

THE CANADIAN MINING JOURNAL

VOL. XXXIII.

TORONTO, March 15, 1912.

No. 6

The Canadian Mining Journal

With which is incorporated the
"CANADIAN MINING REVIEW"

Devoted to Mining, Metallurgy and Allied Industries in Canada.

Published fortnightly by the

MINES PUBLISHING CO., LIMITED

Head Office - - - - - 17-21 Manning Arcade Annex, Toronto

Branch Office - - - - - Montreal, 425 Coristine Building

London Office - - - - - Walter R. Skinner, 11-12 Clement's Lane
London, E.C.

U. S. A. Office - Ward & Smith, 931 Tribune Building, New York

Editor

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

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

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

CIRCULATION.

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

CONTENTS.

Editorials	177
(a) The Canadian Mining Institute.	
(b) The Mineral Production of Quebec During 1911..	178
(c) The Idol of Quick Returns	178
(d) The Mineral Production of Canada During 1911.	179
(e) Gowganda.	
The Fourteenth Annual Meeting of the Canadian Mining Institute	180
Preliminary Report on the Mineral Production of Canada.	183
Advance Statement Mineral Production of Quebec	189
Mineral Production of Ontario	191
The Idol of Quick Returns	193
Marble Bay and Britannia Mines, B.C.	196
Correspondence	198
Report of Department of Mines of Nova Scotia	200
Annual Report of the Trethewey Silver-Cobalt Mine	203
Canadian Mining Institute—Western Branch	206
Special Correspondence, etc.	209

THE FOURTEENTH ANNUAL MEETING OF THE CANADIAN MINING INSTITUTE.

It is hard to strive each year to bestow more encomiums upon those who manage the Annual Meeting of the Canadian Mining Institute. It may be said that it is no exaggeration to characterize the meeting that has just been held as equal to any in the history of the Institute, better far than several within our memory.

A more highly representative lot of visitors from the United States we have never had. A better consignment from Great Britain we could not have had. Further, the presence of delegates from British Columbia and Nova Scotia added to the effectiveness of every session.

The new order-in-council issued with horrid effrontery and accentuated by the presence of an incontrovertible sand-glass, made possible the presentation of a larger number of papers than usual. That was good. But evil effects also flowed therefrom. Some speakers require a curb, some a snaffle; others the spur. A curb uniformly applied is too drastic. The paucity of discussion was marked, although what discussion there was reached a remarkable pitch of interest. As with the suggested amendments to the by-laws, the audience had not the wherewithal to begin a discussion.

Here, we believe, it lies with the council further to change the conduct of the meetings. Certain chosen papers should be printed and distributed. This obviates the necessity of reading in extenso, and also primes the audience.

Since the membership of the Institute is growing so rapidly, and since we are always assured a large attendance, it is time that provision be made for the sectionalizing of certain hours of each session. For instance, papers dealing with geology might be read before one group. Ore mining and metallurgy could be taken up before another group simultaneously. Matters pertaining to coal, or to non-metallic minerals, might be similarly handled. General papers, or papers of especially wide and timely interest might be read before the whole meeting. Tact, care, and much experimenting will be necessary before such an arrangement can be consummated. But none will deny that it is necessary.

A clearer system of announcing the programme for each day is desirable. We may repeat, also, that arrangements should be made for welcoming and looking after the younger members.

A last suggestion is that manufacturers of mining and metallurgical machinery be encouraged to exhibit at

suitable places any new devices or inventions that are worthy of special attention, and that an odd hour be assigned for the inspection of these. To the mining men from remoter districts this would be a boon. Working models of large machinery could be practically utilized.

Let us remark in closing that our suggestions would be most unfair were it not understood that the pronounced improvement effected this year in all details suggests still further smoothness.

The retiring President, the Secretary, the Council, and the local Committees deserve the highest praise for their ardour and activity.

Incidentally, a word of praise is due the daily papers, particularly the Toronto Globe, for the manner in which the meetings were reported to the public.

THE MINERAL PRODUCTION OF QUEBEC DURING 1911.

The Province of Quebec, and for several reasons it is unusually gratifying to report this, has made another stride in mining. \$8,567,143 is the estimated value of last year's mineral production, as against \$7,323,281. This addition, \$1,243,862, or, roughly, 17 per cent., is credited principally to limestone, asbestos, copper-sulphur ore, and bricks. A large item, sand, is included for the first time. It is appraised at \$114,500.

Referring to the largest industry, asbestos, the Superintendent of Mines, Mr. Denis, after mentioning the glutted condition of the market says: "On the whole, "from the commercial and technical standpoints, the "asbestos situation is satisfactory." The mines, he asserts, are in excellent condition.

For the rest, mica mining has improved; copper-sulphur ore mining also has become much more active and is showing great promise; while graphite production has more than held its own.

The Chibougamau incident has certainly done no harm to the Province. The Government has strengthened its hands by showing its determination to arrive at the truth. In variety and richness of natural resources the settled parts of Quebec offer all that can be desired. The development of the Eastern Townships is more important just now than the exploitation of the hinterland. On the other hand, every encouragement is being offered to prospector to fare forth and see what he can find in the northern regions.

THE IDOL OF QUICK RETURNS.

One of the relieving features of many of the Canadian Mining Institute debates and dinners is the presence of Mr. D. H. Browne, who possesses a truly Celtic sense of humour, seasoned and tempered by the exigencies of having had to earn a livelihood as a metallurgist.

Mr. Browne some weeks ago delivered an address at the annual dinner of the Engineering Society of the Kingston School of Mining. He took as the target of

his remarks certain utterances of Mr. R. T. Crane, a Chicago manufacturer.

Mr. Crane, who is an out-and-out utilitarian, perpetrated a pamphlet entitled, "The Futility of Technical Schools in Connection with Mechanics and Manufacturing or Electrical and Civil Engineering." (The futility of Mr. Crane, by the way, is amply proved by that meandering title.)

Just here one of Mr. Browne's statements is open to correction, or, at least, to modification. Mr. Crane attacks very violently the technical schools of the United States. His attack, says Mr. Browne, is equally applicable to Canadian schools. This is hardly the case. Canadian technical schools do superficially resemble American institutions. But there are several essentials in Canadian schools that differ from American. The chief difference is the higher standard for matriculation in Canada. Whether this is or is not, an advantage is beside the point. But the fact remains, and that fact differentiates widely the character of the technical schools of the two nations. Mr. Browne has overlooked this.

But merely to offer this kind of correction is to miss the wholly admirable and lofty spirit of Mr. Browne's address which is an inspiring plea for all those things that make life worth living. Mr. Crane, who is evidently a prolific pamphleteer, sneers at everything in education that does not bring quick and obvious practical results. In effect he urges the training of our young men as artisans. The more speedily they are equipped to earn a living, the better. Nothing should take the place of manual dexterity and physical skill.

Mr. Browne's answer is complete. "We will admit "once for all," says Mr. Browne, "that there are some "subjects that a university or a technical school can "not teach, does not attempt to teach, and should not "be expected to teach. A university does not aim to "make machines, but to make men. It does not take a "boy and perfect him along one narrow line. It aims "to lay broad foundations, to inculcate principles, to "train in culture, to foster a taste for all that makes life "livable and men and women lovable.

"Take this technical school at Kingston, for example. "If a boy wishes to become a mine foreman, or a smelter "man, or an expert winder of commutators, he will "never get that training here. Any of his professors "would advise him to go into the mines at Granby, or "the smelter at Copper Cliff, or into the General Elec- "tric Works at Peterboro. In four or five years he "would be a skilled craftsman, he would earn three or "four dollars a day, he might even be in charge of "some commercial enterprise—but that is all. He "would be successful as he measures success—but what a "price to pay for such a limited success! . . . Many, "many generations have gone by since the preacher said, " "Where there is no vision the people perish"—where "there is no vision, no broad outlook on life, no scope for "larger ambitions. What phrase could better describe

"the condition of one who spends his best years in mere striving to learn a craft whereby to earn his daily bread." "You will go from here in a few years," says Mr. Browne, in concluding, "less skilled, perhaps, in the profession you enter than many a trained apprentice; . . . but when you do attain your ideals you will have brought with you a greater capacity for enjoyment, a broader outlook for life, a nobler patriotism, and a higher ideal than if you had never spent these years at Queen's, for you . . . will have glimpsed the vision without which the people perish."

Thus Mr. Browne, from his sane, broad, and lofty view of life urges the young man to grasp those things that make for the individual's moral and intellectual growth and for the community's happiness and strength. These things cannot be attained in the routine of daily drudgery. They come as lessons, learned for the most part unconsciously, in daily contact with good men and good books. The atmosphere of the university is the best known means of bringing these lessons to the developing youth.

But to Mr. Browne's unquestionably sound diction something may be added. Not all of our young men can go to college, and many that do go must depend upon their earning power to meet all expenses. It is the rare youth who deliberately refuses to go to college. Those who cannot afford the time or the money are, obviously, placed at a disadvantage. Similarly, those who do graduate often find themselves unable to earn an adequate living. Upon the employer, therefore, there falls the moral obligation of doing something towards equalizing chances. And there are many ways of doing this. In the first place, the founding of college scholarships is a splendid method of helping the ambitious poor youth. If groups of mine operators were to contribute in this form to our mining schools immediate good would result. More important than this is the need of looking after the undergraduates, graduates, and apprentices at their work. The employer here can do much for them. Their surroundings can be made more edifying. They can be helped to improve themselves. In fact, a very slight exhibition of interest on the part of the employer will make his employee a better servant.

Canadian mine operators are prone to overlook all save the physical necessities of their employees. Herein they neglect a duty and an opportunity. The day's wage is not everything, but it is wonderfully close to everything for a long period. It is totally unfair to get a foreman's work out of a student, pay him a navvy's wage, and ask him to take the experience as part of his remuneration. It is also unjust to place the educated young man in desolate surroundings with no thought of compensation other than money. In brief, it lies with the employer to give the young man a chance to grow. Beyond a certain point the money question will take care of itself.

THE MINERAL PRODUCTION OF CANADA DURING 1911.

The statistics submitted at the Annual Meeting of the Canadian Mining Institute by Mr. John McLeish, Statistician of the Mines Branch at Ottawa, give the grand total value of Canada's mineral production during 1911, as \$102,291,686, as against \$106,823,623 in the year 1910. This serious falling off, \$4,531,937, was not unexpected in view of the oft-mentioned labour troubles in the western coal mines. From Mr. McLeish's general tabular statement it is seen that the largest item of loss is that of coal, the value of which was \$30,909,779, in 1910, and \$26,378,477 in 1911—the discrepancy being \$4,531,302. This affected the production of every metal except pig-iron and nickel. The falling off in the last-named metal was not significant of anything beyond the fact that the two large Ontario companies were enlarging their plants. It may be added, also, that the curtailment of lead output may be put down to local causes.

In the case of non-metallic products, had it not been for the less amount of coal the total would have exceeded the previous year's total by about \$3,000,000. Every member of the class showed gains, coal and petroleum alone excepted. Notable advances were made in cement, clay products, natural gas, and asbestos. Asbestos, perhaps, occupies a dubious position. For the rest, substantial growth is indicated. The table is a poignant sermon. It gives us an object lesson on the cost of a coal strike. The gross value of the mineral output of the country has been lessened by from six to eight million dollars because the operators and employees of our western coal mines had a disagreement.

On the basis of valuation adopted by Mr. McLeish, Ontario produced 41.72 per cent.; British Columbia, 20.76 per cent.; and Nova Scotia, 15.01 per cent. of the grand total. Ontario, Alberta, and British Columbia showed a falling off, the remaining Provinces a gain. This is somewhat a matter of bookkeeping, as the figures of the Ontario Bureau of Mines show an advance of 5.38 per cent. These confusing and often contradictory results are offensive. While they obtain we shall always be open to strong criticism from outsiders. Why the Provincial and the Dominion officials cannot get together and agree upon a common basis of valuation, we do not know. This has been so long a sore point that we have begun to believe in the existence of a full-grown nigger in the fence. It is our intention seriously to open this question during the coming summer.

Twenty-six years ago the value of the annual products of the mine in Canada was estimated at \$10,221,255, or \$2.23 per capita. To-day it stands at \$102,291,686, or \$14.20 per capita. Making all possible allowance for human error in compiling these figures, they must be approximately correct. And they are astounding.

Unless Canada is drawn into the coal miners' quarrel, the current year will keep Mr. McLeish busier than ever. If, at the next Annual Meeting, figures approaching \$120,000,000 do not greet our eyes, we shall be disappointed.

We must not omit expressing our appreciation of the promptness with which the Mines Branch has brought out its preliminary report.

GOWGANDA.

Gowganda is anxiously waiting for the road from Elk Lake City to be gravelled. The Government is morally, if not verbally, committed to this. The district will produce about half a million ounces of silver. One mine has three years ore in reserve. Another has a large amount of milling ore developed. Still another is showing up well. A gravelled road would put an end to the awful waste of time and money that obtains at present, and would make motor haulage possible in the summer.

Gravel must be laid during the early spring before the roads will have dried, otherwise it will be wasted.

Impressions of the Institute Meeting.

