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Editor:

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

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THE MINERAL PRODUCTION OF CANADA.

Most gratifying are the official statistics of Canada's mineral production for 1910. The Preliminary Report, prepared by Mr. John McLeish, Statistician of the Mines Branch, Ottawa, appeared early in March. The revised figures for the year 1909 show a total value of \$91,831,441, or \$12.82 per capita. The total for 1910 is \$105,040,958, or \$14.02 per capita. An increase of \$13,209,517, or more than 14 per cent., is certainly substantial.

Accepting Mr. McLeish's basis of valuation, we find that Ontario now produces 40.95 per cent. in value of the entire mineral output of the Dominion. British Columbia comes second with 23.37 per cent., and Nova Scotia third with 13.38 per cent. Each of the other provinces contributes less than 10 per cent.

In the list of mineral products, coal shows by far the greatest expansion during 1910, the output for the year being valued at \$29,811,750, which is greater by \$5,030,514 than the figures reported for the previous year. The next largest leap is in silver. Of this metal \$17,106,604 worth was produced in 1910, which exceeds the returns for 1909 by \$2,928,100. Nickel production has been augmented by \$1,719,433; pig iron, \$1,663,766; clay products, \$1,149,190; cement, \$1,068,513; and gold, \$842,680. For products, such as copper, asbestos, stone, gypsum, etc., increases of less than half-a-million dollars are recorded.

The most marked falling off is in the subsidized lead industry. Here a drop of \$455,107 is announced. As British Columbia produces all the lead credited to the Dominion, the direct cause of the curtailment was the destructive Slocan forest fires. The only other serious recession was in the output of petroleum. Here again the causes were beyond human control. The oil-fields of Ontario are gradually being exhausted. The 1910 production was less in value by \$171,054 than that of 1909. Two other commodities, salt and lime, show very slight drops in value. With these exceptions every mineral product shows gains for 1910. And every province, with the exception of New Brunswick, has augmented its annual production. In fact, nearly every province has had a "record" year.

It is hardly necessary to state that the outlook for the current year is even more cheerful. British Columbia's smelters, mines, and collieries are in better condition than ever. Her smelters are being enlarged, and there is good reason to believe that large iron and steel industries will soon be established on the Pacific coast. Few countries possess such a superabundance of iron ore, fuel, and flux on or near tide-water. All the essentials are there except the initiative of the organizer.

The collieries of Alberta and, in less degree, those of Saskatchewan, will be more active this summer. Manitoba is taking her clay industries more seriously. Ontario expects the first fruits of Porcupine. Gold bars should be not infrequent exports from that camp. Quebec's asbestos industry is shaping up better than could have been hoped a year ago. Her copper industry, also, has been revived. New Brunswick is cheered by the development of an encouraging gas- and oil-field. Nova Scotia's coal outputs are growing steadily. Soon tungsten-ore will be on her regular list of mineral products. Her gypsum trade is waxing. Lastly, there is every prospect of a marked increase in the gold yield of the Yukon.

From almost all aspects, the year 1911 should exceed 1910 by more than 1910 exceeded the preceding year.

THE THIRTEENTH ANNUAL MEETING OF THE CANADIAN MINING INSTITUTE.

The Annual Meeting of the Institute on March 1st, 2nd, and 3rd, at the Chateau Frontenac, Quebec, was undoubtedly pleasant and profitable. It is true that the sessions lacked the piquancy of some previous occasions when the results of hard-fought elections were about to be announced. But ploughshares are more to be desired than poniards. Yet a row is an excellent vent for our spleen. Lacking this vent, we must fall foul of somebody. Hence we have resolved to give some good advice to those who guide the affairs of the Institute.

First, however, we must express our keen sense of the hospitality extended to the delegates by Quebec. Not only was the street-car service placed at our disposal, but all delegates were given the freedom of the Garrison Club. These, and other courtesies, helped decidedly to make every one feel thoroughly at home. But best of all, was the warm greeting vouchsafed by the Quebec Government through the Hon. Mr. C. R. Devlin. That gentleman warmed the cockles of our heart by the unmistakable glow that marked his welcoming speech. We shall not easily forget either his Celtic exuberance, his Gallic vivacity, or his Canadian shrewdness.

One fact, which should be appreciated by all members, is that we owe a debt of gratitude to the United States visitors who so regularly attend the meetings. To these gentlemen much of the success of every annual convention is to be credited. Not only would their absence rob the regular sessions of a great deal of interest, but the smoker and the dinner would suffer immeasurably. To them, then, we tender our sincere thanks.

We return now to our self-assumed task of offensive criticism. In the first place, a well-organized reception committee is an absolute necessity. At present far too much falls upon the shoulders of the Secretary. It is, naturally, impossible for one person to see that everybody is properly bestowed. Hence arise many annoyances. An active committee of half-a-dozen members could readily smooth the troubled waters.

Moreover, there is little effort made to welcome the younger members and to introduce them to their seniors. This is a serious omission, an omission that should not be apparent next year. The suggested committee could best undertake this duty. If this is to be overlooked in the future, there will be grave danger of losing the interest of the younger generation.

Another point, one that hardly assumes the dimensions of a grievance, but one that is a source of some discontent, is the arrangement of the papers. Here, of course, the Secretary has our sympathy. The list of papers is always impossibly long. Until the actual time for reading arrives it is not possible to know of a certainty if the author is or is not to be present. Often, also, the person presenting a paper takes up an indecent amount of time, and so dislocates the programme. But these are not insuperable obstacles. We believe that, in the main, the programme can be so arranged as to make almost literal adherence to it quite feasible. Long papers are anathema. They should be read by title, or, at worst, presented synoptically. The salient and debatable points of any paper can be outlined in a very short time. No one speaker should be permitted to occupy the floor for more than half-an-hour. Discussions should be pointed, apposite, and brief. The chairman should be able to call anyone to order without giving offence. In fact, he might well seize such opportunities as occasions for adding to the humour of the meeting. In any case, we need far better control of our meetings. Energy, time, and patience are wasted as matters now stand.

Again, there is room for criticism of the nature of the papers read. The greater number of these treat of pure geology, or are entirely academic. The fault here lies with the mining men themselves primarily, and, secondarily, with the officials of the Institute. But, apart from distributing the blame, it is to be remembered that the mining man, per se, is not interested in remote geological problems. He is keenly interested in practical work. And his attention can be held only by papers and discussions that overlap his own experience. Even if stated papers on practical mining are not presented, time should be reserved for dealing with professional mining topics.

These philippics are sufficient to indicate the views of the submerged three-quarters of the Institute. We all hope to make our society mean more and more. We are justly proud of its prominence and activity. But the time has come when younger members should be given a larger share in the proceedings.

One final suggestion remains. There is no adequate reason for holding the annual meetings in March. The summer months would be much more suitable. Short excursions before and after the sessions would thus be made possible. Travelling would be easier, and the attendance larger. In fact, a change of this kind would be most acceptable. One incidental advantage would be the facility with which torrid geological disputes could be settled out of doors.

NOVA SCOTIA'S MINERAL PRODUCTION.

The Report of the Nova Scotia Department of Mines for the year ended September 30, 1910, has reached us just as we are going to press. In our April 1st issue we shall give this report the usual extended notice. Just now we can notice only the leading features.

The number of tons (gross) of coal raised was 5,477,146. Shipments amounted to 4,896,896 tons, of which amount the St. Lawrence trade took 1,786,948 tons, and Nova Scotia itself, 1,806,999 tons. Of this last amount, 442,764 tons were consumed at the collieries. We note that the output per man employed has gone up to 500 tons per year, as against 430 tons during the previous year.

Gold mining did not hold its own during 1910. The production amounted to 10,675 ounces, a slight falling off as compared with 1909. The average yield per ton of ore was \$4.09. This figure is, of course, a very rough approximation. The decline in gold mining is officially attributed to "insufficient capital, scarcity of good labour, past wildecating, unintelligent direction of operations, [high] cost of fuel, and lack of prospecting." It is to be noted that, whilst this diagnosis is sufficiently comprehensive, each and every ailment mentioned is remediable.

The only locality at which iron ore is being produced is Torbrook. Here the Canada Iron Corporation mined 52,640 short tons during 1910. Of this quantity about 11,000 tons were shipped to the United States and to Scotland. Large shipments are to be made this year. It is possible, also, that ore may be produced at Arisaig, Antigonish County.

Manganese and tin have not yet emerged from the prospect stage. The mining of scheelite, however, is being actively pushed at Moose River, Halifax County. A shipment of 75 tons of high grade ore was made during the year, and much larger quantities will be sold during the current year.

Although the Province's gypsum quarries yielded 322,974 tons of that mineral, only 10,50 tons were utilized by local manufacturers. The remainder was shipped crude to the United States. We believe that in the preparation and marketing of finished gypsum products, on a suitable scale, there should be considerable profit. The report draws attention specifically to this.

The brick and clay industries have not expanded, and the building stone trade has diminished to a few thousand tons.

The total impression that remains after glancing through the report is that Nova Scotia is about as badly in need of prospecting and exploitation as any country can be.

A BREEZE FROM THE NORTH.

About five hundred men interested in the Elk Lake-Gowganda districts, which are situated in the Montreal River Mining Division of Ontario, recently waited on

the Government asking that the Charlton Branch of the Temiskaming & Northern Ontario Railway be extended to Elk Lake and Gowganda in order to provide economical transportation to facilitate development work and mining operation in the districts mentioned.

An organization meeting was held on the 14th instant at which a good deal of steam was let off and speakers chosen to present the case to the Government. The deputation was introduced by Mr. R. Shillington, M.L.A., and received by the Honourable Frank Cochrane, Minister of Mines and Forests, and a number of his colleagues.

Many arguments were put forward to prove that the extension of the Government railroad should be made in the interests of mining, lumbering, and farming, and there was evidence of earnestness and feeling in the language of the speakers.

During the progress of the meeting, Premier Sir James P. Whitney honoured it with his presence for a few minutes, repeated the platitudes with which delegations are so familiar, and retired.

The Minister of Mines candidly told the delegation that the policy of the Government was to protect its timber resources in the Temagami Forest Reserve rather than to encourage further encroachment by prospectors, miners, or railroads. He deplored the serious losses that the forest reserve had suffered through fire during the past few years, implying that those engaged in prospecting and mining were responsible. This is a matter of opinion, but no effort was made to controvert it at the meeting. Whilst the Minister's attitude may be commendable, at this late day it is hardly fair to men engaged in the mining industry, when they are seeking to redeem investments already made.

Whether the Province has benefitted financially or not by the sale of mining locations in the sections referred to, the men who have paid the Government for mining locations should meet with its fullest support in their efforts to reap where they have sown. Had the Government closed the Temagami Forest Reserve against prospecting and mining, as they did the Gillies Timber Limit, the present unfortunate situation would not have arisen. It is useless to talk of locking the stable door when the key has been lost.

After reviewing the arguments which had been made by the various speakers, Mr. Cochrane took the position that the claims put forward as to the probable tonnage of ore, pulpwood, and other products that might be produced and shipped from the district, should be investigated and reported upon to the Government before a decision could be reached.

A committee was thereupon appointed at his suggestion, representing the Government, the Temiskaming & Northern Ontario Railroad, and the miners, to carry out the investigation, and the Minister promised that an immediate decision would be given on receipt of its report.

If, as Mr. Cochrane, stated, the Government's answer depends on a question of tonnage, the miners should carry the day. All other considerations being equal (and there is no doubt that there will be more pulpwood and other timber products brought out from the Temagami Forest Reserve than from the Porcupine district) the tonnage of silver-bearing ores which is already being mined and shipped, even under the existing adverse conditions, is infinitely greater than any tonnage of ore that can ever be expected to come out over the new branch line being built by the Government into the Porcupine district. The Porcupine gold ores will be treated in stamp-mills and cyanide plants on the ground, only the resultant product being shipped in the form of gold bars. These will be taken care of through the banks, or brought out in smug suitcases when the successful operators desire reasonable excuses for making periodical trips to civilization. But the receipts of the T. & N. O. will not be greatly enhanced thereby.

EDITORIAL NOTES.

The Hon. Christopher Chisholm, Commissioner of Works and Mines, recently introduced a bill in the Provincial Legislature of Nova Scotia, providing for the compulsory use of locked safety lamps in all the collieries of the province. Certain clauses are added permitting the use of electric lights when approved by the proper authorities. An expression of opinion is to be obtained from the miners of the province.

Diamond drilling was conducted under the auspices of the Nova Scotia Department of Mines, during 1910, at an average cost of \$0.93 per foot. Boring by Calyx drill cost on an average \$1.44 per foot. The Calyx cores were of 6-inch diameter, the diamond cores from 15-16-inch to 2-inch.

Supplementing our editorial notice of the three leading corporations that have invested in Porcupine, it may be noted that the firm of Bewick, Moreing & Company, which has undertaken the development of certain claims in Porcupine, has offices in London, Melbourne, and Kalgoorlie. The firm manages the affairs of thirty Australasian and African mining companies.

There appears to be no immediate prospect of rendering uniform the statistical methods employed by the Dominion Mines Branch and by the various Provincial Bureaus. Until uniformity is secured there will be endless confusion and duplication.

The Canadian correspondent of the Mining Journal (London, Eng.), in a letter that appears in the February 11th issue of our contemporary, makes a serious blunder. In writing of the New Brunswick gas- and oil-fields, which are being developed privately by Dr. J. A. L. Henderson, of London, the correspondent confounds these operations with those of the Maritime Gas and Oil Company, a Nova Scotian concern capitalized at \$5,000,000. Dr. Henderson's company is Maritime Oilfields, Ltd., and is, as stated above, composed entirely of private subscribers, who have no intention of asking anybody for money until the field is proved.

The Consolidated Gold Fields of South Africa, Ltd., is the corporation that has acquired a large interest in the Rae mine, Porcupine. At a shareholders' meeting in London, on February 22nd, Lord Harris, the chairman, explained the need of the proposed new issue of second preference shares. In addition to the Porcupine venture, new enterprises are being undertaken in the United States, Mexico, and Rhodesia. Although the new issue has not found favour with all the shareholders, the majority have raised no objections.

CANADIAN MINING INSTITUTE, THIRTEENTH ANNUAL MEETING — Held at the Chateau Frontenac, Quebec, Que., March 1st, 2nd and 3rd, 1911.

Early on Tuesday, Feb. 28th, there were signs of activity in the Chateau Frontenac. Several of the councillors, and a sprinkling of other members, had already arrived. But the bulk of the delegates drifted in on Wednesday and Thursday.

The total attendance was large, aggregating about 200. Cobalt, Toronto, Montreal, and Eastern Quebec were heavily represented. The delegation from the United States was exceptionally large. But only one Nova Scotian, and not one Albertan or British Columbian appeared on the scene. Distance is, of course, an adequate excuse for the Westerners; but the lack of maritime mining men is regrettable. More especially is this the case in view of the fact that Ontario and the Dominion are always represented at the meetings of the Mining Society of Nova Scotia.

WEDNESDAY MORNING SESSION.

In the unavoidable absence of the Premier, Sir Lomer Gouin, the convention was formally opened by the Hon. C. R. Devlin, Minister of Mines, Quebec. Mr. Devlin, in the course of an exceedingly witty and cheerful speech, referred to the good work done by the Chibougamou Commission. He announced that three new expeditions would be sent out during the coming summer. Another interesting announcement was to the effect that the Quebec grant to the Institute is soon to be increased. Mr. Devlin's speech was received with hearty applause.

The President, Dr. F. D. Adams, now followed with a survey of progress made during the past year. He predicted great things for the Province of Quebec, and warmly congratulated the local Government on possess-

ing two such officials as the Hon. Mr. Devlin and Mr. Theo. Denis, the present Superintendent of Mines. Alluding to the proposed Canadian meeting of the International Geological Congress in 1913, Dr. Adams urged that all mining men do their utmost to help in making that convention a monumental success.

Mr. J. McLeish, Statistician of the Mines Branch, Ottawa, then presented the official figures of mineral production for the Dominion for 1910. These will be

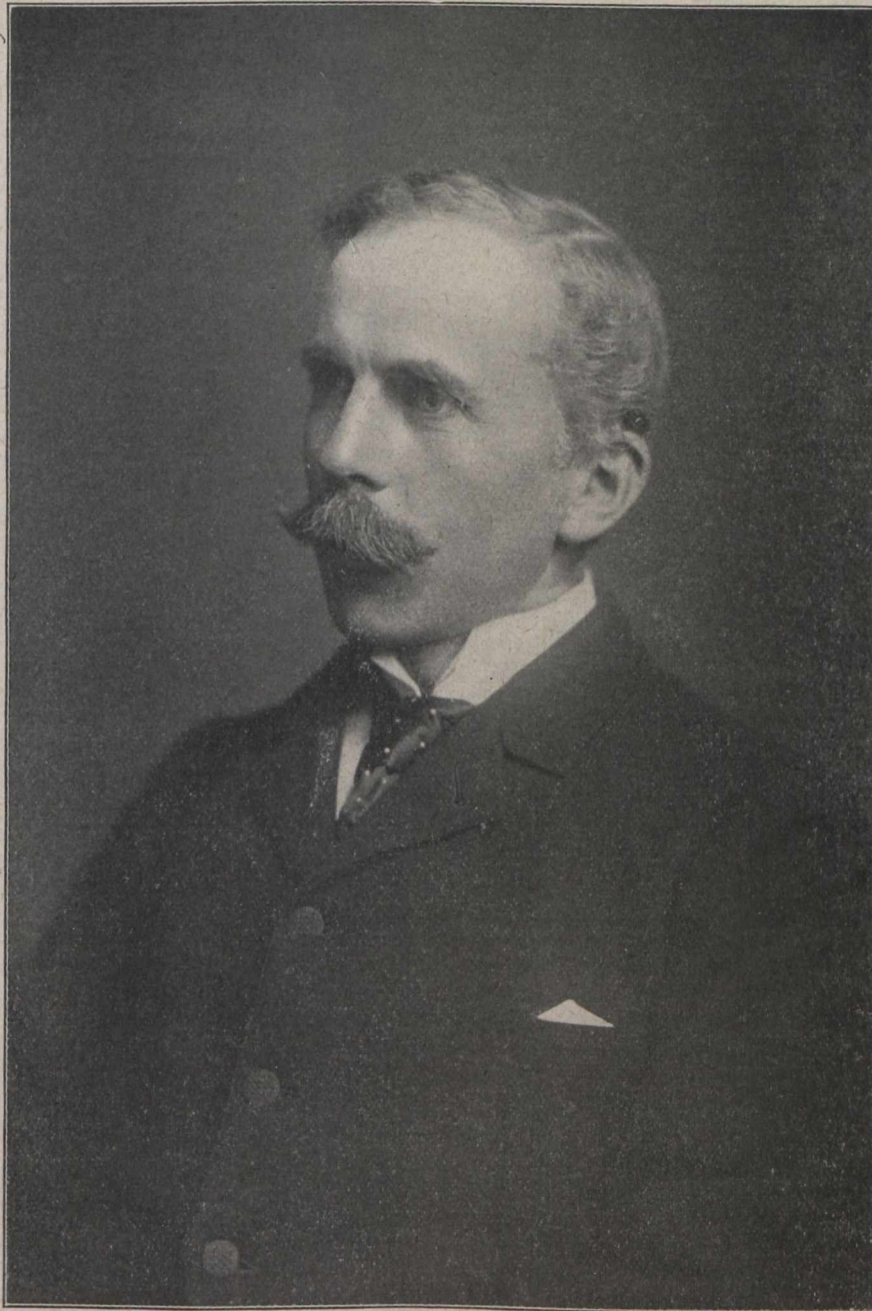
of which were distributed amongst the audience.

Announcement was then made of the results of the election of officers. They are as follows

President, Dr. F. D. Adams.

Vice-Presidents, Dr. A. E. Barlow, Mr. Thos. Cantley.

Councillors:—Dr. J. Austen Bancroft, Mr. R. W. Brock, Mr. A. A. Cole, Mr. E. T. Corkill, Mr. Theo. Denis, Mr. John Donnelly, Mr. E. Dulieux, Mr. F. W. Gray, Mr. G. F. Silvester, Mr. J. B. Tyrrell.



President, F. D. ADAMS,

found on another page of this issue. Mr. Theo. Denis followed with the 1910 statistics for Quebec, and Mr. T. W. Gibson with those for Ontario. In the absence of Mr. Hiram Donkin, Deputy Commissioner of Mines for Nova Scotia, Mr. H. Mortimer-Lamb read a brief statement of the mineral output of Nova Scotia. Mr. Lamb also referred to the mineral statistics of British Columbia, Alberta, Saskatchewan, and New Brunswick, which appear in the last bulletin of the Institute, copies

At this point Col. A. M. Hay rose to move a resolution expressing the Institute's approval of the work of the Conservation Commission. He was seconded by Mr. J. B. Tyrrell. The motion was unanimously carried, and the Secretary was instructed to send a copy of the resolution to the Hon. Mr. Sifton, Chairman of the Commission.

