

THE CANADIAN MINING JOURNAL

VOL. XXXI.

TORONTO, February 1, 1910

No. 3

The Canadian Mining Journal

With which is incorporated the
"CANADIAN MINING REVIEW"

Devoted to Mining, Metallurgy and Allied Industries in Canada

Published fortnightly by the

MINES PUBLISHING CO., LIMITED

Head Office Confederation Life Building, Toronto.
Branch Offices Montreal, Halifax, Victoria, and London, Eng.

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SUBSCRIPTIONS—Payable in advance, \$2.00 a year of 24 numbers, including postage in Canada. In all other countries, including postage, \$3.00 a year.

Advertising copy should reach the Toronto Office by the 8th, for the issues of the 15th of each month, and by the 23rd for the issues of the first of the following month. If proof is required, the copy should be sent so that the accepted proof will reach the Toronto Office by the above dates.

CIRCULATION.

"Entered as second-class matter April 23rd, 1908, at the post-office at Buffalo, N.Y., under the Act of Congress of March 3, 1879."

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THE OLEAGINOUS MR. HENSHAW MADDOCK.

Mr. Henshaw Maddock occupies Suite 9, 10, 11, No. 205 Yonge Street, Toronto. Also he occupies a great deal of advertising space in our dailies. From his portrait, of which he is justly proud, we judge that Mr. Maddock is a person of engaging manners, and of convincing speech.

Mr. Maddock is promoting the sale of shares in the California-Alberta Oil Company. Some time ago we filed away for future reference, a copy of his prospectus. It is quite possible that this prospectus would have remained innocently in the file, had not our correspondent drawn our attention to one or two inaccuracies contained therein.

After pursuing the California-Alberta Oil Company prospectus, and comparing it with our correspondent's letter we are led to believe that Mr. Maddock does not know what he is talking about—or does not care to know.

For instance, on page 7 of the prospectus, a quotation from a report, dated 1898, is credited to Dr. G. M. Dawson. The report was written by Mr. J. B. Tyrrell.

Another quotation, page 8 of the prospectus, is attributed to the Summary Report of the Geological Survey of Canada, 1905, page 7. No such statement is made in the Summary Report. Indeed, any official of the Survey making such a statement would lose his usefulness at once. The quotation reads thus: "The same oil belt was traced into the Athabasca regions, 250 miles north of Egg Lake, showing vast deposits of asphaltum, or tar sands in the Athabasca region." If Mr. Maddock does not realize that he is talking nonsense, we must seize this opportunity of informing him that such is the case.

On page 8, moreover, the reader is told that the Canadian Government pays a bounty on crude oil. This is perfectly true. Unfortunately the Canadian Government, in its blindness, insists that you must first get your oil.

In many other respects the prospectus before us is a network of silly exaggeration. We may be pardoned if, since Mr. Maddock has seen fit to misquote Dr. Dawson, we reproduce here exactly what Dr. Dawson did write of the Egg Lake district. Here it is:—

"It does not follow however, that this would be a specially favourable locality in which to test the beds of the lower Cretaceous by boring, for on the contrary our knowledge of the geological structure of this part of the country indicates that the depth at which these beds lie, is here very great, probably, at least 2,500 feet, and possibly much more" Our correspondent continues thus: "After this was written the well at Victoria had

to be abandoned at 1840 feet, without reaching the lower Cretaceous (supposed oil bearing rock). A private well near Morinville is now down, somewhere near 1900 feet, without reaching it, and two wells near Calgary are down 3,400 feet, without reaching it. It is only fair to state, however, that at Calgary there is a greater thickness of overlying formation than is to be expected near Edmonton. At Pelican, 150 miles north, there is only about 800 feet of overlying formations to penetrate, and going eastward the overburden also rapidly thins down."

In short, we may safely conclude that Mr. Maddock and his associates are trading upon the exploration work, actually being done in Alberta by competent men. A conclusion even more safe for Mr. Maddock is that it is time for him to shut up shop.

THE QUARTERLY BULLETIN OF THE CANADIAN MINING INSTITUTE.

Two years have passed since the Council of the Institute decided to publish the technical papers contributed by its members in the form of a regular quarterly bulletin. The experiment was eyed with disfavour by not a few. It was considered that the annual volume satisfied all needs, and the added expense was unnecessary.

However, the judgment of the Council has been vindicated. The Quarterly Bulletin, has not only been well received, but it has kept interest continuously alive. It has bridged the twelvemonth gap between meetings.

We have before us Bulletin No. 8, for December, 1909. Its contents warrant more than casual commendation. Within its covers are no less than fifteen papers. Papers that in all essentials conform to the highest standards.

Particularly impressive is the variety of topics presented. Shaft sinking, ore sampling, coal, copper, iron, chrome, dynamite, are among the subjects indicated by the titles. Several essays on general questions are to be found. In fact this diversity is a most marked and creditable feature of this particular bulletin, also it is exceedingly difficult to attain. Only suffering editors know the depths to which the average mining man will descend rather than write an article. He promises with fervour. He postpones with equal fervour. But perform he will not except as a dernier ressort. Yellow bate allures him not. Therefore, when Mr. Secretary Lamb lands a basketful of fine fish on bare hooks we take off our hat.

Eight of the fifteen papers are contributed by students. We have compared these with the student papers of former years, and we have no hesitation in declaring in favour of this year's crop.

The gold medal, awarded annually to the student whose paper is considered worthiest, was this year

awarded to Mr. N. L. Bowen, of the Kingston School of Mining. The second and third prizes went to McGill students. The task of judging the essays must have been peculiarly trying.

The policy of inciting students to honourable competition is wise. The Institute can hardly overdo this.

As for the other papers, it suffices to say that they are uniformly good. Noticeably timely is Dr. Fernow's "The Relation of Mining to Forestry." This and other papers we shall discuss more fully at another time.

It is only necessary to add that praise is due Mr. Lamb for the care and discrimination with which he has edited the Bulletin. The Canadian Mining Institute has every reason to be proud of its publications.

AN INDISCREET OFFICIAL.

Discretion is a virtue without which a Government official cannot thrive. Dominion officials are paid servants of the nation. Dr. Eugene Haanel occupies a very responsible and important position. He is Director of the Mines Branch of the Department of Mines. In this capacity his duty is to aid the mining industry to the best of his ability.

A few days ago, at Ottawa, Dr. Haanel publicly criticized the metallurgical methods of the Canadian Copper Company. His criticisms were strong and, we believe, unjust. But, in any case, Dr. Haanel has neither the right nor the technical knowledge to offer criticisms on one of the most modern and most effective metallurgical plants.

Before going further, we may state that we hold no brief for the Canadian Copper Company. Our columns are open to any fair comments on that company. Our position, however, is this: Dr. Haanel, as a public servant, has openly attacked a large industry. Dr. Haanel has therefore laid himself and his Branch of the Department of Mines open to criticism. And incidentally, there is evidence of growing dissatisfaction with the work of the Mines Branch. It now devolves upon Dr. Haanel to substantiate in detail his strictures upon the methods of the Canadian Copper Company. He must show cause, or make instant retraction. We need hardly point out that the Hon. Mr. Templeman, as Dr. Haanel's immediate superior, is strictly accountable for the vagaries of his subordinate.

We shall look forward to Dr. Haanel's explanation with much interest.

RAILWAY STATISTICS.

Government returns concerning the freight traffic on Canadian railways throw light upon the part that mining plays in the industrial life of the Dominion.

During the year ended June 30, 1909, the total freight carried on the 24,104 miles of Canadian railways amounted to 66,842,258 tons—formidable figures indeed. We find under the heading "Products of Mines" 35.81

per cent. of this total, or 23,931,061 tons. In other words, the mining industry provides more than one-third of all the freight moved by our railways.

Comparing mining with agriculture, the returns shew that to the latter industry can be attributed hardly 50 per cent. of the tonnage credited to the former. Products of forests almost equal those of agriculture, both standing at less than 18 per cent. of the total freight moved. Manufactures account for 11.82 per cent.; products of animals, merchandise, and miscellaneous materials making up the balance.

The items classified as products of mines are anthracite coal, bituminous coal, coke, ores, stone, sand, and "other products." The last vague item forms an inconsiderable part of the whole. It is to be noted that cement, bricks, lime, and all metallurgical products are excluded. Nor is petroleum, which is essentially a mineral, included.

We often wonder if our railway corporations really know how dependent their enterprises are upon the mining industry. The figures above quoted are certainly well within the truth. Probably any different classification would place mining in an even higher position. But as they stand they are eloquent enough.

A COMPARISON.

One of the most irritating fictions, and one that is constantly reiterated, refers to mining. It is popularly believed that mining is essentially a dangerous calling. No amount of reasoning convinces the lay mind that this is not the case.

A comparison of statistics may convince where reasoning fails.

More than eighteen thousand men are employed in the collieries of Nova Scotia. During 1908 there were 41 fatal accidents at these collieries. To be exact, there were 2.2 men killed for each 1,000 employed.

Last year the railways of Canada employed 19,443 trainmen. Of these 113 were killed. That is, the fatality rate was 5.8 per 1,000 men employed. As this is considerably more than twice the rate obtaining in Nova Scotian collieries, the moral is obvious.

THE BARTLETT FIASCO.

To no Gowganda prospect was so much newspaper puffing given last winter, as to the Bartlett. The mine has now been closed; the promoter has been exposed; and the shareholders are wondering where they come in.

Comment is superfluous. Incompetent technical management, and prodigal waste at headquarters always bring the one result. But, there yet remains the consideration that the men who permitted their names to decorate the prospectus, are morally and legally liable. The Hon. Mr. Harcourt and his fellow-directors, if they wish to retain the respect of honest men, will assuredly come to the rescue.

EDITORIAL NOTES.

The annual meeting of the Canadian Mining Institute will be held at the King Edward Hotel, Toronto, on March 2, 3 and 4. A fine list of papers has been promised. All arrangements have been completed as to special railway rates, accommodation, etc.

In a review of last year's silver market, reprinted on another page, Messrs. Samuel Montagu & Co., point out that even if a gold standard were to be adopted by China, the demand for silver would not be seriously affected. The development of the Empire's internal wealth will provide a growing market for years to come.

HOUSE CLEANING APPLIED TO MINERAL LANDS IN ONTARIO,

By G. R. Mickle.

In the Ontario Gazette of December 18th ult., and in the three successive issues appears a long list of lands in default of taxes and therefore subject to forfeiture on the 30th of June 1910, if the taxes are not paid before that date. This is the first systematic clean-up since the province made its first grant of land as mining land in 1852 about two generations ago. It is true there have been tax sales under the Algoma Land Tax from time to time, but this act did not apply to the whole province.

It will be noticed that the parcels of land advertised are of all sizes from the 10 sq. mile or 6,400 acre location of the early days down to fractions of 10 acres. Fancy granting an area equal to 160 claims of 40 acres in one block! These lands, which the present owners take no interest in, no doubt once represented great hopes. The fact that they now revert to the Crown is a striking illustration of the gulf often fixed between Expectation and Fulfilment.

Taking the list as a whole it will be seen that 247,037 acres are in arrears for taxes or about 29 per cent. of the total area subject to the Supplementary Revenue Act under which the tax is levied and the lands become subject to forfeiture. In a paper read by me before the Canadian Mining Institute last annual meeting, the working of this Act was fully explained. It applies only to mining lands in territory with no municipal organization. The policy long since abandoned, of selling outright large areas has evidently only resulted in tying-up a large amount of land for a long time to the benefit of no one.

By districts the areas advertised as subject to forfeiture are as follows:—

Kenora and Rainy River				
Districts	4,072	"	"	29% "
Thunder Bay District	96,371	"	"	23% "
Algoma District	36,336	"	"	30% "
Sudbury District	18,230	"	"	22% "
Nipissing District	5,249	"	"	37% "
Parry Sound and Muskoka				
Districts	4,072	"	"	29% "

Since the list was first published the area in Kenora and Rainy River has been somewhat reduced by the payment of amounts due.

It may be anticipated that before the 30th of June the number of acres will be further diminished, and that finally something like 200,000 acres will probably revert to the Crown. This should stimulate prospecting in the Western part of the Province where most of the land that will be re-vested in the Crown lies. It is to be hoped that some valuable discoveries will be made as a result.

POLITICAL AND MISCHIEVOUS INTERFERENCE WITH INDUSTRY.

Written for the Canadian Mining Journal, by J. J. Harpell.

One of the most disastrous conditions into which a country and its government can drift is that which forces companies and other corporations to keep representatives in the government lobbies and to retain the services of legal lights in order to protect their interests from the interference of men who are actuated by the hope that these companies and corporations may find it to their advantage to quiet them by purchasing something that they have to sell or in some other way remunerate them for their silence. Legislation and investigation, and the rumours of both, that proceed from the work and talk of the mysterious men who are advertised as representing foreign governments or as speaking for large amounts of capital that are ready to be invested in Canada if such and such legislation is passed, result in more harm than good.

A short time ago considerable publicity was given to the rumour that an export duty would shortly be put on Canadian asbestos in order to compel its further manufacture within the country. The effect of this rumour has been to increase the efforts of the foreign manufacturers to look for their supplies elsewhere in order to be independent of the Canadian material.

The rumour that is now being featured on the front pages of our dailies and receiving considerable attention in their editorial columns, is that something is to be done to prevent the large and increasing exports of nickel. This rumour seems to have emanated from a man, of whom little is known, who claims that the present producers of nickel, by keeping up the price of the metal, make it difficult for other capital to be invested in the industry. One would think that this fact would encourage the investment of more capital rather than deter it. He claims that nickel can be manufactured for much less than is admitted by the present producers, yet he advocates that the Government should subsidize the industry by means of bounties. According to the *Globe* of Jan. 20th, he advises, "that in the interests of the Dominion and the Empire as a whole, the Canadian Government should step in and take over the ownership, or otherwise provide for Government control of these nickel deposits [the Sudbury nickel deposits] . . . as a matter of imperial urgency it was important that Great Britain should be placed in a position of advantage over all other countries by securing control of the world's nickel resources, both from the standpoint of naval supremacy and from the standpoint of industrial development. At present the trust, by keeping down production, kept the price of nickel so high that practically only governments were able to purchase it in anything like large quantities." How ridiculous and imaginary do these statements appear in the light of the following facts:

1st. At present Canada produces only about sixty per cent. of the world's consumption of nickel.

2nd. The present holdings of the so-called nickel trust in Canada comprise but a small part of the known nickel deposits of the Dominion. Thus there is ample opportunity for this expert and his cheaper process to produce nickel independent of the present producers. If the buyers of nickel are being held up, as he claims,

they will be very glad to buy what he has to offer at a lower price.

3rd. British interests at present have a large share in this so-called nickel trust. In some quarters it is believed they control it. The remainder is owned by citizens of Great Britain's most trusted ally.

4th. Apart from the nickel required for coinage, governments do not purchase nickel.

5th. The British Navy Yards build war vessels for any country from which they can get a contract.

Unfortunately, the agitation which this nickel expert is creating is apt to impress the man in the street, because the manner in which the Dominion Government treats the Canadian nickel production has left him with very false notions of the profits which the producers of nickel are making. According to the report of the Bureau of Mines of Ontario, in which province all the Canadian nickel is produced, the value of the nickel production for 1908 was \$1,866,059. But according to the Dominion Government reports it was \$8,224,180. The difference between these two amounts is due to the fact that the Ontario valuation represents the value of the nickel as it is exported from Canada, while the Dominion valuation is arrived at by multiplying the number of pounds exported by the quoted price of refined nickel in the markets of the world. It is assumed that this price in 1908 was 43 cents. This figure is so far from being the actual price received by the producers that it would be nearer the truth if it were cut in two. Why the Dominion Government should place the nickel producers in such a false light it is difficult to understand, unless the very serious falling off in Canadian exports and production of almost all commodities has forced it to take advantage of every opportunity to inflate.

Another feature of the agitation that is bound to impress the man who has no more information than what he gathers from the daily papers, is the attempt which a Government official, in a speech before the Conservation Commission, made to discredit the excellent work that is being done by the Canadian Copper Company, the largest producer of Canadian nickel. This company, without the slightest assistance from the Canadian people in the way of either bonuses or tariffs, has built up the finest and most up-to-date nickel mining and smelting plant in the world. It is to the efforts and energy of this company more than any other that Canada owes her proud position of being the largest nickel producer in the world. This company is now supplying regular employment to some 1,500 Canadian workmen. But, notwithstanding these facts, Dr. Eugene Haanel, Director of the Mines Branch of the Department of Mines, has seen fit to say that this company employs "an inconsiderable number of men," and uses a process that is "extremely wasteful."

For the last ten years the mining men of Canada have tolerated Dr. Haanel with an indulgence that is eloquent in its prayer for a strong reforming hand or the sickle of Father Time. During this time the mining industry has suffered much from the work of his department. One example will suffice. About the year 1900 Canada was producing over ninety per cent. of the world's consumption of the superior grades of

asbestos. At present she is producing not more than sixty per cent. of these grades. The period at which the change began to set in is coincident with the date at which Dr. Haanel's department began to be interested in the industry. From that time there has been company promotion and flotation at the expense of development and production, and a wide distribution of promoters' literature of a kind that has done much to hurt the market for the Canadian material. The manner in which a subordinate, working under Dr. Haanel, has lent himself and the prestige of his office to this company promotion, and personally profited by it, is a disgrace to the civil service of Canada. Under the guise of a Government official he entered upon and examined freehold properties, manipulated until he got advantageous options on them, and then sold them to company promoters.

Asbestos and nickel are two of the very few industries of Canada that have been built up to exceptional proportions entirely on their own merits. They have had none of those artificial assistances such as bounties or tariffs, which in other industries have meant such a tax and drain on the country. On the contrary, they have both been taxed by provincial and local authorities. The success which both have attained has done much to advertise the exceptional mineral wealth of the Dominion. In both cases the markets for the products have had to be found outside of Canada. In both cases the problems of mining, manufacturing and marketing had to be solved for the first time. There was little to be gained from the experience of the past in this or other countries, because they were new industries.

On the whole these are industries of which the people of Canada should be proud, and grateful to those who have made them. Instead of allowing them to be bled, or hampered by the proposals of dreamers and company promoters, they should be protected and encouraged, and everything done to permit them full and free development under the most natural and advantageous conditions. By this is meant that everything should be done which would improve the facilities and rates of transportation, banking and the costs and conditions of living.

What is the Dominion Government doing to assist the industries of our country in this respect?

Nickel ore can be profitably mined in New Caledonia, transported some 12,000 miles, and delivered in the ports of Great Britain and other European countries for about \$8.50 a long ton, or about the cost of transportation alone of ore from Sudbury to the European markets, a distance of only 3,500 miles. Proportionate to the distance, the freight rates on Canadian asbestos are equally exorbitant. It costs more to ship a ton of mica from Ottawa to Montreal than it does to bring the same quantity from India to New York. India is Canada's greatest competitor in mica. China Clay enters into competition with Canadian talc in a number of important uses, yet China Clay from France or England is carried from either St. John, New Brunswick, or Montreal, to Windsor, Ontario, for much less than talc is carried from Madoc, Ontario, to either Windsor or St. John. All other Canadian ores are equally handicapped in the matter of freight rates, notwithstanding that Canadian railways and transatlantic steamship companies have been much more heavily subsidized than those of any other country.

In passing through the port of Montreal for export, a ton of feldspar worth about three dollars, pays the same port tariff as does a ton of tobacco leaf coming into the country. The tax on a ton of nickel ore

or mica is considerably higher. The whole schedule of Montreal port charges seems to have been compiled with little idea of how it might interfere with the export of low-priced products, particularly ores. In view of the importance of encouraging the development of our natural resources there is little to support a policy which imposes any port charge on exports, and less to support a charge that amounts to over five per cent. of the value of the goods, particularly when there are no facilities for transshipping, and when the goods are transhipped over side of the vessel in the harbour without being landed on the wharf. Most other countries whose products enter into competition with those from Canada in the markets of the world have free ports.

