (f.o.b. ovens).
- Furnace coke, prompt, \$1.90-\$2.00 per ton.
- Foundry coke, prompt, \$2.65-\$2.75 per ton.

April 6.—Tin (Straits), 33.00 cents.

- Copper, prime Lake, 13.55 to 13.65 cents.
- Electrolytic copper, 13.15 to 13.25 cents.
- Copper wire, 15.25 cents.
- Lead, 4.45 cents.
- Spelter, 5.70 cents.
- Sheet zinc, (f.o.b. smelter), 7.75 cents.
- Antimony, Cookson's, 8.37½ cents.
- Aluminium, 23.50 to 24.00 cents.
- Nickel, 40.00 to 49.00 cents.
- Platinum, ordinary, \$29.50 per oz.
- Platinum, hard, \$35.00 per oz.
- Bismuth, \$1.75 per lb.
- Quicksilver, \$48.00 per 75-lb. flask.