The reading of papers by Mr. Denis, Mr. L. Reincke, and Mr. H. Mortimer-Lamb, brought the morning

session to a close. These papers were, respectively, "Mining Rights on Quebec Seignories," "The Ore Deposits of the Beaverdell, West Fork of Kettle River, B.C., and "Photography for Mining Engineers and Geologists." The last paper aroused an animated discussion. Certain facts were brought out that would have provided fine material for a representative of the Lord's Day Alliance. After the smoke had cleared away, the situation resolved itself into a battle between the advocates of films and the supporters of plates. Victory perched on the banners of the latter, until the Duke of Abruzzi was called in as a special "film" reserve. It was "lunch or Abruzzi." "Films" had the last word.

WEDNESDAY AFTERNOON.

No regular session was held on Wednesday afternoon. Many of the members availed themselves of the kindness of the Quebec Electric Railway Company, and visited Montmorency Falls.

WEDNESDAY EVENING SESSION.

The evening was opened by the presentation of one of the most instructive papers ever read before the Institute: "The Engineering Problems of Geological Nature Afforded by the New Catskill Aqueduct of New York City," by Dr. J. F. Kemp, Columbia University, New York. Dr. Kemp traced the position of New York's present inadequate water supply from the Croton reservoir, and showed, by means of lantern slides, how the new supply is to be brought from the Catskill Mountains. The enterprise involves the expenditure of many million dollars. From Dr. Kemp's lucid explanations it was evident that he and his staff had been able to save the contractors a considerable percentage in advising through what formations to carry the aqueduct. This successful application of geology to a huge engineering problem is unique. It carries a lesson that may well be taken to heart by Canadian cities. New York not only has saved money, but has very considerably hastened the completion of the tremendous Catskill aqueduct by acting on the advice of qualified geologists.

The second paper of the evening was read by Dr. Barlow. It was entitled "The Economic Geology of the Chibougamou region. Numerous lantern slides illustrative account of his last summer's exploration of the Chibougamou region. Numerous lantern slides illustrated the lecture. The speaker emphasized strongly the fact that the Commission, of which he was chairman, did not damn Chibougamou. The region has possibilities. But these possibilities are yet unproved. There is little ground for the exaggerated reports that heretofore have been circulated. At one point the audience was electrified by the speaker's statement that he lacked the damnatory language anyway. This assertion was modified later.

THURSDAY MORNING SESSION.

The first paper read at this session was Prof. C. H. Richardson's "Asbestos Deposits of the New England States." This was interestingly discussed by Messrs. Cirkel, Barlow, Dresser, Nason, and Penhale. The last speaker referred to the fact that in manufacturing Russian asbestos fully two-thirds the quantity of Canadian asbestos was mixed with it to bring it up to the desired quality.

Other papers on asbestos were read by Dr. J. A. Dresser, and by Mr. Edward Torrey.

THURSDAY AFTERNOON SESSION.

Dr. A. C. Lane's paper, "The Copper Deposits of the Keeweenaw Peninsula, compared with Similar Can-

adian Deposits." Then followed papers by Dr. David T. Day and Mr. Eugene Coste on the subject of petroleum. These led to a picturesque encounter between the two doughty champions. Had time permitted, there might have ensued a struggle that would have effaced both. But the President intervened. A paper by Mr. D. B. Dowling, "The Undeveloped Coal Resources of Canada," was the last read.

THURSDAY EVENING—The Smoker.

At 9 p.m. most of the visitors had gathered in the capacious tea-room of the Chateau. The usual songs, geological and mining vaudeville, and impromptus were rendered. But the event of the evening was the sensational arrest, trial, and conviction of a prominent Ontario geologist for unconventional behaviour in Sweden. So overwhelming was the evidence adduced by the prosecution that the accused never stood the remotest chance of clearing his skirts. One of these latter was on the scene. The tragic tale unfolded by Prosecuting-Attorney LeRoy brought tears to the eyes of the case-hardened jury, and perceptibly heightened the colour in Justice Penhale's super-dignified countenance. Twice or thrice in attempting to defend his client's conduct, the Attorney for the Defence, Dr. A. R. Ledoux, broke down completely. Indeed the whole audience gave free vent to wave after wave of emotion throughout the trial. The consistent narrative of Dr. Kemp-Cook carried much weight in convicting the prisoner. A contributory cause was the sullen silence of the accused. The sentence, though heavy, was just. Some little confusion arose as to the allocation of the fine. But this was amicably settled when Justice Penhale generously consented to accept a large share of it himself.

FRIDAY SESSIONS.

During these sessions, several papers were presented. Amongst them were the following: "Quebec Earthquakes," by Dr. James Douglas; "The Porcupine Gold Area," by Mr. A. G. Burrows; "The Iron Ore Resources of the World," by Dr. Frank D. Adams; "The Wabana Iron Mines of the Nova Scotia Steel & Coal Company, Limited," by Thos. Cantley; "The Clays of Western Canada," by Dr. Heinrich Ries; "Some Suggestive Phases of the Iron Mining Industry of Eastern North America," by Mr. Frank L. Nason; and "Recent Underground Development Work at Cobalt," by Mr. C. W. Knight, and "Notes on the Iron Ores of the Metagami River," by Prof. M. B. Baker.

Mr. Knight's paper was illustrated by slides of underground photographs taken by Mr. A. A. Cole.

During the afternoon session Mr. Rice, of the United States Bureau of Mines, gave a very interesting talk on the work of the Pittsburgh Testing Station. Mr. W. R. Ingalls led the discussion that followed.

THE DINNER—FRIDAY EVENING.

The attendance at the annual banquet was larger than usual. Dr. F. D. Adams was chairman. Among the speakers were the Hon. C. R. Devlin, Mr. F. Congdon, M.P., Dr. James Douglas, Dr. A. C. Lane, Dr. J. F. Kemp, Col. A. M. Hay, Col. Turnbull, Prof. C. H. Richardson, Dr. W. G. Miller, Mr. F. L. Garrison, Mr. Eugene B. Wilson, and Mr. J. C. Murray.

The menu card, presented by the Asbestos Manufacturing Company, was a tablet of prepared asbestos.

The toast list was commendably short. It was regrettable, however, that several of the United States visitors, including Dr. A. R. Ledoux and Mr. W. R.

Ingalls, were forced to leave on an early train before the dinner was nearly over.

In a broad sense the Quebec meeting was a success. In our editorial columns we draw attention to some details that need attention. But we must not close this correspondence without alluding to the splendid spirit in which the Quebec officials welcomed the delegates.

SOCIETY OF CHEMICAL INDUSTRY.

(Special Correspondence.)

The first joint meeting of the Canadian sections of the above society was held on Friday, Feb. 24th, in the School of Mining, Kingston. The members of the Toronto section travelled in a chartered Pullman to Kingston, where they were joined by representatives from Ottawa and Montreal.

The visiting members were the guests of the School of Mining, and, during the afternoon preceding the meeting, were entertained by the professors of the School. Visits were paid to old Fort Henry, Royal Military College and other points of interest in and about the historic city.

At 6.30 dinner was served in the Red Room of the new Arts Building, at the conclusion of which Dr. Goodwin, on behalf of the School of Mining and the Kingston members of the Society, welcomed the visitors in a felicitous speech. He expressed the desire that this first joint meeting in Kingston would prove to be but the beginning of many similar gatherings. Prof. Lash Miller replied for the different sections represented, and thanked the hosts of the evening for the excellent entertainment provided.

Mr. Alfred Burton, honorary secretary of the Toronto section, read the minutes of the last meetings held in Toronto and Montreal, and letters were read from Messrs. Joel B. Saxe, Wm. Lowrie, Brainerd, and Murray Wilson, regretting their inability to be present.

The paper on "The Use of Permitted Explosives," by Mr. C. J. Coll, Stellarton, N.S., was read in his absence by Dr. Goodwin. As all papers read before the different sections are the property of the parent society until published in their journal, it is not permissible here to report the papers in full.

Mr. Coll, who has had many years' experience in the coal regions of Nova Scotia, traced the change in sentiment of the mine managers regarding explosives from the year 1841, when the use of black powder was universal, to the present day. At present none but explosives on the permitted list in Great Britain are used. Mr. Coll's experience went to prove that explosives, the permitted list in Great Britain, but manufactured in Canada, were not so satisfactory. The reason for this is not apparent; nevertheless the imported article is best. A table was submitted comparing black powder and permitted explosives as to cost and amount used per ton of coal broken, an average for four years being taken for the comparison.

It was found that 28 per cent. more pounds of black powder were used to break a ton of coal, at one and one-half times the cost. The miner working on contract and purchasing his explosives from the company saves 16 cents per day by using the permitted explosive.

Mr. Coll's paper closed with an earnest appeal for better and safer systems of manufacturing, and a closer conformity to the standards required in Great Britain.

Dr. Guttman, Associate Professor of Chemistry at the School of Mining, read a paper on the "Manufacture

of Explosives." Dr. Guttman has had a long connection in different countries with the explosives industry, and is thoroughly conversant with every branch of the business, from the designing of the plants for its manufacture to the proper distribution and use of the finished product. In this industry he had the decided advantage of his father's tuition, during his life a leading authority on the Continent on all branches of the explosives industry. Dr. Guttman's paper was largely descriptive of the latest devices and methods used in different places for nitrating the glycerine and testing the product.

His remarks were illustrated by lantern slides of the various plants and machinery in use. Several slides depicted graphically the disastrous results of the frequent explosions which take place in the factories. Dr. Guttman mentioned the fact that on the Continent, gelignite and explosives of that nature were used almost exclusively. In Canada and the United States, dynamite has the largest use, but the increasing cost and scarcity of glycerine will ultimately necessitate the use of more ammonium nitrate compounds. The world's total visible supply of glycerine for the next two years is already under contract for purchase. A comparison was made between dynamite and the ammonium nitrate and starch compounds, as to cost and effectiveness.

Dr. Guttman closed an exceedingly interesting and instructive paper by describing in detail, with illustrations, the construction of an ideal building for the manufacture of explosives.

Mr. E. W. Monk, of the Hamilton Powder Company, Montreal, read a paper on "The Care, Handling, and Use of Explosives." Mr. Monk is probably the best authority on this subject in Canada. Most of his life has been spent in the practical use of all makes and brands of explosives, and he speaks with the knowledge that comes only from experience. What Mr. Monk doesn't know about powder isn't written in the books, or learned in the factory, and still he says himself that when loading holes he is very careful to watch the men beside him, for fear the fool-killer has missed a man or two. This is a good thing for some miners to remember, especially those who think they know all about explosives. Mr. Monk at the very outset of his address wished it distinctly understood that he was relating his own experiences only and expressing in the paper his personal opinions. He described the ideal explosive and divided all accidents into two classes:—

1. Direct.
2. Indirect.

In the first class he placed all accidents due directly to carelessness. These include 95 per cent. of the total. Mr. Monk mentioned the fact that accidents in British Columbia, among the Chinese labourers, were reduced to a minimum, simply because the wily Chinaman does exactly as he is told, no more and no less.

The effects of the gases from intro-glycerine explosions, on the human system, were explained, and the best methods of resuscitation and treatment described.

Different methods of thawing dynamite, which had come under the writer's notice, were outlined, and some of them certainly exhibited the maximum of foolhardiness and ignorance—thawing the cartridges in boiling water, leaving the nitro-glycerine in the shack and loading the holes with water soaked sawdust, was one method ridiculed.

The latter part of Mr. Monk's paper described in detail, with the aid of lantern slides, the use of gelignite in the Crean Hill shaft of the Canadian Copper Company. This is a four-compartment incline shaft

8-ft. x 24-ft, with a dip of 67 degrees from the vertical. slides were exhibited showing position of the holes giving best breaking results.

In the discussion which followed the reading of the different papers, Capt. Sedgwick, of the Royal Military College, described the uses of explosives as propellants. The captain is a pleasing speaker. He expressed the opinion that the danger from the use of aeroplanes in war operations is not very great.

Prof. Manley Baker described a visit to the United States Government testing plant for explosives at Pittsburgh, Pennsylvania. The professor showed by black-board diagrams that black powder is far more dangerous in coal mines than the permitted explosives.

Dr. Milton Hersey, of Montreal, gave some interesting figures as to cost and methods of manufacturing explosives, and suggested that there is a good field in Canada for a nitro-starch plant.

Dr. Ellis, of Toronto University, was in a reminiscent mood, and quoted from a letter to the London Times of many years ago, written by the famous Nobel agent the carelessness exhibited in the handling of explosives. He related one incident where a poor unfortunate greased his waggon with nitro-glycerine, and, strange to say, it ran along smoothly until the wheel struck a boulder, and then kind neighbours wrote his epitaph. This was on a par with the fellow who filled his lamp with the same substance in lieu of coal-oil.

Prof. Lash Miller, on behalf of the officers of the Society, tendered a hearty vote of thanks to all those who had read papers and had taken part in the interesting discussion that followed.

The Kingston meeting was one of the most instructive and interesting that the Society has ever held. In numerical attendance, in the quality of the papers read, and in sustained interest, it surpassed any of the preceding meetings.

Present at the meeting were: Dr. Goodwin, Eugene Haanel, Dean Dupuis, Dr. Guttman, M. F. Connor, Prof. McPhail, R. Harcourt, B. L. Emslie, Prof. Bain, J. A. DeCew, Dr. Milton Hersey, H. H. Miller, N. F. Kalmus, Prof. W. P. Cohoe, J. A. King, C. R. Stauffer, C. W. Drury, John Donnelley, W. O. Walker, F. W. Babington, Dr. Waddell, Geo. T. Richardson, R. J. Manning, A. Neighorn, N. C. Polson, Douglas Ellis, John Robertson, Walter D. Bonnur, E. B. Henderson, Prof. Gwillim, Dr. D. B. Dowling, A. McGill, Prof. Lash Miller, Prof. W. H. Ellis, Alfred Burton, Prof. M. Baker, G. W. McNaughton, Prof. Kirkpatrick, E. W. Monk, B. Blackhall, J. G. S. Hudson, Geo. Y. Chown, Percy D. Lyman, S. N. Graham, F. G. Stevens, J. A. McRae, R. C. Hammond, R. T. Mohan, J. H. Barrett, E. A. Collins.

PERSONAL AND GENERAL

Mr. P. Kirkegaard has built an office and dwelling in South Porcupine and will in future devote considerable time to private practice in this district.

While returning from the Quebec meeting of the Canadian Mining Institute, Mr. G. H. Gillespie was seriously injured near Madoc, Ont. He is now making substantial progress, but will be confined to the house for some weeks.

Mr. J. McEvoy has just completed a series of lectures on coal-mining before the fourth year mining students of Toronto University. Much appreciation has been expressed by the students. It is hoped that this feature may be incorporated permanently in the mining course.

Mr. Edward W. Parker, of Washington, D.C., statistician in charge, Division of Mineral Resources, U. S. Geological Survey, attended the meeting of the Western Branch of the Canadian Mining Institute at Nanaimo, B.C., on February 16.

Mr. Samuel S. Fowler, of Nelson, B.C., paid a business visit to New York last month.

Mr. Howard W. DuBois, of Philadelphia, engineer in charge of the water supply system the Quesnelle Hydraulic Gold Mining Company is constructing, to bring water from Swift River to its gold gravel leases near Quesnel River, Cariboo district, B.C., was in Victoria lately, on his way to Quesnel.

Mr. J. Edgar McAllister, of Greenwood, Boundary district, B.C., general manager of the British Columbia Copper Company, was in New York last month, in connection with the company's annual meeting of shareholders.

Mr. W. J. Elmendorf, manager of the Portland Canal Mining Company, was in Victoria recently, conferring with the directors of the company relative to its mining and concentrating operations at Glacier Creek, Portland Canal mining division, B.C.

Mr. J. L. Parker, of Victoria, B.C., has been examining mining properties at Sheep Creek, in the Nelson mining division.

Mr. F. J. Longworth, of the British Columbia Copper Company's staff, for some time at Greenwood, B.C., is now superintendent of the company's Napoleon mine, near Boyds, Washington, U.S.A.

Mr. Wayne Darlington, of Boise, Idaho, has been investigating lode mining conditions in parts of British Columbia, for United States clients.

Mr. Walter H. Aldridge and family left Trail, B.C., on February 22, for Los Angeles, California; where their home will be in future.

Mr. T. H. Kerruish, formerly superintendent at the Copper King mine, near Whitehorse, Southern Yukon, has been spending part of the winter in Victoria and Vancouver, B.C.

Mr. Geo. H. Aylard, for six years in charge of the development of the Standard silver-lead mine, near Silverton, Slovan, B.C., has removed, with his family, to Victoria for a three months' change.

Dr. J. M. Bell, after occupying the position of Director of the New Zealand Geological Survey since February, 1905, has tendered his resignation. Dr. Bell's work in New Zealand has been most effective. Not only has the survey been reorganized in an administrative sense, but numerous important geological reconnaissances have been begun and completed. Dr. Bell will return to England, visiting New Caledonia and Westralia *en route*. Early in August he will visit Canada. He intends to take up private practice in London and Canada.

A press correspondent, writing from Greenwood, B.C., claims that Archie Aberdeen, who is employed at Bergen, Meyer's Creek, Boundary district, where a small seam of coal is being developed, is the oldest working miner in that province. He was 80 years old last June.

A press despatch from Ottawa, dated February 13, was to the effect that the Honourable the Minister of Labour had received a message from the chairman of the Board of Conciliation and Investigation, stating that the difficulty between the Crow's Nest Pass Coal Company and its miners, involving the question of hours and wages, had been amicably adjusted through the offices of the board.

Abstract of Preliminary Report of the Mineral Production of Canada, 1910

(Statistics Subject to Revision.)

Prepared by John McLeish, B.A., Chief of Division of Mineral Resources and Statistics.

Although complete statistics are not yet available, sufficient information is at hand to indicate that the total value of the mineral production of Canada during the past year exceeded \$105,000,000. This production is made up from such a great variety of well established mining industries that the record should be particularly gratifying not only to those who are directly interested in the development of the mineral resources of the country, but also the public at large who indirectly profit thereby.

Not only is the increase over the production of the previous year a large one, having amounted to \$13,209,517, or over 14 per cent., but an examination of the details of production shows that the increase has been fairly well distributed amongst the more important ores and minerals produced in Canada.

The production of the more important metals and minerals is shown in the following tabulated statement, in which the figures are given for the two years, 1909 and 1910, in comparative form, and the increase or decrease in value shown. Tabulated statements for both years, in greater detail, will be found on subsequent pages of this pamphlet:

The subdivision of the mineral production in 1909 and 1910 by provinces was approximately as follows:

Province	1909		1910	
		% of total		% of total
Nova Scotia	\$12,504,810	13.62	\$14,054,534	13.38
New Brunswick	657,035	0.71	585,891	0.56
Quebec	7,086,265	7.72	8,193,275	7.80
Ontario	37,374,577	40.70	43,017,026	40.95
Manitoba	1,193,377	1.30	1,470,776	1.40
Saskatchewan	456,246	0.50	557,806	0.53
Alberta	6,047,447	6.58	7,876,458	7.50
British Columbia ...	22,479,006	24.48	24,547,817	23.37
Yukon	4,032,678	4.39	4,737,375	4.51
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	\$91,831,441	100.00	\$105,040,958	100.00

It will be observed that there has been an increased production in nearly every province, the only falling off being shown by New Brunswick, in which the gypsum production, and some of the structural products, showed a slight decrease.

In Nova Scotia there was a largely increased production of coal and gypsum. In Quebec, the principal in-

	1909		1910		Increase (+) or decrease (-) in value.
	Quantity.	Value.	Quantity.	Value.	
Copper	52,493,863 pounds	\$ 6,814,754	56,598,074	\$ 7,209,463	+\$ 394,709
Gold	453,865 ounces	9,382,230	.....	10,224,910	+ 842,680
Pig iron	757,162 tons	9,581,864	800,797	11,245,630	+ 1,663,766
Lead	45,857,424 pounds	1,692,139	32,987,508	1,237,032	- 455,107
Nickel	26,282,991 pounds	9,461,877	37,271,033	11,181,310	+ 1,719,433
Silver	27,529,473 ounces	14,178,504	31,983,328	17,106,604	+ 2,928,100
Other metallic products	405,122	559,186	+ 154,064
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Total	\$51,516,490	\$58,764,135	+ 7,247,645
Less pig iron credited to imported ores ..	607,718	7,359,649	695,891	9,594,309	+ 2,234,660
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Total metallic	\$44,156,841	\$49,169,826	+ 5,012,985
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Asbestos and asbestic	87,300 tons	\$ 2,201,775	100,385	\$ 2,476,558	+ 274,783
Coal	10,501,475 tons	24,781,236	12,796,512	29,811,750	+ 5,030,514
Gypsum	439,129 tons	809,632	531,313	939,838	+ 130,206
Natural gas .....	.....	1,207,029	.....	1,312,614	+ 105,585
Petroleum	420,755 barrels	559,604	315,895	388,550	- 171,054
Salt	84,037 tons	415,219	84,029	409,624	- 5,595
Cement	4,067,709 barrels	5,345,802	4,753,975	6,414,315	+ 1,068,513
Clay products .....	.....	6,450,810	.....	7,600,000	+ 1,149,190
Lime	5,592,924 bushels	1,132,756	5,721,285	1,131,407	- 1,349
Stone	3,127,135	3,499,772	+ 372,637
Miscellaneous non-metallic	1,642,602	1,886,704	+ 244,102
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Total non-metallic	\$47,674,600	\$55,871,132	+\$ 8,196,532
	<hr/>		<hr/>		
Grand total	\$91,831,441	\$105,040,958	+\$13,209,517

creases were in cement and asbestos. Ontario's increases are principally in the metals copper, nickel, and silver.