But one of the greatest injustices to exporters of Canadian products lies in a system that is maintained by the transatlantic shipping combine, by which a special tax is imposed on the purchasers of Canadian goods entering the port of London. This tax is known as the "London Clauses" charge. The conditions of this charge and the rates of tax it imposes, are to be found on all Bills of Lading issued in Canada. This tax is levied only on goods coming from Canada and the United States. Although it is generally paid by the purchaser, yet it comes out of the exporter, because he is forced to accept prices for his goods lower by the amount of these "London Clauses" charges than those received for similar goods from any other part of the world. Feldspar from Sweden, mica from India, or talc from France and Italy, comes into the port of London free, but similar material from Canada is taxed 42 cents a ton. Cheese from New Zealand or Denmark or Holland comes into the port of London free, but cheese from Canada pays 79 cents a ton, etc. In the case of some low-priced commodities this tax is sufficient to shut out the Canadian article. The port of London authorities receive no part of this charge. It is all returned to the shipping companies that carried the goods from Canada.

In the matter of banking accommodation, the Canadian producer and exporter is also handicapped. On his discounts and accommodations he pays a higher rate of interest than his competitor in any other country. During the last few years Canadian exporters have been unable to get their drafts, drawn against Bills of Lading, discounted for less than six per cent., and in many cases they paid seven. In most other countries similar commercial paper is discounted at from 2½ to 3 per cent. Loans to the producer of either mineral, agricultural, or other commodities are made at rates between seven and nine per cent. In most other countries such loans seldom exceed five, and in most cases are made at rates not exceeding four.

It is, to say the least, an insult to the intelligence of the people of the Dominion for the Canadian banks to attempt to justify their excessive foreign call loans by claiming that they have more money than they know what to do with, and at the same time charging the industry of the country the excessive rates they do.

Money and credit is the life-blood of industry, and the banking systems the veins through which it flows. If the money is drawn off from any country or community the industries in that country or community become sluggish or dry up. The more successful and active industry becomes, the more does it require money. The agricultural communities of France are among the most successful and wealthiest of any in the world. Yet the laws of France are framed so that the French farmer can borrow money at low rates of interest. By its charter the Bank of France is required to lend

40,000,000 francs to the co-operative agricultural banks, free of interest. These in turn lend it to the farmers at rates not exceeding three per cent. The agricultural and other producers of Germany and Denmark get their loans at 3 and 3½ per cent. Those of New Zealand and Australia never pay more than 5, and the greater part is borrowed at 4¼ per cent. The Canadian banking system, on the contrary, is built, and proceeds upon the principle that the success of any community is measured by the amount of bank deposits which that community contributes to the money centres of the world. According to the May bank statement, the foreign call loans of the Bank of Montreal were \$90,440,910, or \$3,747,317 more than all the savings deposits which the Canadian people had in that bank at that time. Now there are communities which are entirely dependent upon this bank for their accommodation. How can any bank in such a condition be expected to give it?

Of course, they do not give it, and they avoid direct refusal by exacting an exorbitant rate of interest and by questioning the security offered. There are two reasons why the Canadian banks prefer to loan in the stock markets on call. 1st. In time of dear money they get a higher rate of interest, and, 2nd, in times of cheap money they profit by the increase in the value of stocks, in which the Canadian banks are always large speculators. The people of Canada and its Parliament will make a great mistake if they permit a revision of the Bank Act without first appointing a Royal Commission to thoroughly investigate the workings of the Canadian banks and to carefully study the banking systems of other countries. The present Canadian Bank Act and its administration are sapping the life of the industries of Canada, while of our bankers it is making multimillionaires and penitentiary convicts, according as they succeed or fail in their stock speculations with the people's savings.

Another condition that is attaining alarming proportions and making the position of the producer almost unbearable is the increased cost of living. Owing to this the employer is being pressed by his workmen for higher wages, which, if granted, will increase the cost of his production and make it more difficult for him to sell his products in the markets of the world in competition with those from other countries that have been produced under conditions of lower costs of living. On the other hand, the employer recognizes how difficult it is becoming for his workmen to live on their present rate of wages. Those who have given this question only a superficial consideration are apt to charge the increasing cost of living to the avariciousness of the Canadian farmer. But a careful study of the question reveals nothing to support this contention. On the contrary, the Canadian farmer is suffering from the increase in the cost of living as much, if not more, than any other class in the country. Salaried officials have had their salaries increased. Labourers have had their wages raised. But the farmer, whose profits, even under the most favourable conditions, were never large, is compelled to work along as best he can without any such assistance, while he sees the costs of his living and production increasing much more rapidly than the price of his products and thus wiping out what little profit he used to make. The first to feel the pinch of such a condition is the poor and unscientific farmer, who, in order to make ends meet, begins to grasp at every opportunity to earn an extra dollar, and a diffusion of effort sets in that further aggravates the situation, and brings about a decrease in production. That

the present high cost of living is due to a rapid decrease in the production of agricultural commodities may be gathered from the pages of almost every agricultural report issued. The effect of the increased cost of production on the Canadian farmer is much more fully dealt with in an article entitled "Canada and Tariff Reform," which the writer has contributed to the January number of the Contemporary Review.

Thus, from almost every point of view, conditions in Canada are becoming more and more difficult for industry to thrive, the products of which have to find a market outside of this country. To permit such industries to be harassed by political interference or to hamper them by unreasonable restrictive legislation, is to drive them out of the country just as soon as they can get their supplies elsewhere.

Moreover, it incites these industries to make special efforts to exploit foreign fields and discourages the exploitation of our own unprospected and undeveloped areas.

SOUTH LORRAIN.

Notes by Frank C. Loring.

Two problems in South Lorrain are; proper roads and cheap power.

The power problem will be solved by the advent of the "Mines Power, Limited," bringing electrical energy from Matibitchouan Falls. No expense has been spared in this enterprise. At present the sparse growth of wood, or coal brought from Haileybury at great expense, is utilized.

There is no summer road from South Lorrain to Cobalt, Haileybury, or elsewhere. Steamers supply transportation from Haileybury to Silver Centre, and from there to the mines, there is no means of transportation excepting roads which are a disgrace.

The Government has overlooked the enormous expenditures being made by various companies, and has not considered that district in its appropriation for road construction. It would seem that an enlightened policy would dictate the co-operation of the Government in solving the transportation problem.

The Keeley Mine, after having experienced considerable trouble because of insufficient gas producing facilities, has now overcome all difficulties and is operating with full force.

The Wetlaufer Mine, has completed constructions of station, at 140-foot level, and shaft has been sunk to 160 feet and is being timbered. Upon completion of the timbering, sinking will be continued, electrical power plant is to be installed.

On the Newman Mine a shaft is being sunk. Present depth is 45 feet. This is upon the vein, upon which the rich surface showings occur.

The Maiden Mining Co. is sinking a shaft on a large fissure in Keewatin and some very rich ore is being uncovered.

The South Lorrain Development Co., is about to start to tunnel some fourteen veins, which have been uncovered. These veins will be cut at between 200 and 300 feet, in depth.

On the Adair Mine a shaft is being sunk and from the hundred foot level a cross-cut will be made to intercept several veins known to exist on the surface.

On the Williams a boarding-an-bunk-house has been erected and a shaft is being sunk, present depth 30 feet.

On a number of other claims development work is being done, there is greater activity and far more genuine development work, than at any time in the previous history of the camp.

CONDITION AND NEEDS OF MINING IN THE YUKON.

Extracts from Speech of F. T. Congdon, M.P.

The resident of eastern Canada, and also of western Canada, for that matter, is so deeply engaged in the development of his own section of the country that he takes very little interest in anything beyond it. The common notion with regard to the Yukon territory, or of any other part of our northern territory, is that it is a great barren wilderness filled with icebergs, behind which the inhabitants are dodging and trying to keep themselves from freezing to death. A greater misconception never existed. The hon. member for North Toronto has never been able, in any speech made in this House, to mention the Yukon territory, or the officials of the Yukon, without saying something derogatory of them. He knows no more about the Yukon territory, about the conditions there, than Balaam's ass knows about the Hebrew grammar. Now, the hon. gentleman tries to belittle the Yukon territory by saying that it has a population of less than 8,000, probably 5,000. If it has only 5,000, I say they are one of the most remarkable 5,000 that has ever been collected together in any part of this mundane sphere. Imagine what would happen in the rest of Canada if every unit of 5,000 people added so greatly to the wealth of the country as the 5,000 people in the Yukon territory. Last year, and for several years before that, the gold production of the Yukon territory fell off. It was absolutely inevitable that it should fall off. In the earlier days there happened in the Yukon territory what happened in every other mining camp. Men flocked into the richest spots and these were capable of being worked. Men who knew nothing of mining, only enough to dig a hole in the ground, found a gold yield sufficient to make their fortune. But that ground naturally gets worked out in time, and if you could live in the Yukon territory and visit that ground which yielded these immense fortunes, you would see a gold-bearing ground which I believe is richer than in any other part of the civilized world. The area which can be worked to-day is ten times as large as the area which could be worked nine or ten years ago. The area is increasing in extent and, is so enormous that its output only depends upon the cheapness with which it can be worked. Now the hon. gentleman should remember this fact. He blames this government for the falling off of the gold yield in the Yukon. I do not think the hon. gentleman seriously meant to say that, but perhaps he did. But I say that the falling off of the gold production was exactly what has happened in every other country between the first wild rush when riches are dug out easily, and the second stage when scientific methods are necessary to get the gold out of the ground. Last year our production in the Yukon was a little over two millions, this year it has jumped up to \$3,662,000. I venture to say that for the next ten years you will see an annual increase in the production of gold from placer ground alone with a continued improvement in the scientific mode of mining.

Now with regard to the government of the Yukon, and the reflections made by the hon. member on the government of that territory:—It must be remembered that in the beginning of the Yukon territory there occurred one of the most remarkable movements of men that has occurred since the Children of Israel started out from Egypt on their famous wanderings in search

of easier work and better pay. That movement differed from all other movements that I know of. We had a large body of men moving together. Other movements of men were homogeneous; they were composed of men of the same language and the same ideas, and because of that fact it was easier to control and manage them than a movement such as this in which were represented every nation in the world, every trade, every profession, every occupation and every degree of morality. We had the pious deacon and the pick-pocket, and we had the preacher deserting for a time his sacred calling in the hope of being able to add to his poor stipend by striking a good claim. The worst feature of this crowd, numbering about one hundred thousand, was that while there were splendid men amongst it—no better could be found in the world—and while the large majority was eminently fit, capable, respectable and good, there was a lack of confidence in one section of the crowd with respect to the others. It might be that a man in a little group knew nothing whatever about other groups, and the consequence was that the crowd that rushed in there was filled with distrust of itself and of its different constituents. This naturally created in the government of this country, being guided, I suppose, by the reports of the authorities who had the management of this country, a distrust which was likely to grow. I do not think that any government will be greatly blamed if it takes pains to maintain the integrity of its territory. That is one thing that every government, whether British or Canadian, will protect. No government will take any chance in regard to the integrity of its territory. This government took no chance with regard to maintaining the Yukon territory as a territory of the Dominion of Canada. It sent into that country a force which I think was needless. But, it is easy to be wise after the event. Those 155 battleships that the British government "scrapped" a few years ago were unnecessary, but at the time they were constructed they were not unnecessary. They served a purpose and the fact that they were ultimately "scrapped" is no condemnation of the action of the government in constructing them at a time when they were believed to be necessary. This government sent into the territory a large force of the Northwest Mounted Police. No better force could have been sent, although I am not given to overpraise of the Royal Northwest Mounted Police or any other body of men. I realize that they have their faults and failings. In addition they sent in a large field force. That field force cost Canada \$721,737. That was merely the result of the foresight of the Dominion government in taking such measures as would ensure the retention of the Yukon territory to the Dominion of Canada. In the public accounts the cost is included as a charge against the Yukon territory.

When one comes to ask for some vote for the Yukon, member after member will get up and say that the Yukon has been a loss to Canada instead of a profit, illustrating the unfairness of charging these extraordinary expenditures to that territory. In addition to that we are charged, not only with the original capital cost of the telegraph, but with the whole annual cost. I find that \$600,000 of the cost was for the portion of the

line in the province of British Columbia. Last year the expenses of operating that line were, in the Yukon territory, \$62,000, and the total cost of operating it in British Columbia was \$158,000. Although our cost was only \$62,000 we are charged with \$227,000. The total cost of constructing the telegraph line was something over \$700,000; the cost of the portion in British Columbia was \$600,000. That should be deducted. The cost of operating that line since its initiation in 1901 up to the present time has been \$1,070,000, of which \$500,000 has been expended in the Yukon, and has been charged against the Yukon. The way this occurs in regard to the telegraph is that originally it was treated as the Yukon system, and ever since all the expense incurred in British Columbia or anywhere else in connection with the Yukon telegraph system has been charged to the Yukon territory. I think the account should undergo revision in order to bring into it only those items which are legitimately and properly chargeable against the Yukon. I find in addition that \$283,000 of the amount paid as damages to Mackenzie and Mann is charged to the Yukon territory. I do not think it is fair to take that amount into consideration in estimating whether the Yukon has been a source of loss or profit to the Dominion of Canada. By including these various amounts the hon. member for North Toronto showed that the deficit of the Yukon amounted to \$2,300,000. I think if that account were corrected in the way I have indicated and in the way that, I submit to the Finance Minister and this House, is the proper and legitimate way to correct it, it will be found that the Yukon has a surplus of over \$3,500,000. In addition to that I wish to point out that it is utterly impossible to take the Yukon territory, or any other section of Canada, and make out from the public accounts the cost or benefit to the country of that particular section accurately and properly. The hon. member for North Toronto was surprised that while in 1900 and 1901 we had a surplus we had later used that up.

The government of this country adopted with the concurrence, with the express approval of the members of this House, a mistaken policy in the first place in respect to the Yukon territory which was only corrected about 1901. It is the same policy as is being adopted to-day in the province of Ontario and, without any reflection on the motives for the enforcement of that policy, I repeat that it is a mistaken one. It is based on the idea that the rest of the country can take a large mining district and make money out of it for the other public services of the country. That is not right, it is not the right policy with regard to any large mining territory to impose any taxes in addition to those which are imposed on the whole country and to expect that the rest of the country and not that particular territory will get the benefit of the special taxes so imposed. I think that a very few years will demonstrate the lack of wisdom, for instance, of the province of Ontario, in thinking they can take such a large royalty from the mining production of Cobalt and these other regions, and that the rest of Ontario outside those regions can derive any advantage from that royalty. *Ontario will find a little later, when she has had more experience, that while it may be wise and proper to impose some measure of royalty upon the minerals produced in that district, it is absolutely essential that the income thus derived should be expended exclusively for the benefit of the district from which it came.* Down to 1901, the idea of this Parliament and the idea gener-

ally prevailing was that these enormous sums of money that were coming out of the Yukon territory should, some of them, find their way into the exchequer of Canada for the benefit of the rest of Canada, and as I say it was not until 1901 that this government realized, and adopted a policy founded on that realization, that the only sane and proper use to make of the royalty got from the Yukon territory was to devote it to local uses in the Yukon. Previous to that time we had no public building, the telegraph line was not constructed, we had no roads which are the absolutely essential needs of that country, and whatever large expenditure there was after 1900 was due to the fact that the government, as I think, realized that the royalty which they had received from that territory ought to be devoted to the development of that country. They adopted that policy and expended for these objects the surpluses which they had previously piled up and the surplus of that year.

There are several causes which account for the reduction in the revenue from the Yukon since that time. In the first place, the royalty in the Yukon territory was ten per cent., which was subsequently reduced to five per cent. and later to two and a half. Necessarily the year in which the royalty was reduced from ten per cent. to five per cent. showed a decrease in the revenue, and this decrease was still greater when the royalty was reduced to two and a half per cent. Then, in the beginning of the Yukon, the people of Canada made a greater mistake than any mistake which the government made. They were not very familiar with mining localities and made the great mistake of imagining that anything was good enough for a mining camp, whereas any one who knows anything about mining camps knows that nothing is too good for them. The miners have the money and will pay for good articles, especially if they are far away from commercial centres, because the cost of transportation is so great that they have adopted the wise policy of buying the very best. For instance, some Canadian manufacturers or merchants sent into the Yukon butter not fit for axle grease, and it took four or five years to get over the bad impression created in the Yukon by that horrible butter; only in recent years would people in that country eat Canadian butter, which they now find as good as any produced in the world. That is one matter in which the farmers, or whoever were responsible for the export of butter, made a mistake. Another matter in which the Canadian manufacturers erred was in respect to boilers. I have seen the streets of Dawson for half a mile piled up with small boilers and hoisting machinery. I came to manufacturers in the east, and I know others who came, and asked them to meet that requirement of the Yukon and manufacture suitable boilers. Their answer was that their business was booming so rapidly that they could not undertake that business. One said that his business in the previous year had been so increased that he was obliged to double his capacity, and if he attempted to fill the demand of the Yukon he would be obliged to still further increase his power of production, and as a consequence he did not attempt to supply that market, and I venture to say that not one-half of one-quarter per cent. of the hoisting machinery that went into that country came from Canada; it all came from the United States. The people of the Yukon are quite willing to buy in this country and made endeavours to buy here, but when Canada would not furnish the articles demanded, they were obliged to turn elsewhere.

Another cause of reduction in the revenue from the Yukon is the change of the customs, and if I may express my opinion on the subject I hope that the Ministers of Finance and Customs will recommend a further change, because I think there is no policy which can be wiser for Canada to pursue than the policy of making absolutely free those articles of machinery, those articles of necessity which go into a new country and are absolutely essential to build up its industries. Take the conditions in the Yukon. A mining proposition is of necessity always hazardous, and I maintain that as little taxation as possible should be imposed until the venture has been absolutely set afoot and has been proved to be a profitable one. By imposing large taxation at the beginning, you are crippling and perhaps rendering impossible an industry. Take for instance an industry that proposes to install a large power plant to work mining machinery. It requires, in the first place, a large sum of money for installation. It is told that there is a heavy tariff on all machinery which it is required to import. That, of course, gives a little black eye to the scheme of promotion and then the promoters are obliged to pay a duty on that machinery at a time when their industry has not produced anything and is not in a position to produce anything, and when the promoters are not absolutely certain it will not be a failure. In one respect a royalty is the best of all taxes on a mining territory, because a man is only asked to pay when he has the money in his pocket to pay. *A tariff on mining machinery is the worst form of taxation, because it is a tax at the very initiation of an industry, which may and does stop thousands of developments that otherwise would take place.*

Another cause of reduction in revenue in the Yukon is due to the increased proportion of Canadian manufactured products used in that country. In the earlier days the major part of the importations into the Yukon was of American origin. I shall not weary the House with figures, but, for instance, in 1899 the domestic importations into the Yukon amounted to only 9,800 odd tons. By St. Michael's there were imported 3,334 tons and via Whitehorse, 6,510 tons—a total of 9,844. Of foreign importations via St. Michael's there were 12,000 tons, and via Whitehorse, 2,700 tons, making a total of foreign importations of 15,000 tons against 9,800 tons of domestic importations, the total importations at that time being 24,856. Every effort was made by the Department of Customs and by every one in that country who had any authority to direct the trade of the Yukon territory into Canadian channels, and this effort was successful to the extent that in 1906 the domestic importations into the Yukon were 14,309, and the foreign 10,698, so that you have about the same gross importations, but the proportions of Canadian and foreign goods are reversed between 1899 and 1906. The change in the source of the goods imported into the Yukon necessarily caused a falling off in the customs revenue from that territory, even although some of those goods that appear as domestic may be foreign. Of course that accounts for the falling off in the revenue of the Yukon territory even though some of those that appear as domestic may be foreign. But let me give one instance to show how difficult it is to get at the exact revenue which the national treasury receives from any particular portion of Canadian territory. There is being installed about 40 or 50 miles below Dawson a large power plant which will distribute that power to Dawson and its vicinity, which is absolutely essential for mining purposes. The company pro-

moting that power plant was unable to make arrangements for the transportation of its machinery with the railway company that runs into the Yukon territory, and which I may say is the most horrible incubus that any country has ever laboured under. The power company was compelled to land its machinery at Vancouver, so that the province of British Columbia gets the credit for the revenue of \$58,000 from the duty on that machinery, which will eventually go to the Yukon. Of course it makes no difference so far as the revenue of the country as a whole is concerned, but if the Minister of Customs can find any way to credit that amount to the Yukon territory rather than to the province of British Columbia, I suggest that he should adopt it. That, however, is only one instance, and there are very many others of a similar kind which go to prove the suggestion with which I began, that it is impossible to show the revenue derived from any one section of the Dominion. For example, I am informed that the customs revenue paid in the city of Montreal is one-third of the whole customs revenue of the Dominion of Canada, and while Montreal is a great city in a great province, yet there is no doubt that a very large part of the revenue paid there should be credited to other provinces in which the consumers who use the goods are located. In the same way, British Columbia gets credit for some of the revenue which should rightly be credited to the Yukon territory.