The editor of The Canadian Mining Journal has asked me to record an impression of the recent meeting of the Mining Institute. As a fellow-journalist, I feel it incumbent upon me to accede to his polite request, all the more readily as I have a high regard for the journal under his direction. Moreover, being asked to express an opinion, I find it pleasant to convey the

deserved compliment that logically follows, for, to my mind, the meeting proved an exceptional success. The attendance was sufficiently large and thoroughly representative. Local men were properly in evidence, the scientific chiefs of the mining departments in the Canadian universities were conspicuous, and the contingent from the southern republic was extraordinarily representative of the brains and energy that have contributed so largely to the rapid development of mineral industry in the United States. It is unfortunate that the British sister society was unable to send a delegation, and as the solitary unit from the other side, I can only transmit to my British friends my sincere conviction that they missed a unique opportunity to enlarge their knowledge of the men and things that are worth knowing. As an editor, I may claim to be able to appraise the value of technical writings or addresses, and of the discussions ensuing. If this be allowed, permit me to say that I consider that the records of the recent meeting would enrich the transactions of any technical society anywhere, and that among the papers read were at least a dozen that would (and probably will) grace the pages of the best technical periodicals extant.

The discussion on some subjects was unusually to the point, and if supplemented by later written contributions, it should go far to enhance the value of the original papers. The meetings were conducted with admirable spirit and orderliness. There was a general participation in the proceedings. Those who came from outside the Dominion were the recipients of a thoughtful hospitality that they will be unwilling to forget. As a critic impelled to speak truly or else to be silent, I gladly testify that it was the most pleasant, and, as far as my judgment goes, the most informative mining convention that I have ever attended.

T. A. RICKARD.

THE FOURTEENTH ANNUAL MEETING OF THE CANADIAN MINING INSTITUTE

HELD IN TORONTO MARCH 6, 7 AND 8, 1912

To those of the Toronto members of the Institute who were early on the scene, it was apparent that the sessions were to be well attended. Much larger numbers of delegates were wandering round the King Edward Hotel on Tuesday evening than would ordinarily have been expected, and before proceedings had actually commenced on Wednesday morning, there were enough members on hand to tax the capacity of the King Edward ballroom.

The sprinkling of Canadian and foreign notabilities was distinctly large. One face, however, was missed. Dr. James Douglas could not be present, and his absence was sincerely regretted by all his numerous Canadian friends.

Wednesday Morning.

Shortly after 10 o'clock, the meeting was officially opened by the Hon. W. H. Hearst, Minister of Lands, Forests, and Mines, for Ontario, who welcomed the delegates and visitors in well-chosen language. Briefly reviewing the growth of Ontario's mineral industry, Mr. Hearst made a strong point of the outstanding position that the Province occupies as a producer of silver, having about one-seventh of the world's production to her

credit. But, he added, despite our silver, copper, nickel, and gold territory already opened, there remain vastly larger tracts of promising mineral-bearing land not yet alienated from the Crown. Moreover, the huge slice of land to the north, just added to the Province, may contribute greatly to mining in the future. He earnestly desired the co-operation of the Institute and of all mining men in the work of his Department. He fully appreciated the meaning of mining, and he could read from the past part, at least, of the promise of the future. The Minister's address was admirably succinct, comprehensive, and timely.

Mr. H. Mortimer-Lamb then read a letter from the Governor-General in which as a patron of the Canadian Mining Institute, he expressed his regret that his duties in Ottawa prevented him from being present at the Annual Dinner, and extended his best wishes for the continued success of the Institute and of the industry that it represents.

The address of the retiring President, Dr. F. D. Adams, then followed. Touching on the slight decrease in the value of Canada's mineral output, he pointed out that this fact was due entirely to the coal strike in

Alberta and British Columbia. This had the effect, of course, of reducing the output of western smelters, and had cut down British Columbia's annual showing. On the other hand the Provinces of Ontario, Quebec, and Nova Scotia had achieved higher figures than ever before. Dr. Adams proceeded next to describe the work of the geologist in aiding the development of the country. In eloquent, though restrained, language he outlined the functions of the pioneer geologist and his relation to mining. Referring to the Institute, he announced that the membership had grown from 850 to 945 during the year. The establishment of branches had been a feature of the past year. This, in his opinion, was to be commended and encouraged. In all the efforts of the Institute to control and suggest legislation the branches would be of great assistance. He also commended the suggestion that semi-annual meetings be held by the Western members, many of whom could not attend the Annual Meetings.

The business of discussing Sections 4, 5, 6, 7, 33, 34, and 57 of the By-Laws was now taken up. A wide and radical divergence of opinion was apparent from the moment the discussion opened. The result was that the whole matter was put in the hands of a committee, consisting of Messrs. Ferrier, Penhale, McEvoy, Haultain, and Hedley. The opponents of the changes were strengthened by the ambiguity of the by-laws as at present worded. Common sense was not largely in evidence in the discussion. It became evident, in any case, that either the by-laws or some members need inspection and revising.

Brief presentations of the statements of last year's mineral production of the Dominion, of Quebec, of Ontario, and of British Columbia, were next on the programme. The speakers were, respectively, Messrs. McLeish, Denis, Gibson, and Jacobs. The Secretaries of Branches then gave short reports, Mr. W. E. H. Carter for Toronto, Col. John J. Penhale for Sherbrooke, Mr. Alex. H. Smith for Porcupine, and Mr. E. Jacobs for the Western Branch.

Wednesday Afternoon.

During this session papers were read and discussed bearing mainly on coal. "The Geology of the Nanaimo Coal District, B.C.," by C. H. Clapp; "The Ore and Coal Bearing Formations of the Yukon," by D. D. Cairnes; "The Fuel Problems of the Pacific," by H. Foster Bain (read by J. McEvoy); and "International Coal Competition," by Allen Greenwell (read by H. Mortimer-Lamb), were the features.

Wednesday Evening.

"Accident Prevention, or the Conservation of Human Life," by Dr. W. H. Tolman, and "Sanitary Conditions in Mining Camps," by Dr. Charles H. Hair, were the papers of the evening. Dr. Tolman's paper, profusely illustrated with slides, was particularly well presented.

Thursday Morning.

The general discussion of workmen's compensation and employers' liability, postponed from the previous evening, was now taken up. The whole question has been referred to a committee. "Concentration of Silver Ores," by Prof. Robert H. Richards; "The Evans-Stansfield Electric Furnace," by J. W. Evans; and "The Concentration of Iron Ores at Moose Mountain," by F. A. Jordon, took up the time until noon.

Thursday Afternoon.

Mr. T. A. Rickard's synopsis of his paper, "The Domes of Nova Scotia," evoked much interest and some debate. Mr. Rickard summed up justly his opinion of

gold mining in Nova Scotia, and showed that he based his deductions on personal observation enlarged by the collection and digestion of a large mass of literature. His citations from other writers were numerous. He gave full credit to the work of Mr. E. R. Faribault, of the Geological Survey. Dr. A. E. Barlow and Mr. Reginald E. Hore then read papers on the Porcupine gold ores. Mr. J. B. Tyrrell presented a paper on the Copper Mine Country; Mr. Charles A. O'Connell on "The Past, Present, and Future of Cobalt," and Mr. Charles Reinhardt on "The Origin of the Ores of Cobalt."

Thursday Evening.

Thursday evening was given over entirely to the pleasant business of smoking and other incidentals. Dr. Kemp, as usual, re-established his reputation as a Truthful James, an explorer, and an artist. Col. John J. Penhale made an unsurpassable master of ceremonies.

THE FRIDAY SESSIONS.

The Friday Sessions were marked by the discussion of Mr. J. Parke Channing's paper on the Miami mine by an excellent address from Prof. F. H. Sexton, and by the presentation of several other good papers. A complete list will be found beneath.

The Dinner.

Never was dinner more promptly called and seldom more largely attended. Nearly 200 were seated in the ballroom of the King Edward. In a nearby room about 15 ladies attacked an identical bill of fare. Later they listened to the speeches. Among the guests of honour were the Hon. W. H. Hearst, Mr. J. Parke Channing, Mr. T. A. Rickard, Mr. John Birkenbine, Mr. E. B. Wilson, Mr. W. R. Ingalls, and Prof. F. H. Sexton.

During the evening the newly-elected President, Dr. A. E. Barlow, was given a warmly appreciative welcome by Mr. G. G. S. Lindsey, K.C.

List of Papers Presented.

"Early Mining on the Columbia River, B.C.," by Frank L. Nason, West Haven, Conn.

"The Geology of the Nanaimo Coal District, B.C.," by Charles H. Clapp, Ottawa, Ont.

"The Ore and Coal Bearing Formations of the Yukon," by D. D. Cairnes, Ottawa, Ont.

"Fuel Problems of the Pacific," by H. Foster Bain, San Francisco, Cal.

"International Coal Competition," by Allan Greenwell, London, Eng.

"The Evolution of Mining and Milling of Asbestos," by John J. Penhale, Sherbrooke, Que.

"The Fallacy of the Anticlinal Theory of Petroleum Deposits," by Eugene Coste, Calgary, Alta.

"The Occurrence of Manganese at New Ross, Nova Scotia," by H. E. Kramm, Ithaca, N.Y.

"The Tungsten Deposits of Nova Scotia," by Victor G. Hills, Moose River Gold Mine, N.S.

"Accident Prevention, or the Conservation of Human Life," by Dr. W. H. Tolman, Director, American Museum of Safety, New York.

"Sanitary Conditions in Mining Camps," by Dr. Charles H. Hair, Cobalt, Ont.

"Workmen's Compensation and Employers' Liability" (general discussion).

"Concentration of Silver-lead Ores in British Columbia," by S. S. Fowler, Nelson, B.C.

"Concentration of Silver Ores, with Special Reference to those of the Cobalt District," by Prof. Robert H. Richards, Boston, Mass.

"The Evans-Stansfield Electric Furnace," by J. W. Evans, Belleville, Ont.

"Zinc Smelting," by W. R. Ingalls, New York.

"The Concentration of Iron Ores at Moose Mountain, Ontario," by F. A. Jordon, Moose Mountain, Ont.

"Recent Improvements and Additions at the Canadian Copper Company's Works, Copper Cliff, Ont.," by David H. Browne, Copper Cliff, Ont.

"Monel Metal," by Dr. Wm. Campbell, Columbia University, New York.

"The Hardinge Mill," by H. W. Hardinge, New York.

"Some Characteristics of the Gold Bearing Veins of Nova Scotia," by E. Percy Brown, Bridgewater, N.S.

"The Domes of Nova Scotia," by T. A. Rickard, London, England.

"The Origin of the Quartz Veins of the Porcupine District," by Dr. A. E. Barlow, Montreal, Que.

"The Origin of the Porcupine Gold Deposits," by Reginald E. Hore, Houghton, Mich.

"The Newer Diabase in Preissac, Joanne, and adjacent Townships, Quebec," by Dr. J. A. Bancroft, Montreal, Que.

"The Coppermine Country," by J. B. Tyrrell, Toronto, Ont.

"Cobalt: Its Past, Present, and Future," by Charles A. O'Connell.

"The Origin of the Ores of Cobalt," by Carl Reinhardt, Cobalt, Ont.

"Ventilation in Metal Mines," by Frank C. Loring, Toronto, Ont.

(Title to be announced.) J. Parke Channing, New York.

"Co-operative Mining Investigation," by Prof. H. H. Stoek, Urbana, Ill.

"The Decrease in Value of Ore Shoots with Depth," by F. L. Garrison, Philadelphia, Pa.

"Industrial Education for Miners," by F. H. Sexton, Director, Department of Technical Education, Halifax, N.S.

"A New Departure in Mining Education," by H. G. Carmichael, Sudbury, Ont.

"Use of Geology in Iron Ore Exploration," by Dr. C. K. Keith, Madison, Wis.

"Glaciation and Its Effect on Mineral Veins," by J. B. Tyrrell, Toronto, Ont.

"Additional Notes on the Formation of Contact Zones in Limestones," by Dr. J. F. Kemp, Columbia University, New York.

(Title to be announced.) W. Lindgren, Washington, D.C.

"The Classification of Sudbury Ore Deposits as Affected by Faulting," by Dr. A. P. Coleman, University of Toronto, Toronto, Ont.

"Conservation as Affecting Mining," by James White, Ottawa, Ont.

"Mining Laws," by Horace V. Winchell, Minneapolis, Minn.

"Company Law," by J. M. Clark, Toronto, Ont.

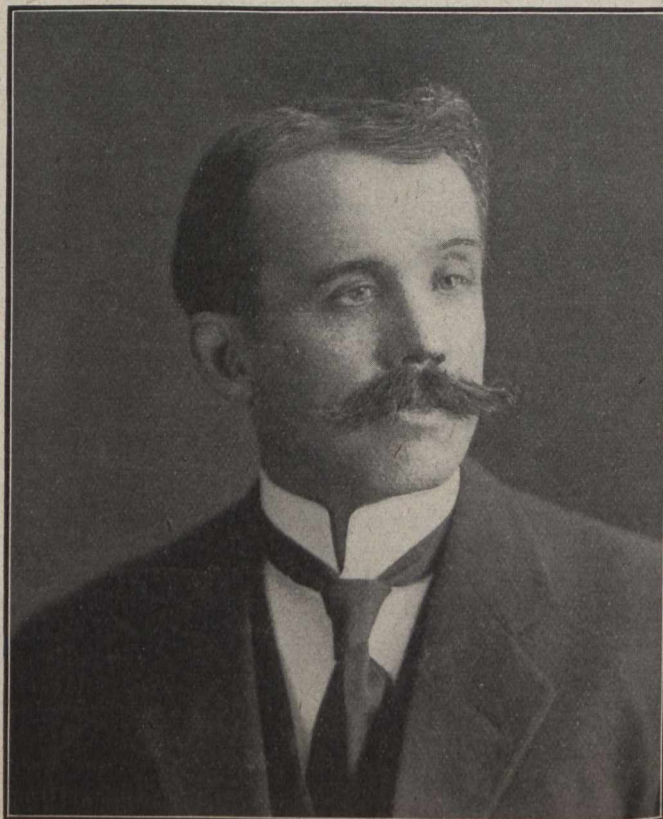
Without question, Dr. Barlow has been most assiduous, unselfish, and aggressive, both as ordinary member, as councillor, and as Vice-President. As President he can be trusted to work unremittingly for the good of the Institute.