Manitoba shows an increased production of gypsum and clay products; while in Alberta, clay products, cement, and particularly coal, contribute the chief gains. In British Columbia the increase is mainly due to the coal industry, while the Yukon not only shows a gratifying gain in gold production, but a growing shipment of copper and silver ores.

Of the total production in 1910, \$49,169,826, or 46.8 per cent., is credited to the metals, and \$55,871,132, or 53.2 per cent., to the non-metallic products. Amongst the individual products, coal still contributes the greatest value, constituting 28.4 per cent. of the total. Silver is next, with about 16.3 per cent.; nickel third, with 10.6 per cent.; gold, 9.7 per cent.; clay products, 7.2 per cent.; copper, 6.8 per cent., and cement, 6.1 per cent.

In valuing the metallic production, the same general practice has been followed as in past years, with one or two slight modifications. Instead of valuing lead at the New York price, the average price at Toronto has been used. This is somewhat lower than the New York price, but higher than that in London.

Nickel has been valued at an average price of 30 cents per pound, although the minimum quotation for the metal in large lots was 40 cents. Considerable quantities of monel metal are now made, the production of which does not require the separation of the nickel metal, and the price of 30 cents is equivalent to valuing two-thirds of the production at 37½ cents, and one-third at 15 cents.

THE MINERAL PRODUCTION OF CANADA IN 1910
(Subject to Revision.)

Product.	Quantity	Value
METALLIC.		
Copper, value at 12.738 cents per pound	56,598,074 pounds	\$ 7,209,463
Gold		10,224,910
Pig iron from Canadian ore	104,906 tons	1,651,321
Iron ore (exports)	114,449 tons	324,186
Lead, value at 3.75 cts. per lb.	32,987,508 pounds	1,237,032
Nickel, value at 30 cts. per lb.	37,271,033 pounds	11,181,310
Silver, value at 53.486 cts. per oz.	31,983,328 ounces	17,106,604
Zinc ore and other products		235,000
Total		\$49,169,826
NON-METALLIC.		
Arsenic, white	1,502 tons	\$ 75,328
Asbestos	75,678 tons	2,458,929
Asbestic	24,707 tons	17,629
Coal	12,796,512 tons	29,811,950

Corundum	1,870 tons	198,680
Feldspar	15,719 tons	47,867
Fluorspar	2 tons	15
Graphite	1,243 tons	59,087
Grindstones	3,847 tons	43,936
Gypsum	513,313 tons	939,838
Magnesite (railway shipments)	328 tons	2,493
Mica		143,409
Ochres	4,813 tons	33,185
Mineral water		175,173
Natural gas		1,312,614
Peat	771 tons	1,735
Petroleum, val. at \$1.23 per bbl.	315,895 barrels	388,550
Phosphate	1,319 tons	11,780
Pyrites	55,925 tons	192,263
Quartz	88,205 tons	91,951
Salt	84,092 tons	409,624
Talc	7,112 tons	22,308
Tripolite	22 tons	134
Total		\$ 36,438,278

STRUCTURAL MATERIALS & CLAY PRODUCTS.

Cement, Portland	4,753,975 barrels	6,414,315
Clay products—		
Brick		5,930,630
Sewer pipe, fireclay, drain tile, pottery, etc.		1,669,370
Lime	5,721,285 bushels	1,131,407
Sand and gravel (exports)	624,824 tons	407,974
Sand lime brick		360,894
Slate		18,492
Stone—		
Granite		634,783
Limestone		2,303,804
Marble		158,779
Sandstone		402,406
Total structural materials and clay products		\$ 19,432,854
All other non-metallic		36,438,278
Total value, metallic		49,169,826
Total value, 1910		\$105,040,958

The average monthly prices of the metals in cents per pound for several years past are shown herewith.

	Cts. 1907	Cts. 1908	Cts. 1909	Cts. 1910
Copper, New York	20.004	13.208	12.982	12.738
Lead, New York	5.325	4.200	4.273	4.446
Lead, Toronto	5.429	3.894	3.692	3.750
Nickel, New York	45.000	43.000	40.000	40.000
Silver, "	65.327	52.864	51.503	53.486
Spelter, "	5.962	4.720	5.503	5.520
Tin, "	38.166	29.465	29.725	34.123

SMELTER AND REFINERY PRODUCTION IN CANADA, 1908 AND 1909.

	1908	1909
	Refined Products.	Metals contained in matte, blister, base bullion and speiss.
Antimony		61,207
Gold	15,436 ounces	18,241
Silver	11,168,689 ounces	14,242,545
Lead	36,549,274 pounds	41,883,614
Copper		51,965,289
Copper sulphate	203,379 pounds	51,405
Nickel		19,506,251
Cobalt		692,170
White arsenic	1,431,052 pounds	2,258,087
Arsenic		436,787
		1,074,516

SMELTER PRODUCTION.

General statistics of smelter production were collected by this branch for the first time in 1908, and the aggregate results of these operations during the years 1908 and 1909 are shown in the accompanying table. Unfortunately, complete returns have not yet been received for the year 1910. It should be explained also that the figures include the results of the treatment of a small quantity of imported ores. The results of the operations at the smelter at Northport, Wash., treating chiefly Canadian ores, have also been included:

The total ore charged to the furnaces during each of the past two years is shown as under:—

	1909	1910
Nickel-copper ores	462,336	628,947
Silver-cobalt-nickel-arsenic ores	8,384	9,466
Lead and other ores treated in lead furnaces	53,006	57,547
Copper-gold silver ores	1,850,889	*2,000,000
Total	2,374,615	2,695,960

*Returns incomplete but tonnage probably exceeded the figure given.

GOLD.

While statistics of gold production are as yet incomplete, a preliminary estimate shows a production of approximately \$10,224,910, an increase of about 9 per cent. over the 1909 production. The production of the Yukon is valued at \$4,550,000, the total exports, on which royalty was paid during the calendar year according to the records of the Interior Department, being 275,472.51 ounces. The Yukon production in 1909 was \$3,960,000, the exports being 239,766.35 ounces. The British Columbia production in 1909 was: placer gold, \$477,000; bullion from free milling ores, \$329,655; smelter recoveries, \$4,367,924. In 1910 the placer production is estimated by the Provincial Mineralogist as \$482,000. An estimate of free milling bullion shipments and smelter recoveries is made of \$4,950,000, or a total production for the province of \$5,432,000. The Nova Scotia production shows a falling off of about \$20,000, while Ontario will probably show a slight increase on account of the gold recovered in development work at Porcupine, of which a record has not yet been received.

SILVER.

The silver production of Canada in 1909 showed an increase of 24.5 per cent. over that of 1908, following a series of large increases during the three preceding years. It is very satisfactory, therefore, to be able to report a further increase in 1910 of about 16 per cent. The total production last year, including that produced as bullion and the metal estimated as recovered from ores sent to smelters or otherwise treated, was approximately 31,983,328 ounces, as compared with a production of 27,529,473 ounces in 1909.

The increase is again chiefly credited to Cobalt and adjacent mining districts of Ontario.

There was a slight falling off in the silver production of British Columbia as a result of the decreased production from the silver lead ores of the province.

For the Province of Ontario, complete returns have been received from all the larger operators, while estimates based on railway shipments have been made for two or three of the smaller mines. The net production of recoverable silver is estimated at 29,375,000 ounces, that is after deducting 5 per cent. from the settlement assays of ores to smelters to allow for smelting losses. At the average price of silver for the year this has a value of \$15,711,513.

The production, similarly estimated, for 1909, was 24,822,99 ounces, thus showing an increase in 1910 of about 4,552,901 ounces, or over 18 per cent.

The total shipments of ore and concentrates were ounces of silver, in addition to which somewhat over 940,000 ounces were shipped as bullion. The average silver content of ore and concentrates shipped was thus about 865.57 ounces, or \$462.96 per ton, as compared with an average of 840 ounces in 1909.

The shipments during 1909 were 27,835 tons of ore, containing 22,349,717 ounces of silver, or an average of 803 ounces per ton; 3,059 tons of concentrates containing 3,627,819 ounces, or an average of 1,186 ounces per ton, and bullion containing 143,440 fine ounces.

The exports of silver in ore, etc., as reported by the Customs Department, were 30,699,770 ounces, valued at \$15,649,537.

The price of refined silver in New York varied between a minimum of 50½ cents per ounce on March 2nd, and a maximum of 56¾ cents on October 19th, the average monthly price being 53.486, as compared with an average monthly price of 51.503 cents in 1909.

COPPER.

No refined copper is produced in Canada, but the copper ores are mostly reduced to a matte or blister copper carrying values in the precious metals. In Quebec, where the copper is recovered subsequently to the extraction of the sulphur from pyritic ores, there was increased activity during the year. A small quantity of ore was exported from British Columbia coast mines and the Yukon to United States smelters for treatment. In Ontario, where the copper is chiefly recovered from the nickel-copper ores of the Sudbury district, there is a very large increase in production. In British Columbia, the most important events during the year were the acquisition of a controlling interest in the Dominion Copper Company by the British Columbia Copper Company, with the subsequent re-opening of several of the big properties, and the destruction by fire of part of the head works of the Granby Mines at Phoenix, B.C., which noticeably affected the output, although the Boundary district as a whole shows an increased production.

Statistics are not available at the present time to show the total quantity of copper contained in ores shipped from the mines. The total production of copper, however, contained in blister and matte produced and estimated as recoverable from ores exported was in 1910 approximately 56,598,074 pounds. In 1909 the production of copper, estimated on the same basis, was 52,493,863 pounds, an increased production of about 7.8 per cent. being therefore shown in 1910.

Of the production in 1910, Quebec is credited with 957,178 pounds; the production in Ontario was 19,259,016 pounds; and in British Columbia the production is estimated at about 36,000,000 pounds. Ontario shows an increased production of about 3,512,317 pounds, or 22.3 per cent., while British Columbia shows a slight increase, the production in 1909 being estimated at 35,658,952 pounds.

The New York price of electrolytic copper during the year varied between the limits of 12 cents and 13¾ cents per pound, the average being 12.738, as compared with an average of 12.982 cents in 1909.

The total exports of copper contained in ore, matte and blister according to Customs Department returns, were 56,964,127 pounds, valued at \$5,840,553. It will be noted that the exports agree very closely in number of pounds with the record of the production which

would be expected since practically all the copper is exported.

LEAD.

The total production in 1910 of pig and manufactured lead was 32,987,508 pounds, valued at the average price of refined lead in Toronto, at \$1,237,032.

The production of refined lead and lead contained in base bullion exported in 1909 was 45,857,424 pounds. A decreased production in 1910 is therefore shown of 12,869,916 pounds.

The production of both years was entirely from British Columbia. The falling off in the output of that province is due largely to the curtailment of production by several of the important Slocan mines, consequent to the destruction of railway facilities and of several mines buildings by forest fires.

The Blue Bell mine also, one of the leading shippers of lead in 1909, suspended operations early in 1910. Against these decreases may be placed the advent of the Sullivan mine, East Kootenay, into the list of shippers.

The exports of lead in ore during the year were 23 tons, and of pig lead, 3,856 tons, or a total of 3,879.

About 12,614 tons of domestic production were, therefore, available for home consumption.

The imports of lead in 1910 were 8,305 tons, valued at \$525,265, in addition to which were manufactures valued at \$107,688, and litharge, white and red lead, etc., \$200,790, or a total value of \$833,743.

The price of lead in Toronto during 1910 averaged about 3.750 cents per pound; in New York, 4.446 cents per pound; and in London, £12.920 per long ton.

The amount of bounty paid during the twelve months ending December 31, 1910, on account of lead production, was \$318,308.28, as compared with a payment of \$346,527.98 in 1909.

NICKEL.

There has been a very large increase in the production of nickel-copper ores in Ontario during the past two years, and it is perhaps not generally realized that the production of nickel in this province is now almost as large, pound for pound, as the production of copper in British Columbia, while the market price of the metal is from two to three times that of copper. A portion of the production is, however, now recovered with copper as monel metal and sold at a much lower price than fine nickel. Active operations are being carried on by the same companies as formerly, viz.: the Mond Nickel Company, at Victoria Mines, and the Canadian Copper Company, at Copper Cliff.

The ore is first roasted and then smelted and converted to a Bessemer matte containing from 77 to 82 per cent. of the combined metals, copper and nickel; the matte being shipped to the United States and Great Britain for refining.

The total production of matte in 1910 was 35,033 tons, valued at the furnace at \$5,380,064, an increase of \$9,188 tons, or 31.6 per cent., over the production of 1909. The metallic contents were, copper, 19,259,016 pounds, and nickel, 37,271,033 pounds.

The aggregate results of the operations on the Sudbury District nickel-copper ores during the past three years were as follows, in tons of 2,000 pounds:—

	1908	1909	1910
Ore mined	409,551	451,892	652,392
Ore smelted	360,180	462,336	628,947
Bessemer matte produced	21,197	25,845	35,033
Bessemer matte shipped	21,210	.....	.....

Copper contents of matte shipped	7,503	7,873	9,630
Nickel contents of matte shipped	9,572	13,141	18,625
Spot value of matte shipped	\$2,930,989	\$3,913,017	\$5,380,064
Wages paid	1,286,265	1,234,904	1,748,153
Men employed	1,690	1,735	.....

Exports of nickel contained in ore, matte, etc., as compiled from Customs reports, have been, for the twelve months ending December 31, as follows:

	1907	1908	1909	1910
	pounds	pounds	pounds	pounds
To Great Britain..	2,518,338	2,554,486	3,843,763	5,335,331
To United States..	16,857,997	16,865,407	21,772,635	30,679,451
	19,376,335	19,419,893	25,616,398	36,014,782

The price of refined nickel in New York remained practically constant throughout the year—the quotation being “Large lots, contract business, 40 to 45 cents per pound. Retail spot from 50 cents for 500-pound lots, up to 55 cents for 200-pound lots. The price for electrolytic is 5 cents higher.”

IRON.

Iron Ore—Excluding Quebec, for which complete returns have not been received, the production of iron ore in 1910 was 254,915 short tons, valued at \$566,109. The shipments may be classified as: magnetite, 124,535 tons; hematite, 130,380 tons. In 1909 the total shipments were 268,043 tons, valued at \$659,316, and comprised magnetite, 74,240 tons; hematite, 190,473 tons, and bog ore, 3,330 tons.

Exports of iron ore from Canada during 1910 are recorded by the Customs Department as 114,499 tons, valued at \$324,186. This is chiefly from Moose Mountain mine, Ontario, Torbrook, N.S., and Bathurst, N.B.

Although not a Canadian production, it may be of interest to state that the two Canadian companies operating the Wabana mines, shipped during the year 1,259,626 short tons, of which 808,762 tons were shipped to Sydney and 450,864 tons to the United States and Europe.

Pig Iron.—An increase of 5.58 per cent. is shown in the production of pig iron in Canada in 1910 as compared with 1909. The total production in 1910 was 800,797 short tons, valued at \$11,245,630, as compared with 757,162 tons, valued at \$9,581,864, in 1909. These figures do not include the output from electric furnaces making ferro-products, which are situated at Welland and Sault Ste. Marie, Ontario, and Buckingham, Quebec. Of the total output of pig iron during 1910, 17,164 tons, valued at \$333,956, or \$19.78 per short ton, were made with charcoal as fuel, and 783,633 tons, valued at \$10,911,674, or \$13.92 per ton, with coke. The amount of charcoal iron made in 1909 was 17,003 tons, and iron made with coke was 740,159 tons. The classification of the production of 1910, according to the purpose for which it was intended, was as follows: Bessemer, 219,492 tons; basic, 425,400 tons; foundry, including miscellaneous, 138,741 tons.

The amount of Canadian ore used during 1910 was 160,290 tons; imported ore, 1,406,668 tons; mill cinder, etc., 22,671 tons.

The amount of coke used during the year was 993,037 tons, comprising 499,717 tons from Canadian coal and 493,320 tons imported coke or coke made from imported coal.

The consumption of charcoal was 1,615,919 bushels. Limestone flux was used to the extent of 569,355 tons.

In connection with blast furnace operations there were employed 1,403 men and \$1,006,727 were paid in wages.

The total daily capacity of 16 completed furnaces was, according to returns received, 2,880 tons.

The number of furnaces in blast, December 31, 1910, was 11.

The production of pig iron by provinces in 1909 and 1910 was as follows:—

Province.	Tons	1909		1910		
		Value	Per ton	Tons	Value	Per ton
Nova Scotia	345,380	\$3,453,800	\$10.00	300,287	\$4,203,444	\$12.00
Quebec	4,770	125,623	26.34	3,237	85,256	26.34
Ontario	407,012	6,002,441	14.75	447,296	6,956,930	15.55
Total	757,162	\$9,581,864	\$12.65	800,797	\$11,245,630	\$14.04

The exports of pig iron during the year are reported as 9,763 tons, valued at \$296,310. Probably the greater part of this is ferro-silicon and ferro-phosphorus, produced at Welland and Buckingham, respectively.

There were imported during the year 227,753 tons of pig iron, valued at \$3,122,695; 16,106 tons of charcoal pig, valued at \$242,152, and 18,900 tons of ferro-manganese, valued at \$464,741.

Steel.—The total production of ingots and castings in 1910 was approximately 822,281 short tons, of which 803,600 tons were ingots, and 18,681 tons were castings. The figures have been partially estimated, the records of the Ontario Iron and Steel Company having been unfortunately destroyed by fire. The production in 1909 was reported as 754,719 short tons, made up of 739,703 tons of ingots and 15,016 tons of castings.

Returns from seven of the principal rolling mills report the production in 1910 of steel in the following shapes; blooms and billets, 635,500 short tons; rails, 399,761 tons; rods and bars, 214,233 tons; miscellaneous rolled products, 23,167 tons.

The total bounty paid on iron and steel during 1910 was \$1,344,144.59.

ASBESTOS.

The total shipments of asbestos in 1910, with one firm still to hear from, are reported as 75,678 tons, valued at \$2,458,929, as compared with 63,349 tons, valued at \$2,284,587, in 1909, an increase of about 19 per cent. in tonnage and 7.6 per cent. in total value.

The number of men employed in mines and mills is reported as 3,443, at a wage cost of \$1,393,856. While the shipments are reported as above, the actual production was returned as 4,815 tons of crude and 91,353 tons of mill stock produced from 1,474,527 tons of asbestos rock, or a total production of 96,168 tons; stock on hand at the end of the year totalled 39,310 tons, as compared with 20,921 tons on hand at December 31, 1909.

The following tabulated statement shows the production and shipments during 1910 and the stock on hand at the end of the year:—

	Production		Shipments.		Stock on hand Dec. 31	
	Tons	Value	Tons	Value	Tons	Value
Crude No. 1	1,971	1,688	1,688	\$ 445,130	1,605	\$ 426,782
Crude No. 2	2,844	1,732	1,732	171,684	2,842	405,419
Mill Stock No. 1	16,026	12,830	12,830	701,681	69,933	718,765
Mill Stock No. 2	56,321	42,612	42,612	997,987	24,541	591,752
Mill Stock No. 3	19,006	16,816	16,816	142,447	3,389	29,988
Total asbestos	96,168	75,678	75,678	\$2,458,929	39,310	\$2,172,706
Asbestic .....	.....	24,707	24,707	17,629	.....	.....

In the absence of a uniform classification of asbestos of different grades, the above sub-divisions have been adopted purely on a valuation basis. Crude No. 1 comprising material valued at \$200 and upwards, and Crude No. 2 under \$200. Mill Stock No. 1 includes stock valued at from \$45 to \$100; No. 2, from \$20 to \$40. No. 3, under \$20.

The shipments of asbestos in 1909 were in detail as follows:—

Crude No. 1, 912 tons, value \$246,655, or \$270.37 per ton.

Crude No. 2, 2,162 tons, value \$328,855, or \$152.11 per ton.

Mill stock No. 1, 14,776 tons, value \$785,731, or \$53.18 per ton.

Mill stock No. 2, 32,417 tons, value \$800,728, or \$24.70 per ton.

Mill stock No. 3, 13,082 tons, value \$122,618, or \$9.37 per ton.

Total, 63,349 tons, value \$2,284,587, or \$36.06 per ton; asbestic, 23,951 tons, value \$17,188.

The exports of asbestos during the twelve months ending December, 1910, are reported by the Customs Department as 71,485 tons, valued at \$2,108,632, comprising 57,939 tons, valued at \$1,505,477 to the United States; 6,700 tons, value \$280,452, to Great Britain; 440 tons, value \$15,925, to Germany; 2,187 tons, value \$94,619, to France, and 1,242 tons, value \$43,948, to other countries.