Now, there is one other thing which I wish to say with regard to the Yukon territory before concluding my remarks, and that is I think the government has adopted a correct policy in reducing to the very lowest possible amount the expenditure on the official administration of that territory. At one time undoubtedly the whole official staff employed in the Yukon was needed, and it is not an easy thing to determine the exact moment when a change in conditions renders it no longer necessary to retain the whole staff previously existing. However, I think that now the time has arrived when the official staff in the Yukon territory should be reduced, and I say that out of no spite or malice against any of the officials. I believe it has been intimated that I secured the dismissal of some of them for political reasons. Indeed, it has been stated in a despatch to the public press that they had incurred my displeasure because they refused to give \$50 each as a contribution to a political campaign fund. Although some newspapers have published that despatch I notice that when these gentlemen were interviewed in Vancouver they made no such statement as that credited to them. At all events, I invite any hon. member of this House who wishes to investigate the charge, or, better still, he can go to any one of these officials and I think he will find they will deny that they ever made such a statement. I might add that I never made a request from them or from any man in my life for a contribution to my own or to any other campaign fund, and any one who knows me knows that I am one of the worst collectors that ever appeared in any country; I cannot collect even my own debts, not to speak of collecting campaign funds. I may point out also that not one of the gentlemen who have been dismissed in the Yukon territory has had his place supplied by another official. He was dismissed simply for the purpose of economizing, and so far as my having any malice against them I have been eager to induce the government to adopt a system by which when it becomes necessary to get rid of an official in the Yukon he shall not be set adrift like an old horse but that he shall

be transferred to some other branch of the service of the government, corresponding perhaps to the service he was in in the Yukon territory. I hope the members of the government will endeavour to carry out that idea, so that these officials may be transferred from places where they are not needed to offices where their services will be of benefit to the country. I am particularly desirous of reducing the expenses of administration in the Yukon in order that there may be a larger amount available for developing the resources of that rich country. I could spend hours, Mr. Speaker, dilating on the possibilities of the Canadian Yukon. There are, I know, some who imagine that its days of prosperity have passed, but I can assure them that the beginning of the development of the Yukon has not yet come. I am supported in this belief by those who know the territory best and who declare that the output from placer gold mining will increase year by year for many years to come. Apart from the placer yield of the country there are the most wonderful deposits of quartz that the world ever saw. You cannot turn in any direction without finding quartz leads, quartz ledges, and stringers, which were it not for the excessive cost of transportation would be developed at once. We have scores and scores of mines which were they situated at an accessible place would to-day be developed and yielding fortunes. There are, however, mines at the threshold of the territory at St. Michaels which are being developed. No enormous amount has been expended upon them because in the development of a large mine half a million dollars is inconsiderable,

but they will no doubt greatly add to the mineral wealth of that territory. Then you pass to Whitehorse and you have a crescent twenty-five miles in extent on which you can scarcely go 100 yards without finding an outcrop of copper of the highest grade. Recently on the dome they have struck at one place on the 50-foot level, and at another place at the 100-foot level, indications of the best paying quartz. Last summer on the Mackenzie River side, the prospectors returned with specimens of some of the richest quartz ever known. Of course I do not know whether it will turn out as anticipated, but at all events the existence of these minerals in every quarter shows that the mining industry in the Yukon territory is practically only in the same initial stage that it is in British Columbia and in Ontario. I do not think it would be rash to say that within twenty-five years Canada will exceed any country in the world in its mineral production. Then experience has taught us, as in the case of the northern regions, and Cobalt, and Gowganda, that the best thing to promote settlement in a territory is mineral discovery, because the minerals will not only yield wealth themselves but they will bring in population which will remain there to develop agriculture and other natural resources. The subject is perhaps more entertaining to me than it is to the members of the House, and I must apologize for detaining hon. gentlemen at such length, but at all events I feel confident that the Yukon territory deserves the encouragement of the government and of the country in the development of its extraordinarily rich resources.

NOVA SCOTIA'S MINERAL OUTPUT IN 1908.

By Arthur S. Barnstead.

The total value of the products of Nova Scotia in manufactured goods, agriculture and horticulture, mining, fishing and lumbering, has been estimated for 1909 to be \$114,400,000. Of this total the mining industry contributes a value of about \$15,550,000, approximately about 12½ per cent. of the total. The development of the mines forms the basis of many of the manufacturing industries of the province so that Nova Scotia mineral wealth may be placed at a very much higher value than the figures given above. The contiguity of coal mines to such centres as Amherst, New Glasgow and Sydney has had very much to do with the development of these towns as industrial centres. It is difficult, however, to estimate the actual value that the mineral wealth means to Nova Scotian communities.

Another very important factor in connection with our mineral wealth is that it affords, by way of royalty, about 50% of the total revenues of the province. Depression in trade or any disturbance that affects the coal industry has a very serious result in diminishing the revenues at the disposal of the provincial government. This in turn prevents the necessary expansion that other industries of the province require.

During the past year a very unfortunate strike among the employees of certain of the coal mines of the province has interfered very seriously with coal mining. It will be seen, however, that the employee who has been striking and the employer are not the

only parties in this test for supremacy. There is a third party in the manufacturing interests of the province and consumers in general; there is a fourth party, the State, all of whom suffer alike as a result of a diminished output.

At the beginning of 1909 the clouds of controversy hung heavy over our mining industry, the legal battle between the conflicting interests of the Dominion Iron and Steel Co., and the Dominion Coal Co., had not been decided. There was an incursion by the American coal operators into the St. Lawrence markets, which had been heretofore controlled by the Nova Scotia mine operators. A third serious difficulty arose out of a possible conflict between clashing interests in view of the determination of the United Mine Workers of America to gain a foothold among the workmen of the province. The two latter difficulties have been grouped together to a very large extent, invasion it is claimed being connected with and succeeding because of the partial tying up of our collieries.

The first cloud of controversy between the Dominion Iron and Steel Co., and the Dominion Coal Co., has happily cleared. The decision of the Privy Council was given early in the year, and in the spring the shareholders and directors of the warring companies agreed to sink their differences and link their interests. This propitious ending has been only recently brought about and both the Dominion Iron and Steel Co., and the Dominion Coal Co., are now practically one and

the same company. The amalgamation will mean much for the steady development of the steel industry because the company will be assured of a continuous supply of coal. On the other hand the coal company will have an assured market for certain grades of coal and there will be no disturbance about prices.

The second and third of the difficulties grew greater and more ominous as the months succeeded one another. The coal operators have had their St. Lawrence market very seriously interfered with by the United States operators who have dumped their coal into Canada because of the depression in the United States and because they are able to mine their product at a much cheaper rate. The strike operations have been for the most part directed against three companies in the province: the Dominion Coal Company, Cape Breton; the Cumberland Railway and Coal Co., at Springhill, and the Inverness Railway and Coal Co. at Inverness. So strongly organized were the United Mine Workers of America at Springhill that as soon as the strike was declared the management felt themselves under the necessity of closing down the mine and doing only such work as was necessary to comply with the law for keeping the mine in a good and safe condition. Since the first of August no coal has been mined at Springhill.

At Inverness the strikers were not so successful. After a short struggle the company was able to do without the services of the strikers and has mined nearly as much coal as in the previous year.

The main strength of the United Mine Workers was directed against the Dominion Coal Co. at its several collieries in Cape Breton. There the battle has been tense and long drawn out. The loyalty of the Provincial Workmen's Association has enabled the management to utilize these men in mining, to import others to take the place of the strikers and so to maintain a working output at most of the collieries. At the moment of writing the strike is still in active force at these centres though rumours are current that it has spent its strength.

Comparing the output for the province with that for 1908 there is a decrease of about 830,000 tons. This has been a serious loss to the miners as well as to the companies and the province. The Dominion Coal Company's output has been diminished by 1,031,640 tons. A few of the other companies who were not affected by the strike operations have as a result increased their output, so that the total provincial loss is not the combined loss of the three companies against which the strikers have contended for recognition.

The Dominion Coal Co. raised 2,785,318 tons of coal during the year, selling of this 2,576,004 tons. Though hampered by the continuance of the strike this company has carried forward its plans for the opening up of collieries on the Lingan and Victoria seams. As a result the new town of Waterford has emerged from the Cape Breton forests in the Lingan district. Its site has been laid out, streets plotted out, sewerage and water supply provided and everything arranged before dwellings are erected to accommodate the expected influx of population. Altogether two million five hundred thousand dollars will be expended in making this an up-to-date colliery town before operations are begun. Waterford is now a village of 300 or 400 inhabitants, but in a short time its population will be up in the thousands.

The Nova Scotia Steel and Coal Company, operating at Sydney Mines, has increased its output by 67,500 tons in excess of the production for the previous

financial year ended September 30th, 1908. This company presents the best record that any coal company in the province can show for the past year. It has also continued to make satisfactory progress in plans for further expansion. The Nova Scotia Steel and Coal Company has had no labour difficulties in the past forty years, a record that few companies can present, but that many would welcome most heartily. A mine, abandoned by the General Mining Association a long time ago, was put into active operation during 1909, and is now sending up 500 tons of coal per day, with a prospect of continuous increase.

The North Atlantic Collieries Company at Port Morien has increased its output to 73,582 tons. During the past two years this company has continued its extensive submarine development and has come into prominence as a producer.

The MacKay Mining Company opened a new mine, from which it raised 13,587 tons. This company and that of the Sydney Coal Company operate their collieries at North Sydney. The latter company mined 4,733 tons. The Colonial Mining Co. entered the field the last month of the year, mining 633 tons.

About 40,000 tons less coal was mined in Inverness County than in the previous year; this is divided among the different coal companies as follows:—

Inverness Railway and Coal	19,000
Port Hood Coal Company	3,500
Mabou Coal Company	17,500

Though the strike did not affect the mining operations in Pictou County, yet there has been a decrease in the coal mined by approximately 100,000 tons. In Cumberland County there have been 17,000 tons less mined than in the previous year. The decrease in the output of the Cumberland Railway and Coal Company's mines amounts to 40,000 tons. On the other hand, the Maritime Railway, Power and Coal Company has increased its output by 33,000 tons, and the Eastern Coal Company at Maccan has produced 4,411 tons. The last-mentioned is a new producer. The other companies maintained their previous outputs, excepting the Strathcona Coal Co., which shows an output of 17,000 tons less than the previous year. The effect of the strike will be more apparent in the current year than in the year ended September 30th last, as the strike had been in force in the Springhill mines for only two months. As will be noticed, marked development has taken place both in Chignecto and the Joggins, and also at the collieries of the Maritime Railway, Power and Coal Company.

The following table giving the amount of coal raised during the twelve months ended September 30th, 1908, and September 30th, 1909, will show the different productions for the two years and the general effect of the strike and conditions of trade:—

	1908.	1909.
Cape Breton—		
Dominion Coal	3,816,958	2,785,318
Nova Scotia Steel and Coal	662,350	757,539
North Atlantic Collieries	58,777	72,582
McKay Mining	13,560	13,587
Sydney Coal	4,801	4,733
Colonial Mining	633
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	4,556,446	3,634,392
Inverness—		
Inverness Railway and Coal...	283,705	264,773
Port Hood Railway and Coal..	99,700	96,133
Mabou Coal	19,250	1,610
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	402,635	362,516

Pictou—		
Acadia Coal	413,782	364,993
Intercolonial Coal	315,590	292,479
N. S. Steel and Coal	47,845	20,165
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	777,217	677,637
Cumberland—		
Cumberland Railway and Coal.	416,132	376,283
Maritime Ry., Power and Coal.	66,963	100,011
Minudie Coal	48,397	49,791
Stratheona Coal	23,928	7,086
Great Northern	2,726	3,814
Atlantic Grindstone	861	644
Eastern Coal Company.....	4,411
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	559,013	542,040
Colchester—		
Debert Coal Company.....	3,951	1,330
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	6,299,282	5,217,915

Gold.

About 25 gold mines were in operation during the year, employing 550 men. The total yield has been 12,600 oz., which is an increase of 600 oz. over the previous year. While comparatively little gold was mined during 1909, yet, facing the new year, it may fairly be stated that the work of installation and development carried on during the past year on gold mining properties will ensure a very much larger output during 1910.

The New England Mining Company crushed 44,375 tons of quartz at Goldboro, producing a yield of 5,027 oz. of gold. This is the one-time Boston-Richardson Company. The Oldham Sterling Gold Mining Co. at Oldham produced 2,710 oz. from 942 tons of quartz, showing a yield of 2.88 oz. per ton crushed. The Great Bras d'Or Company at Middle River recovered 708 oz. out of 783 tons crushed. The Sydney Gold Mining Company, at Country Harbour, Guysboro County, obtained 450 oz. out of a crushing of 510 tons. From these four companies about three-quarters of the yield has been received, the remaining 3,600 oz. have been obtained from the Ponhook Gold Mining Company at Malaga Barrens, the Eagle Mining Company at Renfrew, the Caribou Gold Company at Oldham, the Moose River Mining Company, the Consolidated Mines of Canada, Ltd., the Chester Basin Gold Syndicate, the Eagle Mining Syndicate at Salmon River, the Ophir at Brookfield and the Petpeswick at Lake Catcha. Other companies have either not secured any production or have worked on a very small scale. The Dominion Mining Company at Tangier has installed a hydro-electric plant generating 4 to 800 h.p., securing its power from Tangier River. It would seem that in gold mining the water powers of the province could be used to much greater advantage than they have been in the past.

Iron and Steel.

The total production of iron ore in the province during 1909 was 12,000 tons. The Dominion Iron and Steel and the Nova Scotia Steel Company, the two largest workers of iron ore, imported together about 656,000 tons from their mines at Wabana, Newfoundland. This accounts for the lack of development in Nova Scotia's rich iron ore beds.

The total production of the Dominion Iron and Steel Company in pig iron has been 255,912 gross tons (2,240 lbs. each) and 409,469 tons (2,000 lbs. each) of coke. This company has also produced 297,330 gross tons of

steel ingots, from which were manufactured 140,091 tons of rails, 73,047 tons of wire rods, and 25,470 tons of merchant blooms. They have recovered in by-products 3,031 gross tons of sulphate of ammonia and 4,020,000 gallons of tar.

The Nova Scotia Steel and Coal Company has manufactured 51,408 tons (2,240 lbs. each) of pig iron, and has produced 88,237 net tons (2,000 lbs. each) of coke. It has also made over 63,000 tons of steel ingots, 54,000 tons of blooms and billets cogged, while it has shipped 53,000 tons of finished material, bars, plates and forgings from the New Glasgow plant. 70,000 tons of limestone and dolemite have been quarried for its operations.

Other Minerals.

The export of gypsum has increased by 50,000 tons, the total this past year amounting to 280,000 tons. Together with the amount that must be mined and used by farmers throughout the province, there must have been fully 325,000 tons of gypsum produced during 1909. 23,000,000 bricks have been manufactured from the clay, and a large number of men find employment in an establishment in New Glasgow, where the clay is manufactured into pipe for tile draining.

Owing to the increased use of cement, of which 50,000 barrels of slag cement were manufactured in Sydney, less building stones were quarried than in the previous years. 25,000 tons less of Wallace stone were taken from the quarries than in the previous year. Limestone is used in great abundance by the iron and steel industries; about 240,000 tons were quarried at Marble Mountain, Cape Breton, for the Dominion Iron and Steel Company. Further prospecting has taken place in connection with the important discovery of tungsten at Moose River, Halifax County. About 4,000 tons have been uncovered. This is about equal to the present production of the world for a year. The tungsten is found in the form of scheelite, which assays about 60 per cent., and is consequently a valuable discovery.

REPORT OF THE COUNCIL OF THE CANADIAN MINING INSTITUTE FOR THE YEAR 1909.

The Council, in presenting a report of the work of the Institute for the past year, is gratified to be able to state that the affairs of the society are now in a more flourishing condition than at any previous time in its history. Not only has there been a steady increase in membership, but greater interest is being evinced by members in the work of the Institute than ever before. The financial position of the Institute is also a sound one, and this is the more satisfactory since the expenses of publication, by reason of the considerable increase of volume of printed matter distributed to members have now become a very heavy annual charge. In this connection attention may, perhaps, be called to the fact that Volume VII. of the Transactions, for the year 1909, comprises rather over seven hundred pages; or, in other words, the Institute is at present publishing a volume of twice the size of that of four years ago, and it should be a matter of some pride to members that, in point of value and interest, the Institute's Transactions to-day compare most favourably with those of any mining society in the world. In remarking on this point, thanks and acknowledgments are specially due to those eminent gentlemen (many of whom are members of the United States Geological Survey), who in recent years

have attended the Institute's Annual Meeting, and have so generously contributed material of exceptional merit and value to the proceedings.

Referring to other activities of the year, the Institute has reason to congratulate itself on the repeal of the Quebec Mining Law of 1892 and of the substitution therefor of regulations decidedly more conducive to the encouragement of legitimate prospecting and mining in this province. This very welcome change is largely traceable to the Institute's influence and representations.

At the annual meeting in March, 1909 a resolution was adopted in which the attention of the Dominion authorities was directed to the urgent present necessity of introducing and placing on the statutes a Mining Act wherein proper regulations would be provided governing the acquisition, development and operation of mining lands under Federal control. That such a mining law might be of a nature to encourage rather than retard industry, it was further suggested that before framing such an act, the views of the mining community be ascertained thereon by the appointment of a Royal Commission to secure evidence. No action was taken by the Government in respect of this latter suggestion for the reason that Parliament had just previously appointed a Standing Committee on Mines and Mining, whose duties partook largely of those of a commission; but this committee immediately entered into communication with the Institute, inviting its co-operation and assistance. In consequence, four gentlemen, namely, Dr. A. E. Barlow, Mr. J. M. Clark, K.C., Mr. B. A. C. Craig and Mr. J. B. Tyrrell, having special knowledge of the abuses incidental to the present Dominion system of regulating the granting of titles to mineral land, were requested by the Council to act as the Institute's representatives, and appear before the Parliamentary Committee as witnesses. They did so, representing to the committee that since all matters relating to mining on Dominion lands had been heretofore regulated by Orders in Council, stability of conditions was not ensured, and instances were quoted in proof of the contention. The witnesses also advocated the principle of discriminating between surface and mining rights in the granting of titles to public lands, and urged that all business relating to mines and mining be transferred, and be in future conducted by the Department of Mines, pointing out in this connection that although the Department of Mines had now been established for over two years, it was still requisite that applications for mining areas should be made to the Department of the Interior, which Department also was entrusted with the issuing of grants and patents.

The Parliamentary Committee, since this evidence was given, has issued a report recommending (1) that there be assigned to the Mines Department the administration of mines, including the issue of title thereto, and of all mining laws; (2) that an act be passed consolidating all the laws relating to mines under Federal control; and (3) that consideration be given to a policy which will have for its object the re-acquisition by the Crown of mining rights heretofore granted in patents of land.

In view of report, the Council hopes that the recommendations of the Institute, in respect of the introduction of favourable Dominion Mining Legislation, will, in the near future, be carried into effect, and advantage is taken of the present opportunity to congratulate the Parliamentary Committee on its useful labours in the interest of the mining industry.

Meetings.

The eleventh annual meeting of the Institute was held at the Windsor Hotel in the city of Montreal, on March 3rd, 4th and 5th, 1909. The attendance was exceptionally large, there being over two hundred members and others present. The occasion was also notable in that the Institute was honoured by the presence of several eminent gentlemen from the United States, including Mr. S. F. Emmons and Mr. Waldemar Lindegin, of the U. S. Geological Survey; Dr. A. C. Lane, State Geologist of Michigan; Dr. J. F. Kemp, of Columbia University, New York, and Dr. H. Ries, of Ithaca, New York, who presented addresses or papers of great value, and otherwise materially contributed to the success and interest of the meeting. The Institute was also privileged to entertain at its annual dinner His Excellency the Governor-General, who delivered a most interesting address; the Hon. Wm. Templeman, Minister of Mines for the Dominion, the Hon. Frank Cochrane, Minister of Mines of Ontario, and other eminent Canadian Parliamentarians.