Alfred Ernest Barlow, we learn on enquiry, was born in Montreal not so many years ago as we might have thought. In the year 1883, he secured the degree of A.B. at McGill University. Six years later he became an A.M.; 11 years after that a Sc.D. Throughout the period 1883-1906 he was an officer of the Geological Survey of Canada. The notable geological work that he has done, and the excellent monographs that he has written need not be listed here. Suffice it to mention the brilliant field work that brought reputation to him and to the Survey. That was his investigation of the Sudbury nickel-copper field. His memoir on this region is still a standard.

In 1906, Dr. Barlow resigned his position on the Survey to undertake very important professional work for a European syndicate. Since then he has been a free lance. While he lectures at McGill University occasionally, he has to do a great deal of travelling throughout Canada. In assuming the duties of President of the Institute he fully realizes that he will have to move all over Canada, and he is prepared to do so.

It is his intention, we may add, to attend the meeting of the Mining Society of Nova Scotia, late in this month. He will also visit the Ontario, Quebec, and Western Branches of the Institute during the coming year.

We can give Dr. Barlow full assurance of the hearty support of ourselves and, we are confident, of the Institute as a whole.



Alfred Earnes Barlow

THE NEW PRESIDENT C. M. I.

The announcement of the election of Dr. A. E. Barlow to the Presidency of the Canadian Mining Institute will be hailed with delight by his numerous friends, and will be deplored by no one save the most rabid partizan.

PRELIMINARY REPORT ON THE MINERAL PRODUCTION OF CANADA DURING THE CALENDAR YEAR 1911

Prepared by JOHN McLEISH, B.A.,

Chief of the Division of Mineral Resources and Statistics.

Statistics Subject to Revision.

The mining industry during the years 1909 and 1910 showed such substantial progress and large increase in output that it is not surprising a slight falling off should be shown in 1911, particularly when it is remembered that the long continued strike of coal miners in Alberta and the Crow's Nest District of British Columbia not only seriously reduced the coal output, but also, because of the closing down of the Granby smelter on account of the coke shortage, caused a lower production of copper, silver and gold than would have otherwise been obtained.

The preliminary statistics herewith published, based upon direct returns from mine and smelter operators but subject to final revision, show the total value of the production in 1911 to have been \$102,291,686, a falling off of \$4,531,937 or 4 per cent. when compared with the production of \$106,823,623 in 1910.

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, 1910 and 1911, 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 sub-division of the mineral production in 1910 and 1911 by Provinces was approximately as follows:

Province.	1910.		1911.	
	Value of Production.	per cent. of Total.	Value of Production.	Per cent. of Total.
Nova Scotia	\$14,195,730	13.29	\$15,354,928	15.01
New Brunswick	581,942	0.54	611,597	0.60
Quebec	8,270,136	7.74	9,087,698	8.88
Ontario	43,538,078	40.76	42,672,904	41.72
Manitoba	1,500,359	1.40	1,684,677	1.65
Saskatchewan	498,122	0.47	618,379	0.60
Alberta	8,996,210	8.42	6,404,110	6.26
British Columbia	24,478,572	22.92	21,237,501	20.76
Northwest Territories	4,764,474	4.46	4,619,592	4.52
Dominion	\$106,823,623	100.00	\$102,291,686	100.00

Of the total production in 1911 a value of \$46,197,428, or 45 per cent. is credited to metals, and \$56,094,258 to non-metallic products. Practically all of the metals with the exception of pig iron show a falling off in production in so far as value is concerned. In the case of copper, however, there was an increased output of the metal, although the average price per pound was slightly lower than in 1910. The increase in pig iron production was quite considerable, although this is chiefly attributable to imported ore.

	—1910—		—1911—		Increase (+) or decrease (-) in value.
	Quantity.	Value.	Quantity.	Value.	
Copper Lbs.	55,692,369	\$7,094,094	55,848,665	\$6,911,831	— \$182,263
Gold Ozs.	493,707	10,205,835	.....	9,762,096	— 443,739
Pig Iron Tons.	800,797	11,245,622	917,535	12,306,860	+ 1,061,238
Lead Lbs.	32,987,508	1,216,249	23,525,050	818,672	— 397,577
Nickel Lbs.	37,271,033	11,181,310	34,098,744	10,229,623	— 951,687
Silver Ozs.	32,869,264	17,580,455	32,740,748	17,452,128	— 128,327
Other metallic products . . . . .	.....	510,081	.....	409,674	— 100,407
Total . . . . .	.....	59,033,646	.....	57,890,884	— 1,142,762
Less pig iron credited to imported ores	695,891	9,594,773	875,349	11,693,456	+ 2,098,683
Total metallic . . . . .	.....	49,438,873	.....	46,197,428	— 3,241,445
Asbestos and asbestic Tons	102,215	2,573,603	126,914	2,943,107	+ 369,504
Coal Tons	12,909,152	30,909,779	11,291,553	26,378,477	— 4,531,302
Gypsum Tons	525,246	934,446	505,457	978,863	+ 44,417
Natural gas . . . . .	.....	1,346,471	.....	1,820,923	+ 474,452
Petroleum Brls.	315,895	388,550	291,092	357,073	— 31,477
Salt Tons	84,092	409,624	91,582	443,004	+ 33,380
Cement Brls.	4,753,975	6,412,215	5,635,950	7,571,299	+ 1,159,084
Clay products . . . . .	.....	7,629,956	.....	8,317,709	+ 687,753
Lime Bush	5,848,146	1,137,079	7,227,310	1,493,119	+ 356,040
Stone . . . . .	.....	3,650,019	.....	3,680,371	+ 30,352
Miscellaneous non-metallic . . . . .	.....	1,993,008	.....	2,110,313	+ 117,305
Total non-metallic . . . . .	.....	\$57,384,750	.....	\$56,094,258	— \$1,290,492
Grand total . . . . .	.....	\$106,823,623	.....	\$102,291,686	— \$4,531,937

Amongst the non-metallic products increases are shown in the production of arsenic, asbestos, feldspar, graphite, natural gas, pyrites, salt and in nearly all of the structural materials, including cement, clay products, stone, lime, etc.

Outside of the metallic products, the principal decreases are in coal and petroleum; the falling off in value of coal production alone being practically equivalent to the total net decrease for the year.

There is comparatively little change in the relative importance of the Provinces as mineral producers—Ontario contributed nearly 42 per cent. of the total in 1911; British Columbia nearly 21 per cent.; Nova Scotia 15 per cent.; Quebec nearly 9 per cent., and Alberta 6 per cent. The order in 1910 was the same, except that Alberta slightly exceeded Quebec in production.

The Provinces showing an increased output for the year are Nova Scotia, New Brunswick, Quebec, Manitoba and Saskatchewan; those showing a falling off being Ontario, Alberta and British Columbia.

In Nova Scotia the coal industry was particularly active and to that and the clay and stone industries is the increase in this Province to be chiefly ascribed. There was a slight increase in New Brunswick. In Ontario the net result was a decrease of about \$1,000,000, being chiefly in copper, nickel, and petroleum; on the other hand there were substantial increases in nearly all of the other products of which a great variety is obtained in this Province. Manitoba produces gypsum, clay and stone products; and Saskatchewan coal and clays.

The difficulties incident to coal mining operations in Alberta and British Columbia have already been noted and there have been the chief cause of falling off in production in these Provinces. In British Columbia, notwithstanding the coke shortage and the consequent closing down of the Granby smelter for a portion of the year, there was still a slight increase in the copper production, although the output of silver, lead and zinc was less than in 1910.

The Mineral Production of Canada in 1911.

(Subject to revision.)

Product—	Metallic.	Quantity.	Value.
Copper, value at 12.376 cents per pound.	Lbs.	55,848,665	\$6,911,831
Gold		9,762,096	
Pig iron from Canadian ore	Tons.	42,186	613,404
Iron ore sold for export	Tons	39,162	86,812
Lead, value at 3.48 cents per pound	Lbs.	23,525,050	818,672
Nickel, value at 30 cents per pound	Lbs.	34,098,744	10,229,623
Silver, value at 53.304 cents per oz	Ozs.	32,740,748	17,452,128
Cobalt and nickel oxides			221,790
Zinc ore		2,590	101,072
Total			46,197,428
	Non-Metallic.		
Actinolite	Tons	67	736
Arsenic, white	Tons	2,097	76,237
Asbestos	Tons	100,893	2,922,062
Asbestic	Tons	26,021	21,045
Chromite	Tons	27	351
Coal	Tons	11,291,553	26,378,477
Corundum	Tons	1,472	161,873
Feldspar	Tons	17,718	51,924
Fluorspar	Tons	34	238
Graphite	Tons	1,269	69,576

	Non-Metallic.	Quantity	Value
Grindstones	Tons	5,312	49,942
Gypsum	Tons	505,457	978,863
Manganese	Tons	5½	300
Magnesite	Tons	991	5,531
Mica	Tons		119,863
Mineral pigments—			
Barytes	Tons	50	400
Ochres	Tons	3,622	28,333
Mineral water			223,758
Natural gas			1,820,923
Peat	Tons	1,463	3,817
Petroleum, value at \$1.22½ per barrel.	Brls.	291,092	357,073
Phosphate	Tons	558	4,928
Pyrites	Tons	82,666	365,820
Quartz	Tons	60,526	83,865
Salt	Tons	91,582	443,004
Talc	Tons	7,300	22,100
Tripolite	Tons	20	122
Total			34,191,161
Structural Materials and Clay Products.			
Cement, Portland	Brls.	5,635,950	\$7,571,299
Clay products—			
Brick, common, pressed, paving			6,521,558
Sewerpipe			799,756
Fireclay, drain tile, pottery, etc.			996,395
Lime	Bush.	7,227,310	1,493,119
Sand and gravel (exports)	Tons	573,494	408,110
Sand-lime brick			424,241
Slate	Sq.	1,833	8,248
Stone—			
Granite			880,309
Limestone			2,282,146
Marble			140,903
Sandstone			377,013

Total structural materials and clay products		21,903,097
All other non-metallic		34,191,161
Total value, metallic		46,197,428
Total value, 1911		102,291,686

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

	1907.	1908.	1909.	1910.	1911.
	Cts.	Cts.	Cts.	Cts.	Cts.
Copper, New York	20.004	13.208	12.982	12.738	12.376
Lead, New York	5.325	4.200	4.273	4.446	4.420
Lead, London	4.143	2.935	2.839	2.807	3.035
Lead, Montreal*					3.480
Nickel, New York	45.000	43.000	40.000	40.000	40.000
Silver, New York	65.327	52.864	51.503	53.486	53.304
Spelter, New York	5.962	4.720	5.503	5.520	5.758
Tin, New York	38.166	29.465	29.725	34.123	42.281

*Quotations furnished by Messrs Thomas Robertson & Company, Montreal, Que.

Smelter Production.

General statistics of smelter production have been collected by this branch since 1908. Complete returns have been received for the year 1911, with the exception of one or two plants recently established for the treatment of Ontario silver cobalt ores. It should also be explained that the accompanying statistics include the treatment of a small quantity of imported ores in the British Columbia smelters.

The total quantity of ores treated in 1911 was 2,192,727 tons as compared with 2,683,714 tons treated in 1910.

The ores treated may be conveniently classified as follows:

	1909. Tons.	1910. Tons.	1911. Tons.
Nickel-copper ores	462,336	628,947	610,834
Silver-cobalt-nickel-arsenic ores ..	8,384	9,466	8,504
Lead and other ores treated in lead furnaces	54,539	57,549	55,408
Copper-gold-silver ores	1,850,889	1,987,752	1,517,981
Total	2,376,148	2,683,714	2,192,727

The closing down of the Granby smelter, due to coke shortage was the principal cause of the falling off in copper-gold ores treated.

The products obtained in Canada from the treatment of these ores include: refined lead produced at Trail, B.C., and fine gold, fine silver, copper sulphate and antimony produced from the residues of the lead refinery; silver bullion, white arsenic, nickel oxide and cobalt oxide produced in Ontario from the Cobalt District ores. In addition to these refined products, blister copper, copper matte and nickel copper matte are produced and exported for refining outside of Canada.

The aggregate results of these smelting and refining operations for the years 1910 and 1911 are briefly summarized in the following table:

Smelter and Refinery Production in Canada, 1910 and 1911.

	Refined products.	Metals in matte, blister, and base bullion.	Refined products.	Metals in matte blister, and base bullion.
Antimony, lbs.			30	
Gold, ozs.	13,298	197,181	15,270	175,189
Silver, ozs.	16,373,799	2,136,414	17,711,077	612,401
Lead, lbs.	32,987,508		23,525,050	
Copper, lbs.		56,149,299		47,788,131
Copper sulphate, lbs.	163,228		197,187	
Nickel, lbs.		37,587,676		34,098,744
Cobalt and nickel oxides, lbs.	13,508		15,174	
Mixed oxides of cobalt and nickel, lbs. ...	108,178		127,224	
White arsenic, lbs. ..	3,003,467		4,194,209	

Smelter products shipped outside of Canada for refining were. Blister copper, carrying gold and silver values 10,710 tons in 1911, as compared with 13,918 tons in 1910; copper matte carrying gold and silver values 11,320 tons in 1911, as against 11,519 tons in 1910; Bessemer nickel copper matte carrying small gold and silver values as well as metals of the platinum group 32,607 tons in 1911, as compared with 35,033 tons in 1910.

Gold.