The imports of manufactures of asbestos during the same period are reported as valued at \$230,489.

CORUNDUM.

There was an increased production of corundum in 1910. The quantity of corundum ore treated during the year was 37,183 tons, from which was produced 1,686 tons of grain corundum. The shipments were 106 tons sold in Canada and 1,774 tons sold in other countries, a total of 1,870 tons, valued at \$198,680.

COAL AND COKE.

The total coal production in Canada in 1910, comprising sales and shipments, colliery consumption and coal used in making coke, is estimated at 12,796,512 short tons, valued at \$29,811,750. This is an increase of 2,295,037 tons, or nearly 22 per cent. over the production of 1909, and is the largest production of coal yet recorded for Canada.

There has been an increased production from practically all the larger collieries, while in the Province of Alberta many new mines are being opened up and

developed. The largest increases have been in the west—Alberta showing an increase of nearly 42 per cent., and British Columbia over 27 per cent.; while Nova Scotia shows an increase of a little over 13 per cent. The total production is almost equally divided this year between the eastern and western coal fields, while Alberta contributes about 22 per cent. of the whole, as compared with 10 per cent. in 1905 and 5 per cent. in 1900.

The production by provinces was approximately as follows, the figures for 1909 being also given. With respect to Alberta, while the table below shows a production in 1910 of 2,824,929 tons, the Provincial Mine Inspector estimates the output at over 3,000,000 tons.

Province	1909		1910	
	Tons	Value	Tons	Value
Nova Scotia.....	5,652,089	\$11,354,643	6,407,091	\$12,871,388
British Columbia ..	2,606,127	8,144,147	3,319,368	10,373,024
Alberta... ..	1,994,741	4,838,109	2,824,929	6,161,055
Saskatchewan	192,125	296,339	190,484	293,448
New Brunswick	49,029	98,496	53,455	106,910
Yukon Territory ..	7,364	49,502	1,185	5,925
Totals	10,501,475	\$24,781,236	12,796,512	\$29,811,750

The exports of coal are reported by the Customs Department as 2,377,049 tons, valued at \$6,077,350, as compared with exports of 1,588,099 tons in 1909, valued at \$4,456,342.

Imports of coal during the year include bituminous 5,966,466 tons, valued at \$11,919,341; slack, 1,365,281 tons, valued at \$1,795,598, and anthracite, 3,266,235 tons, valued at \$14,735,062, or a total of 10,597,982 tons, valued at \$28,450,001.

There was a greater importation of each class of coal than in 1909, when the total imports were 9,872,924 tons.

Coke.—The production of oven coke in 1910 was about 897,273 short tons, as compared with a production of 862,011 tons in 1909. The total quantity of coal charged to ovens was 1,373,793 short tons. By provinces, the production was: Nova Scotia, 507,996 tons; Ontario, 25,959 tons; Alberta, 121,578 tons, and British Columbia, 241,740 tons. The coke is all made from Canadian coal with the exception of that made by the Atikokan Iron Company at Port Arthur, Ontario. All of the coke produced was used in Canada with the exception of 50,922 tons sold for export to the United States, chiefly from Alberta. The quantity sold for export in 1909 was 77,407 tons.

The quantity of coke imported during the calendar year was 737,088 tons, valued at \$1,908,725, as compared with imports of 661,425 tons, valued at \$1,508,627 in 1909.

CHROMITE.

No returns of production of chromite have been received, but 619 tons are reported as having been shipped by rail from Coleraine and Black Lake. An export of 15 tons, valued at \$150, is also reported by the Customs Department

PETROLEUM AND NATURAL GAS.

The production of crude petroleum shows another large falling off in 1910, the production being only 315,895 barrels, or 11,056,337 gallons, valued at \$388,550, as compared with 420,755 barrels, or 14,726,433 gallons, valued at \$559,604, in 1909. The average price per barrel was also less, being about \$1.23 in 1910, as compared with \$1.33 in 1909.

The above statistics of production have been kindly furnished by the Trade and Commerce Department, and represent the quantities of oil on which bounty was paid, the total bounty payments being \$165,845.06 in 1910, and \$220,896.50 in 1909.

The production in Ontario by districts, as furnished by the Supervisor of Petroleum Bounties, was, in 1910, as follows, in barrels:—Lambton, 205,456; Tilbury and Romney, 63,058; Bothwell, 36,998; Leamington, 141; Dutton, 7,752, and Onondaga (Brant County), 1,005.

The production in New Brunswick was 1,485 barrels.

In 1909 the production by districts was as follows, in barrels: Lambton, 243,123; Tilbury and Romney, 124,003; Bothwell, 38,092; Leamington, 5,929, and Dutton, 9,513. New Brunswick produced 95 barrels.

While the production has been decreasing, the imports, as might be expected, have been increasing. The total imports of petroleum oils, crude and refined, in 1910 were 67,949,643 gallons, valued at \$3,133,449, in addition to 1,362,235 pounds of wax and candles, valued at \$80,106. The oil imports included crude oil, 53,604,053 gallons; refined and illuminating oils, 7,656,727 gallons; lubricating oils, 3,071,257 gallons; other petroleum products, 2,607,606 gallons.

The production of natural gas was valued at \$1,312,614, being \$68,568 for the Province of Alberta and \$1,244,046 for Ontario. These values represent as closely as can be ascertained the value received by the owners of the wells for gas produced and sold or used and do not necessarily represent what the consumers have to pay for the gas, since in a number of instances the gas is re-sold once or twice by pipe line companies before reaching the consumer. In Alberta, also, some gas is being used by brick manufacturers for which no estimate has been obtained as to quantity or value. The total quantity of gas used in Ontario exceeded 7,036 million feet, and in Alberta over 450 million feet. A considerable flow of gas is reported from the new wells of the Maritime Oil Company, Limited, in Albert County, New Brunswick, which it is proposed to pipe to Moncton.

SALT.

Complete returns of salt production show total sales of 84,092 tons, valued at \$409,624 for the salt alone. Packages used were valued at \$173,446. Stock on hand at the end of the year was reported as 2,474 tons. Two hundred and eight men were employed and \$112,909 paid in wages. The production was about the same as in 1909.

Imports of salt during the calendar year were: salt in bulk and bags, dutiable, 20,174 tons, valued at \$97,326, and salt free of duty, 108,794 tons, valued at \$364,735.

CEMENT.

Complete statistics have been received from the manufacturers of cement, covering their production and shipments during the year 1910. These returns show that the total quantity of cement made during the year, including both Portland and slag cement, was 4,396,282 barrels, as compared with 4,146,708 barrels in 1909, an increase of 249,574 barrels, or 6 per cent.

The total quantity of Canadian Portland cement sold during the year was 4,753,975 barrels, as compared with 4,067,709 barrels in 1909, an increase of 686,266 barrels, or 16.87 per cent. The total consumption of Portland cement in 1910, including Canadian and imported cement, and neglecting an export of Canadian cement valued at \$12,914, was 5,103,285 barrels, as compared with 4,209,903 barrels in 1909, or an increase of 893,382 barrels, or 21.22 per cent.

The average price per barrel at the works in 1910 was \$1.34, as compared with an average price of \$1.31 reported for 1909, and \$1.39 in 1908.

The imports of Portland cement into Canada during the twelve months ending December 31, 1910, were 1,222,586 cwt., valued at \$468,046. This is equivalent to 349,310 barrels of 350 pounds, at an average price per barrel of \$1.34. The imports in 1909 were 142,194 barrels, valued at \$166,669, or an average price per barrel of \$1.17.

The imports from Great Britain during 1910 were 123,880 barrels, valued at \$130,951; from the United States, 168,972 barrels, valued at \$253,463; from Belgium, 19,027 barrels, valued at \$20,618, and from other countries, 37,431 barrels, valued at \$63,014.

The estimated consumption of Portland cement in Canada for 1910 is 5,103,285 barrels. 93 per cent. of this was Canadian made.

THE MINERAL PRODUCTION OF CANADA IN 1909.

(Revised.)

Product.	Quantity	Value
METALLIC.		
Antimony ore tons *	35	\$ 1,575
Antimony, refined pounds	61,207	4,285
Cobalt (k) pounds	.....	94,609
Copper (e) pounds	52,493,863	6,814,754
Gold ounces	453,865	9,382,230
Pig iron from Canadian ore (d) tons	149,444	2,222,215
Iron ore (a) tons	21,956	61,954
Lead (e) pounds	45,857,424	1,692,139
Nickel (f) pounds	26,282,991	9,451,877
Silver (g) ounces	27,529,473	14,178,504
Zinc ore tons	18,371	242,699
Total		\$44,156,841

NON-METALLIC.		
Arsenic tons	.....	\$ 67,446
Asbestos tons	63,349	2,284,587
Asbestic tons	23,951	17,188
Chromite tons	2,470	26,604
Coal tons	10,501,475	24,781,236
Corundum tons	1,491	162,492
Feldspar tons	12,783	40,383
Graphite tons	864	47,800
Graphite, artificial tons	257	.....
Grindstones tons	4,275	54,664
Gypsum tons	473,129	809,632
Magnesite tons	330	2,508
Mica tons	369	147,782
Mineral pigments—Barytes tons	179	1,120
Mineral pigments—Ochres tons	3,940	28,093
Mineral water .....	.....	175,173
Natural gas (h) .....	.....	1,207,029
Peat tons	60	240
Petroleum (i) barrels	420,755	559,604
Phosphate tons	998	8,054
Pyrites tons	64,644	222,812
Quartz tons	56,924	71,285
Salt tons	84,037	415,219
Talc tons	4,350	10,300
Total		\$31,141,251

Structural Materials and Clay Products.		
Cement, Portland barrels	4,067,709	\$ 5,345,802
Clay Products—		
Bricks, common No.	539,228,708	4,212,424
Bricks, pressed No.	57,264,656	630,677
Bricks, paving No.	3,759,803	67,408

Bricks, moulded and ornamental...	.....	8,866
Fireclay and fireclay products ....	.....	78,132
Fire-proofing and architectural terra cotta .....	.....	113,886
Pottery .....	.....	285,285
Sewer pipe .....	.....	645,722
Tiles, drain No.	27,571,097	408,440
Lime bushels	5,592,924	1,132,756
Sand lime-brick No.	27,052,864	201,650
Sand and gravel (exports) tons	481,584	256,166
Slate squares	4,000	19,000
Stone—		
Granite .....	.....	454,824
Limestone .....	.....	2,139,691
Marble .....	.....	158,441
Sandstone .....	.....	374,179
Total, structural material, etc....		\$16,533,349
Total, all other non-metallic....		31,141,251
Total, non-metallic		\$47,674,600
Total, metallic		44,156,841
Total value, 1909		\$91,831,441

*Short tons throughout.

(a) Exports.

(b) The metals, copper, lead, nickel and silver are for statistical and comparative purposes valued at the final average value of the refined metal. Pig iron is valued at the furnace, and non-metallic products at the mine or point of shipment.

(c) Copper content of smelter products and estimated recoveries from ores exported, at 12.982 cents per pound.

(d) The total production of pig iron in Canada in 1909 was 757,162 tons, valued at \$9,581,864, of which it is estimated 607,718 tons, valued at \$7,359,649, should be credited to imported ores.

(e) Refined lead and lead contained in base bullion exported at 3.690 cents per pound, the average price for the year in Toronto.

(f) Nickel content of matte produced at 36 cents per pound (the average minimum quotation for nickel in New York less 10 per cent). The value of the nickel contained in matte was, as returned by the operators, \$2,810,748, or an average per pound of 10.7 cents.

(g) Estimated recoverable silver at 51.503 cents per ounce.

(h) Gross returns for sale of gas.

(i) Quantity on which bounty was paid and valued at \$1.33 per barrel.

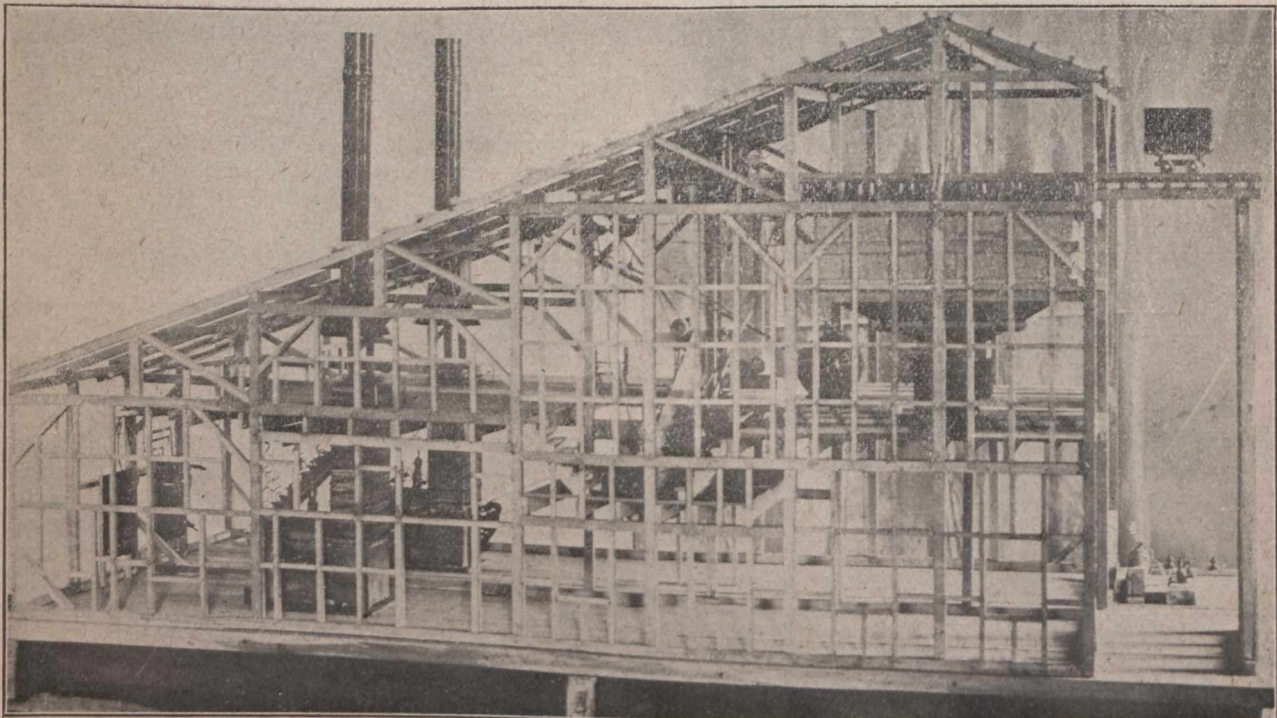
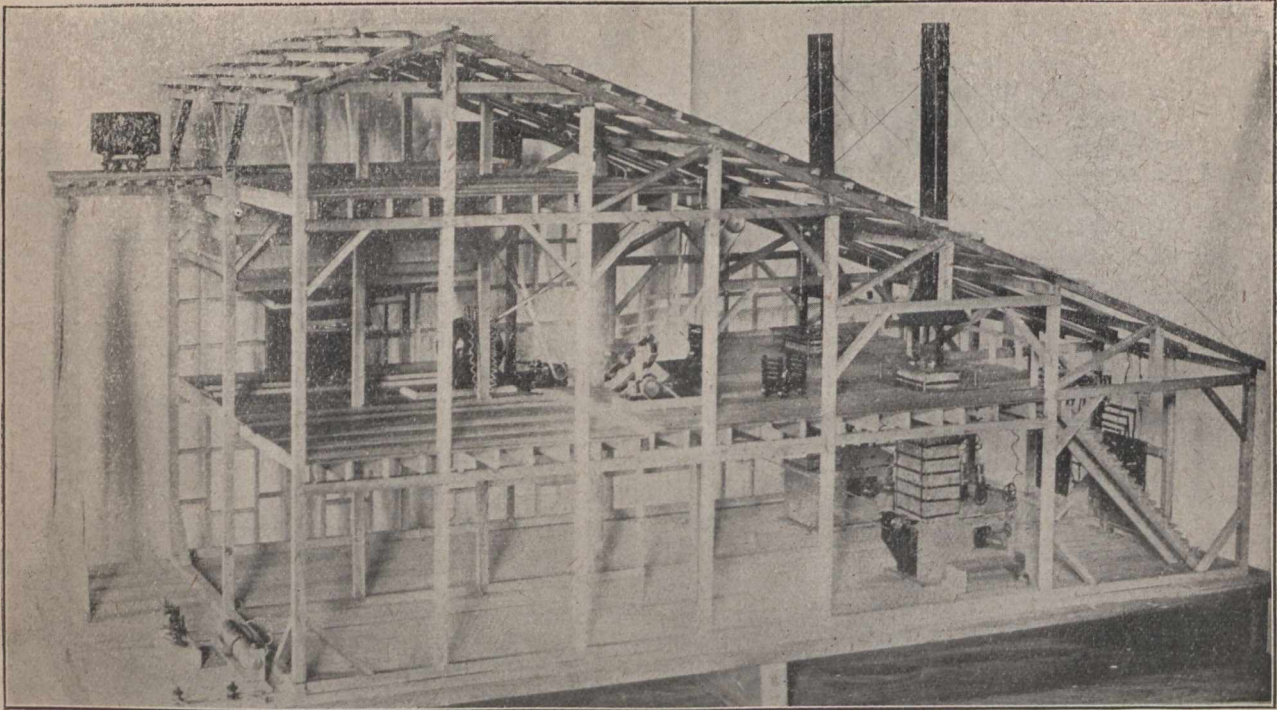
(k) Value received by shippers of silver cobalt ores for cobalt content.

ANNUAL MINERAL PRODUCTION IN CANADA, SINCE 1886

Year	Volume of production.	Value per capita.
1886	\$10,221,255	\$2.23
1887	10,321,331	2.23
1888	12,518,894	2.67
1889	14,013,113	2.96
1890	16,763,353	3.50
1891	18,976,616	3.92
1892	16,623,415	3.39
1893	20,035,082	4.04
1894	19,931,158	3.98
1895	20,505,917	4.05
1896	22,474,256	4.38
1897	28,485,023	5.49
1898	38,412,431	7.32
1899	49,234,005	9.27
1900	64,420,877	12.04
1901	65,797,911	12.25
1902	63,231,836	11.55

1903	61,740,513	11.03	1907	86,865,202	13.35
1904	60,082,771	10.36	1908	85,557,101	12.32
1905	60,078,999	11.35	1909	91,831,441	12.82
1906	79,286,697	12.55	1910	105,040,958	14.02

The Evans 5-ton Direct Electric Smelting Steel Plant.



The accompanying photographs give two views of the very ingenious model exhibited by Mr. J. W. Evans, of Belleville, Ont., at the Quebec meeting of the Canadian Mining Institute. The model is a complete working miniature of one 5-ton capacity unit of the J. W. Evans' Direct Electric Smelting Steel Plant.

The ground ore, limestone, charcoal, and fluorspar are brought in from the grinding building and dumped into their respective bins. All four bins empty over

the portion of track connected to the weigh scales, so that the full charge can be weighed into a car below without moving the car. It is then taken to the mixing machine, into which the charge is dumped. Lime-water is added after the dry charge is mixed, and the mixing is continued for a few minutes. Then the moveable blades of the mixing machine are turned so as to move the material towards the outside of the mixing machine, a door in the side is opened, and the charge is

emptied upon a belt-conveyor which takes it to the briquetting machine. The briquettes are then moved to the pre-heater and are fed into the furnace, as required, by an adjustable power feeder. The steel from the furnace is tapped into moulds the size of large lathe and plane tools, or into billets for forging.

Mr. Evans' model attracted a large amount of attention during the convention. It will probably be secured by the Geological Survey for the new museum in Ottawa.

MINERAL PRODUCTION OF ONTARIO, 1910

Product.	Quantity.	Value.
METALLIC:		
Gold ounces	3,246	\$ 60,918
Silver "	30,558,825	15,433,994
Cobalt tons	378	54,507
Nickel "	18,636	4,005,961
Copper "	9,630	1,374,103
Iron "	231,453	513,538
Pig Iron "	447,351	6,975,418
Zinc Ore "	576	5,760
		<hr/>
		\$28,427,199
Less Ontario iron ore (143,284 tons) smelted into pig iron		317,804
		<hr/>
Net metallic production		28,109,395
NON-METALLIC:		
Actinolite tons	32	320
Arsenic pounds	3,047,699	70,709
Brick, common No.	304,988,000	2,374,287
Tile, drain "	21,028,000	318,456
Brick, pressed, etc. "	44,204,295	458,596
Brick, paving "	3,799,025	70,648
Building and crushed stone .. "		761,112
Calcium carbide tons	3,072	184,323
Cement, Portland barrels	2,471,837	3,144,343
Corundum tons	2,692	171,994
Feldspar "	16,374	47,518
Fluorspar "	2	15
Graphite "	992	55,637
Gypsum "	10,043	17,825
Iron pyrites "	33,812	98,353
Lime bushels	2,889,235	474,531
Mica tons	513	85,294
Natural gas		1,490,334
Peat tons	851	1,284
Petroleum Imp. gal.	11,004,357	368,153
Pottery		51,485
Quartz tons	90,685	87,424
Salt "	84,071	414,978
Sewer pipe		359,087
Tale tons	7,112	16,713
		<hr/>
Total non-metallic production		\$11,123,419
Add net metallic production		28,109,395
		<hr/>
Total production		\$39,232,814

METALS.