Other meetings held during the year have included those at Rossland, Nelson and Spokane, under the auspices of the Western Branch, and branch meetings at Cobalt and Montreal.

Five regular meetings of Council have been held at headquarters, whilst a special meeting was held in Toronto in the month of July.

Publications.

The papers presented at the annual meeting, together with those read at the branch meetings, and also others transmitted direct to the Secretary, in all 41 papers contributed by members, associates and student members, together with the discussions thereon, have been published in Volume XII. of the Journal of the Institute, copies of which have been distributed to members in good standing.

There have also been published and distributed during the year four bulletins, in which have been printed papers "subject to revision," notices and other matters of interest to the general membership.

Branches.

Both the Cobalt and Western Branch have been very active during the year, and show substantial membership gains. In addition to holding two well-attended meetings in British Columbia, the Western Branch accepted an invitation to participate in a joint meeting in Spokane with the American Institute of Mining Engineers in September last, whilst under the leadership of the president of the Institute the Cobalt Branch acted as host to a party representing the geological section of the British Association, who had been invited to visit the mines of this district. The party, accompanied by representatives of the Institute, subsequently visited Temagami, Sudbury, Moose Mountain, Copper Cliff and Silver Islet, and after attending the general meeting of the association in Winnipeg, continued the journey across the continent to Vancouver.

Library and Reading Room.

The present location of the Institute's office in the Windsor Hotel, Montreal, has proved a very great convenience to members visiting headquarters, who have availed themselves freely of the facilities afforded them to consult the library, or make use of the reading room. Many visitors from abroad and foreigners desirous of obtaining information anent Canadian mines and mining have also called at the offices to seek the secretary's

assistance or advice, and it is believed that the possibilities of rendering valuable and useful service in this direction are considerable, more especially when the fact that the Institute is prepared to supply information to those requiring it becomes more generally known. In order to advertise its readiness in this respect in Great Britain, the High Commissioner's Office in London has been notified that the Institute is prepared to receive and reply to any enquiries on the subject of Canadian mining.

Little or no expenditures have been made this year on library account, but numerous donations of books have been received, particulars of which have been published in the Institute's bulletins.

Secretary's Office.

The following returns are taken from the secretary's records for the ten months ending December 31st, 1909:—

Letters received	2,274
Letters written, etc.	6,395
Circulars issued	7,400
Publications issued	6,200

Students' Competition and Awards.

In 1909 ten papers were submitted by student members in competition for the Institute's annual awards. After receiving the report of the judges, namely, Dr. H. Ries, of Cornell University, Ithaca, N.Y.; Mr. Arthur A. Cole, of Cobalt, Ont., and the secretary, who acted in an ex-officio capacity, the Council has awarded the president's gold medal to Mr. N. L. Bowen, of the School of Mining, Kingston. In addition, Mr. Bowen received a cash prize of \$25, while cash prizes of \$25 and \$20 respectively were awarded to Mr. E. P. Cowles, of McGill University, and Mr. G. J. Burland, of McGill University. The papers submitted by Messrs. King, Rider, Rutherford and White received honourable mention.

Frecheville-Commans-Mariotti Competition.

Three of the gentlemen, namely, Messrs. R. E. Commans, Wm. Frecheville and Hugh F. Mariotti, who participated in the Institute's summer excursion of 1908, as representatives of the Institution of Mining and Metallurgy, desiring to give definite expression of their appreciation of the hospitality they received on that occasion, early last year, communicated with the Council, requesting permission to donate the sum of fifty guineas as a prize to be offered for the best paper contributed by a junior member (namely, one under thirty years of age) to the Institute's Transactions before January 1st, 1910, on a subject descriptive of any mining or metallurgical improvements effected in Canada during the year from October 1st, 1908. The offer having been gratefully accepted, the Council appointed three of its members, Messrs. J. Bonsall Porter, J. C. Gwillim and H. E. T. Haultain, a committee to direct the competition and to see that the conditions were properly complied with. Under instruction from the committee, a circular, in which particulars of and conditions governing the competition, was duly issued to members in April last. In response to this circular, five papers have been forwarded to the secretary for submission to the committee, and it is hoped that the judging will be completed in time for the results to be announced at the annual meeting.

Membership.

The membership of the Institute, inclusive of all classes, now totals nine hundred and thirty-six (936). The accessions during 1909 were as follows:—

Corresponding members	2
Ex-officio members	1
Members	70
Associates	20
Students	4

It may be here noted that the mining students of the "Ecole Polytechnique," Montreal, have recently organized a Mining Society, and have applied for affiliation with the Institute. The present membership of this society is 25.

With a view to establishing and promoting friendly relationship between the Institute and the Institution of Mining and Metallurgy, the Council in July last submitted a proposal to the Council of the latter organization, offering to provide in future that members of the Institution of M. & M. non-resident in Canada should be admitted to membership of the Institute upon payment of a reduced annual subscription of \$5. This offer having been accepted, a by-law in accordance therewith has been prepared for submission to and for the consideration of the annual meeting.

Deaths.

The Council records with profound regret the deaths during the year of the following members:—

Members—Fraleck, E. L., Member of Council; Colville, Andrew; Fletcher, Hugh; Fowler, L. A.

Associates—Ferguson, John; Graham, Harvey D.

The following gentlemen have resigned their membership:—

Members—Auzias-Turenne, R.; Brainard, Dwight; Corbett, Geo. E.; Diekson, Dr. C. W.; Hayward, A. A.; Hidden, Wm. Earl; Hillis, J. T.; Hungerford, W. A.; Leach, Norman L.; MacLean, John S.

Associates—Allen, K. C.; Gaskin, R. G.; Hall, F. Asa; Horne, J. T.; Monk, Ed. W.; Naismith, Arthur P.
H. MORTIMER-LAMB, Secretary.

ACCIDENT AT GOODWIN LAKE MINE, TWP. OF LORRAIN, JAN. 15, 1910, WHEREBY FRANK SHEPHERD WAS KILLED.

The accident occurred in a 90-foot shaft being operated by the Goodwin Lake Mining Company. Frank Shepherd and Leo Doyle were employed in shooting a round of four holes in the bottom of the shaft. The blasting signal was rung, and as soon as it was answered by the engineer, Doyle spit the four holes and he and Shepherd climbed on the bucket and rang the hoisting signal. As the bucket started, Shepherd fell and caught the edge of the bucket with his hands. He hung on until the bucket was up 60 feet, when he had the bucket stopped, but in trying to get a better hold he slipped and fell to the bottom. After Doyle reached the surface the bucket was sent to the bottom, but Shepherd was apparently unconscious from the fall. The four blasts went off shortly after, cutting Shepherd up in a horrible manner.

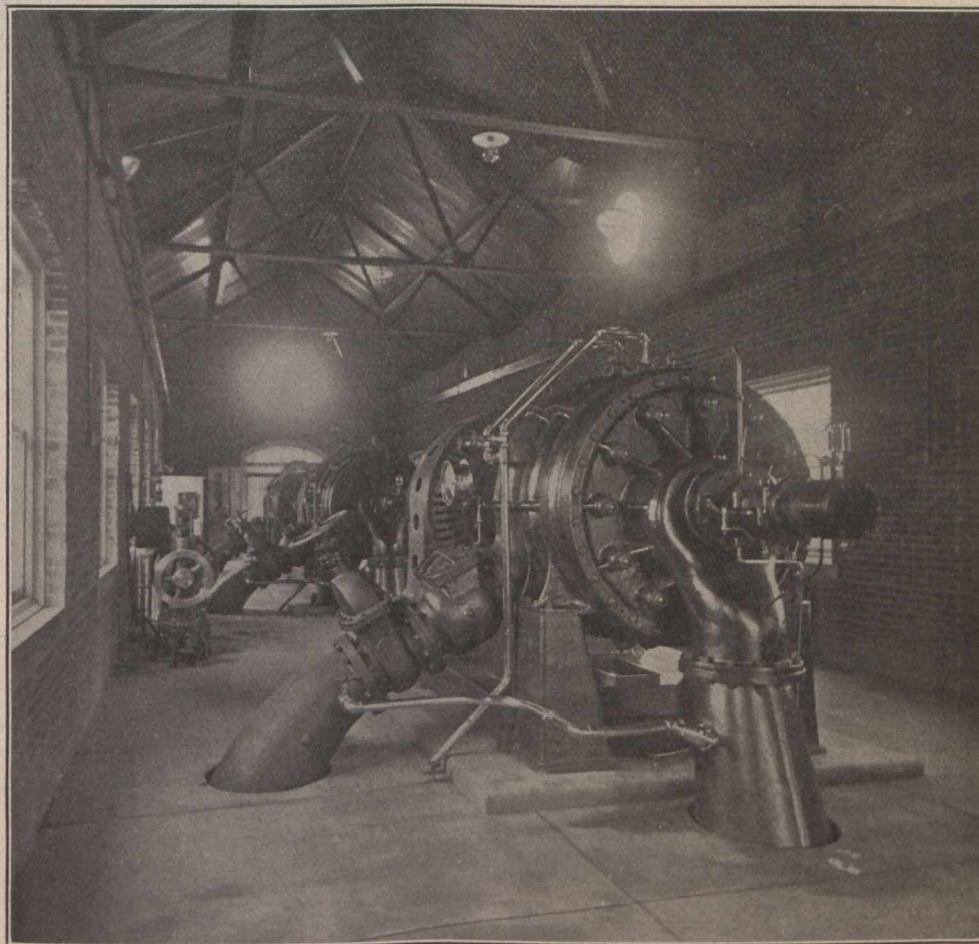
After an inquest was held, information was laid by Mr. E. T. Corkill, Inspector of Mines, before Magistrate Atkinson against the Goodwin Lake Mining Company and Contractors McDonald & Kenty, for a violation of Sections 164, 23 (a) of the Mining Act of Ontario, which calls for a suitable ladder to be always in the shaft to provide an auxiliary means of escape. Had this ladder been in position, as called for by the act, the deceased would have had an opportunity of dropping from the bucket when he first slipped and of climbing up the ladder. Both the contractors and the company, if proved guilty, are liable to a fine of not less than \$100 nor more than \$1,000.

THE ELECTRICALLY DRIVEN PUMPS OF LOCKPORT, N. Y.

The city of Lockport, N.Y., derives its water supply from the Niagara River, near North Tonawanda, thirteen miles away. From the electrically-driven pumping station at this point, the water is forced through 69,000 feet of 30-inch main to a stand pipe 25 feet in diameter and 120 feet high, at Lockport.

The pumping plant contains three independent units with a combined capacity of delivering 15,000,000 gallons in 24 hours against a pressure of 125 pounds. Each unit comprises a Westinghouse induction motor, designed for 500 horse power at 750 revolutions per

time readings of the electrical input were taken every five minutes; readings of the Venturi water meter every ten minutes; pressure gauge every five minutes, and revolutions of pump every fifteen minutes. The results are given in the accompanying table, which shows that all three of the pumps exceeded the duty requirement of 27,000,000 foot-pounds by approximately 4,000,000 foot pounds. It will be further noted that the temperature rises are well within the specifications, and that the pump capacities and horsepowers are well exceeded:—



minute, with three-phase current at 400 volts, direct connected to a single suction, enclosed impeller centrifugal pump made by the Holly Manufacturing Company, Buffalo.

Power generated at Niagara Falls is transmitted to North Tonawanda at 22,000 volts and is stepped down to 440 volts at the pumping station by three 500 kilowatt, oil insulated, water cooled transformers.

The three motor-driven pumping units were recently given a very complete test, which developed some interesting economies of electric operation. Each unit was run continuously for 15 hours, during which

Results of Tests of Lockport's Motor-Driven Pumping Units.

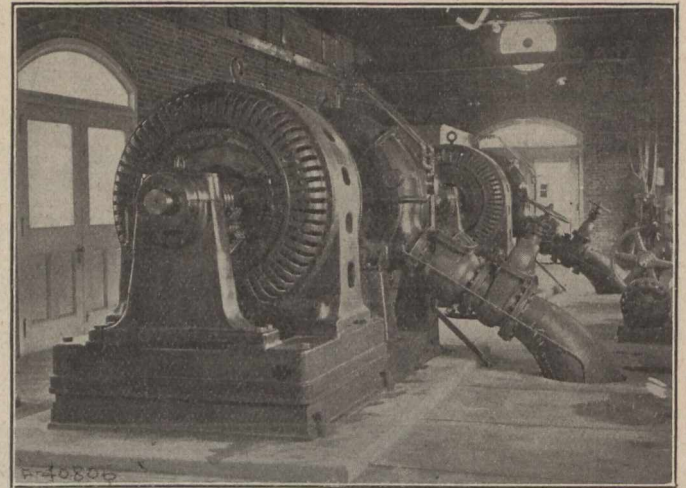
	Pump 1.	Pump 2.	Pump 3.
Maximum revolutions per minute	746	752	744
Minimum revolutions per minute	738	738	739
Average revolutions per minute	743	744	744
Maximum gauge pressure, pounds	142.5	144.5	143.5
Minimum gauge pressure, pounds	119.5	139.5	134.5
Average gauge pressure, pounds	136.9	142.6	138.9

Average head, feet	315.8	329.1	320.6
Gallons pumped per hour..	238,000	236,300	236,700
Gallons pumped in 24 hours at this rate	5,712,000	5,672,000	5,712,000
Kilowatt input per hour....	342.4	346.1	341.5
Gallons per kilowatt hour	1,454	1,464	1,443
Hydraulic horsepower	318	327	319.5
Electric horsepower	456.6	456	455
Efficiency per cent.	69.6	71	70
Duty, foot-pounds per 1,000 kw.	30,800,000	31,600,000	31,000,000
Degrees temperature rise in 15 hours	41	38	43

In the case of the Lockport pumping station, electrical energy is purchased at \$16.00 per horsepower year. The cost of power for this station is thus just about equal to that of steam operation under conditions assuming cross-compound pumping engines giving a duty of 130,000,000 foot pounds per 1,000 pounds of steam; coal at \$3.00 per ton delivered into the boiler room; 8½ lbs. evaporation under working conditions, and including labour for making steam and handling ashes, as well as increased fixed charges against the additional plant for operating with steam. This electrically-driven pumping plant is thus developing duty equal to 130,000,000 foot pounds per 1,000 pounds of steam.

In connection with this plant, which is pumping its output 13 miles to Lockport, it may be of interest to note that last summer when a large fire broke out there

eleven powerful fire streams through varying lengths of hose were maintained from the stand-pipe and pumps as long as needed for service.



The entire water supply of which this station forms a part, as well as the station itself, was designed by Mr. Charles A. Hague, consulting engineer, New York City.

SILVER IN 1909.

Messrs. Samuel Montagu & Co., Review the Past Year.

A retrospect of the silver for the year is singularly uninteresting in regard to price. During the first four months the monthly averages of the cash quotation kept within the narrow limit of about five-eighths of a penny—23.226 and 23.834—and those of the concluding six months—23.351 and 24.030—show a slightly wider difference. The highest prices of the year were reached in the remaining two months, May and June, the averages for which were 24.342 and 24.166 respectively. The highest quotation of the year was 24½d on the 5th May, the lowest 23-1/16d on three dates—namely, 4th March, 26th and 30th October; the net difference between the highest and lowest of the year is therefore 1 13-16d. During seven months the average forward price was slightly above, and during the remainder, slightly below, that for cash. The difference between the two daily prices was rarely large except in the early part of January, when the cash stood for a week or so—3/16d to 5/16d higher than the forward price. Not only does a general view of prices reveal the narrow limits within which the quotation moved, but in certain periods fluctuation ceased entirely, and an absolute record for immobility in recent times was created in August, when the price stood at 23½d for eight successive working days. It is a curious fact that notwithstanding this remarkable rigidity of price the year has been prolific in business, with the turnover unusually large, and at the very time the pointer rested in August at 23½d, transactions were on quite a substantial scale. More or less throughout the year there has been a prolonged contest between India and China; this appears to be the chief reason for the exceptional stability of price. Owing to

excessive imports into China in preceding years, merchants were encumbered with goods, and fresh imports were very small until the then existing stocks became absorbed. Meanwhile, the exchange being one-sided, the foreign banks were compelled to import silver, or more frequently to purchase forward silver, so as to adjust the balance of trade, and in consequence the stock of sycee, &c., at Shanghai rose until a record figure of 31,000,000 ozs. was reached on 18th October. At the same time the stock in Bombay amounted to 15,000,000 ozs. and in London 2,000,000 ozs., besides another 4,000,000 ozs. on the sea. Apart from the Cobalt mines of Ontario, there is little need to comment on the world's supply. It is anticipated that the total for 1909 is in the neighbourhood of 25,000,000 ozs. Favourable news continues to come from the mines, and, for the present at any rate, a possible advance on these figures must be taken into account. The ore is so rich that the silver markets of the world would soon be glutted if the veins were as large as those of the ordinary silver mine. But, while the ore is exceptionally rich, the veins are small. How this addition compares with the increase of the world's population is most vital to the future of silver.

The effect of railway development in China is most important. It is probable that the Chinese themselves will endeavour to finance and build most of the future lines, but of each million sterling of capital financed by the West it is estimated that at least two-thirds will be remitted in silver for labour and material on the spot. The awakening of China by the introduction of machinery and the opening up of its hidden resources will re-

sult in vast addition to its internal wealth. To sum up, development, railway facilities, and a cohesive Government in China, though slow in coming, are powerful factors to be taken into account as to the future. It must not be assumed that, even if a gold basis were to be fixed in China, it would seriously affect the need for silver. We have an example in India of such a change. The closing of the free mint for silver did not have that effect, for during the fifteen years preceding the date of the change, 1,056 million rupees were coined, against 1,011 millions in the fifteen subsequent years. Remembering that a very large proportion of the earlier total must have been melted down for jewellery, &c. (the value of the rupee, coined or melted, being about equal at that time, whilst in the later period the operation would involve a loss of, perhaps, 45 per cent.), the slightly lower total loses significance entirely.

In regard to India, there are two factors ever working increasingly for the prosperity of that country, and against the risk of famine. Inasmuch as the natives of India imported about £62,000,000 of silver in the fifteen years since the closing of the mints, over and above the £42,000,000 required for coinage, it is evident that the well-being of the native must have a very direct bearing upon silver itself. The first influence at work is irrigation. In the year 1906-7, as a result of irrigation, a net revenue accrued to the State of nearly £800,000 from an expenditure in previous years of only 5 millions, and an area of 36 million acres was brought into cultivation. Since that date much larger sums have been laid out each year, and the subsequent returns may be expected to increase proportionately. It is stated that, owing to irrigation, the monsoon is becoming of less importance to the wheat crops, and that much now depends on the after rainfall in June. A second influence for good is the extension of railway mileage, by which is afforded a readier market for produce and a speedier means of alleviating the distress caused by local famine.

It would be of extreme interest if the irreducible minimum of silver actually required by wastage and by the increase of population could be ascertained, but data in regard to the quantity used in the industrial arts for jewellery and manufactures is so vague that any approximate estimate is quite impracticable. On the best authority available the loss by wear of silver coin is about 10 per cent. in 43 years. Taking the value at present prices of the world's stock of silver coin at 2,700,000,000 ozs., the wastage amounts to about 6,300,000 ozs. per annum; adding 1 per cent. as the annual increase of population, 27,000,000 ozs. is obtained—thus 33,300,000 ozs. is demanded on the score of coinage alone. A further quantity is called for by the increase of wealth in India and China; both of these countries, especially the latter, place a large portion of their savings in silver. There is a certain increasing demand for silver quite irrespective of price, and fluctuations in the value of silver affect merely a balance, perhaps smaller in proportion than generally suspected. It is not reasonable to suppose that the yearly increase from Ontario will not be so great, for the area involved, though large, is limited in extent, and many mines are now in full working operation. It is fair to assume from the remarkable steadiness of the price during the year, in spite of such addition to the world's supply, that the world's consumption, barring disastrous crops in the East, is likely to keep pace with any reasonable increase from that quarter, and no fall in value need be expected specially from that cause. Some confident anticipation must exist in the minds of Indian operators who have held the large stock of about 12,000 bars throughout the period of the year when money was most dear that the inquiry for silver will not only prove sufficient for the absorption of such stocks, but lead to an enhanced demand in the near future. Should this year's monsoon be good, the reduction in the currency reserves may make purchases on Government account not impossible toward the end of 1910.