The gold production in 1911 is estimated as approximately \$9,762,096, which, compared with the 1910 production \$10,205,835, shows a falling off of \$443,739. The Yukon placer production in 1911 is estimated at \$4,580,000, as against \$4,550,000 in 1910, the total exports on which royalty was paid during the calendar year, according to the records of the Interior Department, being 277,430.97 ounces in 1911, and 275,472.51 ounces in 1910. The British Columbia production in 1911 was \$4,989,524, of which the placer production, as

estimated by the Provincial Mineralogist, was \$468,000, smelter recoveries and bullion obtained from milling ores being valued at \$4,521,524.

The production in Nova Scotia is estimated at \$142,000 all from milling ores. In Quebec there was a small recovery from alluvial workings and a small content in the pyrite ores shipped, the total value of production being \$12,443. Returns so far received from Ontario show a production of \$37,929.

The exports of gold-bearing dust, nuggets, gold in ore, etc., in 1911 were valued at \$7,493,523.

Gold was imported during 1911 in bars, blocks, ingots, etc., to the value of \$924,233.

Silver.

The silver production of Canada which has been very rapidly increasing during the past few years will probably show but little change in 1911.

Returns so far received appear to indicate a falling off of about 128,516 ounces. The total production of the year is estimated at 32,740,748 ounces valued at \$17,452,128, of which 30,761,690 ounces were from Ontario, 1,910,323 ounces from British Columbia, 50,300 ounces from the Yukon, and 18,435 ounces from Quebec.

The production in Ontario was slightly greater than that of the previous year and in British Columbia a falling off of nearly half a million ounces is shown.

For British Columbia the figures represent the recovery as silver bullion or silver contained in smelter products, while for Ontario the figures represent the total silver contents of ore and concentrates shipped less five per cent. allowed for smelter losses, together with bullion shipments.

The total shipments of ore and concentrates from the Cobalt District and adjacent mines were about 16,234 tons, containing approximately 28,817,198 ounces in addition to which 3,334,052 ounces were shipped as bullion. The average silver content of ore and concentrates shipped was thus about 1,744 ounces, or \$929.62 per ton, as compared with an average of 867 ounces in 1910 and 840 ounces in 1909. The 1911 shipments were chiefly high grade ore averaging over 3,400 ounces and concentrates averaging over 850 ounces.

The shipments in 1910 were 28,684 tons of ore containing 23,797,111 ounces of silver or an average of 830 ounces per ton; 6,943 tons of concentrate containing 7,111,579 ounces, or an average of 1,024 ounces per ton and bullion containing 1,003,111 fine ounces.

The exports of silver in ore, etc., as reported by the Customs Department were 31,216,725 ounces, valued at \$15,807,366. There was also an importation of silver in bars, blocks, sheets, etc., valued at \$847,645.

The price of refined silver in New York varied between a minimum of 51 7/8 cents per ounce in February, and a maximum of 56 3/8 cents in November, the average monthly price being 53.304, as compared with an average monthly price of 53.486 in 1910.

Copper.

There is practically no production of refined copper in Canada, and the production is represented by the copper contents of smelter products, matte and blister copper, produced, together with the amount of copper contained in ores exported estimated as recoverable.

The total production on this basis in 1911 was 55,848,665 pounds, valued at 6,911,831, as compared with 55,692,369 pounds valued at \$7,094,094 in 1910, an in-

crease in quantity of 156,296 pounds, but a falling off in total value owing to the slightly lower price of copper in 1911.

The total copper contents of ores shipped in 1911 was approximately 67,282,590 pounds, being 3,123,189 pounds from Quebec, 21,402,221 pounds from Ontario, and 42,757,180 pounds from British Columbia. This record is of special interest as illustrating the distinction between ore contents and smelter recoveries.

Of the production or smelter recovery in 1911, Quebec Province is credited with 2,436,190 pounds, as against 877,347 pounds in 1910. This is altogether from pyrite ores, which are mined primarily for their sulphur contents. Ontario's production in 1911 was 17,932,263 pounds, as compared with 19,259,016 pounds in 1910, all being from the nickel-copper ores of the Sudbury district.

The production in British Columbia, notwithstanding the failure of the domestic coke supply due to strikes in the coal mines of the Crow's Nest Pass district and the consequent shutting down of the Granby smelter for nearly five months, shows a slight increase, being estimated at 35,480,212 pounds in 1911, as against 35,270,006 pounds in 1910.

The British Columbia Copper Co. operated with larger output, using imported coke, and production from Coast mines, particularly the Britannia and Marble Bay, was specially active. The increased production from these mines more than balanced the falling off at Granby.

The New York price of electrolytic copper varied during the year between the limits of 11.85 cents and 14.05 cents per pound, the average being 12.376. During December the price ranged from 13 to 14 cents. The average monthly price in 1910 was 12.738 cents.

The total exports of copper contained in ore, matte and blister, etc., according to Customs Department returns, were 55,287,710 pounds, valued at \$5,467,725, which agrees fairly closely with the record of production.

The total imports of copper in 1911 were valued at \$4,936,459, and included crude and manufactured copper to the extent of 35,155,550 pounds, valued at \$4,632,452; copper sulphate 2,191,899 pounds valued at \$88,419, and other copper manufactures valued at \$215,588.

Lead.

The total production of pig and manufactured lead in 1911 was 23,525,050 pounds, valued at \$818,672, or an average of 3.48 cents per pound, the average wholesale or producer's price of pig lead in Montreal for the year. There was also small production of lead concentrate from Calumet Island, Que., the shipments being about 45 tons.

The production of lead in 1910 was 32,987,508 pounds, thus showing a considerable falling off in 1911. The decrease is probably chiefly due to the diminished tonnage from the St. Eugene mine in East Kootenay and the idleness of some of the more important mines of the Slocan following the destruction of the Kaslo and Slocan Railway by forest fires in 1910. The Bear Lake branch of the C.P.R., now under construction, will provide shipment facilities for these properties.

The Sandon and Silverton camps would seem to promise an increased tonnage of silver-lead ores in the near future.

The exports of lead in ore in 1911 are reported as 32

tons and of pig lead only 36 tons, as compared with exports of 23 tons and 3,856 tons respectively in 1910.

The total value of the imports of lead and lead products in 1911 was \$1,049,276, including 13,135 tons in the form of pig lead, bars, sheets, tea lead, etc., valued at \$706,020; manufactures of lead, valued at \$108,012; litharge and lead pigments having an equivalent lead content of approximately 2,395 tons, valued at \$235,244.

The total value of the imports of lead and lead products in 1910 was \$833,743, and with the exception of manufactures, valued at \$107,688, represented an equivalent lead content of 10,544 tons.

The average monthly price of lead in Montreal during 1911 was 3.48 cents per pound and in Toronto 3.53 cents. These are producer's prices for lead in car lots as per quotations kindly furnished by Messrs. Thos. Robertson & Co. The average monthly price of lead in New York during the year was 4.42 cents, and in London £13.970 per long ton, equivalent to 3,035 cents per pound.

The amount of bounty paid during the twelve months ending December 31, 1911, on account of lead production was \$219,557.70, as compared with payments of \$318,308.28 in 1910.

Nickel.

The mining and smelting of nickel copper ores in the Sudbury District of Ontario was carried on actively throughout the year, and although the production was slightly less than in 1910, it was still very much larger than in any previous year. Active operations were, as usual, carried on by the Mond Nickel Company at Victoria Mines and the Canadian Copper Co. at Copper Cliff, Creighton, Crean Hill, etc., while the Dominion Nickel Company continued to develop its property at Norman Station.

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. A portion of the matte is now used for the production of the alloy monel metal which is obtained directly from the matte without the intermediate refining of either nickel or copper.

The total production of matte in 1911 was 32,607 tons, valued at the smelters at \$4,945,593, a decrease of 2,462 tons, or 6.9 per cent. from the production of 1910. The metallic contents were copper, 17,932,263 pounds, and nickel, 34,098,744 pounds.

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

	1908.	1909.	1910.	1911.
Ore mined	\$409,551	\$451,892	\$652,392	\$612,511
Ore smelted	360,180	462,336	628,947	610,834
Bessemer matte produced.	21,197	25,845	35,033	32,607
Copper contents of matte	7,503	7,873	9,630	8,966
Nickel contents of matte.	9,572	13,141	18,625	17,049
Value matte shipped.	\$2,930,989	\$3,913,017	\$5,380,064	\$4,945,592
	Pounds.	Pounds.	Pounds.	Pounds.
Exports to Great Britain.	2,554,486	3,843,763	5,335,331	5,023,393
Exports to U.S.	16,865,407	21,772,635	30,679,451	27,596,578
	19,419,893	25,616,398	36,014,782	32,619,971

The price of refined nickel in New York remained practically constant throughout the year—quotations in the Engineering and Mining Journal being large lots, contract business, 40 to 45 cents per pound during the first four months and 40 to 50 cents from May to December. 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.

The imports of nickel anodes in 1911 were valued at \$34,199, as compared with \$23,317 in 1910.

Iron.

Iron Ore.—The total shipments of iron ore in 1911 are reported as 210,344 tons, valued at \$522,319. These may be classified as magnetite 72,945 tons, and hematite 137,399 tons.

In 1910 the total shipments were 259,418 tons, comprising magnetite 127,768 tons; hematite 130,380 tons, and bog ore 1,270 tons.

Exports of iron ore from Canada during 1911 are recorded by the Customs Department as 37,686 tons, valued at \$133,411. The exports were chiefly from Bathurst, New Brunswick.

The shipments from the Wabana mines, Newfoundland in 1911 by the two Canadian companies operating there were 1,181,463 short tons of which 765,184 tons were shipped to Sydney and 416,279 to the United States and Europe.

Pig Iron.—The total production of pig iron in Canadian blast furnaces in 1911 was 917,535 tons of 2,000 pounds, valued at approximately \$12,306,860, as compared with 800,797 tons, valued at \$11,245,622 in 1910.

Of the total output in 1911, 20,758 tons were made with charcoal as fuel and 896,777 tons with coke. The classification of the production according to the purpose for which it was intended was as follows:

Bessemer, 208,626 tons; basic, 464,220 tons, foundry and miscellaneous, 244,686 tons.

The amount of Canadian ore used during 1911 was 67,434 tons; imported ore, 1,628,368 tons; mill cinder, etc., 30,298 tons.

The amount of coke used during the year was 1,121,321 tons, comprising 543,933 tons from Canadian coal, and 577,388 tons imported coke or coke made from imported coal. There were also used 1,190,459 bushels of charcoal.

Limestone flux was used to the extent of 625,216 tons.

In connection with blast furnace operations there were employed 1,778 men and \$1,097,355 were paid in wages.

The total daily capacity of 18 completed furnaces was, according to returns received, 3,630 tons, and the number of furnaces in blast December 31, 1911, was 12.

The production of pig iron by Provinces in 1910 and 1911 was as follows:

Production of Pig Iron by Provinces, 1910 and 1911.

	1910			1911		
	Tons.	Value.	Value per Ton.	Tons.	Value.	Value per Ton.
Nova Scotia—	\$350,287	\$4,203,444	\$12.00	\$390,242	\$4,682,904	\$12.00
Quebec—	3,237	85,255	26.34	658	17,282	26.34
Ontario—	447,273	6,956,923	15.55	526,635	7,606,674	14.44
Total . . .	800,797	\$11,245,622	\$14.04	917,535	\$12,306,860	\$13.41

The exports of pig iron during the year are reported as 5,870 tons, valued at \$271,968, an average of \$46.33 per ton. Probably the greater part of this is ferro-silicon and ferro-phosphorus, produced at Welland and Buckingham, respectively.

There were imported during the year 208,487 tons of pig iron, valued at \$2,610,989, and 17,226 tons of ferro-manganese, etc., valued at \$429,465.

Steel.—The production of steel ingots and castings in 1910 is reported as 876,215 tons of 2,000 pounds, of which 861,493 tons were ingots, and 14,722 tons castings.

The production in 1910 was 822,284 tons, including 803,600 tons of ingots and 18,684 tons of castings, valued at \$18,794,192, or a total of 14,558,892 tons, valued at \$39,292,591.

The production of open hearth and Bessemer steel has been for four years as follows:

Production of Steel, 1908, 1909, 1910, 1911.

	1908.	1909.	1910.	1911.
	Tons.	Tons.	Tons.	Tons.
Ingots—Open-hearth (basic)	443,442	535,988	580,932	651,676
Bessemer (acid)	135,557	203,715	222,668	209,817
Castings—Open-hearth	9,051	14,013	18,085	13,982
Other steels	713	1,003	599	740
Total	588,763	754,719	822,284	876,215

Asbestos.

For a number of years past the annual output of asbestos has exceeded the sales. In 1911, however, the sales have been greatly increased, but at considerably reduced prices. Returns received for the year 1911 show a total output of 96,299 tons, as compared with 100,430 tons in 1910. The sales in 1911 are, however, reported as 100,893 tons, valued at \$2,922,062, or of \$28.96 per ton, as compared with 77,508 tons valued at \$2,555,974, or an average of \$32.98 per ton in 1910, an increase of 23,385 tons, or 30 per cent. in quantity, but only \$366,088, or 14 per cent. in total value. Stocks on hand at December 31, 1911, are reported as 34,568 tons, valued at \$1,509,100, as compared with 41,903 tons, valued at \$1,943,171 on December 31, 1910.

The average number of men employed in mines and mills during 1911, was 2,707 at a wage cost of \$1,231,896.

The total quantity of asbestos rock sent to mills is reported as 1,484,691 tons, which, with a mill production of 91,237 tons, shows an average estimated recovery of about 6.14 per cent.