Gold—The production, \$60,918, though small, is nearly double in value that of 1909. More than half the yield came from the new camp at Porcupine, where active developments are in progress, and where large stamp mills are being erected at the Hollinger and Dome mines. A branch of the Temiskaming and Nor-

thern Ontario Railway—the Ontario Government line—is being built into Porcupine from the main line at Mileage 224, near Kelso. At Long Lake, on the Sault branch of the Canadian Pacific Railway, gold is being obtained by the Canadian Exploration Company from an arsenical ore. The old Mikado mine at Shoal Lake, Lake of the Woods, and the Havilah, formerly the Ophir, in the township of Galbraith, have been reopened. In Hastings county the Cordova or Belmont mine, long idle, has recently changed hands, and it is understood will soon go again into commission.

Silver.—The entire production, with a trifling exception, comes from the mines of Cobalt, including in that term not only Cobalt proper, but Gowganda and South Lorrain. Shipments comprised 27,394 tons of ore and 6,845 tons of concentrates, in all 34,316 tons, bringing the total shipments from the camp since the beginning up to 112,965 tons, of which 10,930 tons were concentrates. The total silver contents of the shipments for 1910 were 30,558,825 ounces, or an average of 890 ounces per ton, taking ore and concentrates together. For the whole period since the mines were opened Cobalt has produced 93,977,833 ounces of silver, which brought the mine-owners the sum of \$48,327,280. The average tenor of the shipments fell from 1,309 ounces per ton in 1904 to 677 ounces per ton in 1907, in which year low-grade ores began to be shipped in considerable quantity, concentration plants not then having been introduced. In 1908 the effects of concentration, now a well-developed feature of the camp, began to be noticeable, and the average contents per ton rose to 758 ounces, in 1909 to 844 ounces, and in 1910 to 890 ounces. The improvement would have been still greater were it not for the large quantities of low-grade ore or rock which have been shipped to Denver and other smelting points for use largely as a flux, much of it containing less than 60 ounces silver per ton.

The extension of concentration processes—there being now 14 concentrating mills at work—the shipment of bar silver from several properties, and the introduction and universal adoption of hydraulically developed electrical power, were noticeable features of the Cobalt camp in 1910. The power transmitted from the falls on the Montreal and Matabitchewan Rivers has materially reduced the cost of operations, the price being lowered from about \$150 per horse power when using steam to \$50.

The principal producers at Cobalt were Nipissing, which led with a production of 5,584,742 ounces; Crown Reserve, 3,158,156 ounces; Kerr Lake, 2,877,299 ounces; Coniagas, 2,621,681 ounces; McKinley-Darragh-Savage, 2,607,071 ounces; Temiskaming, 1,887,127 ounces, and Buffalo, 1,514,895 ounces; others with large outputs were La Rose, O'Brien, Hudson Bay, Trethewey, Right of Way, etc.

In the newer fields of Gowganda and Elk Lake, six mines in the former shipped 480 tons of ore, containing 481,523 ounces of silver, and two in the latter 233 tons, containing 221,233 ounces.

Much the greater portion of the high-grade ore from Cobalt is now treated by refineries in Ontario. These are three in number, at Copper Cliff, Deloro, and Thorold. All produce merchantable bars for the London market. The quantity of silver recovered at these plants during the year was 14,574,837 ounces.

It may be pointed out that Ontario now ranks third among the silver-producing communities of the world, being surpassed only by Mexico and the United States. In 1910 her output was only one and a half million ounces short of the combined production of Montana,

Utah, and Nevada, the three largest silver states of the Union.

That silver-mining at Cobalt as a whole is a profitable undertaking may be deduced from the fact that the dividends declared in 1910 amounted to \$7,275,240, or nearly one-half the total returns from the silver produced. Up to the end of the year the total dividends distributed amounted to \$21,802,180, not including the profits made by two or three mines, either individually owned or close corporations.

Cobalt.—The quantity of cobalt shown in the table is only that part of the output for which the mining companies were paid by purchasers of ore. A much larger quantity was shipped out, but for the most part brought no returns. No assays of it are made or records kept, consequently no exact data are available. The price of cobalt oxide has fallen to 75 or 80 cents per pound, and further reductions seem inevitable, if the law of supply and demand is allowed to have its natural effect.

Nickel.—The nickel-copper mines of the Sudbury region, now the most important source of nickel not only in America but in the world, were operated vigorously in 1910, and the output of nickel—18,636 tons—exceeds that of 1909, previously the largest on record, by 5,495 tons. The matte product of the Bessemer furnaces was 35,033 tons, and the value of the nickel contents was returned at \$4,005,961, or 10.7 cents per pound. Valued at 40 cents, the price quoted for refined nickel in New York, the output of nickel was worth \$14,908,800, but credit is taken herein at the smaller figure only, which represents, or is supposed to represent, the value of the nickel in the matte, when it leaves the smelters for the United States or Wales, where the final separation and refinement take place.

There are two companies mining and producing nickel, the Canadian Copper Company, whose works are at Copper Cliff, and the Mond Nickel Company at Victoria Mines. Both operate well-equipped plants, first smelting the ore and then converting it into a Bessemer matte containing approximately 80 per cent. of nickel and copper. The Canadian Copper Company draws its supplies of ore principally from the Creighton and Crean Hill mines, the former being richer in nickel than in copper, and the latter vice versa. Hitherto the Victoria Mines have been the chief sources of supply for the Mond Company, but latterly the Garson mine has been largely drawn upon, and the company has under consideration the removal of its furnaces to a point east of Sudbury and nearer the Garson ore body. Both companies operate their mines and works by electrical power, the Copper Company utilizing falls on the Spanish River, and the Mond Company falls on the Vermilion. The Dominion Nickel-Copper Company, formed to work large deposits of ore on the northern range, has not yet reached the stage of production.

The nickel contents of the silver-cobalt ores, which yield nothing to the mine owners, are not here included in the output of nickel.

Copper.—Most of the copper produced in Ontario is found accompanying the nickel in the ores of Sudbury, consequently the yield rises or falls with that of the principal metal. The copper contents of the matte produced in 1910 amounted to 9,630 tons, valued at \$1,374,103, or at the rate of 7.1 cents per pound. If reckoned at the average value of electrolytic copper in New York for 1910, viz.: 12.73 cents per pound, the value would be \$2,451,798. A small part of the copper is to be credited to Bruce Mines, from which a quantity

of silicious ore was shipped to Victoria Mines and used for converter linings.

Iron Ore and Pig Iron.—Four iron mines were in operation in 1910, producing 231,453 tons of ore, which is a falling-off as compared with 1909, when the output was 263,777 tons. Of the ore 119,207 tons was magnetite from Moose Mountain, Atikokan and Bessemer; 112,246 tons was hematite from Helen mine. The ore was returned as worth \$513,538, or \$2.21 per ton. The Lake Superior Corporation has been developing an iron prospect called the Magpie mine in Michipicoten district, and has ascertained by borings that it contains a large body. The ore is sideritic, but preliminary roasting will reduce the sulphur contents and raise the percentage of metallic iron. At Moose Mountain it is proposed to increase the capacity of the magnetic concentrator plant.

There were eight blast furnaces at work producing pig iron last year, the total yield being 447,351 tons. The total quantity of ore charged into the furnaces was 822,174 tons, of which 143,284 tons was of domestic and 678,890 tons of foreign origin. The value of the pig product was \$6,975,418. Steel produced amounted to 331,321 tons, valued at \$7,855,407.

NON-METALS.

Building Materials.—The raw materials for building purposes are plentiful in Ontario, including clay for making brick, etc., limestone for lime and construction work, sandstone and granite, Portland cement, etc. Building operations were brisk and called for an increased production of brick and lime as compared with 1909. The Portland cement industry is steadily growing, the production being 2,889,235 barrels, as compared with 2,633,500 barrels in 1909. The aggregate value of products which may be classed as construction materials, including brick and other clay products, stone, Portland cement, and lime, was \$7,961,060. Part of the stone, however, was for use as flux in blast furnaces and road-making.

Petroleum.—Of late years the production of petroleum has been declining. In 1910 the yield amounted to only 11,004,357 Imperial gallons, which is about one-third the production of 20 years ago. The diminution is most marked in the newer field of Tilbury, but is also going on in the older districts of Petrolea and Oil Springs. The average production per well is now very small, averaging only a few gallons daily. A new oil pool was located during the year in Onondaga township, Brant County, but the production has not yet been important.

Natural Gas.—On the other hand, the flow of natural gas is increasing year by year, in 1910 amounting in value to \$1,490,334, at a low rate per thousand cubic feet, as compared with \$1,188,179 in 1909. The gas fields are confined to the Lake Erie counties, but the gas finds a ready market not only in the localities in which it is produced, but also in the cities, towns and villages of southwestern Ontario. Several wells have been drilled in the shallow water along the shore of the lake, and a new field is being exploited in the township of Bayham, Elgin County.

Minor Products.—The list of Ontario minerals is long and varied, and a number of other substances in the table of production constitute the basis of industries of considerable importance. Among these are salt, corundum, iron pyrites, feldspar, quartz, graphite, talc, gypsum, arsenic, etc. It is not, however, necessary in a summary statement of this kind to refer to these at length.

Preliminary Statement of the Mineral Production of the Province of Quebec, during the year 1910.

(Subject to revision.)

	1910		1909
	Quantity.	Value.	Value.
Bog iron ore tons	7,601	\$ 24,773	\$ 4,668
Ochres tons	4,812	33,185	28,093
Chromite tons	619	6,190	26,604
Copper & sulphur ore, tons	24,040	145,690	215,580
Asbestos tons	77,875	2,535,664	2,296,584
Asbestic tons	24,716	17,613	20,468
Mica pounds	241,429	57,617	27,034
Phosphate tons	1,291	13,905	4,800
Graphite		8,865	10,339
Mineral waters gallons	356,096	72,420	17,246
Titaniferous iron ore . . tons	3,596	5,394	.....
Slate squares	3,959	18,492	24,000
Cement barrels	1,563,716	1,954,646	1,314,551
Magnesite tons	322	2,160	2,508
Marble		151,103	130,000
Flagstone		890	8,500
Granite		251,447	149,064
Lime		236,948	105,489
Limestone		483,447	457,143
Bricks M	123,077	946,011	584,371
Sewer pipes, tiles and pottery.		103,771	125,000
Quartz tons	805	2,013	.....
Totals		\$7,072,244	\$5,552,062

The above table presents the preliminary figures of the mineral production of the Province of Quebec, as compiled from the returns so far received from the producers, for the year ending December 31st, 1910. The total will be seen to be \$7,072,244, an increase of \$1,520,132 over the total of the revised production for the preceding year 1909, which is given in the adjoining columns.

At first sight the increase may appear very large, but it must be said that to a certain extent it is more apparent than real, and is in a measure due to a more thorough collecting of data of such products as structural materials, mineral waters, etc. Nevertheless a comparison of the various individual items for 1910 with those for 1909 will show substantial increases in almost every case, indicating on the whole a very gratifying state of the mineral industry in the province.

The following table gives the annual value of the mineral production of the province for the last decade:

Year	Value.
1901	\$2,997,731
1902	2,985,463
1903	2,772,762
1904	3,023,568
1905	3,750,300
1906	5,019,932
1907	5,391,368
1908	5,458,998
1909	5,542,062
1910	7,072,244

ASBESTOS.

The asbestos and asbestic sold and shipped during the year amounted to 102,591 tons, representing a value of \$2,553,277, as follows:

	Tons.	Value.
Crude Asbestos, No. 1, No. 2 and No. 3	3,529	\$ 620,186
Mill Stock	74,346	1,915,477
	77,875	\$2,535,664
Asbestic	24,716	17,613
	102,591	\$2,553,277

This is a substantial increase over the preceding year, but is slightly below the value of the asbestos and asbestic produced in the banner year 1908, when it reached \$2,577,302.

The asbestos industry in 1910 was very active; much more so than the figures given above seem to indicate. For at the close of the year considerable stocks remained on hand. There was, in fact, an over-production and the market could not absorb all the output of the mills. From this cause the asbestos industry is at present undergoing a slight crisis, but everything points to this as being only a temporary embarrassment, and there is no doubt that within a short time there will be a readjustment between consumption and production.

The mines themselves and the mills are in excellent condition. At the depths reached, over 200 feet in some cases, there is no apparent decrease in the contents of asbestos of the rock.

IRON ORES.

The returns received from pig iron producers give a quantity of 7,601 tons of bog iron ore, to which they assign a much higher value per ton than in past years. This is perhaps due to the fact that formerly the iron producers worked some iron deposits themselves, and their returns properly gave the actual cost of mining. Whereas at present the bog iron ore used in the furnaces is obtained from numerous small producers, and the price assigned to the ore represents its value delivered at the furnace.

We do not include in the total production the value of the pig iron made. There was in 1910 a quantity of 2,890 tons, valued at \$91,000. This is high grade wood-charcoal pig iron, which brings a high price in the market.

The titaniferous iron ore was mined from the St. Urbain deposits. Part of it was used in the manufacture of steel, and the rest in the manufacture of a certain grade of electrodes. All was exported.

MICA AND PHOSPHATE.

Both products show very substantial increases in sales and shipments. A large proportion of these were made from stocks carried over from the previous year, and the actual mining of these substances was not very active throughout the year. The market is, however, markedly improving and everything points to a greater activity during the coming year. The greater part of the phosphate was used in the manufacture of phosphorus.

COPPER AND IRON PYRITES.

The largest producer is still the Eustis Mining Company, but a new mine, operated by the Eastern Canada Smelter Company at Weedon, has also made substantial shipments.

CEMENT.

The products of this industry in the Province of Quebec show an increase in value of \$640,095, which is a proportionate increase of 48 per cent. over the value

of the production of the preceding year. Such increases are significant and indicate the preponderating part which cement is taking among the building materials. It is sufficient to recall that in 1904 the total production of cement in the province was slightly over \$50,000, while two years later it was \$625,000. It is now nearly \$2,000,000.

OTHER STRUCTURAL MATERIALS.

All of the other building materials show very large increases as compared with the previous years. Part of these increases, as was mentioned before, is undoubtedly due to a more thorough collecting of figures,

but, nevertheless, there has been a much greater building activity throughout the province than ever before.

It will be noticed that the item sewer pipes, tiles and pottery on the other hand has decreased from \$270,000 in 1908 and \$125,000 in 1909, to \$103,000 in 1910. This is not to be taken as an indication of a decrease in the manufacture of these clay products, but is owing to the fact that the production of several important manufacturers of sewer pipes, tiles and pottery, which was included in previous years was eliminated this year, on discovering that they use clay imported from New Jersey. The value of such products would have amounted this year to over \$350,000.

OUR LONDON LETTER

Mining Advances in 1910—Interesting Rand Developments—Treating Refractory Ores in West Africa—More About Nigerian Tin and the Tin Boom—Electricity in British Collieries—Russian Platinum Developments.

(Exclusive correspondence of CANADIAN MINING JOURNAL.)

London, January 21st, 1911.

Last year was an extremely interesting period for the miner. Especially it saw great advances made in metallurgy, accompanied by substantial improvements in mechanical appliances and chemistry. This tide of progress has swept ever up towards the practicability of profitable treatment of very low grade ores, especially gold and copper. On the Rand four-pennyweight stuff can now be dealt with.

The increasing use of tube mills as aids to the stamp battery was another feature of the year. The new heavy stamps of the East Rand Proprietary with tubes succeeded in crushing 24 tons per stamp in 24 hours. Most of the Rand companies proceeded strongly in the direction of adding tube mills where they wished to increase the capacity of their reduction works rather than by adding further stamps. The heavier stamps of the year were about 1,800 pounds, but soon 2,000-pound stamps will be in operation easily crushing 20 tons or more per stamp per 24-hour day, the limit being set by the coarseness of screen employed. Generally, the lines of mining improvement of the year may be summarized as larger mining areas, fewer shafts, greater tramming distances, larger scale of handling ore, and freer and wider ideas in the laying out of underground workings.

In ore breaking, day shifts only are now worked in many mines, making each contractor solely responsible for his own stope. This results in narrower stopes (less waste being broken down) and more effective supervision of the natives employed. The question of the employment of small rock drills, whilst not finally settled, has made considerable progress. The 100-pound weight drill has been found too light for the rough work in the mine, but 150-pound drills, with two natives to each, are giving satisfactory results. In this direction lie possibilities of finding an efficient substitute for the many thousands of hammer-boys employed on the Rand, permitting this labour to be otherwise employed. The view largely obtains that we are on the eve of securing a practical small stope drill which will liberate a large number of the natives employed underground for other work, and so relieve the pressure of the demand for more native labour.

Overhead mechanical transport on the Rand has made substantial advances also and a wire rope railway over

the Brakpan mine has been invented to operate on 2,000 tons per day of 10 hours at a total cost of \$35 per day. Sand filling of stopes from the tremendous waste heaps of the Rand came into practice during 1910 and plants are at present under construction to deal with sands at the rate of 4,000,000 tons per annum. Ventilation in the deep mines also came to the front owing to the adoption by the Cinderella Deep of a Capell fan having a discharge capacity of 50,000 feet of air per minute. The necessity for this movement is clear when we consider that in the deepest mines of the Rand the temperature rises at the rate of one degree Fahr. for every 255 feet vertical, as compared with one degree for 65 feet in the deepest mines of the European Continent.

The much discussed Marriott square fathom system for attaining better results has not yet secured wide adhesion on the Rand, although the Ecksteins have adopted it. It is claimed that this system, although it would raise working costs, would yield higher profits on a given block of ore. Other new Rand methods of mining deal with the flat reefs in the Far Eastern section. These place the levels as much as 1,000 feet apart independent of the variations of the reefs, which makes for cheaper haulage.

In the West African goldfields the treatment of refractory ores made a distinct advance in the past year, especially on the property of the Ashanti goldfields. These ores are quarried in the Justice's Find property. In former days the process employed was ordinary wet stamp milling, followed by cyaniding, but as this ore contains graphite material and small quantities of various sulphides only 60 per cent. of the gold was recovered. The new process consists of dry crushing, followed by roasting and cyaniding, which has resulted in the extraction being raised to 90 per cent. The cost of treatment by the new process is \$1.50 per ton higher, but the increased extraction on 15 pennyweights ore amounts to \$3.12 per ton. The ore, after being broken in a rock breaker, is fed as 2½-inch cubes into Krupp ball mills. It is then roasted in Edwards' furnaces and finally treated in the cyanide vats. On leaving the furnaces the ore loses about 12 per cent. of its weight, being deprived of its graphite and most of its sulphur and arsenic contents. For the year ended 30th June, 1910, 47,091 tons of Justice's ore gave \$10.84 per ton, with a 90 per cent. extraction.

Your correspondent's articles last year contained a reference to the birth of tin mining in Northern Nigeria. The Government in control of that British territory is seeking to do all that it can to prevent investors here from being robbed by wild-cat schemes and are and 16 feet deep. Strenuous efforts are being made to

push on the railway, especially to the Bouchi field. At the present time there is a twelve to fifteen days' march between the present rail head and the tin mines.

Especial interest is, of course, given to the discoveries by the persistent rise in the price of the metal. At the time of writing the figure is \$950 per ton and users are at their wits' ends. For six months prior to last August the price of tin remained steady in the neighbourhood of \$750 per ton. This rise, of course, is largely attributed to the cornering operations of a strong Continental syndicate. At the same time the tinplate trade of this country has been persistently active during the past year, as it has also been in America. In 1903 the tinplate mills dropped to 360. That was the minimum and since then the trade has recovered so rapidly that there are now over 500 mills in operation, more than produce evidence of substantial financial resources before concessions and mining rights are granted. Returned prospectors told glowing stories of the huge extent of the tin-bearing area with its black sands 15 insisting that every concessionaire or company shall before the McKinley tariff came into operation. Thirty-five mills were built last year and 59 more are in course of erection. Quite 1,500 tons more tin is already required to keep pace with the contracts now coming forward, many new mills having been opened in South Wales. At the end of 1910 visible tin supplies were under 18,000 tons, a decline of nearly 4,500 tons on the year.

In its way, the rubber boom, by attracting labour from the Straits Settlements' tin mines, has reduced production there. The offer of double the old rate of wages to the native labourers has recently failed to attract sufficient men.

Rapid advances in the use of electricity in British collieries are the order of the day. Additions are being made more rapidly to the series of overhead and underground cables which now extend throughout the area of the North of England collieries. The system of electric supply in these districts consists of the generation of power at 6,000 volts at a number of generating stations, some of which utilize the waste heat of blast furnaces and coke ovens. The power is transmitted to various sub-stations at this pressure, where it is transformed to 3,000 and to 440 volts, and also to 11,000 and 20,000 volts. At the majority of the collieries and works the power is employed at 3,000 volts; in some cases 440 volts, 3-phase, is utilized, while at others it is transformed to direct current and used at 600 or 480 volts. In the Cleveland area a new 11,000-volt pole line is being laid. The poles have a span of 80 yards, and carry three .05 square inch copper conductors, as well as pilot and telephone cables suspended from the catenary.