THE NICKEL INDUSTRY.

This unsigned article was written at the request of the *Canadian Mining Journal*. It presents the case for those who think that the market for nickel could be largely expanded were the market price lowered. The author desired to preserve his anonymity.

There are practically only two sources from which the world's nickel supplies are obtained, viz:—The Island of New Caledonia in the Southern Pacific Ocean, and the Sudbury district in Ontario. From the ores of the former, about 15,000,000 lbs. of nickel, representing 40 per cent. of the world's production are produced annually; whilst the ores of the Sudbury district yield about 21,000,000 lbs. yearly, or 60 per cent. of the world's production.

The New Caledonia ore occurs as a silicate of nickel and magnesia, in large surface deposits, covering a considerable area of the island. It is soft and easily mined but, owing to the isolated position of the island, its climatic conditions, the scarcity of labour and the absence of fuel, and necessary fluxes, it cannot be treated on the island itself, but is shipped to Europe in the raw state. This renders it necessary to bring the ore up to as high a nickel content as possible, which invol-

ves a large amount of handworking, as no mechanical concentration is practicable. The ore as shipped, averages 5½% nickel in the natural state, which, as the ore carries about 20% moisture, is equivalent to about 7% in the dry. The cost of the ore, delivered in European ports, is \$8.50 per ton, or 7 cents per lb. of nickel contained in the ore. It is smelted with iron pyrites and gypsum to form a matte, and although the subsequent extraction of the nickel from the matte is considerably cheaper than the necessary separation of the copper from the nickel in the case of the Sudbury matte, yet the initial cost of the New Caledonia ore delivered at the smelter is so great that the ultimate cost of the production of nickel must remain in favour of Sudbury ores. All the output from New Caledonia is shipped to Europe.

The world's total production, therefore, is a little more than 36,000,000 lbs., or 18,000 tons, of which probably two-thirds is used in the manufacture of nickel steel, and one-third in the production of white metal, nickel coinage, electro-plating, etc. Of the output of nickel steel, by far the larger proportion is put into armour plate, turrets and heavy guns, for battleships; this steel contains usually 3½% nickel. It is also used

to some extent for other purposes, e.g. propeller shafts, crank axles, ship plates, deck plates, automobile frames, &c., but it would be used much more universally for these latter and other purposes, if manufacturers could secure supplies of the metal at lower prices than is now possible.

It is generally accepted as a fact that the control of the nickel market is vested in the International Nickel Company who, by agreement or arrangement with the French Company "Le Nickel" (the owners of the principal mines in New Caledonia) and with Mond's Nickel Company (the only other producers at Sudbury), fix and maintain the price of this metal in all markets. The supply of nickel may therefore be considered a monopoly, and the price has been kept at such a high level that the use of the metal for many purposes for which it is essentially adapted, has been made prohibitory. It is a significant fact that the consumers who pay the lowest price for nickel are those large and financially powerful firms who manufacture ships of war and their equipment for the Governments of their respective countries, and this was only brought about by a combination of the firms which the interests controlling the nickel market find too powerful to resist. The price of the metal to these consumers is about 26 cents per pound, but manufacturers requiring nickel for the production of nickel steel for any other purpose than ornaments have to pay about 35 cents per pound, whilst white metal manufacturers and nickel plating works, pay anything from that figure up to 60 cents per pound, according to the quantities they consume.

These prices are out of all proportion to the cost of production, from Sudbury ore, which certainly does not exceed 15 cents per pound. This statement is corroborated by the profits made by the two companies operating there; the profits of the International Nickel Co. are in the neighbourhood of \$3,000,000 a year, on their out-

put of about 17,000,000 lbs. of nickel, whilst Mond's Company's profits exceed \$550,000 on an output of about 4,000,000 lbs.

There are millions of tons of proved and valuable ore in the Sudbury field awaiting development and exploitation. This district certainly affords an instance, unique in mining experience of such immense bodies of valuable ore lying unworked year after year, one might almost say decade after decade. And what is the reason for this state of affairs? It is not owing to the lack of a process for treating the ore, for notwithstanding the cloud of mystery with which the processes at present in use are purposely enveloped, they are perfectly well-known, and any patent rights that may have at one time attached to them, have expired long ago. Nor is it owing to the want of a market for the products of these ores, for anybody who has investigated the subject at all knows perfectly well that all steel manufacturers are anxious to secure supplies of nickel if they can be obtained at a price commensurate with the gain in strength and the saving in weight, which the use of nickel steel has over ordinary steel.

The only conceivable reason for the large bodies of ore lying unutilized is on account of the control of the market being vested in a powerful combination, who have bound the principal consumers to them in a most ingenious manner, and who deter capital from embarking in the enterprise. Naturally they are quite content with the profits they are making; why should they incur more capital expenditure in opening more mines, and increasing the capital of their plants—which they would be compelled to do in order to make the same profits from a lower price—when they know that their position is absolutely secure? So long as matters are left in their present condition, so long will the more universal use of nickel be prevented, and so long will the enormous and valuable deposits at Sudbury remain unutilized.

A NEW ELECTRIC PROCESS FOR PRODUCING AND REFINING STEEL WITH COMPOSITE ARC ELECTRODES.

By Frank C. Perkins.

A new process of producing a high grade of steel, low in phosphorus or with any analysis desired as described below is of interest, the construction and arrangement of the electric ladles or furnaces provided with special composite electrodes being seen in the accompanying drawings, the covers not being shown. This process on which United States patents have recently been allowed consists in electrically treating molten iron from a blast furnace or low grade molten steel as taken from a Bessemer converter or open-hearth furnace, with electric heat produced by arcs formed between the slag of the bath and specially designed electrodes. Several forms of composite electrodes are indicated in the drawings. It will be noted that one consists of a cored carbon or a mixture of carbon, and lime or oxide or iron or other slag producing materials. Another shows the slag materials packed in an iron or steel tube and still another surrounding a carbon or iron rod or rods with or without projections for supporting the

slag materials with the usual binder employed in carbon electrodes.

It may be stated that the use of the composite or combination electrode, instead of the ordinary carbon electrode or an electrode of pure iron, introduces the fresh and additional refining slag materials to the bath fused and in a highly fluid state at the hottest points which are at the arcs or at the point of contact of the electrodes and the layer of slag floating on the bath of molten steel.

When two of these electrodes are used in an electric furnace of the double pole type, the current passes from one electrode into the slag, through the slag as a resistance and out of the other electrode, the two arcs operating at about 100 volts pressure. One electrode may extend into the slag or down into the molten steel below the slag, a single arc only being employed at this time formed at the other electrode, with a pressure of approximately 50 volts.

The double pole electric furnace is well adapted for practising this composite electrode process similar to the Heroult method because when the two electrodes are introduced into the refining slag, the latter acts as the resistance and forms one or two arcs according to whether one or both electrodes are out of contact with the bath and producing the arc and arcs. If one arc is used the other electrode may be raised and lowered by electric motor driven hoist stirring the molten bath by this action.

An ordinary basic lined ladle, crucible or pot may be used as noted in the drawings without cover which may be supplied in the same manner as a basic lined two pole electric furnace. This ladle having received the charge of molten steel from a Bessemer converter is electrically refined by eliminating the phosphorus and sulphur, as far as desired and the steel is deoxidized and recarburized. The steel is then poured into the in-

By the use of these special electrodes made with slag producing materials the highly fluid slag at the arcs causes rapid circulation to take place and the gases are removed which are often retained in metal and cause bad steel when poured into the ingot molds directly from the Bessemer converter without electric refining.

Furthermore, in this electric refining process segregation of sulphur and phosphorus are largely avoided while any quality of steel may be produced regardless of the quality of the raw materials.

It is well known that the Bessemer converter process for making steel is far cheaper than the open-hearth process, but the quality very largely depends on the metal, ore and other material available, and it is not possible to test the metal during the operation. The resulting steel, therefore, from high phosphorus and high sulphur charges contains an injurious quantity of sulphur and phosphorus which cannot be eliminated

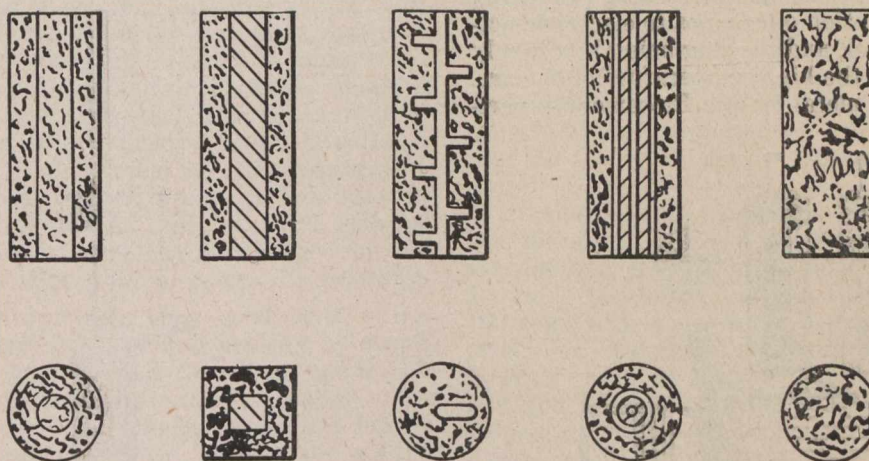


Fig. 1 Showing Suggested Forms of Electrodes to be Used in Ordinary Arc Furnace.

got molds after an electric treatment of from a few minutes to an hour or more in the electric ladle according to the degree of refining desired.

When only one of these electrodes is used in an electric furnace this electrode extends into the refining slag forming the arc at this point, the current being conducted through the molten bath and out through the bottom of the ladle similar to the Girod process.

Another construction shows double arc or single arc action taking place when the ring of cylindrical electrode is arranged on a level with the slag. A single arc action only at centre may be employed, the outer electrode dipping into the slag or molten steel.

By this electric arc process the molten metal continually circulates, all particles of the bath coming into contact with the refining slag at the arc or arcs and elsewhere and being rapidly refined, remaining at the highest temperature only a short time, then replaced by other particles of molten steel reaching the slag near the arcs.

It is held that in Heroult arc steel furnaces the circulation in the bath is always active and the average temperature may be kept as low as any other furnace and all parts of the bath come rapidly into contact with the slag. In case a deep bath of say 10 or 12 tons or more is used in the electric ladle and additional circulation is desired, one electrode may be plunged up and down in the metal by an electric hoist mechanism, while the other electrode produces the single arc then used with the slag.

by the existing acid Bessemer process. Too much or not enough carbon, manganese silicon or other elements can readily be corrected and gauged by the charge introduced into the converter, and subsequent treatment, but phosphorus and sulphur less than .09 and preferably below .05 is desired and this is not attainable by the existing Bessemer process.

With these special electrodes and the use of an electric arc for refining purposes, materials can be used in the electrodes or added to the bath for a neutral slag, as it is maintained that a thorough deoxidation of the steel is not possible when there are iron oxides in the slag as they will react to a certain extent with the molten bath of steel.

It is held that adding carbon under ordinary conditions will not result in complete deoxidation as both iron carbide and ferrous oxide readily exist together. By means of the electric process of steel refining with these combination or composite electrodes, however, carbon or a mixture of carbon and iron may be added to the slag as an auxiliary to the carbon mixture of the electrode, forming calcium carbide and resulting in deoxidation without the slightest difficulty at no great expense, and on any scale desired by providing electric arc apparatus for several electric furnaces, ladle cars arranged for serving various Bessemer converters or open-hearth furnaces.

The desired amount of manganese can be added for counteracting the bad effects from the ferrous oxide, the carbon reducing the manganese ore which has been

added to the slag and taking out the last traces of ferrous oxide leaving the steel bath protected by the layer of slag from oxygen in the air so that no further oxidation takes place.

The determining questions of the electric refining of steel, are cost and output. By shortening the time of treatment with these special composite electrodes combined with slag producing mixtures, and refining only down to such percentage of phosphorus and sulphur as are essential for rails and structural steel, the electric power consumed is so low, and the time required so short as to be practical for this work.

By this process cheap ore can be used having higher phosphorus and sulphur, these ores being abundant while high grade ores are nearly exhausted.

This new composite electrode process may be utilized as an auxiliary treatment to the Bessemer process for eliminating the phosphorus by employing an oxidizing slag in the bath as the molten metal is treated in the electric ladle with the arc, the auxiliary slag producing materials in the combination or composite electrode acting instantly on the metal, and the slag being in a highly fluid state as it melts in the high temperature of the arc.

The highly oxidized metal from a Bessemer convert-

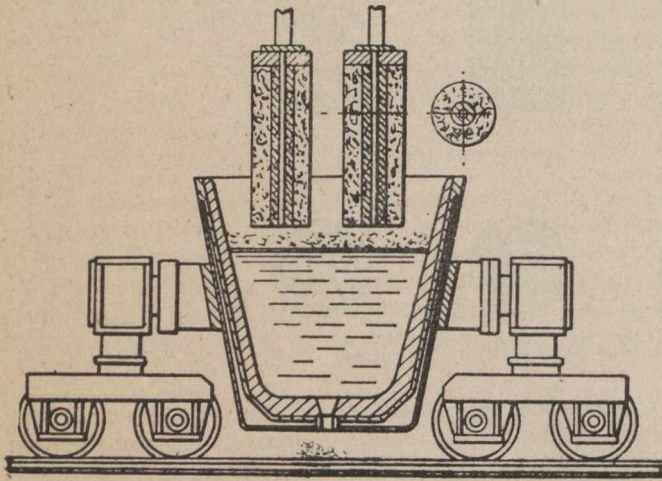


Fig. 2. Electrodes Used with Ladle.

er overblown, may be utilized deoxidizing same in the electric ladle by this process. It may be stated that the desired end to be attained by this electric auxiliary process with the Bessemer converter for rail making particularly, is the reduction of phosphorus, to .05 or thereabouts by the oxidizing slag and electric arc, the other elements being easily controlled by existing Bessemer methods.

It is well known that the Heroult electric furnace having pure carbon electrodes and a treatment extending from 75 to 90 minutes or more taking molten metal from an open-hearth furnace and electrically treating same with oxidizing and neutral slags, the phosphorus can be brought down to .003 per cent. and the sulphur down below .007 per cent. according to time of treatment.

By the use of composite electrodes containing slag producing mixtures it is possible to reduce the phosphorus to .03 or .05, which is 10 to 20 times as much as the above in a far shorter time and within practical limits for Bessemer working, only a small part of the phosphorus being removed.

It is also well known that the carbon is always eliminated before the phosphorus, and if it is attempted to

carry the reduction far enough to lower the phosphorus, in an open-hearth furnace the metal is highly oxidized and decarburized.

This composite electrode process provides a means of taking the highly oxidized metal from the open-hearth furnace, if carried far enough to eliminate as much phosphorus as desired and by electric treatment with the arcs and these special electrodes having neutral slag mixtures, it is also impossible to eliminate, if desired, nearly the last traces of sulphur the metal being deoxidized and as much carbon being added as found desirable, producing a finished steel of any degree of perfection desired according to the length of time the electric treatment is carried on.

It may be stated that in metal taken from an open-hearth furnace, if the reduction is carried on long enough to reduce the phosphorus to .01 per cent. or less than this amount, the carbon is eliminated. It is

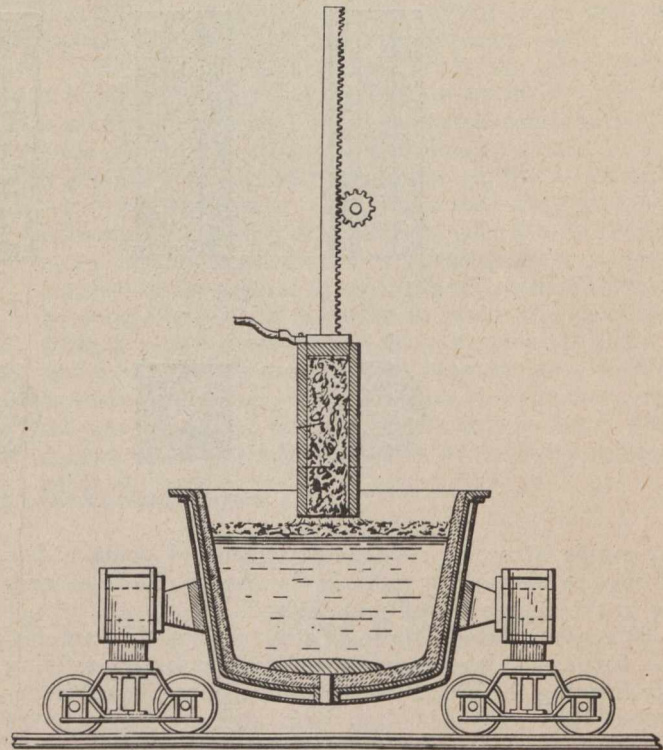


Fig. 3.

of course true, that such a highly oxidized metal would be very unsatisfactory in practice but by means of the electric furnace treatment with these composite or combination electrodes, the arc and proper slag mixture in the electrode themselves acting as auxiliary slag producers, will bring most satisfactory results, eliminating the sulphur, adding the proper amount of carbon, and deoxidizing the steel completely.

The proper mixture can be introduced into the molten bath and also provided in the electrode mixture to remove the sulphur on account of the high temperature of the electric arc even though the slags selected could not be used by any other than the electric treatment without addition of other slag materials to lower the melting point and this would interfere with the efficiency of operation. The slag mixture is also melted to a highly fluid state at the arc, largely from the mixture in the electrode itself, placed there for this purpose, in addition to that supplied in the ordinary way on the top of the bath.

Ordinarily there is great trouble and it is very costly to deoxidize the metal by existing processes and it is claimed that pipes and blow holes are produced in the ingot and other difficulties result from the presence of iron oxides. It is also maintained that when ferro-silicon and ferro-manganese are used to prevent these troubles, the oxides which result stay in the steel as an "Emulsion" in a finely divided state.

By this process of only taking the metal from the converter or open-hearth furnace when it is nearly finished steel and still molten, and merely completing the refining operation electrically, only $\frac{1}{4}$ of the electric power and less time is required than when electrically heating from cold metal. It is of value as an auxiliary process to the Bessemer converter and open-hearth furnace, taking the molten metal with little loss of heat and refining same to any degree according to time taken, the mixtures of carbon and iron or steel combination electrodes used and nature of slags employed.

While this process is specially adapted to the refining of molten steel taken from the Bessemer converter and open-hearth furnaces and treated in an electric furnace or ladle, it is not confined to this as the identical process will convert iron into steel from the molten or cold state without being previously treated in a Bessemer converter. Any grade of steel may be made regardless of quality of raw materials and carbon may be eliminated from electrodes for special steel making, the current being conducted to the arc by the iron rod instead of carbon and iron oxide, or composite electrode.

The neutral slag electrodes may work with a low current arc or dipping into slag and heating by resistance, and the steel may be kept for hours under this molten neutral slag without changing its quality. The metal may be cast, remelted or worked over to a higher or lower grade or it may be cooled, chilled, and melted a second time without injuring the quality of the steel.

The cost of production in this process is low as most of the work of steel making is done by the Bessemer converter or open-hearth furnace, only the removal of small percentages of the phosphorus or sulphur from the steel being attempted or the deoxidation of the metal, this being a good product for the larger rolling mills which supply the demand of rail and structural steel interests. The partial removal of the injurious phosphorus and sulphur reduces the time to a few minutes instead of hours, hence reduces the current required per ton.

It may be stated that the shorter time also lowers cost of linings and refractory materials per ton of metal and many charges may be treated in same time required for treating one open-hearth charge by existing process with gases alone. This shorter time process only reducing phosphorus from .09 to .05 for rail steel instead of to .003 which is possible by longer treatment, makes it a practical process for rail mills dealing with Bessemer converters treating full charges of 15 tons in electric ladles, handled by cranes taking same to positions where electrodes are inserted.