The following tabulated statement shows the output and sales during 1911 and the stock on hand at the end of the year:

	Output.		Sales.		Stock on hand	
	Tons.	Tons.	Value.	Per ton.	Tons.	Dec. 31. Value.
Crude No. 1—	1,467.9	1,301.4	\$342,855	\$263.45	1,256	\$327,508
Crude No. 2—	3,594.5	3,562.7	402,107	112.86	3,222.7	404,198
Mill stock No. 1—	20,376	18,315	916,678	50.05	8,471	380,570
Mill stock No. 2—	39,289	47,326	991,370	20.95	17,794	365,457
Mill stock No. 3—	31,572	30,388	269,052	8.85	3,824	31,367
Total asbestos—	96,299.4	100,893.1	\$2,922,062	\$28.96	34,567.7	\$1,509,100
Asbestic		26,021	21,045	81		

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 \$30 to \$100; No. 2 from \$15 to \$30. No. 3 under \$15.

Output, sales and stocks in 1910 were as follows:

	Output.		Sales.		Stock on hand	
	Tons.	Tons.	Value.	Per ton.	Tons.	Dec. 31. Value.
Crude No. 1—	2,181	1,817	\$471,675	\$259.58	1,702	\$446,675
Crude No. 2—	3,268	1,923	192,833	100.28	3,219	440,571
Mill stock No. 1—	16,720	13,480	735,244	54.54	6,978	398,895
Mill stock No. 2—	56,395	43,414	1,013,251	23.34	26,613	628,528
Mill stock No. 3—	21,866	16,874	142,971	8.47	3,391	29,177
	100,430	77,508	\$2,555,974	\$32.98	41,903	\$1,943,846
Total Asbestos	100,430	77,508	\$2,555,974	\$32.98	41,903	\$1,943,846
Asbestic	24,707		17,629	0.71		

Exports of asbestos during the twelve months ending December 31, 1911, are reported by the Customs Department as 75,120 tons, valued at \$2,067,259, comprising 62,551 tons, valued at \$1,732,541 to the United States; 7,511 tons, valued at \$192,993 to Great Britain; 1,841 tons, valued at \$62,737, to Belgium; 2,596 tons, valued at \$52,047 to France; 361 tons, valued at \$20,494 to Germany, and 260 tons, valued at \$6,447 to other countries.

The imports of manufactures of asbestos during the same period are reported as valued at \$319,815.

Coal and Coke.

The long continued strike which took place in the coal mines of Southern Alberta and Eastern British Columbia, was responsible for a considerable falling off in the coal production of Canada in 1911.

The total coal production during the past year, comprising sales and shipments, colliery consumption and coal used in making coke is estimated at 11,291,553 tons of 2,000 lbs., valued at \$26,378,477. This is a decrease of 1,617,599 tons, or nearly 12.53 per cent. from the production of 1910, which was 12,909,152 tons, valued at \$30,909,779.

There was an increase of 562,978 tons in the Nova Scotia production, that of New Brunswick remained practically stationery, while an increase of about 23,097 tons is shown in Saskatchewan.

In Alberta, the decrease was about 1,396,412 tons, or 48 per cent., and British Columbia also shows a falling off of 794,243 tons, or nearly 24 per cent.

The production by Provinces was approximately as follows, the figures for 1910 being also given:

Province.	1910.		1911.	
	Tons.	Value.	Tons.	Value.
Nova Scotia	6,431,142	\$12,919,705	6,994,120	\$14,050,687
British Columbia	3,330,745	10,408,580	2,536,502	7,926,569
Alberta	2,894,469	7,065,736	1,498,057	3,933,958
Saskatchewan	181,156	293,923	204,253	342,921
New Brunswick	55,455	110,910	55,781	111,562
Yukon Territory	16,185	110,925	2,840	12,780
Totals	12,909,152	\$30,909,779	11,291,553	\$26,378,477

The exports of coal in 1911 were 1,500,639 tons, valued at \$4,357,074, as compared with exports of 2,377,049 tons in 1910, valued at \$6,077,350, a decrease in exports of 876,410 tons.

Imports of coal during the year include bituminous 8,905,815 tons, valued at \$18,407,603; slack, 1,632,500 tons, valued at \$2,090,796, and anthracite 4,020,577, valued at \$18,794,192, or a total of 14,558,892 tons, valued at \$39,292,591.

The imports of coal in 1910 were: Bituminous, 5,966,466 tons; slack, 1,365,281 tons, and anthracite, 3,266,235 tons, or a total of 9,872,924.

Coke.—The total production of oven coke in 1911 was 847,402 tons, valued at \$2,340,674, as compared with the production of 902,715 tons, valued at \$3,462,872 in 1910. The total quantity of coal charged to ovens was 1,228,700 short tons.

By Provinces the production was: Nova Scotia, 469,305 tons; Ontario, 259,554 tons (made from imported coal); Alberta, 36,216 tons, and British Columbia, 82,327 tons. All the coke produced was used in Canada with the exception of 9,290 tons, sold for export to the United States.

The quantity of coke imported during the calendar year was 751,389 tons, valued at \$1,843,248, as compared with imports of 737,088 tons, valued at \$1,908,725 in 1910.

Petroleum and Natural Gas.

A further falling off is shown in the output of petroleum, the production in 1911 being 291,092 barrels, or 10,188,219 gallons, valued at \$357,073, as compared with 315,895 barrels or 11,056,337 gallons, valued at \$388,550 in 1910. The average price per barrel at Petrolia in 1911 was \$1.22 2/3, and in 1910, \$1.23.

These statistics of production have been furnished by the Trade and Commerce Department, and represent the quantities of oil on which bounty was paid, the total payments being \$152,823.29 in 1911, and \$165,845.06 in 1910.

The production in Ontario by districts as furnished by the Supervisor of Petroleum Bounties was in 1911 as follows, in barrels. Lambton, 184,450; Tilbury and Romney, 48,708; Bothwell, 35,244; Dutton, 6,732, and Onondaga, 13,501. In 1910, the production by districts was: Lambton, 205,456; Tilbury and Romney, 63,058; Bothwell, 36,998; Leamington, 141; Dutton, 7,752, and Onondaga 1,005.

The production in New Brunswick in 1911 was 2,461 barrels, as against 1,485 barrels in 1910.

Exports of refined oil in 1911 were 489 gallons, valued at \$73. There was also an export of naphtha and gasoline of 23,959 gallons, valued at \$4,427.

The imports of petroleum and petroleum products again show a very large increase. The total imports of petroleum oils, crude and refined in 1911 was 116,892,689 gallons, valued at \$6,009,730, in addition to 1,959,787 pounds of wax and candles, valued at \$106,424. The oil imports included crude oil, 71,637,533 gallons, valued at \$2,187,952; refined and illuminating oils, 13,690,962 gallons, valued at \$722,403; gasoline, 23,338,773 gallons, valued at \$1,976,032; lubricating oils, 5,308,917 gallons, valued at \$806,452, and other petroleum products, 2,916,504 gallons, valued at \$316,891.

The total imports in 1910 were 84,629,334 gallons of petroleum oils, crude and refined, valued at \$4,826,763, and 1,362,235 pounds of wax and candles, valued at \$80,106.

A large increase is shown in the production of natural gas in 1911, the total value being reported as \$1,820,923, of which \$96,665 was the production in Alberta and \$1,724,258 in 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 many cases the gas is resold once or twice by pipe line companies before reaching the consumer.

The total quantity of gas used in Ontario was about 9,869 million feet, and in Alberta probably over 611 million feet.

The production of natural gas in 1910 was valued at \$1,346,471 and represented about 7,952 million feet.

Cement.

Complete statistics have been received from the manufacturers of cement covering their production and shipments during the year 1911. These returns show that the total quantity of cement made during the year, including both Portland and slag cement, was 5,677,539 barrels, as compared with 4,396,282 barrels in 1910, an increase of 1,281,257 barrels, or 29 per cent.

The total quantity of Canadian Portland cement sold during the year was 5,635,950 barrels, as compared with 4,753,975 barrels in 1910, an increase of 881,975 barrels, or 18.5 per cent.

The total consumption of Portland cement in 1911, including Canadian and imported cement, and neglecting an export of Canadian cement, valued at \$4,067, was 6,297,866 barrels, as compared with 5,103,285 barrels in 1910, or an increase of 1,194,581 barrels, or 23.4 per cent.

Detailed statistics of production during the past two years are shown as follows:

	1910.	1911.
	Barrels.	Barrels.
Portland cement sold	4,753,975	5,635,950
Portland cement manufactured	4,396,282	5,677,539
Stock on hand January 1	1,189,731	844,741
Stock on hand December 31	832,038	903,590
Value of cement sold	\$6,412,215	\$7,571,299
Wages paid	1,409,715	\$2,103,838
Men employed	2,220	3,010

The average price per barrel at the works in both 1910 and 1911 was \$1.34, as compared with an average price of \$1.31 in 1909 and \$1.39 in 1908.

The imports of Portland cement during the twelve months ending December 31, 1911, were 2,316,707 cwt., valued at \$834,879. This is equivalent to 661,916 barrels of 350 pounds at an average price per barrel of \$1.26. The imports in 1910 were 349,310 barrels, valued at \$468,046, or an average price per barrel of \$1.34.

The imports from Great Britain during 1910 were 190,506 barrels, valued at \$210,839; from the United States, 441,317 barrels, valued at \$575,768; from Belgium, 2,683 barrels, valued at \$2,019; from Hong Kong, 22,059 barrels, valued at \$38,292; and from other countries, 5,351 barrels, valued at \$7,962.

Following is an estimate of the Canadian consumption of Portland cement for the past five years:

Calendar Years.	Canadian.		Imported.		Total.
	Barrels.	Per cent.	Barrels.	Per cent.	
1907	2,436,093	78	672,630	22	3,108,723
1908	2,665,289	85	469,049	15	3,134,338
1909	4,067,709	97	142,194	3	4,209,903
1910	4,753,975	93	349,310	7	5,103,285
1911	5,635,950	89.5	661,916	10.5	6,297,866

Annual Mineral Production in Canada Since 1886.

Year.	Value.	Value	Year.	Value.	Value
		per Capita.			per Capita.
1886	\$10,221,255	\$2.23	1899	\$49,234,005	\$9.27
1887	10,321,331	2.23	1900	64,420,877	12.04
1888	12,518,894	2.67	1901	65,797,911	12.16
1889	14,013,113	2.96	1902	63,231,836	11.36
1890	16,763,353	3.50	1903	61,740,513	10.83
1891	18,976,616	3.92	1904	60,082,771	10.27
1892	16,623,415	3.39	1905	69,078,999	11.49
1893	20,035,082	4.04	1906	79,286,697	12.81
1894	19,931,158	3.98	1907	86,865,202	13.75
1895	20,505,917	4.05	1908	85,557,101	13.16
1896	22,474,256	4.38	1909	91,831,441	13.70
1897	28,485,023	5.49	1910	106,823,623	14.93
1898	38,412,431	7.32	1911	102,291,686	14.20

ADVANCED STATEMENT OF THE MINERAL PRODUCTION OF THE PROVINCE OF QUEBEC, DURING THE YEAR ENDING DEC. 31st, 1911.

(Figures are subject to revision).

From the items now at hand, received direct from the producers by the Mines Branch of the Province of Quebec, the total value of the products of our mines and quarries reached the very substantial figure of \$8,567,143, during the year ending December 31st, 1911. This is an increase of \$1,243,862, as compared with the previous year.

For the purpose of comparisons the value of the corresponding mineral products for the previous year, 1910, has been given in the last column of the table.

Product.	Production 1911.		Value in 1910.
	Quantity.	Value.	
Asbestos, tons	99,352	\$2,939,006	\$2,667,829
Asbestic, tons	25,732	19,802	17,612
Copper and sulphur ore, tons	38,554	240,097	145,165
Gold, ozs.	590	11,800	.....
Silver, ozs.	23,000	11,500	.....
Bog iron ore, tons	931	4,041	4,406
Ochres, tons	3,612	28,174	33,185
Chromite, tons	197	2,469	3,734
Mica, tons. . . . .	.....	76,433	51,901

	Production 1911.		Value in 1910.
	Quantity	Value.	
Phosphate, tons	558	5,595	3,182
Graphite, lbs.	753,405	33,588	15,896
Mineral waters, gals.	117,462	62,607	68,155
Titaniferous ores, tons	3,789	5,684	5,292
Slate		8,248	18,492
Cement, bbls.	588,283	1,931,183	1,954,646
Magnesite, tons	885	6,416	2,160
Marble		143,457	151,103
Flagstone		500	890
Granite		308,545	291,240
Lime, bush.		284,334	279,306
Limestone		1,081,059	503,173
Bricks, M.	130,297	1,135,501	906,375
Tiles, drain and sewer pipe, pottery, etc.		100,000	197,526
Quartz, tons	500	1,125	2,013
Feldspar, tons	30	600	.....
Glass sand		1,179	.....
Sand		114,500	.....
Peat, tons	175	700	.....
Totals		\$8,567,143	\$7,323,281

It is very gratifying to note that the producers are now responding much more readily to our requests for figures and information than formerly. And although the final figures which will be compiled in a month or six weeks from now, are expected to be slightly different from the figures given above, the variance will probably be much less than in previous years.

For the purpose of illustrating the growth of the mineral industry in the Province of Quebec, the following table is given:

Table Showing the Annual Value of the Mineral Production of the Province of Quebec since 1900.

Year.	Value.
1900	\$2,546,076
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	5,552,062
1910	7,323,281
1911	8,567,143

Asbestos.

Despite the unfavourable conditions under which the asbestos industry laboured during the year 1911, the shipments of this substance, from the producers to the consumers, show a substantial increase as compared with the previous year, 1910.