The recent high level prices touched for platinum (\$40 per ounce) is attributed to the same cause that occasioned the similar advance in 1906. Consumption of the mineral expands steadily and new uses are continually being discovered. The world's annual consumption is estimated now at about 360,000 ounces, about one-third of this being metal recovered from scrap and re-marketed. France absorbs about 40 per cent. of the production, Germany and America each about 26 per cent., and Great Britain 7 per cent. The remainder is absorbed in Russia, which is the sole source of supply. In that country the bulk of the metal is obtained by placer mining from the alluvial sands of the Ural Mountains. Small quantities are obtained from time to time in other Continental countries, but the largest producer outside of Russia is Colombia,

South America, with an output of between 6,000 and 7,000 ounces per year.

Official Russian figures show that the annual production has averaged in recent years about 175,000 ounces, but illegal trading probably accounts for quite one-third more than this. The platinum yielding sands are now comparatively exhausted, much of the alluvium now worked yielding not more than one pennyweight per ton, whilst even the richer sands do not yield more than three pennyweights.

Until 1898 the producers in Russia were absolutely in the hands of big refining firms abroad, who purchased the output years ahead, practically all the metal produced being exported in a crude state for refining abroad in the principal consuming markets. In the year mentioned Russian producers controlling 60 per cent. of the output were formed into one concern at the instigation of French financiers. Thus, the Compagnie Industrielle du Platine, which has since taken a leading part in the industry, was then established. The "tied" condition of the majority of the producers as regards their output accounts in a large measure for the continued falling off in the production, notwithstanding the high prices which have ruled. As their output is sold ahead for years to come at prices said to average less than \$15 per ounce, producers have not benefitted to any extent from the high prices which have ruled, and accordingly not only is the incentive lacking to increase the production, but there is distinct encouragement to conserve the remaining but steadily-dwindling supplies in the hope that advantage may be obtained later on of the higher values now ruling.

At the beginning of last year the discontent of producers crystallized into an active propaganda for the establishment of a Government monopoly, or the passing of legislation which would free the smaller miners from the grip of the foreign refining houses. At a meeting then held, proposals were formulated and pressed on the Government, but after a time seemed to have been shelved indefinitely. Quite recently, however, the Russian Minister of Trade and Industry has come forward with proposals for regulating the industry on lines somewhat similar to those suggested by the producers last year. Briefly, it is proposed to prohibit the export of crude platinum and to provide for its treatment in Russia by means of a State refinery should private enterprise fail to prove equal to the task. The crude platinum would be sold to the Russian Imperial Bank on certain specified terms—the price suggested by the producers last year was \$19.86 per ounce troy or crude 83 per cent. platinum—and the marketing of the refined product would be left in the hands of the Bank, which would account to the placer owners for the balance of the price, less commission. The production, refining, and distribution of the metal would be strictly governed by hard-and-fast regulations, any breach of which would bring upon the offenders condign punishment in the shape of heavy penalties.

To transmit a given volume of compressed air through a 1-inch pipe of given length requires over three times as much pressure as is required to pass it through a 2-inch pipe of the same length.

A volume of 500 cubic feet of free air per minute, at 5-lb. gauge pressure, can be transmitted 1,000 feet, through 3-inch pipe, with a loss of only 4.1-lb. If a 5-inch pipe be used, the loss is reduced to 0.25 lb.

MINE ACCOUNTS AND COST SHEETS

(From the Bulletin of the Institution of Mining and Metallurgy.)

(Continued from last issue)

In pursuance of the objects stated, therefore, the following suggestions are put forward merely as broad principles, which the Committee consider should be adhered to as far as possible by all metalliferous mines in framing their general accounts, cost sheets and working statements, after the various amounts spent on Wages, Stores, Materials, Power, Repairs, Maintenance, etc., have been segregated and allocated as much as may be necessary for the intermediate working accounts of each mine, which are required for the information of the mine officials and for the preparation of the final Working Costs.

Capital Expenditure.

Before the producing stage is reached, all expenditure should be charged to Capital Account and grouped as follows:—

Property.

Main vertical shafts or main adits.

Machinery and plant.

All shafts which develop ore, and underground development.

Buildings.

Surface works (reservoirs, water service, railway sidings, roads, etc.).

General expenditure.

Sundry Revenue during this stage should be deducted from General Expenses, Head Office Charges, etc., and the balance distributed proportionately over the remaining heads of expenditure since the acquisition of the property.

All vertical deep-level shafts, and shafts sunk to reach the plane of the orebodies, should be charged to Capital Account. All incline shafts in ore and shafts which assist development, as they progress, should be considered as part of the expense of development, the latter being either—

(a) Placed to a Temporary Development Account; or

(b) Charged to Capital Account finally.

Theoretically, the cost of vertical shafts should be written off under the heading of Depreciation, i.e., a proportion for each year over an average life; but in practice this is seldom found to be desirable.

After the producing stage is reached, all expenses of development, including deepening main shafts, sinking incline shafts, cutting stations, drives, cross-cuts (including main cross-cuts), winzes, raises, etc., should be charged—

(b) To the Development Redemption Account.

(a) Direct to the Working Costs; or

In the latter case, working costs should be regularly debited with a rate of Development Redemption per ton milled, slightly in excess of the average cost at which the total, fully-developed and payable ore reserves stand in the books—the object being to extinguish gradually the temporary account, and thereafter to charge all current development and shaft-sinking to Working Costs, or to provide funds for securing a gradual and automatic increase in the ore reserves. The quantity of ore developed cannot, it is true, be well ascertained at short intervals, but it can be determined annually more or less closely, and a fair rate can then be fixed as the price per ton under (b).

After the producing stage is reached, no expenditure should be debited to Capital Account, except for large special items, such as:—

·Purchase of additional property.

·Increase of machinery or plant, to increase power, output or extraction.

·Erection of additional buildings, dams, etc.

·Sinking of new main shafts to reach orebodies.

·Excess development of payable ore that can be clearly proved to be excess development, guarding carefully against abuse.

Such items of capital expenditure should bear their proportion of the administration and general expenses.

No small items, repairs, maintenance, or merely replacement of worn-out machinery, should be charged to Capital Account, which should be considered as closed, except for heavy expenditure specially authorized when funds are specially raised, or allocated for the purpose. Each additional large installation should be shown separately in the Balance Sheet if possible.

In cases where a new deep shaft, with its equipment, takes the place of an old shallow shaft, or an old mill is replaced by a new one, the old shaft or the old plant should be written off from Capital Account against Revenue, either at once or by means of instalments spread over a short period. Alternatively, if no depreciation is written off, the cost of the new plant should be charged direct to Revenue, by instalments if necessary.

TEMPORARY ACCOUNTS.—In addition to the Development Account, there are other temporary accounts which cannot always be avoided, especially in regard to annual payments, a portion of which has to be charged up each month; but they should be avoided wherever possible, and extinguished at a more rapid rate than would appear to be necessary. Such temporary accounts might include such items as:—Insurance, licenses, native recruiting fees, conveyor-belts, hauling ropes, etc.

VALUATIONS FOR BALANCE SHEET.—The cost of ore-reserves and dumps of payable ore should automatically appear at first as an asset in the Balance Sheet, until extinguished by Redemption. The gross or net value of such ore-reserves should not be considered as Revenue, or as an asset. Unfinished products, when taken into account, should be reckoned only at cost, provided such cost does not exceed market value. Bullion, concentrates, or other marketable products ready for shipment, should be shown as assets in the Balance Sheet, and included as Revenue, after deducting all possible returning or other realization charges.

Realization charges should be preferably included in costs, rather than deducted from yield of mineral, etc., so that the value may correspond to the extraction and that costs may duly reflect varying charges for realization and smelting charges, freight, etc.

DEPRECIATION.—Under the head of Capital Account, reference has been already made to this question as regards depreciation of main shafts with their equipment, and milling plants which are becoming or have become obsolete.

Depreciation of property (i.e., mining claims, etc.) is also correct in theory, especially in the case of mines with fixed vertical boundaries and limited orebodies, the approximate rate of exhaustion of which is therefore ascertainable. Similarly, it would be logically correct to write off systematically the cost of main shafts sunk to orebodies before the development stage is reached. In most cases of mining enterprise, however, it would be impossible to make an accurate allowance for depreciation of either property or main shafts, and even in cases where such a course is possible it appears to be never carried out. The result of such a course, when depreciation is written off Profit and Loss Account, is only to accumulate cash for future shareholders whilst reducing the rate of dividends for existing shareholders. Mining is looked upon usually, and perhaps to some extent rightly, as being on a different footing from most kinds of commercial enterprise, and shareholders in mining companies, as a rule, prefer to take their proportion of the gross profits in the form of dividends, and make their own allowance for depreciation.

As regards machinery and plant, buildings and surface works, auditors in England insist on annual depreciation of machinery, plant, etc., which is, of course, theoretically correct, and to some extent it is useful for reducing Income and Profit Taxes and Fire Insurance Premiums; and, when carried out on a very liberal scale, would in some cases give shareholders a rough idea of the value of such assets.

Auditors abroad, on the other hand, do not always insist on Depreciation on machinery and plant, buildings, etc., being allowed for, and a large number of companies registered abroad do not write off the plant at all.

After all, depreciation of plant on mines is often in practice unnecessary—new and improved plant is erected almost continually—the old plant has to be well maintained or replaced for efficient work.

The important object is to make, by some means, adequate provision out of revenue for such new machinery, plant, buildings and surface works, as are almost certain to be required before the mine is worked out, and, provided this object be attained, the means employed would appear to be of minor importance. Depreciation is, of course, the more usual method, and appears to be more generally preferred.

Other methods, however, are to include regularly in working costs a monthly or quarterly allowance for a fund to be called "Provisions for Additions to Machinery and Plant," or to appropriate each year a certain proportion of the profits to a special reserve fund. These alternative methods tend to simplify accounts and, when ample cash reserves are kept in hand, such simple methods of obtaining the principal object aimed at by depreciation appear to work well.

Too much stress cannot be laid upon the fact that the accuracy of accounts depends very largely upon the accuracy of the data obtained through careful surveying, sampling, and assaying, and upon the correct allocation of all items of expenditure.

Working Accounts, Cost Sheets, and Reports.

The main sub-divisions of the ordinary Profit and Loss Accounts usually presented to the shareholders of a company should correspond with the main sub-divisions of the Cost Sheets. The accurate determination of Working Costs is, obviously, greatly complicated by the inherent difference in the nature of Capital and Revenue charges, the results of the former class of expenditure being frequently deferred for a considerable

time, whilst the latter lead to results that can be closely estimated at once.

Working Costs may be, and frequently are, based on different units, such as the ton of ore, foot of progress, cubic foot or fathom of ore mined, ton or pound of metal produced, and in the case of base metal mines it is generally most important to ascertain and keep records of the last-named factor, in order to arrive at the financial results of the undertaking.

The ton is, however, the commonly recognized unit employed for administration purposes.

In this connection it is very important to determine the actual weight of the ore per unit of measurement, i.e., the number of cubic feet to the ton (taking cavities, moisture, etc., into account) for making "tonnage cost" calculations.

The Committee recommend that all statements of cost calculated upon a unit of this kind should state clearly the unit referred to, thus:—"Based on tonnage milled;" "tonnage of concentrates treated," etc., and that all statements of Working Costs presented in the ordinary accounts should be based on the cost per ton milled or treated, and not on ore mined, as is sometimes done. At the same time, cost per ton of ore mined and per ton of products specially treated are necessary for departmental supervision and returns.

In figuring out Working Costs, the charges that lie on the border-line between various primary and different sub-headings of expenditure are sometimes difficult to locate; and finally, a stage is reached where further detail in the dissection of expenditure becomes merely a refinement of little practical value, which does not justify the cost of collecting it. An accurate knowledge of the distribution of important "supplies used underground," such as timber and explosives, is, obviously, of the first importance; but minor supplies, such as steel, candles, picks and shovels, cannot be apportioned to particular levels and stopes without an expense and strain upon foremen and storekeepers rarely worth the information gained except under special circumstances; this applies more particularly to large mines.

The Committee feel that the consideration of various forms of detail cost sheets would widen the scope of their Report too much, and render it impossible to make any recommendations; but they submit that, in their opinion, the following general principles should be observed in the preparation of all cost sheets, since they consider that these are applicable in most, if not all cases, and are capable of being expanded or modified in detail to meet the special requirements of any particular case.

The Committee think it is possible and desirable to classify all expenditure under the following main heads, which may sometimes be extended to cover such special items as "removal of overburden" and "prospecting for new orebodies."

1. Development.
2. Extraction of Ore (i.e., mining).
3. Sorting at Surface, Preliminary Crushing and Transport.
4. Reduction Costs (i.e., ore treatment).
5. Administration Charges and General Charges at Mine.
6. Realization Charges on Products.
7. Taxes and Royalties of all kinds, shown separately.
8. Head Office Charges.

The total Capital Expenditure should also be shown on all General Expenditure sheets.

The sub-division of these main heads into sub-heads must necessarily depend somewhat upon the conditions, but the advantages of adhering as closely as possible to one form, and departing from it only where necessary, are manifest. The following may be suggested as desirable sub-divisions:—

1. DEVELOPMENT COSTS as charged may be either the actual expenditure on shaft-sinking, station-cutting, drives, cross-cuts, winzes, raises, diamond drilling, maintenance, etc., or a liberal rate of redemption for those charges. Development should be charged its proper proportion of surveying, sampling and assaying costs, pumping and hoisting costs, and be credited with the ore won in development at the average stoping cost, the amount being charged to mining. In the general Cost-sheet, Development Costs need only appear in one total, but a detailed sheet should be prepared, showing the total expenditure and cost per foot in shaft-sinking, driving, cross-cutting, raising, winzing, and plat (or station) cutting separately, as well as the proportions of the expenditure which are for labour and for materials respectively.

2. EXTRACTION OF ORE may be usefully divided into:—

- (a) Stopping or breaking of ore, including under sub-heads:—Compressed air, hand drilling, and rock-drill costs, labour and supplies, shovelling, etc.
- (b) Timbering, filling excavations, and sorting of ore in stopes.
- (c) Hoisting.
- (d) Pumping.

NOTE.—In cases where a mine is only just beginning to come into partial production, and is still carrying on heavy capital expenditure, the cost of pumping may be divided between Capital and Revenue in any desired proportion.

- (e) Underground tramming.
- (f) Sampling, assaying and surveying.
- (g) General underground maintenance.

It is suggested that these sub-divisions of the main head, Mining or Extraction of Ore, should be set out in detail in the general cost sheet, because mining is at once the principal item of working cost and offers the greatest scope for economies.

3. SURFACE TRANSPORT, SORTING AND COARSE CRUSHING.—The conditions of these vary so much at individual mines, that for standardization and comparative purposes a separate heading should be given for these three items combined, so as clearly to divide "Mining" and "Reduction" charges.

4. REDUCTION CHARGES (ORE TREATMENT).—These should include all costs from the time the ore is delivered at the mill or reduction works until the bullion or marketable product is obtained, and may be sub-divided to suit circumstances, as, for instance, at a gold mine into:—

- (a) Milling (crushing with stamps or any other appliances).
- (b) Fine Grinding.
- (c) Concentrating.
- (d) Roasting.
- (e) Cyanide Works.
- (f) Slimes Works, etc.

Other metal mines call for special sub-divisions, such as smelting, leaching, etc.

A detail cost sheet should, of course, be prepared for each department.

5. ADMINISTRATION AND GENERAL CHARGES.—Owing to

the great variations in items debited to other accounts, the Committee recommend:—

That all possible expenditure at the mine be allocated to the different departments concerned, including such items as Power (strictly on the basis of units of steam consumed), Stores, Sampling, Assaying, Surveying, Maintenance and Repairs, Native Recruiting Fees, and Salaries of Staff up to and including Mine, Mill or Works Managers, and be spread over the different accounts in proportion to the total expense of each department, so as to show the amount that should properly be charged to it.

"Maintenance" or "Repairs," for instance, should not appear as separate primary headings, but should be segregated for the different departments, e.g., mine-maintenance to be included in "Mining," mill-maintenance in "Milling," etc., either on the basis of actual shop returns, or in proportion to the labour employed in each department, as is sometimes done.

The Committee recommend that General Charges should, as far as possible, include such items as:—

- (a) Consulting Engineer's and General Manager's Fees.
- (b) Office Staff.
- (c) Stationery, Postages, Telegrams.
- (d) Medical and Sanitary Charges.
- (e) Travelling Expenses.
- (f) Fire Insurance.
- (g) Employer's Liability Insurance.
- (h) Transport, Stabling.
- (i) Local Bank Charges.

6. REALIZATION CHARGES ON PRODUCTS.—These may include:—

- (a) Transport to Railway.
- (b) Railway Freight.
- (c) Shipping Charges, Agency and Commission.
- (d) Sea Freight, Insurance, etc.
- (e) Selling Expenses, Returning Charges, etc.

7. PROFIT TAX, INCOME TAX, ROYALTIES AND OTHER TAXES.—An estimated allowance for these taxes should be included in working costs.

8. HEAD OFFICE CHARGES.—These may include, in addition to expenses inseparable from a Head Office, such items as:—

- (a) Auditors' Fees.
- (b) Bank Charges.
- (c) Legal Expenses.
- (d) Directors' Fees.
- (e) Office Rent.
- (f) Foreign Agency Expenses and Advertising.
- (g) Interest on Loans or Debentures.

The Committee also think that an estimated average amount for Head Office charges can in most cases be included with advantage in the monthly cost sheets, though it is sometimes thought preferable not to include them in local costs, on the ground that they can only be ascertained at irregular intervals, and are outside the control of the manager on the spot. If not included, this should be stated clearly.

The Committee recommend that all statements as to the quantities and values of stores, ores and products on hand should be certified by the responsible officials, countersigned by the manager of the mine. An independent audit of stores, etc., is advisable from time to time.

The Committee also recommend that annual or semi-annual Reports of Consulting Engineers or Managers, which are usually published, should contain the following information:—

- (a) The total Development footage, total expenditure and cost per foot in shaft-sinking, driving, cross-cutting, raising, winzing and plat-cutting, shown separately.
- (b) The total quantity of ore extracted from the stopes of each level separately, when practicable, as well as the ore won in course of development, from all parts of the mine; all of which should be added together.
- (c) The total tonnage of ore dealt with, and gold, etc., won, during the year in each separate branch of treatment, with the relative recovery per ton milled and treated in each department; the recoveries to be stated, at gold and silver mines, in percentage and sterling value of "fine" gold or silver, and the cost per ton treated and milled shown as far as possible in each case.
- (d) A detailed summary of working costs subdivided to correspond with the main headings and sub-headings of the cost sheets.
- (e) A short tabulated statement of the nature of and expenditure upon new Plant and Equipment, showing sales of old plant, if any.

It is proposed, with the approval of the Council, to file for reference, in the Library of the Institution, copies of working accounts and cost sheets which are in use at various important mines; and the help of members, with a view to making this collection as representative as possible, would be much appreciated.

In the past, the difficulty in standardizing mine accounts has largely arisen from the fact that Directors or Accountants, and Consulting or Managing Mining Engineers have considered that questions which concerned both belonged to their particular sphere exclusively; but the Committee hope that the recommendations they have here formulated, which specially concern their own side of the business in a greater or less degree, will be carefully considered by Directors and Mine Accountants, and will, as far as possible, be generally adopted by them at mines under their control, and be approved by the senior members of the mining profession.

(Sgd.) A. G. CHARLETON,

Chairman of Sectional Committee "E"—
Mine Accounts and Cost Sheets.

Reciprocity with Canada in Lead.

How It Would Benefit the Idaho Producer.

Written by GEORGE HUSTON.

Lead mining in British Columbia, the province producing nearly all the lead in Canada, was started by the hardy American prospector. For a considerable time the ore was shipped to the United States plants for reduction.

Lead smelting, refining and manufacturing owes its establishment to the high tariff imposed on lead in ore, into the States and to the effort of the Canadian Pacific Railway, in its fight against the aggressions of the American lines feeding the United States smelters. The smelting, refining and manufacturing concerns had a hard row to hoe for years, but are now in point of equipment, shrewd management, and honest capitalization, equal to anything on this side of the boundary line.

Mine labour in British Columbia is paid about the same as in the Coeur d'Alene region, while smelter

labour receives a higher compensation than in any of the plants taking Idaho ore.

The lead production of the Coeur d'Alene region may be classed as custom ore, that is, it is mined for sale to the highest bidder under time contract. The interests of the region are best served when the greatest number of smelting centres compete for the product, and the economic facts governing the competitors are such as to prevent combination. Local smelting is out of the question as we are short the supplementary ores.