After treatment the metal is drawn from the bottom of ladle or tilted and poured into the ingot molds after slag has been removed. These simple methods are of vital importance as any new process for removing phosphorus and sulphur should not greatly increase the cost of power; should not cause excessive cost for basic linings or electrodes, or slag producing materials; and should be readily used as an auxiliary process in existing Bessemer plants.

THE RELATION OF MINING TO FORESTRY.

By B. E. Fernow, Dean of the Faculty of Forestry, University of Toronto (Annual Meeting, C. M. I., Montreal, March, 1909.)

In order to give to the discussion on the relation of the mining industry to forestry some local colour, rather than in the expectation of securing very valuable data, the writer recently sent a circular letter to mine managers in various parts of the Dominion, in which questions were put to them in regard to the use and the conditions of local supply of mine timbers. Their replies have been utilized in arriving at some general conclusions.

A canvass of the mines of the United States, made by the writer twenty years ago, afforded information showing a minimum consumption of not less than 150,000,000 cubic feet—the annual growth of at least three to four million acres. In the coal fields of Pennsylvania, for which the best data were available, the consumption varied at from one-half cubic foot to one and a half cubic feet of timber per ton of coal mined (bituminous). The iron mines of the Lake Superior field required over two cubic feet per ton; but the open pit mines were supposed to reduce the wood consumption for the total iron ore output to one cubic foot per ton.

In the precious metal and other mines the variation was found too extreme to afford data on which to base satisfactory conclusions. While the Bodie mine used 4.5 cubic feet per ton of ore, the Ontario could produce 100 tons with an average utilization of $6\frac{1}{4}$ cubic feet of timber. On the other hand, the timber consumption in such mines as those of the Comstock, the Montana and the Leadville mines, where large ore bodies are stoped and the Nevada system of timbering and cribbing is employed, is enormous. In 1887 the great Anaconda mine alone consumed over 1,000,000 cubic feet of mining and building timber, besides burning a large quantity of fuel-wood for smelting, this latter consumption in one camp alone amounting to 300,000 cords.

If it were assumed that the increased ore tonnage, during the last twenty years, was accompanied by a proportionate increase in wood consumption, the above figure would require to be increased to 500,000,000 cubic feet; roughly speaking, the annual growth of 10 million acres of well-kept forest.

We are not in a position to make even such approximations as these to the wood consumption by Canadian mines, for while most courteous replies were received from Canadian correspondents, they did not afford sufficient data upon which to issue a statement in any sense comprehensive. The impressions left by the perusal of the replies would, however, lead to the following generalizations:—

1. Canadian mines apparently use very little timber, conditions of rock in most localities being favourable, and roofs requiring little support. Shafts and shutes, and structures above ground, are responsible for the bulk of the consumption. Yet at some of the mines the consumption approaches that prevailing in the United States.

From the few reports available, the information points to a consumption of between one and eight cubic feet of wood per ton of ore mined. One of the Rosslund mines indicates $1\frac{1}{2}$ cubic feet, and at one of the Kaslo mines as much as eight cubic feet, which in these sections of the country can be purchased at a cost of about eight to twelve cents a cubic foot; while the Granby mines indicate a

consumption of hardly one-third of a cubic foot. A very complete report sent in by the International Coal and Coke Company, of Alberta, indicates a consumption of two cubic feet per ton; the cost varying from two cents per lineal foot for dead, to eight cents for green timber, largely poplar and spruce, or say an average cost of five to six cents per cubic foot of timber cut on the company's own limits. The consumption of the Nova Scotia Steel and Coal Company is also, probably, in the neighbourhood of two cubic feet at a cost of four cents per ton of ore. The Oldham gold mines use three cubic feet per ton, the cost of purchased material being from three to five cents per cubic foot for stulls and poles, and six to twelve cents for better class timber and lumber. The Dominion Coal Company, while using perhaps the largest absolute quantity of any Canadian enterprise in the neighbourhood, namely, of 1.5 million cubic feet, shows a very small per ton consumption, hardly one-half a cubic foot, the pillar and stall working being mostly employed.

2. The life of timbers underground, which is, of course, variable according to water conditions and mine ventilation, seems, on the whole and as one would expect, longer than in the warmer climate of the United States. In the well drained workings of the Oldham mines the timbers are crushed by the heavy hanging long before their durability is tested; while, curiously enough, in lower, flooded workings the same class of timber supported the hanging; but the theory of the writer's informant, that the water contributed to their support, is scarcely tenable. Moreover, the increased moisture contents of the wood reduces its strength to its minimum, so that the probable explanation can be sought only in a different distribution of pressures in the lower levels. In the dry climate of the Rosslund district, seven to ten years' life, at least in shafts, is not uncommon, with a reduction in the drifts to five and even three years. The Granby reports timbers put in when first opened nine years ago, still in good condition. In many districts, mines have hardly yet been worked for a sufficient length of time to afford data on this point. The kind of timber employed would also require to be considered in this connection.

At the International mine of the Dominion Coal Company timbers have in some positions remained in good condition since 1869. In other parts their life has been less than two years, and they are mostly affected by rot in the first year, and that without distinction of species.

It is interesting to note that this company is experimenting with a process of treating timbers to increase their life, but as yet without arriving at valid conclusions.

3. Throughout the eastern provinces the most satisfactory timber seems to be furnished by the spruce. The statement is made that it is found to carry greater loads and to stand heavier shocks than any of the other timbers found in the northern country. This would seem strange wherever the pines and hemlocks are in competition.

At the Dominion Coal Company's mines tamarack is given the preference, and next to it black spruce, which is supposed to have longer life; but lately the balsam fir is becoming the main supply. It is the least desirable species in point of strength and life. This balsam, as the writer had reason to ascertain, forms fully 75 per cent. of the timber on the Cape Breton plateau, from which these mines are probably largely supplied. Another reason assigned by the reporter is that spruce on the mainland has been either largely

cut out or brings a better price as pulpwood, and hence the mine is obliged to depend on the poorer material.

In eastern Ontario, the most satisfactory results underground are said to have been secured from the use of elm; except that its life is shorter than that of spruce. For lagging, cedar, which is the most lasting wood, is preferred if obtainable. In British Columbia the best timber is, of course, the red fir, while the larch is rather brittle, yet, in comparison with spruce and bull pine, superior.

4. The question of the continuity of supplies in the face of the relatively small supplies required, causes as yet little concern. Most of the Canadian mining enterprises are so young that local supplies have so far appeared ample, and prices low. Yet it is significant to note that in some instances not only is the increase in prices due to increased haulage, commented on, and felt to be a burden, but the needs of the future are beginning to be considered. From the General Chemical Company, operating at Sulphide at a depth of now 400 feet on an ore body 22 foot width, the statement has been received that "mine timbering was an expense to which we could not afford to go." And the writer expresses the belief that with proper management, timbering might be almost entirely dispensed with, except for shafts and shutes.

This statement recalls a similar example from the Menominee range, once one of the best timbered sections of Michigan, where a systematic rock filling method proved itself 50 per cent. cheaper than the use of timbers. A similar system is, in part, employed by the Canadian Copper Company, which uses not only rejected rock, but low grade ore, "this ore filling forming an ore reserve, mined and ready to hoist at a moment's notice."

Again: "The Eustis Mining Company of Capelton, Quebec, has experienced great difficulty of late years in getting satisfactory mine timber, and it is quite evident that this difficulty will increase from year to year. There is practically no satisfactory mine timber to be had within a reasonable distance from us. The probability is that we shall have to alter the system of mining to conform to the new conditions."

In other correspondents the question seems also to have stirred up the contemplation of diminishing supplies in the future, which future is being shortened by the much greater demand for wood materials from other than the mining industry.

Some of the mining companies own or control their own limits; but even these more providential concerns have, perhaps, scarcely realized that further wisdom may be applied in the manner of utilizing these properties, in order to insure continuous supplies. In other words, that just as they apply system and technical skill in exploiting their mines, they should manage their wood properties; they should practise forestry.

The first intelligent class of manufacturers, which has realized that provision for continuity of supplies of raw material is absolutely necessary, are the paper manufacturers, who have begun to practise forestry on their limits. Thus the Laurentide Paper Company employs a forester with a staff of 42 men to manage its large buildings. The Riordon Paper Company has commenced this work with a staff of a forester and 12 assistants to prepare for a regular management. These facts should stimulate other timber land owners to emulation.

To most people the word forestry is a synonym for tree planting; or else, if they do not dismiss it from their minds as a fad, they conceive its purpose is to make

mismanaged, culled woods again productive. What every timber land owner should realize is that forestry—intelligent planning—should begin when the first tree is cut, for by the mere manner of exploiting his property he may make or mar its future. Forestry in the timbered country means to so cut the timber as to secure a natural reproduction without the necessity of planting; the mere use of the axe securing this result. The forester is then a logger who besides harvesting the logs can direct the wood chopper to do his work so as to secure a desirable aftergrowth.

How this is done may not be stated briefly and in general terms, for each case requires its own diagnosis and prescription, but it requires more than is generally believed—more than merely cutting to a given diameter limit, or removing only the “mature” timber, to secure this reproduction.

To describe silvicultural methods would be beyond the scope of this paper, the object of which is merely to invite mining engineers to a fuller realization of the fact, that wood supplies are an exhaustable but restorable resource, and that by proper management exhaustion can be prevented.

If the needs of their mines do not call as yet for

provident measures to secure continued supplies, the writer would remind mine operators that besides being managers of properties, they are also citizens, who should take a general interest in the conditions of their country. Moreover, they are, by their occupation, placed in localities and positions where they can exercise—more than any other educated class—a wholesome and intelligent influence on the rest of the community.

While the mining industry has not directly consumed much of the timber wealth, it has indirectly been responsible for untold damage to forest growth. For a large part of the devastation by fire is chargeable against prospectors who burn over the ground to facilitate their work, and forest destruction, particularly in the Rocky Mountain regions, is largely attributable to this cause.

For this damage, atonement should be made by a special effort on the part of the more intelligent mine managers to assist in preventing further damage and to throw their influence into the balance to raise the standard of commercial morality to a proper realization of the enormity of the offence of the “fire-fiend.”

THE NISSEN STAMP IN COBALT.

The two Nissen single-stamp units installed last autumn at the mill of the Northern Customs Concentrators Company (nee Muggley), Cobalt, started dropping early in September; but throughout the latter half of October and through the former half of November the stamps were out of commission, owing to lack of power. On November 25th they were again started, and have been working continuously ever since.

The two stamps, each of which has a circular individual mortar, developed a capacity of 5½ tons per stamp per twenty-four hours through 30-mesh screens. The ore, La Rose dump stuff, is extremely refractory. Each stamp weighs 1,650 pounds.

As a basis of comparison, it may be mentioned that the corresponding duty performed by each stamp of the ordinary 5-stamp battery (stamps 1,250 lbs. each) was about 2¼ tons per day per stamp.

Thus the two Nissen stamps are credited with 11 tons per day, the 5-stamp battery with 11¼ tons. The power consumption is, roughly, 40% to 50% less for the Nissen stamps than for the 5-stamp battery.

Record of Trial.—Ore was fed to the Nissens at a size of one inch or slightly larger. The ore consisted entirely of conglomerate, and was extremely hard.

The stamps dropped 100 drops per minute, height of drop 7½ inches. The foundations were of 8" x 8"

timbers, set on concrete. The timbers were grouted with concrete. Had the foundations been entirely concrete, absorption of shock should not occur.

The Nissen individual mortar weighs only 3,000 lb. The ordinary 5-stamp battery mortar weighs about 10,000 lb. Hence the Nissen stamps are handicapped by a more or less resilient foundation.

Contrary to the expectations of some of those interested in the trial, the screen wear on the Nissen mortars was not excessive. The shoes and dies wore evenly and smoothly.

The Nissen independent circular mortar is provided with a screen that represents roughly a segment of a circle slightly greater than a semi-circle. The screen is vertical, and thus every aperture is normal to the splash radiating from the centre of the die. This, of course, makes for rapid discharge. Wear on the stamps is compensated by means of weights placed upon the boss-head, which extends out of the mortar. Thus the stamps can be kept up to maximum duty.

The above remarks are given to shew a few of the advantages claimed for the Nissen stamp. The tabulated records below speak for themselves. Attention is drawn to the percentage of silver in the different sized products, also to the proportion of slimes produced by the Nissen and by the ordinary stamps.

Sample from Five-Stamp Batteries, Dec. 2nd, 1909.	Percentage of Sized Pulp.	Assay Value per ton of 2,000 Pounds.	Silver in each Fraction Calculated on 1-T. of Ore.	Percentage of Silver Contents of Ore in each grade of sized pulp.
Pulp retained on 40	5.19	13.8 oz.	0.73 oz.	3.50
“ passing 40 retained on 60	13.75	25.4 “	3.57 “	17.15
“ “ 60 “ 80	18.23	20.5 “	3.78 “	18.35
“ “ 80 “ 100	3.21	23.8 “	0.78 “	3.74
“ “ 100 “ 200	8.48	23.4 “	2.02 “	9.70
“ “ 200	48.82	19.8 “	8.89 “	47.51
as sampled		22.2 “	20.81 “	

Sample from the Nissen stamps, Dec. 3rd, 1909.	Percentage of sized Pulp.	Assay value per ton of 2000 pounds.	Silver in each fraction cal- culated on 1-T. of Ore.	Percentage of Silver contents for Ore in each grade of sized Pulp.
Pulp retained on 40	8.56	12.8 Ozs.	1.11 Oz.	9.88
" passing 40 retained on 60	13.92	10.0 "	1.41 "	12.55
" " 60 " " 80	19.73	12.6 "	2.52 "	22.43
" " 80 " " 100	3.40	8.4 "	0.29 "	2.58
" " 100 " " 200	6.39	11.2 "	1.06 "	9.43
" " 200	43.39	11.0 "	4.84 "	43.09
" as sampled.		12.0 "	11.23 "	

Details of Rough Classification Test on 200-Mesh Product from Nissen Stamps. — 20 grains of pulp were taken and thoroughly mixed with clear water, and settlement was allowed to take place for a very short space of time (less than a minute), and the water holding the finer portion of the pulp in suspension was poured off. This process was repeated with the pulp four times, thus obtaining four products from settle-

ment and one of float matter. Results were as follows:—

First settlement	24.50%
Second settlement	15.75%
Third settlement	36.75%
Fourth settlement	18.30%
Fifth floating matter	4.05%, slimes

LEGAL COLUMN.

LEGAL COLUMN.

The Office of Mining Commissioner.

It has been claimed as one of the features of the Mining Act of Ontario that the office of Mining Commissioner does away with the cumbrous proceedings of the courts and facilitates the trial and disposal of disputes regarding mining claims.

One may have doubts, however, as to the advisability of the practice which is growing so common of creating commissions and commissioners to supersede the regular courts. The machinery of the courts, while cumbrous, is adequate. Its movement is as certain as it is slow. We should not be too hasty to discard the result of many years' growth and adaptation.

The success of the Dominion Railway Commission has been responsible for the creation of numerous other commissions, including the Ontario Railway Board, the Public Utilities Commission in Nova Scotia, and doubtless also the Mining Commissioner for Ontario. The Dominion Railway Commission is successful, however, rather in spite of itself. It has been singularly fortunate in having for its three chairmen one man of long legal and administrative experience and two of judicial experience, all of them exceptionally able men. While its power is great, its jurisdiction is concentrated on a few corporations whose means of communication and transportation are exceptional, consequently its localized and comparatively meagre machinery does not limit its effectiveness.

The same results have not followed the erection of the Ontario Railway and Municipal Board nor, it is submitted with due deference, that of the Mining Commissioner's office.

The Mining Commissioner, as a general inspector and referee of mining recorders, is doubtless an expedient and useful official, but his jurisdiction is much more extensive than is thus implied. Under Section 123 of the Mining Act of Ontario, subject to certain exceptions, "no action shall lie nor shall any other proceedings be taken in any court as to any matter or thing upon which before the issue of the patent any right, privilege or interest conferred by or under the authority of this Act depends, but save as in this Act otherwise provided, every claim, question and dispute in respect to such matter or thing, shall be determined by the Commissioner, and in the exercise of the power conferred by this section the Commissioner may make such order and give such directions as he may deem necessary for making effectual and enforcing compli-

ance with his decision." Under this section a great variety and volume of cases arise in which no special knowledge of mining law or mining is required. Proceedings under the Mechanics' Lien Act are expressly excepted. But all questions relating to the ownership of unpatented claims, whether arising from trust, partnership or sale agreements, disputes depending solely on the facts and on principles of commercial law, are obviously of equal importance with purely technical disputes.

For these there is absolutely no machinery provided to the Mining Commissioner. It is often necessary that immediate proceedings should be taken, an injunction obtained, or the like. A certificate of "Lis Pendens" putting every purchaser on notice of a litigant's rights to any real property may be obtained from the court and registered in half an hour at a disbursement of \$2.60. The same thing under the Mining Act cannot be done within, at best, two or three days, and a disbursement (exclusive of telephone and agency fees) of \$10. The Mining Commissioner's only settled office is in St. Thomas. His duties require him to spend a great part of his time in the mining districts, where his movements are uncertain and communication difficult. He is not provided with any staff or office in Toronto, and, as everyone in actual practice knows, it is sometimes impossible for days to get before him. The inconvenience and foolishness of this is obvious, while at the same time the courts are right at hand with ample, accurate and well-known machinery for the relief of the litigant.

We do not wish at all to reflect on the present Mining Commissioner. Under a less industrious and painstaking official the situation would be worse.

Re Perkins and Dowling.

Appeal by the claimant Perkins from the decision of the Mining Commissioner for Ontario, by which he affirmed the validity of a certificate of record issued by the Mining Recorder of the Gowganda mining division to the respondent Dowling in respect of a mining claim in that division. The appellant asked that the certificate should be set aside, and that the respondent's claim should be declared forfeited for non-performance of the working conditions required by Sec. 78 of the Mining Act of Ontario, 8 Edw. VII., ch. 21.

The appeal case came on for hearing before Meredith, C.J., C.P., Teetzel and Sutherland, JJ.

Counsel for the respondent took the preliminary objection that no appeal lay from the decision of the Mining Commissioner confirming the validity of the

certificate of record issued by the Mining Recorder, citing Sub-Sec. 4 of Sec. 78 of the Act, which provides that "the Recorder, if satisfied that the prescribed work has been duly performed, may grant a certificate, . . . but he may first, if he deems proper, inspect or order the inspection of the work, or otherwise investigate the question of its sufficiency, and his decision thereon shall be final unless appeal is made to the Commissioner, whose decision shall be final."

Counsel for the appellant argued that the decision of the Commissioner was not final unless he had made an inspection or investigation under the above provisions of the Act.

At the conclusion of the argument on the question of jurisdiction, the judgment of the Court was delivered by Meredith, C.J., dismissing the appeal, on the ground that the decision of the Commissioner was final, whether or not any inspection or investigation had been made by him before giving his decision.

As the point was a new one, no costs were awarded.

PERSONAL AND GENERAL.

Mr. R. B. Lamb, of the C. L. Constant Company has left New York for Central America, on important examinations. He expects to be gone some time.

In our issue of January 1st, 1910, in the list of members elected to the Canadian Mining Institute, the name of Mr. D. G. Wilson, should have appeared as superintendent The Hosmer Mines, Limited, Hosmer, B.C.; instead of superintendent Crow's Nest Pass Coal Co.

EXCHANGES.

The Engineering and Mining Journal, Jan. 15, 1910.

—According to the E. and M. J., neither Mr. Ballinger nor Mr. Pinchot will have lived in vain, if their row over Alaskan coal-lands leads Congress to appreciate the national importance of the immense coal deposits of Alaska. While making no attempt to excuse those persons who have been evading the law, the E. and M. J. very reasonably points out that Alaska is not a poor man's field. The coal lands will have to be exploited by rich corporations, or by nobody.