The average value per ton has somewhat decreased, from \$33.09 in 1910, to \$29.58 in 1911. This is due in a great measure to the over-production of the previous year, which glutted the market and caused a consequent fall in prices. On the whole, from the commercial and technical standpoints, the asbestos situation is satisfactory. Some producers may take exception to this statement, but on a close examination, it will be seen that many of the asbestos ventures, which are now closed down or are stagnating, should not have installed elaborate mining plants, and put up expensive mills without doing first a great deal more pre-

liminary development work,—and ascertaining more thoroughly the workability of their deposits.

The applications and uses of asbestos are increasing year by year, but the absorbing power of the market is limited, and this must be taken into consideration by the producers.

As to the mines themselves, more especially those which produce a fair proportion of crude products, it can only be re-stated that they are in excellent shape, and the rock shows practically no change in depth.

The total shipments of asbestos in 1911 reached 99,352 tons, valued at \$2,939,006. On December 31st, stocks on hand unsold were 31,420 tons, valued at \$1,480,417.

For the year 1910, the figures were: Shipments, 80,605 tons, valued at \$2,667,829. Stocks on hand on December 31st, 1910, amounted to 41,159 tons, valued at \$1,921,923.

The shipments of asbestos made during the year 1911, according to grades, are as follows:

	Tons.	Value.
Crude Nos. 1 and 2	5,530	\$778,549
Mill stock Nos. 1, 2 and 3	93,822	2,160,457
	99,352	\$2,939,006

Copper and Sulphur Ores.

The marked increase in the production of copper and sulphur ore is owing to the shipments of the McDonald mine, from which over 2,000 tons a month are shipped. A great deal of systematic work has been done in this mine, which is giving very good results. The shipments of the Eustis Mining Company fell short of the previous year's, but the management took advantage of this comparative lull to do development work, and there is, at present, ore in sight for two years.

A small shipment was made from the old Ives mines near Eastman.

Gold and Silver.

The gold production recorded this year comes in part from the recovery of that metal from the treatment of the cupriferous pyrite ores of the Eastern Townships. The silver comes wholly from that same source.

But the greater part of the gold produced is the result of the resumption of work on the alluvial deposits of the Beauce gold fields. Owing to delays in installing the hydraulic washing plant, only a very short run was made at Beauceville by the "Compagnie des Champs d'Or Rigaud-Vaudreuil," but this was very satisfactory, and operations will be resumed with renewed activity as soon as the climatic conditions will allow.

Iron Ore.

The iron ore industry of the Province of Quebec has, in the last few years, shown a serious decline. The bog iron ore deposits of the St. Maurice district and of Drummond County seem to be passing away, and, so far, no other iron ore deposits have been brought into prominence to replace them. In 1911, only 931 tons of local ore were charged into the Drummondville furnace, of the Canadian Iron Corporation, the main supply of ore having had to be imported from Ontario. The Radnor furnace of the same company went out of blast in the summer of 1910 and was not blown in during 1911.

Titaniferous Iron Ores.

Some 3,789 tons of Titanic iron ore were shipped from the St. Urbain mines. This ore is used as an ore in Titanium, in the United States, in the manufacture of special rail steel, and also enters into the composition of special carbons for arc-lights.

Chrome.

No chrome mining was done during the year. The shipments were made from old stock piles.

Graphite.

The new mill of the Dominion Graphite Company, on the Stuart property near Buckingham started operations on July 1st, and substantial shipments have been made. Other producers of graphite, who have made returns of shipments are: The Bell Graphite Co., the North American Graphite Co. and the Peerless Graphite Co, all in Buckingham.

Mica.

The returns received from mica producers indicate a marked improvement in the state of the mica market. The better prices ruling have caused a renewal of mining activity and the shipments in 1911 have been 50 per cent. higher than in 1910. Mica is mainly mined in the valleys of the Gatineau and the Lievre Rivers.

Feldspar.

Only a few tons of very high grade feldspar were shipped from Moose Lake in Villeneuve Township by Messrs. O'Brien & Fowler, of Ottawa. This feldspar, which is valued at \$20.00 a ton, is used exclusively in the manufacture of artificial teeth.

Sand.

The building sand which appears in the table for a value of \$114,500 is specially coarse river sand, which is exploited by means of suction dredges, in the beds of certain streams which are under mining license from the Quebec Government for this substance. This sand is shipped to Montreal and other large centres where it finds a ready market for building purposes, more especially in reinforced concrete construction:

Other Building Materials.

A notable increase in the production of stone, brick and other structural materials is recorded this year. This increase, in a measure, is due to a more thorough collection of data and returns, but, nevertheless, it is sufficient to consider the development, the increase and the progress of the industries in general in the Province of Quebec, to realize that the market for structural materials has increased tremendously in the last few years and will continue to do so for many years to come.

MINERAL PRODUCTION OF ONTARIO, 1911.

Metallic.	Quantity.	Value.
Gold, oz.	2,153	\$42,638
Silver, oz.	31,507,791	15,949,019
Cobalt in crude cobalt material, lbs.	234,749	58,687
Cobalt oxide, cobalt nickel oxide, etc., lbs.	111,823	112,203
Nickel, tons	17,049	3,664,474
Copper, tons	8,966	1,281,118
Iron ore, tons	175,631	445,930
Pig iron, tons	526,610	7,716,314
		\$29,270,383
Less Ont iron ore (67,631 tons) smelted into pig iron		172,391
		29,097,992

Non-Metallic.	Quantity.	Value.
Arsenic, lbs.	4,341,078	74,609
Brick, common, No.	316,000,092	2,480,177
Tile drain, No.	21,461,000	343,956
Brick, pressed, etc., No.	51,843,548	562,345
Brick, paving, No.	4,522,400	86,658
Building and crushed stone		882,667
Calcium carbide, tons	1,383	84,437
Cement, Portland, bbls.	2,943,003	3,563,995
Corundum, tons	1,471	147,158
Feldspar, tons	17,697	51,610
Fluorspar, tons	30	200
Graphite, tons	894	36,492
Gypsum, tons	20,335	32,535
Iron pyrites, tons	43,629	118,457
Lime, bush.	2,335,085	394,551
Mica, tons	322	43,058
Natural gas		2,068,429
Peat, tons	1,180	2,830
Petroleum, Imp. gals.	10,102,081	353,573
Phosphate, tons	20	240
Pottery.		50,500
Quartz, tons	56,723	64,405
Salt, tons	88,689	430,835
Sewer pipe		410,064
Talc, tons	7,104	51,125

Total non-metallic production	12,334,906
Add net metallic production	29,097,992

Total production	\$41,432,898
------------------------	--------------

NOTES.

Metals.

Gold.—The greater part of the production came from Porcupine, being derived from the small test mills at two or three properties. The fire destroyed these mills and thus caused the output to be smaller than it otherwise would have been. The two or three large mills that were in course of construction were also destroyed. The new mills at the Dome and Hollinger mines are nearing completion and will be in operation about the end of the first quarter of the year. The branch of the Ontario Government Railway, the Temiskaming and Northern Ontario, is now in operation to South Porcupine, and is almost completed to the town-site of Timmins. The plant of the Canadian Exploration Company at Long Lake, near the Sault branch of the Canadian Pacific Railway, is nearly completed. As soon as electric power is available the mill will begin operations. Toward the end of the year, the St. Anthony mine at Sturgeon Lake, northwest of Port Arthur, was unwatered, and milling of ore has begun. The Belmont or Cordova mine, in Hastings County, has, after being idle a number of years, begun operations under new owners. There was a small production of gold from seven or eight mines, in addition to those mentioned, in other parts of Northern and North-western Ontario.

Silver.—The entire production came from the mines of Cobalt and surrounding region. The output in 1911 was 31,507,791 ounces, this being the greatest annual production since the beginning of mining at Cobalt, exceeding the production of 1910 by approximately one million ounces. The shipments of bullion from Cobalt increased greatly during the past year, owing chiefly to the operations of the refinery of the Nipissing mine. The process employed by that company is

somewhat unique, being a combination of amalgamation and cyanidation. There was a shortage of power during the early part of the year owing to an accident to one of the large plants. The power situation has since been satisfactory. The extension of the concentration process has brought about a change in the character of the shipments. Instead of much low grade ore being shipped from Cobalt, the shipments now embrace a large quantity of high grade concentrates. That silver is produced at a very low cost at Cobalt is shown by the last annual report of one of the companies, the Coniagas, which produced metal throughout the year at an average total cost of 8.8 cents an ounce, including mining, concentrating, freight to smelter, sampling, assaying, and treatment charges and all head office expenses and royalties.

At Cobalt in 1911 there were seven mines which each produced 1,500,000 ounces or more of silver. In order of production they are as follows: Nipissing, 4,627,043; La Rose, 4,090,157; Crown Reserve, 3,430,902; Coniagas, 3,273,464; McKinley-Darragh, 2,551,884; Kerr Lake, 2,238,353. Buffalo, 1,644,245. Three other mines produced over a million ounces each.

Two properties at Gowganda were producers during the year, as were also two in South Lorrain.

Refineries at Copper Cliff, Deloro, Thorold and Orillia continue to treat the greater proportion of the high grade ore shipped from Cobalt.

The dividends paid by the companies operating at Cobalt and in South Lorrain in 1911 amounted to \$8,588,916, or over one-half of the total value of the silver produced. The total dividends distributed up to the end of 1911 amounted to \$30,391,095, not including profits made by two or three privately owned mines or close corporations. For the whole period since the mines were opened at Cobalt, there has been produced from this part of Ontario 125,571,980 ounces of silver, which brought the mine owners \$64,317,352.

Cobalt.—The quantity of cobalt in crude material shown in the table is only that part of the output for which mining companies were paid by purchasers of ore. A much larger quantity was shipped out, but, for the most part, brought no returns. The table also shows the quantity and value of cobalt oxide, cobalt nickel oxides, and other cobalt-holding material shipped by the refineries of the Province. The market for cobalt oxide continues depressed.

Nickel.—The nickel mines and smelters in the vicinity of Sudbury had a smaller output in 1911 than in 1910. Toward the end of the year, however, the output was increased, and the two operating companies are preparing to still further increase it. The Mond Nickel Company is arranging for the erection of a plant with increased capacity at Coniston, east of Sudbury, at the junction of the Canadian Northern with the Canadian Pacific Railway.

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.—The copper produced in Ontario last year came from the nickel-copper mines at Sudbury. The two metals, copper and nickel, occurring together, the output of the former rises and falls with that of the latter. In 1910 the production of copper was 9,630

tons, in matte. In 1911 it was 8,966 tons. The price of the copper in the table of statistics, like that of the nickel, is based on its value in the matte and not on its refined value.

Iron Ore and Pig Iron.—In 1911, all the hematite shipped came from the Helen mine of the Lake Superior Power Company. The quantity was 137,377 tons, an increase over the shipments of 1910, which amounted to 112,246 tons. Three other mines shipped a total of 38,254 tons of magnetite.

The 526,610 tons of pig iron produced came from the following companies, viz.: Hamilton Steel and Iron Company, Atikokan Iron Company, Standard Chemical Company, Canada Iron Corporation, and the Algoma Steel Company. The Hamilton Steel and Iron Company and the Algoma Steel Company were also producers of steel. Of the ore smelted, 67,631 tons were of domestic and 848,814 of foreign origin.

Discoveries of metals, not hitherto found in economic quantities in the Province, include mercury and tungsten. The former metal occurs in the silver-bearing Cobalt ores, and the latter in the mineral scheelite, in certain gold-bearing quartz veins at Poreupine.

Non-Metals.

Building materials.—The value of the building materials, such as brick and Portland cement, produced in 1911 shows a material increase over that of 1910. There is an increasing demand for suitable stone for road-making, and arrangements are being made for opening quarries to supply the needs of the older part of the Province. Marble from the quarries near Bancroft, in Hastings County, is being employed for the decoration of the interior of buildings.

Petroleum.—The production of petroleum continues to decline. The output during 1911 amounted to 10,102,081 Imperial gallons, as compared with 11,004,357 in 1910.

Natural Gas.—In contrast to petroleum, natural gas shows an increased production year by year. In 1911 natural gas from Ontario wells had a value of \$2,068,429, while in 1910 its value was \$1,490,334, and in 1909 considerably less, \$1,188,179.

By counties, the new producing wells of 1911 are distributed as follows, viz. Welland 26, Haldimand 124, Brant 60, Norfolk 19, Wentworth 9, and Elgin 16.

Minor Products.—Among the products of lesser value, calcium carbide shows a decrease in 1911, as compared with the preceding year. This is due to the absorption of Ontario plants by an extra-provincial company and the closing or partial closing down of the works during a part of the year. Talc shows a considerable increase in quantity and value of output, as does iron pyrites. Another acid plant, which will use pyrites as a raw material, was erected in the Province during 1911. There are a number of industries, which, owing to abundance of raw material, are capable of great expansion. These include gypsum and salt, both of which show an increased output during the past year.

Ontario's mineral industry is characterized by the variety and uniqueness of its products. Moreover, it is characterized by rapid increase in the value of annual output during recent years, and it offers great scope for increase in the future.

THE IDOL OF QUICK RETURNS

(An address delivered by D. H. Browne at the annual dinner of the Engineering Society, School of Mining, Kingston.)

There are here at Queen's University some 1,200 students, who have come here to spend from four to six years of their life in the pursuit of some definite object. These students will each spend, perhaps, five hundred dollars a year, in railway fares, college fees and living expenses, which means that about \$600,000 a year is expended by these young men and women. In addition to this they have during this time surrendered their earning power and become non-producers. We will assume that during eight months of the year these young people are idle, and that their earning capacity is \$50.00 a month. This amounts to a monetary loss of at least \$400,000 a year. So that I am quite within the bounds of reason when I say that it costs these students at least one million dollars a year to maintain their attendance at this university.