The ores of the region are shipped to smelting centres, having need for the lead contained therein, to act as a furnace collector for the values of dry ores, and a single interest dominates the ore purchasing competition. The latter is heavily capitalized, much of it representing nothing but well irrigated good will. The Coeur d'Alene ore production is peculiarly sensitive to this capitalization, as the rates for treatment in the States where the plants are located have been repeatedly lowered, with few or no reductions here. The region is paying an unjust return on an inflated capitalization, to which there has recently been added an alarming increase highly prejudicial to the future of its lead mining. No relief is possible unless competition can be obtained from plants outside of the States, as the monopoly is almost complete.

If the British Columbia smelters could enter the United States market on terms of equality, through a well-considered scheme of reciprocity all through the lead schedules, the monopoly now existent in ore purchase in the Coeur d'Alene region could be broken. It is exactly the type of competition needed to correct the present abuses, and there could be no combination, owing to the transportation policy of the powerful railway system, backing the smelters.

Reciprocity in lead products would tend to stimulate the production of a great tonnage of supplementary ores on both sides of the line, a tonnage now mined in Colorado and adjoining states to go with the Idaho lead ore in furnace work. It would probably put another transportation line into the Coeur d'Alene, while the benefit to the Inland Empire would be very great.

At a convention of miners, held at Lethbridge, Alberta, on February 18, it was decided to ask the Government to have established at different mines, stations equipped with Draeger mine-rescue apparatus.

In the course of a speech he made recently in the Provincial Legislature, in support of a bill authorizing the Lieutenant-Governor-in-Council to grant certain lands near the city of Vancouver as a site for the University of British Columbia, the establishment of which was determined upon several years ago, Hon. Dr. Young, Minister of Education for the province, said: "There will also be in the new university a College of Mining, in connection with which the Government is determined that there shall be secured one of the foremost faculties identified with university work." The Minister also made appropriate reference to the vastness and variety of the mineral wealth of British Columbia, and said that with such a resourceful mineral province, and the best professors to give them instruction, it is expected with confidence this department of the university will turn out, as its graduates, students who will hereafter take their places among the foremost mining men of the world.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

HALIFAX—The recently issued annual report of the Department of Mines gives the figures of mineral production for the year ended September 30th, 1910. The principal items are: Coal raised (gross tons), 5,477,146 tons; domestic iron ore, 52,640 net tons; pig iron, 341,674 net tons; coke, 493,167 net tons; limestone, 483,100 net tons; gypsum, 322,974 gross tons; bricks, 21,305,500; gold, 10,675 ounces; sulphate of ammonia, 3,622 net tons. The revenue from coal royalty amounted to \$554,491.48. The total Mines Office revenue came to \$614,576.10.

The Springhill disturbance is still troublesome. It is hoped that the striking miners will be brought to their senses without more violence.

The bill, now before the Legislature, providing for the compulsory use of safety-lamps, will meet with opposition from some of the miners. But the majority, it is believed, especially native-born miners, will be strongly in favour of it.

Mr. Robert Bryce, well known in Cobalt and Poreupine, is actively working several gold claims in Molega. Results to date have been encouraging.

Mr. A. L. McCallum is pushing work on his tin prospect near New Ross, Lunenburg County. Within a few miles of this prospect, Dr. Cain, of Windsor, is continuing work on his manganese property.

Work at Scheelite, Halifax County, is progressing satisfactorily. Mr. Blount, of Ottawa, has assumed direction of affairs. Regular production will be commenced during the summer. A good deal of territory has been taken up adjoining or in line with the original tungsten leases.

The annual meeting of the Mining Society of Nova Scotia will be held in the last week of March.

ONTARIO.

COBALT—All last month and so far this month, the two power companies supplying air to the mines have been giving inadequate pressure. After the Cobalt Hydraulic had made good the

are operating at much higher cost. An early break up will save Cobalt operators many thousands of dollars.

An optimistic report was presented at the annual meeting of the Bailey Cobalt by the president, Mr. E. A. Benson. He states that there was on hand and ready for shipment a car of concentrates, 143 pounds of nugget silver, and 7 bars of bullion silver. As the Standard Cobalt had settled for its claim of \$32,810.23, there was a considerable surplus on hand.

Some good ore was struck in a vein on the Lumsden property at Brady Lake at the 250-foot level; but as it appeared to be the top of an ore shoot the shaft was continued down to 400 feet, where a level is now being opened up in the diabase.

The Moosehorn, at Elk Lake, is sinking a winze below the 125-foot level on a strong vein of niccolite. The company is also doing a considerable amount of crosscutting to pick up several veins that showed high grade on the surface.

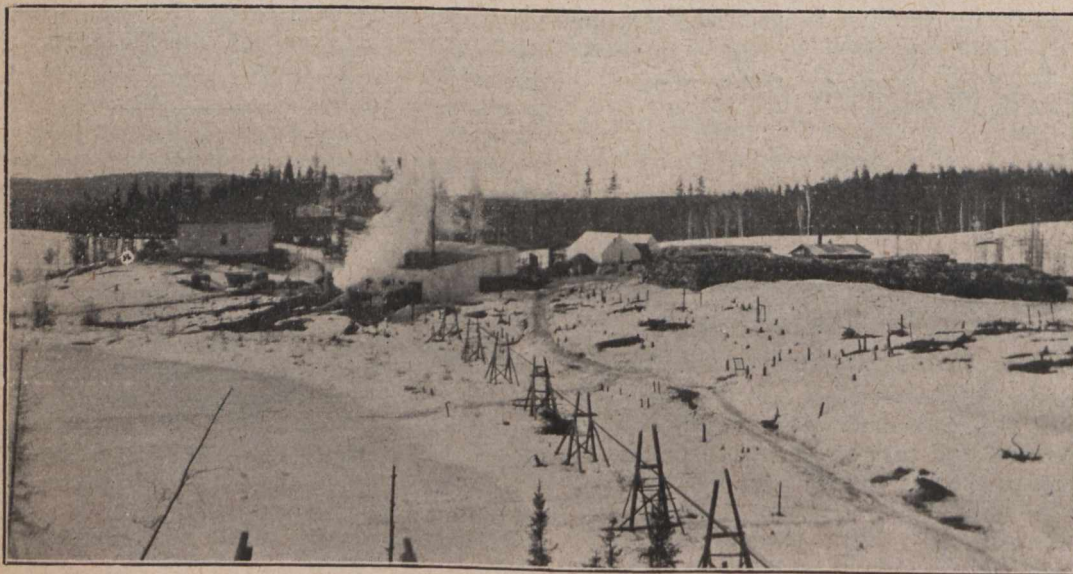
The Devlin property at Elk Lake is now cross-cutting for veins at the 200-foot level. There are three short shoots of good ore on the surface. Below, some leaf silver is showing up in one of the calcite veins already cut.

For the month of February the Savage mine of the McKinley-Darragh-Savage group made a record, producing 80,000 ounces of silver. It is predicted that this property will produce three-quarters of a million this year.

Some promising indications have been discovered at the 100-foot level of the Green Meehan. A two-inch vein of smaltite gives silver assays and there is some leaf in the wall rock.

At the annual meeting of the Cobalt Lake Mining Company it was decided to reduce the capitalization to \$3,500,000. The president's statement included a report that the company had on hand \$59,343, to which was to be added about \$25,000 for a car at the smelters. The veins at depth have in the main shown very disappointing values.

The Buffalo has declared another dividend of 5 per cent. regular and 3 per cent. extra. When this amount has been paid the company will have disbursed \$1,097,000, or 113 per cent. of issued stock.

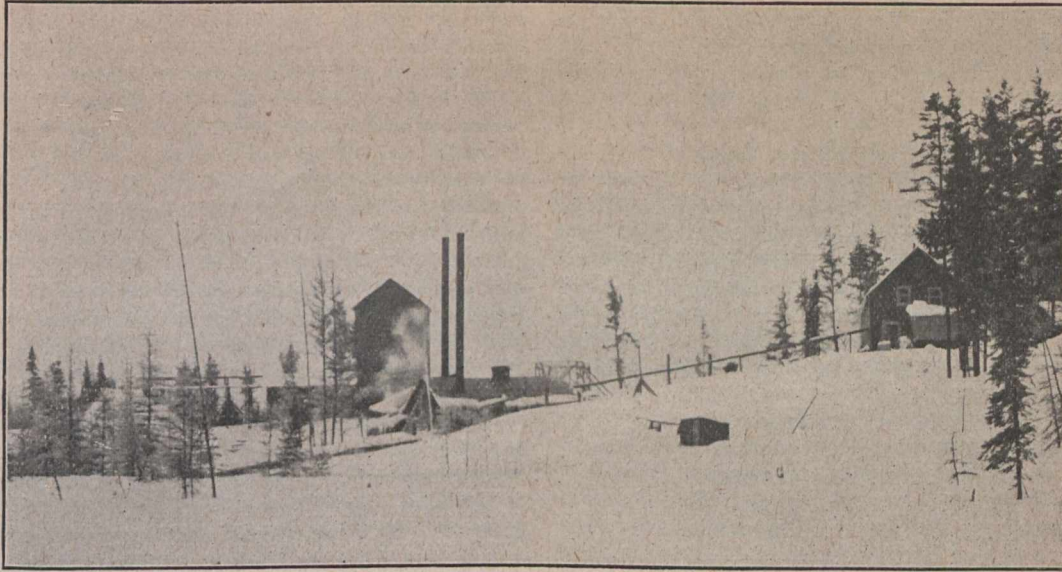


Millerett

break at the plant at Ragged Chutes, the flow of water, owing to a very severe winter with no thaws, fell to away below normal. Many of the smaller customers had to shut down while the larger consumers are running some of their drills with their own compressors.

Last week the British Canadian Power Company had trouble from the same cause. The Beaver and Temiskaming are working with greatly reduced forces and other properties still using air

At a meeting of the Cobalt branch of the Canadian Mining Institute, Mr. Cyril Knight advanced some very interesting theories in regard to the formations as they will be discovered in deep workings in the camp. He declared that according to the dip of the diabase as seen at the Lumsden and other mines where the Keewatin has been cut through, the diabase should give place to the Keewatin again at 1,200 feet. The deduction of Mr. Knight



Miller Lake O'Brien

has caused a very lively interest among engineers and mining men in the camp.

PORCUPINE AND OTHER GOLD AREAS.

It is probable that between four and five hundred stakers rushed into Bartlett township and the Sudbury division south of it in order to stake round Jim Nelson claim near what is already known as Telluride Lake. Nelson has a 20-foot wide vein of quartz from which he had assays running between two and forty dollars. The report that gold tellurides were found probably caused the largeness of the stampede.

It is stated that from the first run at the Swastika's new five-stamp mill nineteen ounces of gold were recovered. The capacity of the mill is between ten and twelve tons per day.

Since their advent into the Porcupine camp Messrs. Bewick, Moreing & Company have shown every disposition to discover the value of their holdings as soon as possible. They have taken over



Sacking Ore, Millerett

45 claims of the Timmins McMartin Dunlap syndicate, all of it virgin territory. Two six-drill Rand compressors and four boilers with complete camp outfits are now on their way in from the steel, and two camps in north and south Tisdale have already been established. Mr. Hollow, the former manager of the Arroyo-Brownhill mine in Western Australia, will be in charge, with Mr. Williams, another Bewick-Moreing man, as his assistant, and Mr. Bill Cooper to see to the construction end of the project.

Extraordinary progress is being made with the power scheme at Sandy Falls, where a syndicate controlled by the Timmins is now putting in water wheels and generators. A 36-foot head of water can be obtained and the plant now installed will be able to supply three thousand horse power. It is confidently expected that everything will be ready by June 1.

The Thelma Gold Mines in Bryce township is installing a compressor, three boilers, and a five-stamp mill to treat its ore. The shaft is now down 35 feet.

It is stated that, as an indirect result of the interest in Porcupine, an English syndicate has taken over the Harris Maxwell claim at Larder Lake, and will endeavour to make a mine out of these holdings.

Much interest has developed in northern Whitney as the result of spectacular finds on the Hughes, Mulholland and other claims, nearly all, if not all, on the continuation of the big vein the Scottish Ontario is now working in at a hundred feet.

The Hollinger mine has yet 500 or 600 tons of supplies to get in over the winter road; but all the heavy machinery and the mill equipment has gone over the roads into the camp. The Dome has an even greater tonnage to handle yet. There are over 300 teams in the road; but it is certain that a very considerable amount of the machinery and supplies ordered will have to remain for the railway to haul. Taken as an average, 400 tons per day have been taken out of Kelso yards since the winter roads became good.

BRITISH COLUMBIA.

The new Coal Mines Act has been passed by the Provincial Legislature. A number of amendments were offered by the two Socialist members of the House, who, by the way, respectively represent Vancouver Island constituencies, in which are situated large producing coal mines. Some of these were accepted by the Honourable the Premier (who is also Provincial Minister of Mines), but others were not. Apropos of this measure, Mr. Wm. Blakemore, a well-known coal mining engineer, writing editorially in "The Week," published in Victoria, recently observed, in part: "The Premier as Minister of Mines is to be congratulated on the admirable measure which is now before the House and on the able and exhaustive speech in which he introduced it. It is not a little surprising that a man of so many activities and responsibilities should have been able to acquaint himself to such a remarkable extent with the technicalities of mining and the details of the Bill. 'The Week,' with some practical knowledge of the subject, has no hesitation in saying that when this Bill shall come into force, British Columbia will have the best coal mining laws in the world, not perfect, but perfect as conditions will admit of.

The Bill is conceived mainly in the interest of the miner and for his protection, and if honestly lived up to will tend greatly to minimize the dangers of this most hazardous calling. . . . On the whole, there can be nothing but praise for an admirable measure, and for the exceptionally able manner in which it was expounded by the Premier."

In the course of his presentment of his Budget to the Provincial Legislature on February 13, the Hon. the Minister of Finance gave the House some information concerning mining in British Columbia in 1910, taken from the pamphlet issued early in January by the Provincial Bureau of Mines, and to which the CANADIAN MINING JOURNAL on February 1 made editorial reference in kindly and appreciative terms. Later in his speech the Finance Minister said: "I shall venture to give the following estimate of production of last year, based upon the best available information:

Manufactures	\$35,000,000
Mining	26,183,505
Timber	17,160,000
Agriculture	14,399,090
Fisheries	8,000,000
Total	\$100,742,595

or an increase of nearly \$14,000,000 over the previous year. As actual production is a test of a people's potentiality, we have the largest per capita production in the world. The outlook is promising in every respect."

The general prospects for mining in the province appear encouraging. Some notes of progress in various districts follow:

CARIBOO—Reports received at the Coast from this district indicate that the outlook for a plentiful supply of water for the ensuing season's gravel washing is excellent, more snow having fallen during the winter of 1910-1911 than in that preceding last season. A larger total recovery of placer gold is, therefore, looked for. Beside an increased yield expected to result from the provision of additional facilities for hydraulicking in Cariboo mining division, it is probable the Quesnelle Hydraulic Gold Mining Company will have its construction work sufficiently advanced towards completion to admit of gravel-washing being commenced about the middle of next summer, in which case there should be an appreciably large addition to the output of gold from Quesnel, in which mining division this company's placer leases are situated.

ATLIN—The quantity of placer gold recovered by the North Columbia Gold Mining Company last season was the largest it has yet obtained from one season's operations. Last season this company worked the property known as the Guggenheims', as well as its own, and it is understood that results from both properties were satisfactory and profitable. The coming season's operations and results may be expected to be larger than those of last year, for the company has an abundant supply of water, and its hydraulicking plant is equal to handling a greater quantity of gravel than has yet been washed in any one season. Other hydraulic operators in this camp expect a good run this year. Lode mining will also have more attention than in the past, and should add to the year's production of gold.

EAST KOOTENAY—The St. Eugene, Sullivan, and Society Girl are the several producing metal mines of this district at the present time. The production of the St. Eugene during the two expired months of the year has totalled about 10,000 tons of ore, which has been concentrated to approximately 1,400 tons of shipping product. The output from the Sullivan during the same period has been a little more than 5,000 tons of ore, shipped crude to the smeltery at Trail. Shipments from the Society Girl are small as yet—only about 250 tons since the beginning of the year. It is expected the yield of placer gold from district mines will be larger this year than for several years, a Vancouver firm of contractors having made preparations for hydraulicking on Perry Creek, in the Fort Steele mining division, and, for the more expeditious removal of the gravel, has put in a steam shovel. With four collieries shipping coal, the 1911 output of this mineral may exceed last year's total of approximately 1,615,000 short tons,

gross. A larger production will be dependent chiefly upon (1) continued freedom from labour difficulties, and (2) a sufficient demand for coal to keep the miners fully employed.

AINSWORTH AND SLOCAN—The finding of a new shoot of ore in No. 1 mine, Ainsworth, has been reported. The sale of several mineral claims, also in this camp, took place lately. The Utica, in another part of Ainsworth division, is likely to become one of the most important properties in the district.

In the eastern part of Slocan mining division, development work is being continued at the Lucky Jim, while the Rambler-Cariboo is making shipments of ore at the rate of more than 50 tons a week. An important recent development in the last-mentioned mine was the widening of the oreshoot on the 1,050-ft. level to 6 feet, practically all ore of high average grade, running 170 ounces of silver per ton. About Sandon, the Richmond-Eureka and Hope are the only mines sending ore to the smeltery. Of the properties above Cody Creek, the Noble Five lately sent out a carload of ore for the first time in recent years, development work late in 1910 having resulted in the finding of more ore in this mine. Near New Denver, the Mollie Hughes and Sweetgrass are both being worked, and have recently made small shipments. On Four-mile Creek, near Silverton, the Standard, Van Roi, and Hewitt-Lorna Doone mines are together employing many men. Smelter receipts from the Standard during eight weeks to February 26 were about 300 tons of silver-lead ore, but the output has been small in comparison with the large quantity of shipping ore now easily accessible in the mine. Machinery for the Van Roi concentrating mill is being delivered at the mill site, where the mill building has already been erected. The plant will be put in place as quickly as shall be practicable. Meanwhile production has been suspended, awaiting the provision of concentrating facilities. The Hewitt has shipped between 100 and 200 tons this year, and has beside much ore in reserve. In Slocan City division, ore has been found in the Enterprise lower tunnel, driven by Mr. S. S. Fowler, since he took the mine under lease a few months ago, and the Ottawa has shipped one car of ore. While the total output of ore from the Slocan has not been large for the two expired months of this year, the outlook for the district is distinctly good.

NELSON—The Kootenay Gold Mines, Limited, a company organized to acquire the Granite-Poorman group of mines, is expected to increase the output of gold from these properties, which have been steadily producing for years. A lately published statement was to the effect that during February some \$10,000 worth of gold had been received in Nelson from the Athabasca mine. The discovery of a new shoot of ore in the Fern mine has been reported. This mine was well known in past years as a profitable producer. Silver-lead ore is being hauled from lower terminal of the Molly Gibson tramway to Kootenay Lake for shipment to Trail.

The Yankee Girl, at Ymir, is again shipping freely, about 500 tons of ore having been sent out during January and February. The chief value in this ore is gold. The Wilcox stamp mill has been running on ore from that mine and a few hundred tons have been crushed since the beginning of the year. The Emerald, near Salmo, which is the only mine in Nelson mining division shipping ore having lead as its chief marketable constituent, has shipped between 500 and 600 tons this year. In Sheep Creek camp, the Queen and Nugget are the most productive mines, there being little gold coming from other properties in this locality, though several give promise of becoming important-producers.

ROSSLAND—The Centre Star group is maintaining an output of 12,000 to 13,000 tons of ore per month, while that of the Le Roi No. 2, including ore milled, is about 3,500 tons, and of the Le Roi approximately 1,000 tons. The Nickel Plate sends an occasional carload of ore to Trail, while two or three other properties make a very small production. The total output from Rossland mines is now between 16,000 and 17,000 tons per month.

BOUNDARY—For some reason that was not published there was a falling off in the quantity of ore shipped by both the Granby and British Columbia Copper Companies during the latter half of

February, but this was probably attributable to temporary disablement of plant or weather conditions. The aggregate production for the district for the two expired months was about 290,000 tons, of which, approximately, 186,000 was from the Granby Company's mines, 83,000 tons from those of the B. C. Copper Company, and 21,000 tons from those of the Consolidated Company. The last-mentioned company is now shipping copper ore to Trail from its Phoenix Amalgamated group, a commencement having been made in February. Prior to this only about 250 tons of ore had been sent out from this property, some eight or nine years ago. The B. C. Copper Company expects to shortly augment the ore supply for its smeltery at Greenwood by 3,000 tons a month from its Lone Star mine, construction of an aerial tramway from which to the railway at Boundary Falls, a distance of 29,000 feet between terminals, being nearly completed. The Granby Company is proceeding to replace, at No. 3 tunnel outlet, the surface works that were destroyed by fire last summer. Several cars of coal have been shipped from the small mine opened near Midway, and another cropping of coal at Meyers Creek, a few miles away, is being prospected. Steel is being laid on the Kettle Valley Railway westward from Midway, and there seems reasonable probability to look for railway transportation facilities being this year provided for the West Fork of Kettle River district, in which are situated several small gold and silver mines.