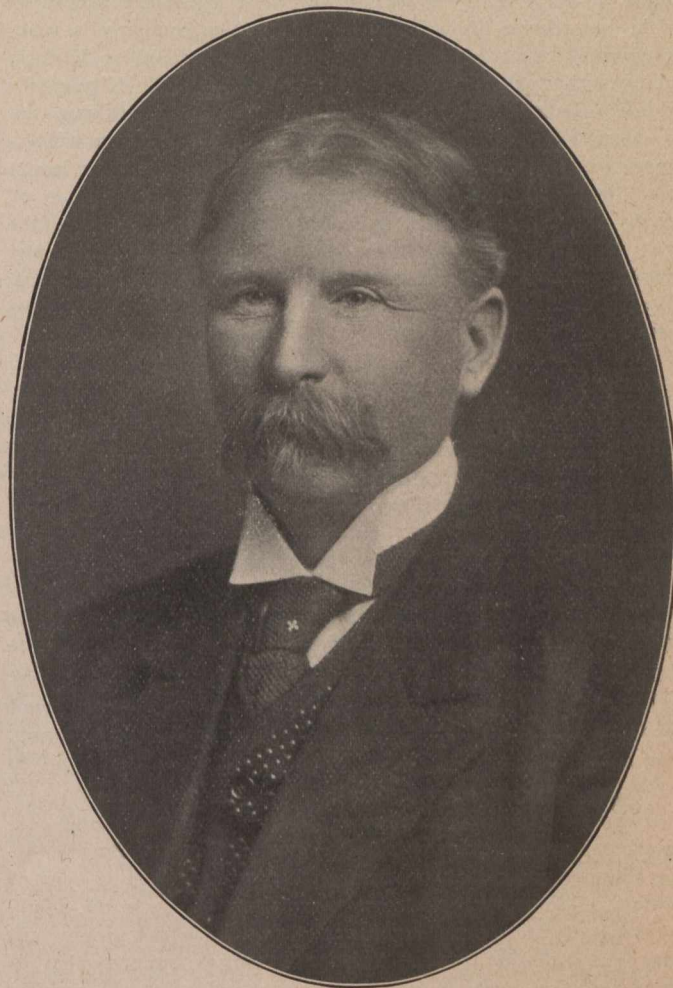
OBITUARY.

Harold A. Wiley.

To Ontario mining men, the death, on January 15, 1910, of Mr. H. A. Wiley, was a most unwelcome surprise. Mr. Wiley was a partner in the firm of Thomas Marks & Co. Associated with him, were his brother Mr. F. S. Wiley, and the late Messrs. Thomas Marks and George T. Marks.

Twenty years ago Mr. Wiley undertook the first diamond drill in the Atikokan Iron Range, and was instrumental in interesting Belgian capital. He was connected with the development of several silver mines, in the Port Arthur district. One of these, the West End

Mine, shipped over half a million ounces during Mr. Wiley's connection with it. Mr. Wiley also was one of the pioneers in the exploitation of the Animikie Iron Range at Loon Lake, 25 miles east of Port Arthur. Along with his brother and the late George T. Marks, he was largely interested in the Port Arthur Mines Company Limited, of which, Messrs. MacKenzie & Mann are directors.



Mr. H. A. Wiley.

During recent years Mr. Wiley became interested in Cobalt, and was one of the owners of the Nugget Claim, and a director of the Smaltite Mining Company.

His interests were by no means confined to mining. As president of the Canadian Northwest Steamship Company he occupied an important office.

His sense of citizenship was broad. He was a member of the following clubs and associations:—The Albany Club, Toronto; The Jockey Club; Royal Canadian Yacht Club; Empire Club; Lake Shore Club; the Port Arthur and Fort William Clubs; the Boards of Trade of the Cities of Toronto and Port Arthur; and the Dominion Marine Association.

SPECIAL CORRESPONDENCE

ONTARIO.

Cobalt.—The Little Nipissing property has been coming into prominence again on account of the good results obtained in the development of the new vein found some time ago. This vein was found about 500 feet east of the shaft on the 165-foot level,

and it has now been drifted on for over 60 feet, thirty feet of which is in good ore. The vein in places is about 5 inches of smaltite, carrying high values in silver.

The physical condition of the Cobalt Lake Mine has much improved of late, due largely to the developments on the vein found some time ago on the 190-foot level. From the work done

so far, it promises to be the most important ore body that the Cobalt Lake has ever discovered. Since this property was first bought from the Government it has been a great disappointment, but the work done during the past six months has given the most promising results in its history.

The new vein discovered on the 75-foot level of the Hargraves a couple of weeks ago has now been drifted on for over 20 feet, and already several tons of high-grade ore have been bagged. The vein in the face of the drift is about 5 inches in width, and carries high values in silver. The company is making preparations to sink the shaft an additional 50 or 75 feet, and from this point drifts will be run on the vein. High-grade ore is also being produced in the No. 3 shaft. This working was put down on what was supposed to be a continuation of the famous Jacobs vein of the Kerr Lake. Drifts on four levels failed, however, to give any evidence of silver. A couple of months ago a cross-cut was run north from the lowest or 380-foot level, and when in 60 feet encountered an ore body that has since been proved to be a continuation of the Jacobs vein. A drift was run on this for over 30 feet, and this ore is now being stoped.

The Wettlauffer Mine in South Lorrain, which has come in for a good deal of prominence on account of the shipments it has made lately, has received the smelter returns for the first three cars of high-grade ore sent out, showing a total content of over 200,000 ounces of silver. Up to date this company has shipped about 110 tons of ore, and it was the first property in New Ontario, outside the Cobalt camp, to make shipments. Practically all this ore has been taken out in development work, as the company had ore from the grass roots down. Sinking is being continued in the main shaft, which has now reached a depth of 160 feet.

The Temiscaming and Hudson Bay Company was the first to declare a dividend for the year 1910. The dividend amounted to 300 per cent. on the issued capital of the company. This brings the total dividends paid by this company up to 15,400 per cent.

Gowganda has at last commenced to ship ore, the first consignment from that camp being made by the Blackburn mine. The shipment consisted of 20 tons of high grade and 10 tons of medium grade ore. The former will probably carry in the neighbourhood of 2,800 ounces per ton, and the medium grade will assay about 500 ounces. There are already a large number of teams carrying supplies into the district, although the number is, of course, small as compared with last year. It is estimated that there will be about ten carloads of high grade ore to send out. The Blackburn will probably be one of the heaviest shippers as it is generally conceded to be the best property in that part of the country. It is rather a remarkable thing that this property is the only one in the Gowganda district that is in the conglomerate. The Bartlett, about which so much was heard a year ago, has been closed down and has reverted to the original owners, McLaughlin and McIntosh, the Bartlett Company having failed to make the last payment. The property, which is well located and has some good surface showings, might have made good had it been properly managed. It is a significant fact that absolutely nothing in the way of surface prospecting was accomplished last summer.

The new road into South Lorrain, which is being built by the merchants of Cobalt and the mine managers of Lorrain, is nearing completion, and as it will be about ten miles shorter than the old road, it will effect a considerable saving in time and freight charges, and teams will be able to make the round trip in one day. The shipments for the present year should show a large increase, as there are now seven prospects that are producing high grade ore.

Negotiations between the City of Cobalt Mining Company and Northern Customs Concentrator have been concluded where-

by the City of Cobalt's dump is to be treated on a royalty basis. It is estimated that the dump contains about 11,000 tons that will assay approximately 25 ounces of silver per ton. This dump will augment very considerably the revenue from the mine, and with the reduction in the royalties that has been effected, and the bettering of the physical condition of the mine that has taken place within the past few months the company should make a very favourable showing.

The Otisse-Currie Company has decided to sell the plant that it originally had on its property. This plant was supplemented by a larger one to meet the growing needs of the mine and is now of no further use. It is understood that it will be bought by the Berlin Mine.

It has been determined to shut down the Union Pacific Mine, which is one of the leases of the Peterson Lake Company, for the present. The shaft was being sunk with steam, but having reached the point where this power was not satisfactory the directors decided to shut down till air from one of the power companies is ready. The shaft will be timbered and put in shape to recommence work as soon as the power is available. In the meantime work is mainly confined to the development of the Michigan Cobalt.

Despite the many promises made by the power companies regarding the date for the delivery of air and electricity, it is hardly probable that they will be able to fill their contracts before the month of May. The company that has made the greatest progress is the Mines Power, Limited. This company only commenced operations about last June, and since that time it has made remarkable progress. At one time it carried about 1,300 men on its pay roll, but this number has now been reduced to 750. The sub-station at Cobalt is practically completed and in a few weeks the large compressors will be installed. The pipes for the delivery of air are being distributed, and as these are of no great size it will not take long to connect them up. The Cobalt Hydraulic Company has still a large amount of drilling to do in its underground workings, and its facilities for handling the muck have decreased on account of the work to be done in the intake shafts. At the present time the whole camp is greatly handicapped by the lack of power, and the probability is that most of the mills now under construction will be finished before the power arrives. The work on many properties is less than it would be on account of the managers not wishing to go to the expense of putting in machinery for a few months to supply the extra needed power.

It is stated that at the Victoria mine a shoot of high grade ore has been encountered on the 80-foot level.

Stoping has commenced on the Waldman vein at the 75-foot level. At this point a drift was run to the west for about 70 feet, and from the end of the drift a raise will shortly be started on the vein. At the 75-foot level the vein was in one place about a foot under eight inches of smaltite carrying considerable quantities of native silver and about four inches of calcite. A diamond drill has been installed at the bottom of the shaft to locate the vein at a depth of 150 feet. Several tons of high grade ore have been obtained from development work and are ready to ship. Two veins have been found on Lot 99, bought by Waldman in the recent Government sale, but they do not contain any silver values. When air can be obtained a shaft will be sunk. The Waldman vein and the one on the York and O'Brien lots are the only discoveries of importance that have yet been made on the limit. It was largely due to the Waldman vein that the prices in the last sale of lots ruled so high. The great majority of purchasers are already regretting the prices paid as they were altogether out of proportion to the value of the properties.

Porcupine.—Less than three months ago Porcupine Lake was a place practically unheard of except by a few prospectors, and now it is one of the busiest portions in New Ontario. The big

gold discoveries made there have caused a rush of very considerable proportions, which even yet is only in its infancy. So far the best known claims are the Wilson, Bannerman, Hollinger, Miller, and Gillies; but many more important discoveries have been made. The Wilson has the most spectacular surface showings yet discovered, the vein being in places 75 feet wide, with the free gold scattered through it in various places. The Bannerman group of claims has been taken over by the firm of McArthur & Co., of Glasgow, Scotland, and they are making all preparations for carrying on operations on an extensive scale. The O'Brien people have taken an option at a large figure on the Gillies properties and they have a diamond drill working to test the vein at a depth of about 100 feet. As the time for the option has nearly expired the results of the boring are looked forward to with a great deal of anxiety by all who are interested in this new camp. It is understood that an effort will be made to get the option extended. The Tummins have an option on the group of claims known as the Hollinger and have a large force of men at work sinking test pits. As far as can be learned the results obtained have been very satisfactory. The option on these properties will not expire till the middle of February. Another important discovery of free gold is stated to have been made on the south-east corner of Tisdale, adjoining Shaw and Whitney, the samples showing free gold in remarkable quantities. A large number of Cobalt engineers and mine managers recently paid a visit to the district to look over different properties there and they were all very favourably impressed with what they saw. These men are well-known mine operators and their opinions carry considerable weight.

Considerable discussion has been raised by the action of Father Paradis in cutting through High Falls on the Frederickhouse River. As a consequence Frederickhouse Lake and Wilson's Creek are dry and Night Hawk Lake has been lowered about seven feet, a beach over a mile in width being formed around the lake. This action was taken without permission of the Dominion Government. An official has been sent up to see what is necessary to be done in the matter. The district as a whole is getting along wonderfully well, and with the good roads and easy transportation important developments may be expected before spring.

KENORA MINING DIVISION.

Kenora.—The Prospectors' and Mine Owners' Association of the Kenora Mining Division held its annual general meeting in the Town Hall, Kenora, on January 11th, at 8 P.M., when the following report was made by the secretary:—

Mr. Chairman & Gentlemen:—Since you have all taken an active part in the business of this Association it will be unnecessary for me to go into details, but I will take this opportunity of reminding you of some of the more important moves made by this Association during the past year.

First I may say that our paid up membership list for 1909 comprised 86 members, 24 of whom are now residents of Kenora and nine now residents of the province of Ontario, some coming from Manitoba, but the major portion from Detroit and its vicinity through the co-operation of the Shareholders Protective League whose head office is in that city.

Almost the first matter of importance taken up by this Association was the question of obtaining for the prospector and mine owner more consideration from the hands of the Government in connection with the timber of a mining location whether patented or not.

Next we took up an advertising campaign with the object of attracting the attention of those desirous of investing in mining enterprises, to this district, which campaign was inaugurated and to a large extent carried on by a series of articles and notices in The Canadian Mining Journal, which is probably the most reliable disseminator of mining news in Canada. And not

to be forgotten among the other actions of this association is that of introducing to its members Mr. Geo. Thurber and allowing them to judge for themselves the advances made in his process for gold extraction. Finally I would point out that apart entirely from any actual results in Government action, or re-action caused by or obtained through the workings of this body, the very fact of having such an association in this district, has called attention to a greater or less degree to this country and has exerted an influence beneficial to the town and district as a whole.

Financially the Association is on its feet. Its books audited by your auditors, Messrs. Geo. W. Fullerton and C. H. Challoner, and by them found correct show a balance to your credit of \$34.50, all liabilities having been discharged. I have the honour to remain,

Sincerely yours,
H. P. THOMAS,
Sec.-Treas.

After this report had been received the following officers were elected:—

Honorary President—Capt. H. A. C. Machin, M.P.P.
President—Major the Hon. J. E. P. Vereker (by acclamation).
Vice-President—Harding Rideout, Esq. (by acclamation).
Secretary-Treasurer—Herbert P. Thomas.
Auditors—F. W. Hockley, Thos. Walsh.
Committee of Twelve—J. S. Whiting, Thos. Walsh, Jas. Weidman, C. W. Chadwick, P. H. Austin, Leo. Stevenson, A. McMeekin, John Nash, A. Woods, Geo. Thow, T. J. Cherry, J. S. Harvey.

When the routine business had been completed, Capt. H. A. C. Machin took the opportunity of impressing upon the members the value of such an institution as that to which they belonged and roused the enthusiasm of the meeting by informing them that he had that day signed an option on the Mikado Mine and expected to see it in operation again this spring. The Mikado Mine has always been admittedly one of the largest gold mining propositions in this district, and in spite of bad management and a too lax overseeing of the miners, the mine has in the past been a paying proposition. The main shaft, however, which by the way is an inclined one, gave the former owners of this mine the impression that the vein had pinched out at a depth of approximately 250 feet. From Capt. Machin's own observations on a recent trip to the mine, by taking the strike and dip of the lode, he has come to the conclusion that the main shaft has passed outside of the containing wall of the vein through miscalculation on the part of those formerly in charge of the mine and that the mine is to-day in a position to equal its previous good record of gold output. This conclusion as to the direction of the lode has been reached, not by Capt. Machin alone, but by others of his party as well as by the man who for the last few years has been left in charge of the mine and plant by the company. This new conclusion relative to the former misjudgment of the strike and dip of the lode will account for the apparent pinching out of the vein, inasmuch as since the shaft of the retaining wall and the vein were not running parallel, but more gradually approaching each other it would give the effect of the vein gradually pinching out, while in reality a little drifting on the opposite side of the shaft would have proved the original lode to be there in its full width and not to have pinched at all.

The opening of this mine, in which many of our local men have such a firm belief, will, we feel sure, show the public that this mining district has not failed in the past through poverty in ore values.

BRITISH COLUMBIA.

Rossland.—The ore shipments from this camp for the first week of the year amounted to over 5,700 tons, which is far above the average that was maintained during 1909. The three

leading mines have started the new year with substantial shipments, the Centre Star over 4,000 tons for the week, the Le Roi 2, Limited, over 700, and the Le Roi nearly 400 tons. Rossland is in a good position to make a record year of 1910, and as a greater interest in mining seems to be awakening over the country generally it is highly probable that several of the companies that have been letting their mines lie idle here for the last few years will resume work during 1910. The situation certainly seems ripe for it. There are vast areas of mineralized ground about this camp and there is no doubt at all but other rich deposits lie hidden in Rossland's seven hills than those already uncovered. The coming year will be a propitious one for companies owning mines here to do development work as there is little doubt but what they would receive good financial support from the investing world. The valuable work done here by the Geological Survey of Canada and the vast amount of work done at depth in the leading properties of the district have changed things for the better from what they were five or six years ago. While there is nothing definite there are prospects of the Blue Bird Co. doing development work in the South Belt, and the Jumbo is also likely to resume operations late in the spring. The Hattie Brown will no doubt be worked, and rumour has it that a plan of development may be carried on at the O. K. gold property. The I. X. L., adjoining the O. K., is now being worked under lease. The gold in this ground occurs in a pockety form in a quartz vein on a contact between porphyrite and serpentine. This property is paying a little more than its own way and there is the element of chance in the probability of opening up a pocket of more than ordinary richness.

The Boundary.—The Granby mines, Mother Lode, Snowshoe and Oro Denoro mines, for the week ending January 8th, shipped ore aggregating over 40,000 tons. The outlook for the Boundary mines for the coming twelve months is probably brighter than it has ever been, but it is more than likely that the usual crop of drawbacks will creep in and hinder matters. Already a strike cloud is hovering over Greenwood, where the Miners' Union is demanding the closed shop of the B. C. Copper Co. As this is a most unreasonable demand, there being no other difference, apparently, if it is pressed it will surely end in a deadlock. As the miners of the surrounding districts, however, deem their Greenwood brethren somewhat temerarious and are not giving them the moral support that they would like, it is thought that the affair will not go much farther than it has.

The development of the Rawhide property of the New Dominion Copper Co. is being energetically executed and it is expected that the mine will begin shipping ore to the Greenwood smelter of the B. C. Copper Co. within ninety days. It is stated that as soon as the B. C. Copper Co. is assured a steady supply of ore for its three furnaces as is highly probable, it is the intention to resume the payment of dividends. The smelter is at present treating about 1,600 tons per day from the Mother Lode and Oro Denoro, but as some of this ore is being taken from the glory hole workings inclement weather is liable at any time to interfere with operations. For this reason the company is desirous of securing a steady supply of ore from the Dominion properties until its mine in Wellington camp has better shipping facilities, which are now being built.

The Greenwood-Phoenix Tunnel people have abandoned the idea of using a tunnelling machine for the present and have installed an air compressor at the mouth of the adit, with a view to using machine drills, which will be at work in a week or two.

The shaft on the Alaska-Buster property, near Beaverdell, is now down 90 feet, and the ledge has been opened up three feet wide with a 6-inch paystreak carrying \$100 to \$200 silver and lead. The Standard Fraction, adjoining, is also being worked. The Riverside, another West Fork property of promise,

was recently examined by experts and may be soon worked by a local syndicate. Near Greenwood the E. P. U., Tip Top and Dynamo claims are being worked steadily. Operations are about to be resumed on the Bay mine with a crew of five men. The new machine shop at the Granby mines is about completed and the labour-saving machines are being installed. The new shop will prove a time and money saver for the mines of the company, being up-to-date in every particular.

Nelson.—The St. Eugene, Blue Bell, North Star, Richmond-Eureka, Van-Roi and other steady shippers appear on the list for the week ending January 8th, and in addition the Broadview mine, which has not shipped for a couple of years, sent out 31 tons of select ore. The Arlington shipped 20 tons. The total quantity of ore shipped and milled in the district for the first week of the year amounted to over 3,500 tons.

The prospects for the Slocan-Kootenay district for the coming year are very good. The Sullivan group of lead mines, at Kimberley, which were idle all of last year, will be extensive producers this year, under the lease held by the Consolidated M. & S. Co.; the Slocan Star is to be worked by the B. N. White Co., the Big Ledge zinc property will likely join the list of shippers and increased production may be looked for at the Richmond-Eureka and Van-Roi mines, while several new shippers will enter the list from the Sheep Creek section. W. J. Milne, of Vancouver, has bonded the Golden Gate, Fancy and Golden Fate claims in Poplar Creek camp, and work has been started with a crew of five men. It looks as though Poplar Creek district would have another innings this coming year. The Ethel mine in the Lardeau is under bond to Spokane mining men and a quantity of high-grade ore is being taken out of the property. A good strike of silver-lead ore has been made on the Iona group near Ymir. The Yankee Girl mine, near this group, is working a crew of about thirty men and shipping steadily. The Vancouver men who held the bond on the Alma M. property have permitted their bond to lapse and the original owners have put a crew to work on development on their own account.