Now, why do they do this? No one pays out money, no one devotes his time, his labour, his ambition in this way without hope of recompense. Ask these boys and girls, and they will answer that they do this in order to be successful in life. Success in life—this means two things, greater earning ability and greater enjoyment capability. The end of life is happiness. Happiness is not mere Hedonism, not the simple pursuit of pleasure for the sake of pleasure. Happiness means the attainment of man's best, highest, noblest desires. We seek for riches, not for the sake of money alone, but for what we can do therewith to further our physical, mental and spiritual welfare. I take it that these students are here at Queen's in order to gain two things, first, the ability to attain a higher position in life, and, second, the capability to enjoy that position when they have attained it.

The first proposition is, then, that these students came here with the idea that when they leave college they will be able to earn more and to fill higher positions than if they had never attended college. Is this correct?

I have here in my hand a pamphlet written by R. T. Crane, President of the Crane Co., of Chicago, which is entitled, "The Futility of Technical Schools in Connection with Mechanics and Manufacturing or Electrical and Civil Engineering." This pamphlet and several others along the same line have been widely circulated. They contain a very violent attack upon the technical schools of the United States, and while the Canadian schools are not mentioned, Mr. Crane's arguments are perfectly applicable on this side of the border. It seems to me that these ideas are false, illogical, and dangerous, but in order to show why I thus deny them, it is necessary first to state Mr. Crane's ideas in order.

"Importance of Starting Out in Life Right."

The question whether one is starting out in life right is decidedly the most important that ever arises with any person. I therefore urge you, before you go any further, to stop, look and listen. No boy or man in these days can afford to throw away eight of the most important years of his life in acquiring a schooling

that will be of little or no use to him. My experience convinces me that the boy who went into the factory or field to learn some business when you entered high school has a tremendous advantage over you, and that you never will be able to make up this loss of time and money.

Most people who have been successful owe their success largely to a right start. Of course, they had natural ability to help them, but it may be said safely that if they had started differently they would not have succeeded so well. On the other hand, if a great many who have failed had begun right, it would have been greatly to their advantage. This matter of a right beginning has not been given the consideration it deserves, but has been left largely to chance.

"Why Are You Here?"

You are starting out with the belief that a large amount of technical school training will be of use to you—in fact, that it is indispensable; hence you are here. But if I were to ask you for some sound or logical reason for being here, you would find it difficult, probably, to give any. It is my opinion that you are here for some of the following reasons:

First, because of the popular feeling that these technical schools possess great merit, which feeling seems to be magnified by the growth of these institutions. Later you will see that this popularity exists simply among people who have little knowledge of the subject, and that these schools are promoted by educators because the great mass of the unthinking public has faith in them, thus affording these educators opportunity to humbug you and the public by multiplying them, all of which is a part of the whole higher educational scheme to fleece you and the public.

Secondly: Another way in which you are deceived is through the claims which the heads of these schools are making that a great many prominent employers favour their students and seek them for their business. Some of them go so far as to say that these employers are clamouring for you boys, and thus make it appear that your schooling is going to be of great value to you, which I shall show you is another fraud.

Thirdly: Another reason why some of you are here is because of the silly talk that is being indulged in by a few impractical men in business who are taking the ground that the technically school trained boys are superior to those who have had a practical training only, and that in their business they are giving preference to the former. I shall show you that these people are in a very small minority.

Fourthly: I think that the fascination which the word "engineer" possesses affects you, since it seems to be so much more dignified than "foundry man" or "plumber."

When we sum up the reasons for your being in a school of this kind we find that not one has a sound, substantial foundation, so that, as a matter of fact, you are here simply through the grossest deception. I challenge the heads of these institutions, or any business man who pretends to give preference to boys

trained as you are being, to show any substantial results of such training.

"Mechanics and Manufacturing."

Let us first look into the question of the utility of technical schools in connection with general mechanics or manufacturing. In considering such a question, theories, guesses, or the individual opinions of persons who have not given it any serious thought, or who are in the higher schooling business for money purposes, are of little or no value. What you want are facts or the preponderance of evidence from men of judgment who are in a position to have sound ideas on the subject, who have given it some thought, who are free from prejudice and have no selfish interest in these schools. Now, here are some of the facts:

"Facts."

First: Comparing this country to-day with fifty years ago, it has gone to the greatest extreme in all kinds of technical schooling. In the United States to-day there are 129 technical institutions, including universities, that have a special department devoted to this branch of schooling, and the number of students taking this course of study is about 30,000, which in all probability means that about 10,000 boys are leaving these schools each year. From this we see that there would have to be an enormous demand in order to provide places for this large number of young men supposed to be trained for the higher and better positions.

Secondly: It is also a well-known fact that this country was immensely successful before the technical schools were established.

Thirdly: Notwithstanding many educators are trying to make us believe that this country is going to destruction through dry rot and that the only means of saving it is through their schools, the fact is that no country on the face of the earth to-day is more prosperous or stands so high in everything in which technical schools are pretending to aid us as the United States.

Fourthly: All the heads of these technical schools, as well as all employers who claim to favour boys from such schools, admit that before such boys can be of any value in any line of business they must have a large amount of practical training.

Fifthly: Although tens of thousands of technically school trained men have been coming from these institutions, this class of men are doing little or nothing to contribute to the real prosperity of the country, and if you should go through our great industrial institutions you would find little trace of them in any important positions; probably not in one per cent.

"Importance of Experience."

What a manufacturer wants is not a man of theory, but a man of brains who has had an immense amount of experience, who knows the state of the art thoroughly, and who understands all kinds of tools and what they are capable of doing. This is the only kind of a man that is of any account in a manufacturing business. Hence we regard these schools as absolute failures so far as being a help to general manufacturing and industrial business is concerned, and, therefore, it is not necessary to discuss this feature of technical school work."

Mr. Crane then goes on to show that a graduate of a technical school will go to work for the General Electric Co. for two years in the testing department at 20c.

an hour, and will then spend two years more in the engineering department at 27½c. an hour. This brings the boys to 27 years of age, at which time, as he says, they will be very lucky if they can go out and secure a job at \$3.00 a day. Mr. Crane's remedy for this is given in his pamphlet, under the caption:

"Common Sense Method of Making Electrical Engineers."

The common sense way to make electrical engineers is as follows: Select, with the greatest care, boys about 16 or 17 years of age for machine shop apprentices. Watch over them carefully, in the first instance, to see that they are what the employers are seeking as material for good machinists. If the foremen who keep a close eye on the boys discover that some of them have unusual ability, let such be put in the line of direct training for electrical engineering. Such boys, after having two years of training in the machine shop (say, one year at bench work and a year at tool work), shifting around considerably, would get the knowledge of that part of the work which is required to make of them good electrical engineers. Then let them spend six months in the testing department, six months drafting, a year in the erecting department, and a year in the operating department.

While working in this way they are surrounded constantly by an electrical atmosphere and will absorb, through observation and association, nine-tenths of all the knowledge they will need to have regarding electricity, and all this will have a splendid influence over them. The grandeur of the work is particularly inspiring, and the absorbing of all this information takes none of their time, as it is done unconsciously.

During this period the boys could attend night school as much as is necessary and be furnished books on the science of different lines of electrical apparatus, books containing only such things as the best practical men know to be essential. If necessary, lectures could be given advantageously by the company's own engineers who know decidedly better what these boys require than any school teacher could possibly know. This would make five years in all, and then you would have a young man who, at 21 or 22 years of age, would be a fairly good electrical engineer. Such a man is likely to make his mark and certainly should be of considerable value to any one requiring his services. Besides this he would have been earning his living all this time." Mr. Crane concludes by accusing the college authorities of sharp practice.

"College Authorities Sharp-Practice Men."

"As you grow older you will discover that there are many kinds of sharp-practice men, each of whom has his own way of bleeding and defrauding the people in order to make his money, that is, to steal your money. The man who picks your pocket, the man who robs you, the burglar who enters your house, or the trusts who are muleting you on every side are all decidedly vicious, but they are insignificant thieves compared with the man who induces you to spend your money and eight or ten of the best years of your life in acquiring something that will be of little or no value to you. You can overcome, perhaps, the loss of money which these things have robbed you of, but you cannot afford to be robbed of the years which should be employed in laying the foundation of your future career by which you can support yourself and family.

"In Conclusion."

Criticisms upon my method of dealing with this subject have been made, and there comes to me a recent instance of a young man of fine character and excellent home training, who, in an unguarded moment, while in the employment of the post office department in Chicago, took one dollar from a letter, and was sent to the penitentiary for one year. If it was justice to punish this young man by committing him to the penitentiary for his act, what should be done to the people who are using every possible effort to induce boys to spend eight of the best unfolding years of their lives in securing a training which will be of no practical value to them in later years. Therefore, I have no apology to offer for what any one may call the harshness of my views."

Now Mr. Crane's attack is directed against American technical schools, but it is reasonable to suppose that his arguments are equally applicable to those on this side of the border. There are, however, some important points in which our Canadian schools differ from the American. It is customary in the States to carry a course of nine months, even in some cases of eleven months' work. On this side our custom is to limit the class work to a period of six or seven months, and to allow the boys to spend three or four months of each year at practical work, in the mine, smelter or shop, according to whatever branch of scientific work they intend to make a specialty of. It has been my privilege at the smelter at Copper Cliff to hire a large number of Canadian students during the summer months. The majority of these are hard-working, diligent, intelligent men, keen to grasp a new situation, and manly enough to accept the discomforts incident to the work in a cheerful way. We are glad to have them there. Those who make good are always welcome again. Of course, as in any other body of men, there are a few goats. I have had a student come to me after a week's work around the furnace and ask for his time, giving as his reason that he wanted to get away, as he had learned all there was about the work, except the details. He got his time.

But the vast majority of Canadian boys are manly and self-reliant. My only regret is that more of them do not stay with us. Like all other commercial enterprises I know of, we are always hard pushed to find among our men some men of intelligence and experience to make foremen. I can assure you that such men are hard to find. Many times we have had to put in responsible positions men who were none too well qualified for these positions, simply because no others were available. What we and many other firms need is bright young men who will remain in our employment, even if their present positions are not exactly to their liking, until we have had time to move them from one department to another in order that they may get a broad experience in their work. But frequently the very man we have talked over and planned to move into some more responsible position gets another opportunity offered him elsewhere, and when we want him, he is gone. This fact, which I wish to emphasize, shows very clearly that the demand for such intelligent work as these boys give is greater than the supply. This fact disposes in very large measure of Mr. Crane's argument that the technical schools turn out a lot of young men who are worthless to their employers, and who can not obtain responsible positions. But Mr. Crane goes on, "these technical school men

are not fully trained craftsmen, they are not competent along any one line. They come out of college and have to compete with the uneducated labourer, who by sheer dint of sticking to one line of work has mastered that line, and is receiving good wages." This is very true. Take a college boy who, after studying, say, electrical engineering, goes into the shops at Peterboro. He finds there men who can do the work he is put at far better than he can, men who know nothing but this particular work. These are his competitors. He has to accept their wage rate, and pit his brains against their experience. He is at a disadvantage for a time. If he considers his present condition only, he may regret that he had not followed Crane's advice, which you will remember was to omit the technical school course, go directly into a shop, and spend four years of practical training at one line of work.

Now, all I say to this is that if a boy desires to become a highly efficient machine, this is certainly the best way to go about it. The modern shop is always in advance of the technical school; the surrounding influences are all in one direction, and a young man thus spending six years of his life is undoubtedly a better craftsman, and can immediately earn higher wages than one who has spent four or six years in a university.

We will admit once for all that there are some subjects which a university or technical school can not teach, does not attempt to teach, and should not be expected to teach. A university does not aim to make machines, but to make men. It does not take a boy and perfect him along one narrow line. It aims to lay broad foundations, to inculcate principles, to train in culture, to foster a taste for all that makes life livable and men and women lovable.

Take this technical school at Kingston, for example. If a boy wishes to become a mine foreman, or a smelter man, or an expert winder of commutators, he will never get that training here. Any of his professors would advise him to go into the mines at Granby, or the smelter at Copper Cliff, or into the General Electric works at Peterboro. In four or five years he would be a skilled craftsman, he would earn three or four dollars a day, he might even be in charge of some commercial enterprise—but that is all. He would be successful as he measures success—but what a price to pay for such a limited success! Like Selkirk on Juan Fernandez, he is monarch of all he surveys, but how far can he survey, how limited his horizon!

Many, many generations have gone by since the preacher said, "Where there is no vision the people perish"—where there is no vision, no broad outlook on life, no scope for larger ambitions. What phrase could better describe the condition of one who spends his best years in mere striving to learn a craft whereby to earn his daily bread. This is all a training such as Mr. Crane proposes can give, the certainty of daily employment. Is this then all we are to strive for? Is the training we get here simply a meal ticket? I claim that life is more than this. Man cannot live by bread alone. Remember that happiness arises not merely from greater earning power, but from greater capacity for enjoyment.

There are schools, exactly such as Mr. Crane describes, where a man can learn to be a telegraph operator, or a stenographer, a watchmaker, or a barber, and at the end of his training course he comes out a brisk useful craftsman, needing only practice to

make him perfect. But what profiteth it a man if he gain the whole world and lose his capacity for enjoyment? Wherein is he a gainer if he can earn a living, and his life is not worth living? He can wind a commutator, but he has never heard of Franklin or Faraday. He can cut stone or mix paints, but is blind to the smile of the Venus of Milo or the grace of the Sistine Madonna. He can tune a piano, but is deaf to the pathos of Beethoven and the pious exaltation of Handel. He can survey a wilderness into town lots, but has never lifted his thoughts to the Pleiades and the flashing belt of Orion. He has mastered the books of the Scranton Correspondence School, and has never heard of the madness of Hamlet, or the troubles of Tristram Shandy. He can work for a party victory in his own riding, and knows not that his liberty to vote was won by Pym and Hampden and William the Silent and Stephen Langton. He is living by bread alone. He has no vision, he cannot see the world as a whole, he has bartered his birth-right for a mess of pottage, and sold his manhood for a meal ticket.