SIMILKAMEEN—Metalliferous mining in this district, so far as production is concerned, continues to be confined to the Hedley Gold Mining Company's property. Much other development work

has been done on various properties in each of several camps, but no production of importance has yet followed it. Coal mining bids fair to soon come into more prominence about Princeton and Granite Creek than mining for any other class of mineral. In addition to that of the Princeton Coal & Land Company, which last year entered upon production on a commercial scale and shipped about 12,000 tons of coal, there are several coal development enterprises, including the Princeton Collieries, the Osoyoos Coal Company, and the Columbia Coal & Coke Company. The last-mentioned has done much development work on its valuable property at Granite Creek, and is preparing to put in plant and other facilities for considerable production whenever railway transportation facilities shall be available, which will probably be within a year.

COAST—At the Britannia mine, Howe Sound, developments are being continued. On Texada Island, the Tacoma Steel Company is maintaining production of gold-copper ore from its Marble Bay mine, while the Tye Copper Company is developing the Cornell. Reports from Portland Canal district state that there has been satisfactory improvement in regard to quantity of silver-gold ore opened for extraction, in both Nos. 2 and 3 levels of the Portland Canal Mining Company's mine, while at Goose Bay, where the Granby Company is developing, under option of purchase, the Hidden Creek Company's copper mine, both cross-cut driving and diamond drilling have disclosed the existence of more ore than was previously known to be in the mine.

GENERAL MINING NEWS.

NOVA SCOTIA.

SYDNEY, N.S., March 1—Fire broke out this afternoon in the Dominion Steel Company's temporary office in the I. C. R. station. The two upper storeys of the building are already badly gutted.

HALIFAX, February 28—A writ of foreclosure has been issued by the Eastern Trust Company as trustee under a debenture mortgage against the North Atlantic Collieries, of Port Morien, C.B., claiming \$930,351 on behalf of the bondholders of the company. This will necessitate the closing down of the mine and throwing several hundred men out of work.

SPRINGHILL, March 1—The first break occurred to-day in the history of the strike which has now extended for twenty months. Twelve of the leading mechanics, who have stood shoulder to shoulder with the strikers throughout the strike, presented themselves at the company's office this morning and were given places on the working staff and two of the active miners also returned to work in the pit.

SPRINGHILL, March 4—Following the riot of Thursday, comparative quiet prevails at the mines. Men are standing in groups discussing the situation, but no disturbance took place. Of the twelve strikers who returned to work at the first of the week, five stayed at home, three of them because they would not face the hostile demonstration to which they were subjected, and two because of injuries sustained at the hands of the crowd.

The charge against Manager Sharp, who was arrested by the town police, was "inciting to riot." The case against him and the other men arrested comes up this morning before Stipendiary Hunter at Springhill.

There will be a requisition for troops to be sent to Springhill. The force now on the scene numbers 35 men, under Major Grey, and reinforcements are being asked for. The general opinion that further men will not return to work in the mines unless protection is afforded, something that yesterday's events apparently showed, does not exist. The strike has now continued for eighteen months.

HALIFAX—News has reached Halifax to the effect that the suit brought by Phil H. Moore against J. Thomas Reinhardt, broker, of New York, for \$250,000, has been decided in favour of Mr. Moore, by the Supreme Court of the United States.

means the probable early reopening of the Micmac, Jackpot, North Star, and Lincoln gold mines.

ONTARIO.

HAILEYBURY, February 28—The first run on the new five-stamp mill at the Swastika was satisfactory to the management. From 20 tons of ore put through the battery, 19 ounces, 5 pennyweights of gold were saved. This means that the ore runs about \$20 per ton. The capacity of the mill is between ten and twelve tons a day.

COBALT—Some 300 feet from shaft No. 122 of the Nipissing, high-grade ore from two to five inches wide has been struck at a depth of 170 feet.

TORONTO, March 6—The British Columbia Steel Corporation, to whom a charter has just been granted by the Dominion Government for the establishment of a \$10,000,000 steel plant near Vancouver, has received a communication from the American Car & Foundry Company, in which they signify their intention of establishing large works in connection with the former steel plant.

The British Columbia Steel Company has its headquarters in Toronto, and the exact location of the site has not yet been decided upon, although Port Mann, the proposed C.N.R. terminus, has been under consideration for some time.

The full plant, when in operation, will employ five thousand skilled workers, and have a capacity of nearly 1,000 tons of steel daily.

ALBERTA.

FRANK, March 1—Miners of this district who have been away from work for two weeks on account of differences with the operators, have returned to work under orders from the district president pending the completion of the agreement which is to go into effect on April 12.

BRITISH COLUMBIA.

FERNIE, B.C., March 1—By a large majority the miners at Michel voted to return to work last night, thus clearing the slate of grievances to be considered before going to Calgary to go into negotiations for a new agreement.

The Crow's Nest Pass Coal Company has agreed to install a telephone system in the Michel mines by means of which quick communication can be had with any part of the mines in which ventilation might go wrong. This amicable action upon the part of the men and company clears the way for the Calgary convention which takes up the task of deciding upon a scale of wages and other details which enter into the making of the agreement which is to govern the working of the mines during the next two years.

TRAIL—The operations of the Consolidated Mining & Smelting Company's smelter at Trail for January make a very favourable showing, according to a statement just issued by the company. During the month the company received 34,500 tons of ore and smelted 32,958 tons. The gross output for the month was about \$349,000, of which 58 per cent. of the values was gold.

The January statement is very nearly a duplicate of that for December. In December, 35,000 tons of ore were received and 36,360 tons were smelted. The gross output was \$351,000, of which 53 per cent. of the values was gold.

During the seven months ending with January 31, the company has produced about \$2,645,000 gross value of metals.

VICTORIA, March 3—The long vexed question of the restoration of the Kaslo & Slocan Railway has now reached a stage in the

negotiations when a definite arrangement is expected within a few weeks. The Great Northern is considering the offer of \$25,000 made by a syndicate of Kaslo, who plan to restore the line and either themselves operate it or to secure future operation by the C.P.R. The offer, although the Great Northern regards it as inadequate, will probably be accepted.

NELSON, March 7—Under the weight of five feet of heavily packed snow on its roof, the stamp mill on the Sno Sio claim on Sheep Creek, owned by A. H. Tuttle, of Ymir, caved in on Monday night or yesterday morning. The exact amount of damage done is not yet known, but the loss must amount to some thousands of dollars, even if the machinery is not injured to any extent.

The Tuttle mill had batteries comprising 14 stamps, and at different times in recent history milled ore from the Columbia, the Mother Lode, and the Kootenay Belle gold mines, being practically a custom mill, though most of the ore was milled under lease. The mill site is directly opposite the Kootenay Belle mine, with which the mill was connected by aerial tram, and is on the opposite side of the creek from the mine. At the sessions of the board of provincial water commissioners at Nelson last fall, the water record attached to this mill was confirmed and converted into a license under the new act, though opposing parties asked for its cancellation.

COMPANY NOTES

BUFFALO MINES DIVIDEND.

The Buffalo Mines Company has declared the regular quarterly dividend of 5 per cent., payable April 1; also the customary extra dividend of 3 per cent., payable May 15.

AMALGAMATED ASBESTOS.

The annual meeting of the Amalgamated Asbestos Corporation was held in Montreal on March 8th. The report submitted was for seven months ending December 31, 1910, the date of the fiscal year having been changed. The addition and improvements to plant and property during the 19 months of operation have been paid for out of working capital.

To reimburse the working capital for expenditures made for capital account, the company sold \$300,000 treasury bonds at 85, and has arranged for a further sale of \$200,000 at the same price. Expenses of management have been reduced by about \$47,000 per annum.

Profits for seven months were \$195,424.53, against \$221,825.33 bond interest and \$32,812.50 preferred stock dividend, a deficit of \$59,213. From the previous year \$93,232.24 was brought forward, leaving the sum of \$288,656.77 available to meet the \$254,637 charges and preferred dividend. The balance of profit and loss as at December 31, 1910, to be carried forward, was \$34,018.91.

Owing to exigencies of the asbestos trade, and as a result of the accumulation of material on hand, the company decided to close its mills and quarries on November 15, so that the income period was practically for 5½ months, although the statement covers seven months.

The general financial statement shows \$74,031 in cash, \$44,540 accounts receivable, and \$900,633 asbestos on hand. Against this are bills payable, \$575,922, and accounts payable and interest accrued, \$125,782.

YUKON GOLD.

Yukon Gold Mining Company has declared the seventh regular quarterly dividend of 2 per cent.

The dividend is payable March 31 to stock of record March 15. Books close March 13 and re-open April 1.

CROW'S NEST PASS.

The directors of the Crow's Nest Pass Coal Company met on Friday, March 10th, at Toronto, and decided to pay the usual 1 per cent. dividend on March 20th to shareholders of record on March 15th. The stock is offering at 77, without bids.

At the annual meeting it was shown that the total amount available for distribution was \$334,950.28, out of which were paid two dividends of one per cent each, making a total of \$124,216.

There is carried forward to the credit of profit and loss \$210,734, as against \$156,025 similarly treated a year ago.

The coal mined during the year amounted to 1,209,762 tons. The coke produced during the year was 194,498 tons. The production of coal shows a steady and satisfactory increase each month over the corresponding months of 1909; the total increase for 1910 being 310,717 tons.

The amount spent on improvements during the year was \$144,314.48, as against \$215,839.15 the previous year. The amount charged to mine development during the year 1910 was \$19,316.29, as against \$98,115.37 in 1909, or per ton of coal produced, .0160c. in 1910 as against .1091c. in 1909.

HILLCREST COLLIERIES.

At the annual meeting of the Hillcrest Collieries, Limited, the old board was re-elected. C. B. Gordon and C. Meredith were re-elected president and vice-president respectively, and J. M. Mackay secretary-treasurer. This was the first annual meeting, being for a ten-month period.

The secretary reports a considerable cash balance in treasury, and the purpose is to spend on plant and equipment so as to put company in a position to double its output in the course of the next six months.

Nothing relating to merger plans was discussed at the meeting.

STATISTICS AND RETURNS

TORONTO MARKETS.

March 9—(Quotations from Canada Metal Co., Toronto):

Spelter, 5.60 cents per lb.

Lead, 3.65 cents per lb.

Antimony, prices unsettled.

Tin, 44 cents per lb.

Copper, casting, 13.15 cents per lb.

Electrolytic, 13.15 cents per lb.

Ingot brass, 8 to 12 cents per lb.
 March 9—Pig Iron (Quotations from Drummond, McCall Co., Toronto):
 Summerlee No. 1, \$23.00 (f.o.b. Toronto).
 Summerlee No. 2, \$22.50 (f.o.b. Toronto).
 Midland No. 1, \$20.00 (f.o.b. Toronto).
 Midland No. 2, \$19.50 (f.o.b. Toronto).
 Hamilton No. 1, \$18.50 (f.o.b. Hamilton).
 Hamilton No. 2, \$18.00 (f.o.b. Hamilton).
 Clarence, \$20.00 (f.o.b. Toronto).
 Cleveland, \$20.00 (f.o.b. Toronto).

GENERAL MARKETS.

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

COKE.

March 7—Connellsville Coke (f.o.b. ovens):
 Furnace Coke, prompt, \$1.55 to \$1.60 per ton.
 Foundry Coke, prompt, \$2.00 to \$2.15 per ton.
 March 7—Tin (Straits), 40.00 cents.
 Copper, Prime Lake, 12.65 cents.
 Electrolytic Copper, 12.40 cents.
 Copper wire, 14.00 cents.
 Lead, 4.45 cents.
 Spelter, 5.67½ cents.
 Sheet zinc (f.o.b. smelter), 7.50 cents.
 Antimony, Cookson's, 9.50 cents.
 Aluminium, 21.00 to 21.50 cents.
 Nickel, 40.00 to 45.00 cents.
 Platinum, ordinary, \$38.50 per ounce.
 Platinum, hard, \$41.00 per ounce.
 Bismuth, \$2.00 to \$2.10 per lb.
 Quicksilver, \$52 per 75-lb. flask.

SILVER PRICES.

		New York.	London.
		cents.	pence.
February	22.....	Holiday	24 1/8
"	23.....	52 1/2	24 3/8
"	24.....	52 7/8	24 5/8
"	25.....	53	24 7/8
"	27.....	52 3/4	24 5/8
"	28.....	52 5/8	24 1/4
March	1.....	52 3/4	24 5/8
"	2.....	53	24 7/8
"	3.....	52 3/4	24 5/8
"	4.....	52 3/4	24 5/8
"	6.....	52 5/8	24 1/4
"	7.....	52 5/8	24 1/4

SHARE MARKET.

(Courtesy of Warren, Gzowski & Co.)

MISCELLANEOUS.

	March 9, 1910.	
	Bid.	Ask.
Amalgamated Asbestos .....	..	..
Black Lake	15	17
Dominion Coal .....	..	..
Dominion Steel .....	..	..
Dominion Steel Corp.	57 1/2	57 3/4
Granby	33	35
Consolidated Mining	45	55
Nova Scotia Steel	95	95 1/2
Crow's Nest Pass .....	..	77

COBALT STOCKS.		
Bailey .....	.05 1/2	.06
Beaver Consolidated .....	.37 1/4	.37 3/4
Buffalo	2.15	2.40
Chambers-Ferland .....	.10	.12
City of Cobalt .....	.19 1/2	.20
Cobalt Central .....	.07	.09
Cobalt Lake .....	.17 1/2	.18
Coniagas	6.90	7.20

Crown Reserve	2.55	2.68
Poster .....	.06	.08
Gifford .....	.02 1/2	.03 1/4
Great Northern .....	.14 3/4	.15
Green Meehan .....	.03 1/4	.03 1/2
Hargraves .....	.19	.20
Hudson Bay	90.00	105.00
Kerr Lake	6.30	6.55
La Rose	4.46	4.50
Little Nipissing .....	.04 1/2	.04 3/4
McKinley	1.59 1/2	1.60
Naney Helen .....	.01 1/2	.03 1/2
Nipissing	10.65	10.90
Nova Scotia .....	.14	.16 1/2
Ophir .....	.10	.12
Otisse .....	.01 3/4	sellers
Preston East Dome .....	.45	.46
Peterson Lake .....	.12 1/4	.13
Right of Way .....	.08 1/2	.09
Rochester .....	.04 3/8	.05
Silver Leaf .....	.04 1/2	.04 3/4
Silver Bar .....	..	..
Silver Queen .....	.03	.05
Temiskaming .....	.80 1/2	.81
Trethewey .....	.90	1.00
Wettlaufer .....	.85	.87
Hollinger	8.00	8.35

NEW YORK CURB.

March 9th, 1911.

	Bid.	Ask.
Brit. Col. Copper	6	6 1/4
Butte Coalition	17 1/2	18 1/2
Chino Copper	21 1/4	21 1/2
Davis-Daly Copper	1 7/8	1 1/2
Giroux Mining	5 1/8	5 7/8
Ely Consolidated .....	.25	.27
Goldfield Consolidated	6	6 1/8
Greene-Canadian	6 7/8	7 1/8
Hareuvar Copper .....	..	..
Inspiration Copper	7 3/4	8
Miami Copper	19 1/4	19 3/8
New Baltic Copper .....	..	..
Nevada Con. Copper	18 5/8	18 7/8
Ohio Copper	1 7/8	1 3/8
Rawhide Coalition .....	.03	.04
Ray Central	1 5/8	1 1/2
Ray Consolidated	17	17 1/2
Union Mines	1/4	3/8
Yukon Gold	3 1/8	3 1/8

COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending Feb. 24, and those from Jan. 1, 1911, to date:

	Ore in lbs.	Ore in lbs.
	Feb. 24	Since Jan. 1
Barber	6,000	6,000
Beaver	121,276	431,796
Buffalo	62,570	430,700
Chambers-Ferland	64,000	192,900
Cobalt Lake	181,510	562,050
Cobalt Townsite	40,000	239,740
Coniagas	123,740	628,190
Crown Reserve	64,000	340,540
La Rose	63,710	871,130
McKinley-Darragh-Savage	188,080	941,150
Nipissing	65,760	1,388,880
Wettlaufer	60,022	60,022

The shipments for the week were 1,040,668 pounds, or 520 tons. The shipments from Jan. 1 to Feb. 24 were 8,020,702 pounds, or 4,010 tons.

Following are the shipments from the Cobalt camp for the week ending March 3, and those from Jan. 1, 1911, to date:

	March 3	Since Jan. 1
	Ore in lbs.	Ore in lbs.
Beaver	119,717	551,513
Buffalo	63,800	494,500
City of Cobalt	60,000	186,280
Cobalt Lake	397,750	959,800
Coniagas	178,240	806,430
Crown Reserve	52,900	393,440
Hargraves	41,100	41,100
La Rose	86,800	957,930
Kerr Lake	60,173	721,592
McKinley-Darragh-Savage	118,360	1,059,510
Nipissing	99,500	1,488,380
Silver Cliff	50,260	98,180
Standard Cobalt	44,813	44,813
Temiskaming	80,224	363,419

The shipments for the week were 1,453,637 pounds, or 726 tons. The shipments from Jan. 1 to March 3 were 9,474,339 tons, or 4,737 tons.

Following are the shipments from the Cobalt camp for the week ending March 10, and those from Jan. 1, 1911, to date:

	March 10	Since Jan. 1
	Ore in lbs.	Ore in lbs.
Barber	.....	6,000
Beaver	.....	551,513
Buffalo	62,620	557,120
Chambers Ferland	64,000	256,900
City of Cobalt	.....	186,280
Cobalt Lake	125,770	1,085,570
Cobalt Townsite	.....	289,740
Coniagas	58,350	864,780
Crown Reserve	50,250	443,670
Hargraves	.....	41,100
Hudson Bay	.....	122,350
La Rose	86,390	1,044,520
Kerr Lake	.....	721,592
King Edward	.....	40,000
Nipissing	117,860	1,606,240
McKinley-Darragh-Savage	188,240	1,247,760
O'Brien	66,110	271,320
Peterson Lake (Little Nip)	.....	58,430
Right of Way	124,710	318,260
Silver Cliff	.....	98,180
Standard Cobalt	.....	44,813
Temiskaming	.....	363,419
Trethewey	42,350	181,600
Wettlaufer	.....	60,022

The shipments for the week were 986,880 pounds, or 493 tons. The shipments from Jan. 1 to March 10, were 10,461,160 pounds, or 5,230 tons.*

*Note—The present small shipments are due to a shortage of power. See Special Correspondence.

BRITISH COLUMBIA ORE SHIPMENTS.

The following are the figures of the ore production and movement for the past week, ended March 3rd, and for the year to date:

BOUNDARY SHIPMENTS.		
Granby	16,338	192,664
Mother Lode	5,964	51,997
Snowshoe	959	18,493
Rawhide	1,909	32,528
Jack Pot	749	4,344
Number Seven	61	563
Phoenix Amalgamated	785	1,755
Other mines	.....	240
Total	26,765	302,584

ROSSLAND SHIPMENTS.		
Centre Star	3,822	30,831

Le Roi No. 2	424	4,611
Le Roi No. 2, milled	300	2,700
Le Roi	98	2,455
I. X. L.	7	21
Nickel Plate	50	174
Other mines	.....	22
Total	4,701	40,814

SLOCAN-KOOTENAY SHIPMENTS.

Sullivan	664	5,581
St. Eugene, milled	2,775	24,975
Richmond-Eureka	26	522
Ruth	33	165
Rambler-Cariboo	59	474
Hewitt	22	154
Queen, milled	420	3,570
Granite-Poorman, milled	250	2,250
Nugget	110	990
Wilcox	75	675
Emerald	63	689
Standard	30	328
Evening	19	34
Knob Hill	90	133
Athabasca	20	20
Molly Gibson	22	22
Kootenay Belle	32	32
Other mines	.....	1,803
Total	4,710	42,417

The total shipments for the week, including the estimated milling, were 36,176 tons, and for the year to date, 385,815 tons.

B. C. COPPER COMPANY'S RECEIPTS.

GREENWOOD, B. C.

Mother Lode	5,964	51,997
Rawhide	1,909	32,528
Jack Pot	749	4,344
Other mines	.....	240
Total	8,622	89,109

GRANBY SMELTER RECEIPTS.

GRAND FORKS, B. C.

Granby	16,338	192,664
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CONSOLIDATED COMPANY'S RECEIPTS.

TRAIL, B. C.

Centre Star	3,822	30,831
Snowshoe	959	18,493
Sullivan	664	5,581
Le Roi No. 2	424	4,611
Le Roi	98	2,455
Number Seven	61	563
Richmond-Eureka	26	522
St. Eugene	35	1,210
Ruth	33	165
Rambler-Cariboo	59	474
Hewitt	22	154
Emerald	63	689
Standard	30	328
I. X. L.	7	21
Nickel Plate	50	174
Queen	67	413
Evening	19	34
Knob Hill	90	133
Phoenix Amalgamated	785	1,755
Athabasca	20	20
Molly Gibson	22	22
Kootenay Belle	32	32
Other mines	.....	1,957
Total	7,388	70,637

The total receipts at the smelters for the week, including concentrates, were 32,348 tons, and for the year to date, 352,410 tons.