Shipments from the Lucky Jim zinc mine are averaging about 355 tons per week, of about \$12 per ton net. A new tunnel is now being driven 200 feet below the present workings, which will permit of more economical operation, gravity being used extensively in taking the ore out of the mine. It is said by the management that there is a body of about 60,000 tons of ore "in sight," from every five tons of which one ton of 50 per cent. zinc ore can be hand sorted; while it is expected the "second-class" ore will concentrate four into one of 50 per cent. zinc ore.

It has been said that some of the coal mines in the Crow's Nest district were thinking of building a number of coke ovens similar to those now in use in Germany, which save some of the by-products, lost in the ordinary bee-hive oven. This would seem to be a great step toward economy. It is said that as much as four gallons of tar useful for aniline manufacture and two pounds of sulphate of ammonia could be saved per ton of coal coked. In fact, the by-products have been found more valuable than the coke itself. As an instance, at the Crow's Nest Pass collieries, Michel and Fernie about 1800 tons of coke is made per day in the bee-hive ovens, a loss ensuing, roughly speaking, of about 14,000 gallons of valuable tar product and about 3500 lb. of sulphate of ammonia, to say nothing of possible illuminating gas, which could be used to advantage for lighting, possibly, and generation of power, surely. Without knowing all the actual conditions it seems as though it would pay the companies along the Crow's Nest to put in apparatus for distillation, providing a method that is not too slow can be found and adopted. Furthermore, the loss of these valuable by-products of coal year in and year out is not only a loss to the operating companies themselves but is a national loss that will surely make itself felt in due time.

GENERAL MINING NEWS.

NOVA SCOTIA.

Glace Bay, Jan. 17.—J. H. Plummer, President of the Dominion Iron and Steel Co., and Coal Co., and M. J. Butler, General Manager of Companies, spent this afternoon in town, and visited the various departments of the company's works here. They were accompanied by D. H. McDougall, General Superintendent of Mines and Quarries, and Hector McInnes, the company's solicitor. The early afternoon was spent in conference with General Manager Duggan, Mine Supt. B. McKenzie, Messrs. McEachern and P. Christianson, the managers of the general collieries and other officials.

Answering the inquiry as to whether he would meet a representative of the strikers, Mr. Plummer said that he had not met the representatives of the United Mine Workers Association, and that he did not consider it necessary that he should meet them. The position of his company, as regards its employees had already been plainly stated, and a meeting with these representatives to discuss the terms on which the men now out of employment may return to work, might be misconstrued as a recognition of the United Mine Workers of America, which would be against the policy of the company since the beginning of the present disagreement.

President Plummer intimated though that any of the men now out of work would be taken back as soon as places could be made for them, should they desire to return.

ONTARIO.

Verona.—From the McDonald feldspar property at Verona shipments amounting to more than 3000 tons of this mineral were made in the last six months of 1909. The present output is about 500 tons per month.

Brockville, Ont., January 17.—Clifford E. Smith, mining engineer, of Brockville, has issued a writ in the High Court against Dr. Milton L. Hersey et al., of Montreal, purchasers of mining claims A26 and A39, and against the Wyandoh Silver Mines

Ltd., of Cobalt. Smith claims his agreement was for a one-tenth interest in these properties, and asks for a declaration of his title to the same, and also for damages to the extent of \$55,000.

Toronto, January 18.—A car load of silver ore from Gowganda, en route to Thorold, is expected in some time to-day. This is the first carload from Gowganda country. It comes from the Reeves-Dobie mine. It is consigned to the Comagas smelter at Thorold, where it will be treated.

Only a little more than a day sufficed in transportation along forty-five mile road through mush. On Friday morning twenty-five sleighs started, each one loaded with sacks containing about one thousand pounds of ore, and on Saturday afternoon the railroad was reached.

BRITISH COLUMBIA.

Greenwood, Jan. 7.—The local branch of the Western Federation of Miners has notified the British Columbia Copper Company that members in its employ at Mother Lode mine and local smelter will quit work on Tuesday, January 10th, unless the company agrees to employ members of the order exclusively.

The demand has been refused by Frederick Keffer, general manager, who, in reply, states that it would be impossible to coerce non-union employees to join the federation. As long as an employee was efficient he did not care anything about the man's creed, nationality, or connection with labour unions.

The situation here is acute, but it is hoped that a strike, involving the suspension of mining and smelting operations, resulting in the enforced idleness of 500 men, will be averted.

There has been a strong feeling in the ranks of the union employees because many of their fellow workmen refused to join the federation. Recently, as a test case, one of the non-union employees was fined \$50 for refusing to join the federation, and later an additional \$10 was imposed for failure to pay the fine.

MINING NEWS OF THE WORLD.

RUSSIA.

A report on the Russian naphtha industry has been furnished to the "Frankfurter Zeitung" by its St. Petersburg correspondent. "As far as can at present be judged," he writes, "the past year has brought retrogression rather than progress in the Russian naphtha industry. Over-production is on the increase, and the circle of customers is not being extended. As I learn from a competent source of information, the stocks of petroleum in 1909 show a considerable increase as compared with those of previous years. Prices at the same time display unusual fluctuations. This is a state of affairs that utterly contradicts the rumours current both here and abroad as to a secret syndication of the Russian oil-works. On the contrary, embittered competition prevailed the whole year through in the Russian oil market. Exact statistics of the petroleum output up to 1st December, 1909, are now to hand, and give a total of 449,580,000 poods, as compared with 433,180,000 poods for the corresponding period of 1908. That makes an increase of 16,400,000 poods of raw oil for the eleven months, which is to be attributed exclusively to developments in the Bibi-Eybat dis-

trict. In all the other districts the output has receded considerably, a circumstance which appears to confirm the view that the old areas of exploitation in Baku are petering out. As to export, the estimated figure for 1909 is 28,000,000 poods, as against 90,000,000 poods in former years."

The Russian Ministry of Commerce is said to be considering the question of reducing the royalties levied by the Treasury on small-sized petroleum plots at Baku.

GREAT BRITAIN.

A meeting of the South Wales Coal Conciliation Board was held at Cardiff, January, 11th, to commence negotiations for a new wages agreement. The proceedings were preliminary in character. The men have given three months notice to terminate the present agreement, and unless a new agreement is decided upon before the notices expire the men will come out on strike. At present their demands are—the raising of the minimum wage from 30 to 40 per cent. above the 1879 standard and the abolition of the maximum wage, the payment of a

special allowance to colliers working in abnormal places, the payment in respect of small coal, the payment of six turns for five worked by night men, and that the lowest paid workman shall receive a standard wage of not less than 3s 4d per day. On the other hand, there was to be dealt with employers' claim to damages for the men's refusal to work the extra sixty hours provided for in the Eight Hours Act, and in respect of which the employers had obtained a Divisional Court decision in their favour. This matter was discussed at length.

The employers have not framed their proposals, but intimated that they would forward them to the Miners' Federation on Saturday. The owners expressed surprise at the men's demand for payment for small coal, pointing out that it was a violation of the Conciliation Board agreement, which provided that the cutting price paid upon the weight of the large coal included all services in respect of small coal. The men's representatives replied that, while anxious to carry out the provisions of the existing agreement in reference to small coal, they were bound by this demand to protect the men against the owners' claim for damages for the refusal of the men to work the extra sixty hours under the Eight Hours' Act. The owners declined to withdraw this claim for damages, and it was agreed that the differences between the parties on this point should not be a bar to proceeding with the negotiations for a new agreement. In order to prevent injury to the trade which would result from the prolongation of the negotiations up to the date of the termination of the men's notices on 31st March, it was agreed that a definite arrangement should be arrived at by 28th February, and that for this purpose the Conciliation Board should meet on Wednesday and Thursday in each week. The Board then adjourned.

The situation in the Northumberland coal trade continues unsettled. The miners are concentrating their efforts to resist the introduction of the three-shift system, under the Eight Hours Act. Several collieries have resumed work under the new system, but this does not mean that they are satisfied with the arrangement, but only that they are endeavouring to give the new working conditions under the new Act a practical trial.

The North-West Durham Miners' Federation, at a mass meeting attended by 3,000 men at Medomsley, on January 5, decided to remain loyal to the ballot of the local lodges and remain out on strike against the Eight Hour agreement, and also to ask other collieries at present working to cease until the dispute was satisfactorily settled. An amendment that the men resume work under protest for three months pending modification of the three shifts per day agreement was supported by about 50 men. It was announced that the Langley Park Colliery had struck work, and it was agreed to appeal to the collieries unaffected for financial assistance until a settlement had been effected.

UNITED STATES.

Colorado Springs, Colo., Jan. 11.—Not less than 30 high-grade-fences are being operated in the Cripple Creek district, according to the mine owners who held the annual meeting of their association here yesterday, and the fight against the illegal traffic in ore is to be waged more earnestly than ever. The subject was the principal business discussed by the association members, more than 50 attending the meeting and outlined plans for the next year.

The reports showed that during the year \$250,000 had been stolen in ore by the high-graders of the district, although much had been accomplished, it was reported, by the association in running down the thefts. Four convictions were secured during the year and the men are serving terms in the penitentiary.

CUBA.

The Havana Asphalt and Bitumen Company has been registered with a capital of £80,000, in £1 shares, to acquire a license to work the asphalt, bitumen and oil-bearing deposits known as the Mariel group of mines, Cuba, and also to adopt an agreement between the Havana Exploration Company of the first part, Havana investment Syndicate and the liquidator thereof of the second part; and to carry on the business of miners, refiners of and dealers in asphalt, bitumen, oil and other mineral substances.

Company Notes

The International Coal & Coke Company has increased its dividend from 1¼ to 1½ per cent. quarterly. The dividend is payable February 1, to shareholders of record January 20.

The management of the Nipissing Mines Company has sent shareholders the following brief statement showing the physical and financial conditions of the operating company on January 1, 1910 as compared with conditions on January 1, 1909.

1909 company shipped 6,510 tons, ore valued at net. . . \$2,210,364
 1908 company shipped 3,505 tons, ore valued at net. . . 1,363,783

Increased tons, 3,005; net inc	846,581
On January 1, 1910 our cash surplus was	\$1,322,985.50
On January 1, 1909, our cash surplus was.....	\$920,475.16
Increase	\$402,510.34
1909 dividends	\$1,500,000
1908	840,000

Increase

From this statement it will be noted that although dividends during the past year have been almost doubled, the cash surplus has been increased more than \$400,000. The general manager reports that the ore reserves are greater to-day than at any period in the company's history

STATISTICS AND RETURNS

SOUTH AFRICA.

Johannesburg.—The dividends declared by Rand gold mining companies for 1909 total £9,217,071.

Transvaal gold mines outside the Rand have declared £184,298.

AUSTRALIA.

Sydney, Jan. 4.—Leave has been granted by the courts for the prosecution, under the amended Industrial Disputes Act, of four union officials, including Mr. Bowling, the president of the Miners' Federation.

OPERATIONS OF THE ROYAL MINT IN 1909.

The Deputy Master of the Royal Mint has issued the following summary of the operations of the Mint during the past year compared with 1908:—

IMPERIAL COIN ISSUED AND WITHDRAWN.

	GOLD.			
	Issued.		Withdrawn.	
	1908.	1909.	1908.	1909.
Sovereigns	12,600,000	11,800,000	1,705,000	1,618,000
Half Sovereigns ..	2,000,000	2,000,000	1,595,000	1,382,000
Totals	14,600,000	13,800,000	3,300,000	3,000,000

SILVER.

	Issued.		Withdrawn.	
	1908.	1909.	1908.	1909.
	£	£	£	£
England & Wales	362,876	496,699	150,300	640,350
Scotland	48,400	32,000	25,630	40,240
Ireland	12,000	126,500	64,295	37,000
Colonies	392,475	734,400	15,194	17,531
Totals	815,751	1,389,599	255,419	735,121

BRONZE.

	Issued.		Withdrawn.	
	1908.	1909.	1908.	1909.
	£	£	£	£
United Kingdom	138,135	102,401	5,260	20,275
Colonies	17,445	19,410	200	600
Totals	155,580	121,811	5,460	20,875

NUMBER OF PIECES STRUCK.

Imperial:—

	1908.	1909.
Gold	15,725,998	16,167,814
Silver	23,804,187	22,846,050
Bronze	52,391,808—91,921,993	36,748,544—75,762,408
Colonial:—		
Silver	9,510,829	2,750,072
Bronze	99,000	525,000
Nickel	12,817,152	34,102,000
Aluminium	12,134,068—34,561,049	nil —37,377,072
Totals	126,483,042	113,139,490

The operations of the Dominion Steel Company for the year just closed were affected adversely by the disturbance in supply of coal through the strike at the Dominion Coal Company's collieries.

The company suffered from an actual shortage in quantity, which could not be promptly made good by purchases elsewhere, and also from the variation in the quality of coal brought from other sources.

Notwithstanding this the production of steel was considerably increased, and the other figures make a satisfactory showing. The production in 1904 and 1908 respectively were as follows:

	1904.	1908.
	Tons.	Tons.
Coke	401,182	411,086
Pig Iron	256,496	262,839
Steel ingots	296,950	279,513
Blooms	262,052	248,621
Rails	140,738	152,440
Wire rods	73,004	40,420

The receipts of iron ore, and the shipments of iron and steel were as follows:

Ore from Wabana	530,682	556,255
Ore from other sources	14,765	44,212
Shipments	267,286	246,041

Considerable progress has been made in the work of enlarging the plant. The new coke ovens are well under way. Contracts have been let for the new blast furnace, the additions to the open-hearth, and for most of the other additions proposed. By next autumn the capacity of the plant will have been very greatly increased.

Kalso Shipments During December.

The ore shipments through Kaslo for the month of December totalled 1,160 tons, of which 620 were silver-lead and 540 zinc. The latter class of ore was shipped exclusively by Lucky Jim

with 320 tons and the Whitewater 220. In addition the Whitewater and the Deep under the same management, shipped 420 tons of silver-lead or about two-thirds of the entire tonnage of that class of ore. The December tonnage puts the total output of the Kaslo-Slocan mines for 1909 up to 19,852 tons of silver-lead and zinc ores.

Three new properties appear in the shipping list, namely, the Utica at Sproules, the Gold Cure up South Fork and the Ohio at Whitewater. Nine properties shipped the last month of the year, they and their tonnage being as follows:—

Mine	Tons.
Rambler	60
Utica	40
Cork	20
Flint	20
Gold Cure	20
Ohio	20
Whitewater Deep	240
Whitewater	180

Zinc.

Lucky Jim	340
Whitewater	220

Total 1,160

The output for 1909 totalled 19,852 tons of silver-lead and zinc.

B. C. ORE SHIPMENTS.

Nelson, Jan. 8.—Following are the details of the ore shipments for the first week of the new year: .

Boundary	
Granby	26,034
Mother Lode	9,250
Ore Denoro	370
Snowshoe	4,196
Total	39,850

Rossland.

Centre Star	4,602
Le Roi	393
Le Roi No. 2	711
Total	5,706

Slocan-Kootenay.

St. Eugene	340
Broadview	31
Silver Cup	76
Arlington	20
Richmond-Eureka	67
Standard	68
North Star	87
Whitewater	78
Blue Bell	110
Van Roi	47

Total 924
Grand Total 46,560

The smelter receipts follow:

Granby, Grand Forks	26,034
Consolidated Co., Trail	10,906
B. C. Copper Co., Greenwood	9,620

Total 46,560

B. C. ORE SHIPMENTS.

Nelson, January 15.—The ore shipments and smelter receipts in detail are as follows:

ORE SHIPMENTS.

Boundary	Week.	Year.
Granby	26,572	52,606
Mother Lode	9,875	19,125
Oro Denoro	350	720
Snowshoe	1,432	5,708
Total	38,229	78,159

Rossland.

	Week.	Year.
Centre Star	3,199	7,801
Le Roi No. 2	152	863
Velvet	69	69
Other Mines		393
Total	3,420	9,126

Slocan-Kootenay.

St. Eugene	398	738
Richmond-Eureka	187	254
North Star	40	127
Blue Bell	66	176
Whitewater	42	120
Queen	19	19
Belcher	57	57
Rambler-Cariboo	23	23
Emerald	64	64
Highland Buckeye	67	67
Ferguson	31	31
Yankee Girl	87	87
Nugget	32	32
Granite Poorman	33	33
Eastmount	32	32
Other mines		242
Total	1,178	2,102
Grand Total	42,827	89,387

SMELTER RECEIPTS.

	Week.	Year.
Granby	26,572	52,606
Consolidated Co.	6,156	17,062
B. C. Copper	10,225	19,845
Total	42,953	89,513

The Transvaal gold output for December showed an increase in value of £30,676, but the daily average production was lower. The gold output for the year was a record. Native labour showed a gain of 4,674 "boys" for the month.

COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending January 21, and those from January 1, 1910, to date:—

	Jan. 21. Ore in lbs.	Since Jan. 1. Ore in lbs.
Buffalo	47,644	112,144
City of Cobalt		64,000
Cobalt Central		40,000
Cobalt Lake	132,000	132,000
Coniagas		119,542

Crown Reserve	123,353	245,785
Drummond	264,200	664,200
Kerr Lake	182,392	302,605
King Edward	49,952	49,952
La Rose	256,059	577,031
McKinley-Darragh	50,329	98,370
Nipissing	302,939	365,240
O'Brien	64,056	64,056
Right of Way	64,902	127,963
Temiskaming	60,000	60,000

Ore shipments for week ending January 21 were 1,597,826 pounds, or 798 tons. Total shipments from January 1 to January 21 were 3,022,888 pounds, or 1,511 tons.

TORONTO MARKETS.

Metals.

Jan. 24.—(Quotations from Canada Metal Co., Toronto.)

- Spelter, 6½ cents per lb.
- Lead, 3.75 cents per lb. (very strong).
- Antimony, 8¼ to 9 cents per lb.
- Tin, 35¼ cents per lb.
- Copper, casting, 14¼ cents per lb.
- Electrolytic, 14¼ cents per lb.
- Ingot brass, 9 to 12 cents per lb.

Jan. 24.—Pig Iron—(Quotations from Drummond, McCall Co.)

- Summerlee, No. 1, \$23.50 (f.o.b. Toronto).
- Summerlee, No. 2, \$23.00 (f.o.b. Toronto).
- Midland, No. 1, \$22.50 (f.o.b. Toronto).

- Coal—Anthracite, \$5.50 to \$6.75.
- Bituminous, \$3.50 to \$4.50 for 1¼-inch lump.

Coke.

Jan. 20.—Connellsville coke (f.o.b. ovens).

- Furnace coke, prompt, \$2.60 per ton.
- Foundry coke, prompt, \$3.00 per ton.

Jan. 20.—Tin (Straits), 32.45 cents.

- Copper, prime Lake, 13.95 cents.
- Electrolytic copper, 13.62½ cents.
- Copper wire, 15.25 cents.
- Lead, 4.70 to 4.75 cents.
- Spelter, 6.25 cents.
- Sheet zinc, 8.50 cents.
- Antimony, Cookson's, 8.50 cents.
- Aluminium, 21.75 to 23.00 cents.
- Nickel, 40.00 to 49.00 cents.
- Platinum (hard), \$34.50 per oz.
- Platinum (ordinary), \$29.00 per oz.
- Bismuth, \$1.75 per lb.
- Quicksilver, \$51.00 to \$51.50 per 75-lb. flask.

SILVER PRICES.

	New York.	London.
	cents.	pence.
January 6	52½	24 3-16
" 7	52¼	24 1-16
" 8	52¾	24½
" 10	52½	24 3-16
" 11	52½	24 3-16
" 12	52¾	24½
" 13	52¾	24½
" 14	52½	24 3-16
" 15	52½	24 3-16
" 17	52¾	24½
" 18	52¾	24½
" 19	52½	24 3-16
" 20	52¼	24½
" 21	52¼	24½