You are taught many things which may appear to you dry, tedious, irrelevant, uninteresting. Never mind that. You will forget more than you will remember. But always remember this, it isn't the water that stays in the fleece that scours it, it's the water that goes through the fleece. It isn't always what you remember that does you most good, it is the act of grasping new ideas, of fixing the attention, of facing novel problems, of training your brain to act quickly in emergencies. These studies you grind out here are useful, not solely for what you remember of them, but for what they suggest to you.

Mathematics is not, as the Beloved Vagabond says, a lot of damned facts about triangles; it is the plan on which the Creator fashioned the universe. Chemistry and Biology are not the mere study of reactions and adaptations; they are the keys to all life, past and present. Mining and Metallurgy are not hand-crafts; they are the factors that open new continents and change the map of the world. French and English are not simply languages in which to call for another wheel-barrow of concrete; they are the open doors to the literature and history the wisdom and pathos, the wit and humour of a thousand years.

All this broad outlook on life is summed up in one word—Culture. No one can give you this, but every college gives you an excellent opportunity to attain it. Culture, friendship, inspiration—these are three things that make life worth living, three things which are here for you to grasp and take with you. Culture, as I have said, comes from the study of broad principles and can never be attained by undivided attention to one narrow subject. Here in these halls, among these libraries and museums, you have the chance to attain it. Friendship, the good-will and affection of your fellows is here also for you. You cannot dig this out of dead books. Here around you are young men who may be leaders of the future. Learn to know them, find out the best that is in them, be loyal to them, for as the Norse proverb says, "Back is bare without brother behind it." The loyalty you give to the captain on the campus is the same loyalty that has made Canada a great country, and some day will make it, in name as well as in fact, a great self-governed, self-centred nation.

Culture, friendship and inspiration, these three, and the greatest of these is inspiration. This is the one thing which all the others lead to, for this is the true vision. Inspiration means the inbreathing of a great spirit, the breath of life in man's nostrils. We cannot define it, we cannot analyze it, we can only feel it, as we feel a chord in music. It comes from the consciousness of the presence of the mighty dead, who have moulded the nation, it comes from the companionship of noble men and women living around us, from the memories with which the college halls are hallowed. You know the feeling that comes over you in a close-packed crowd when the leader rises, and you see the tense upturned faces around you and hear the quick intake of breath, as the truth he speaks sinks home. You picture the gaunt figure of Lincoln at the National Cemetery and the hushed audience that hangs on his words as he gives them the greatest speech ever made in the English language, the matchless Gettysburg address. They turn away too deeply moved to applaud, too much uplifted to cheer, because they have received the inspiration, they have seen the vision.

There has been in every college some man around whom the highest and noblest ideas have crystallized, men that have moulded the nation; such men are our greatest inspirations. Such men as Arnold of Rugby, Elliot of Harvard, Wilson of Princeton, Angell of Michigan, and fit companion of the greatest, Grant of Queen's—these are the men who have made us men. Can any narrow course of training such as Mr. Crane desires give us anything for which we would exchange these memories? Never. Man cannot live by bread alone.

You will go from here in a few years, less skilled, perhaps, in the profession you enter than many a trained apprentice, you may earn less for a few years than if you had never come here, you will have your struggles as we have all had; but when you do attain your ideals you will have brought with you a greater capacity for enjoyment, a broader outlook on life, a nobler patriotism, and a higher ideal than if you had never spent these years at Queen's, for you will take with you somewhat of these three, culture, friendship, inspiration, to broaden and brighten your life, and you will have glimpsed the vision without which the people perish.

MARBLE BAY AND BRITANNIA MINES, BRITISH COLUMBIA.

At the general meeting of members of the Western Branch of the Canadian Mining Institute, held in Vancouver, B.C., on February 15-16, Mr. W. M. Brewer, of Victoria, B.C., gave a brief account of the Marble Bay and Britannia copper mines. He said:

"It is my desire to say something about some of the metalliferous mining properties situated within a comparatively short distance of Vancouver. Too little has been said concerning the mineral resources tributary to Vancouver. We want people to know what is going on close to their own doors, so to speak. There are two mining properties in this district with which I am acquainted, and of these I will tell you something.

The Marble Bay Mine.

"First, there is a little property over on Texada Island, known as the Marble Bay mine. It is only a

small mine, but it has the distinction of being the only mine in this district that has been operated practically without interruption since 1898, and that has been producing pay-ore continuously since 1899. This mine has paid for all of its development work out of proceeds of its ore, and, too, has paid dividends since 1902. It is interesting to know that this mine is now being worked down to a depth of 1,360 feet, and that the ore continues to be at depth of uniformly good grade. In fact, this mine was a sufficiently large producer last year, together with the Britannia, to in some measure offset, in the total production of the Province, some of the decreases in production in other mining districts.

"I remember having visited the property in the fall of 1900, in company with Mr. Palmer, then one of the owners. The shaft at that time was down 140 feet, and the owners were considering the desirability of quitting, thinking the ore was worked out. We advised them to sink deeper, so the shaft was sunk another 100 feet. The result was that Palmer and Christie, of Toronto, took out about \$65,000 worth of ore, and later sold the property to the Tacoma Steel Company for \$150,000. The new purchasers did not have to put up much money, for they were given three years in which to make the payments on purchase account, and they provided for these payments out of proceeds of ore they took from the mine. They had money from ore-shipment returns to meet their payrolls and they never afterwards had to put up a single dollar for working expenses, except, perhaps, when they deepened the shaft to the 1,000-foot level.

[Note.—Shipments from this mine in 1911 totalled about 22,500 tons of ore averaging 5 per cent. copper and fair value in gold and silver.]

The Britannia Mine.

"The second property to which I will call your attention is the Britannia, on Howe Sound, within about three hours' steamer run of Vancouver. This property was located in 1898, and was afterwards sold to Mr. Leo Boscowitz for \$10,000. In the fall of 1899, Mr. Boscowitz sold a seven-tenth interest in the property for \$35,000. Five years later he sold his remaining three-tenths interest to George Robinson and Harry Stern of New York for \$125,000.

"Robinson and Stern put up a big concentrating plant, but before they ever shipped a ton of ore the shares of original stock, issued at \$125, were selling at \$2,100. Everything went along satisfactorily, and at last Robinson sold his control to Moore and Schley, of New York. Last year the general manager, Mr. Robert H. Leach blocked out 400,000 tons of ore, and the mine is now shipping ore at a profit of \$50,000 a month.

"These two instances of mines in our own vicinity show that with perseverance and a proper expenditure of capital, it is possible to achieve very good results."

[Note.—Mr. E. Jacobs, correspondent in British Columbia for The Canadian Mining Journal, adds to the foregoing the following information: A statement made to me last November by a man familiar with operations at the Britannia during 1911 was to the effect that it was estimated fully 1,000,000 tons of ore of commercial grade was in sight in the mines of the Britannia group. Last month I learned from another source that about 700 men were then employed on the property, some in doing development work, others in

mining and milling ore, and still others at construction. The question of whether the Britannia shall in future be worked as a big low-grade mine, or as one from which only the higher-grade ore shall be extracted, is an important one. If the owners shall decide to work it as a big low-grade mine, and mine and smelt all the ore upon which even a small margin of profit will be obtainable, then it will become a much more important mining enterprise than if only the better-grade ore be extracted and the poorer ore left. There are immense bodies of ore in the mines of this group, and their utilization on a large scale will probably involve the erection and equipment of smelting works at Britannia Beach, and the employment of from 800 to 1,000 men constantly. In any case, the doubling of the generating capacity of the hydro-electric power plant, and the provision of additional transportation facilities from mine down to Britannia Beach, are likely to soon be undertaken. In the year 1911 there was mined and concentrated more than 100,000 tons of ore containing between 8,000,000 and 9,000,000 lbs. of copper.]

SAVED BY THE MINE TELEPHONE.

The public at large has already for some time past appreciated what great reason they have to be grateful for the invention of the telephone; but there are to-day two miners in Kansas who are more than grateful. They owe their lives to it.

These two miners, or "shot-firers," to be exact, are employed by the Girard Coal Company in a mine at Radley, Kansas. The mines of this company have recently all been equipped with Western Electric Company mine telephones, and, according to the rules of the Coal Company, the shot-firers must report to the night engineer, by means of the telephone, the progress of their work as they go through the mine lighting the shots. This enables the engineer to know where his men are, so that if he does not hear from them at certain intervals, a rescue party is sent down.

One evening after the miners had left, the shot-firers went down as usual to fire the shots which would bring down the coal for removal during the next day. The two men had just entered a refuge hole and one was in the act of ringing the engineer to tell him they had lighted the shots in that particular entry, when an explosion occurred. The force of the explosion was so strong that it blew in the back end of the refuge hole, and the shot-firer did not even get to talk, but was immediately overcome by the after-damp. His partner, who was with him, was likewise overcome. The night engineer, knowing that this was the station from which they should next report, immediately tried to call them, but was unable to get any response, started the distress whistle. In fifteen minutes after the explosion had occurred a rescue party was in this refuge hole and had the two shot-firers out working upon them and succeeded in resuscitating them. A little later it would undoubtedly have been impossible to revive them.

There is an employers' liability law in some States which compels the operator to pay a considerable sum for loss of life or personal injury. The fact that the telephone very often prevents accidents and assists in quick rescue work, saves the operator a great amount of money. In the Girard Company's mines there were three severe explosions during the winter, but not one of the Western Electric mine telephones was injured, nor was service interrupted.

CORRESPONDENCE

MR. J. G. S. HUDSON'S REPORT ON THE BELLEVUE DISASTER.

Editor Canadian Mining Journal:

Sir,—As my name is mentioned in this report and Mr. R. W. Coulthard has contributed an article to the February 1st edition of *The Canadian Mining Journal*, I beg to submit a few notes to encourage discussion on the subject generally and on mine rescue business in particular.

Cause of the Disaster.

Under this heading Mr. Hudson has made some mistakes, which might have been avoided if he had examined the inside of the mine for himself, instead of depending implicitly on information given to him by various people who may have been in the mine.

On page 152, he agrees with others, that the destructive "zone" of what he calls the "explosion" was at 75 or 76 chute, and that the proof of an "explosion" was demonstrated by the "large amount of carbon mon-oxide gas and afterdamp encountered by the exploration party, in this section of the main gangway, and also that three of the four bodies recovered between 53 and 54 were burnt."

No evidence was given at the inquest that there was a large amount of carbon mon-oxide and afterdamp present, neither was there any evidence given that "any" bodies were "burnt," anywhere in the mine, and certainly not between 53 and 54 chutes.

To take the evidence of burning first: Two out of the four men who were packing a stick of timber along the fourth cross pitch, between 52 and 46, had burns on their faces on one side only, and only one of these two had both hands burned. The evidence was that these burns were from the heat of the floor where they were lying, and not from gas burns. No singeing of the hair, whiskers or moustaches, was in evidence. The peculiarity of these burns has not yet been explained. As some aid to those who may take part in a discussion on this subject, it may be noted, that these four men were carrying a piece of timber when the disaster overtook them, and were probably passing a cut through to the level above, as one man was buried by the debris blown down it, and his body showed marks of the force with which particles of coal were carried along. But his body was absolutely free from burns of any kind, and one of the other men was also equally free from burns. The man found close to the top of 52 chute was the one who had his cheek roasted where it rested on the floor and both his hands burnt. The fourth man also had one cheek roasted where it rested on the floor. The debris on this level, also in 52 chute, was found to be hot when the bodies were recovered. As an indication of the force which may have been exerted in this fourth cross pitch, it may be noted that in the previous disaster of the 31st of October this cross pitch driving from No. 52, was not cut through to the cross pitch driving from 46, but the force blew out the rock strata, of about 3 feet thick, which separated the headings. In this part of the mine the coal had doubled in thickness and was separated by the rock which was blown out and the headings or levels had just overlapped.

This demonstration of hot debris on the floor, was also in evidence in No. 82 chute, from between the 2nd and 4th crosscuts, after both the October 31st and December 9th disasters. On the first occasion it was thought to be a "gob fire," and on the second occasion Heal, one of the miners, tried to escape up No. 82 and out at the upcast shaft, but turned back because the floor was so hot that he could not bear his hand on it, and also because there was a large fall of roof. This fact also nullifies Mr. Hudson's assertion, on page 154, that there was only one way of exit and that that was along the main haulage road. Further than that there was a travelling way out of the mine through No. 45 chute. This is sufficient to show that there was no justification for saying that no one "made the slightest attempt to escape from the mine by travelling up the chutes."

Mr. Hudson then goes on to give his theory of the disaster, but the writer thinks that it was an inopportune time to put his reasons in print after the enquiry was closed. He ought to have brought it forward at the time of the inquest, when he might have assisted the jury, and, at the same time, given the interested parties an opportunity of examining him on the correctness or otherwise of his deductions. The writer, in his theory that the effects produced throughout the mine were due to "air percussion caused by a very heavy fall of roof," receives considerable support from Mr. Hudson's argument, viz., that "the heat generated by the friction and concussion of rocks raised the temperature of the air and gas to a high point, so that it would require only a spark of comparatively low thermal intensity to reach the ignition point of a small volume of hot explosive gas."—"the air was in sluggish condition, consequently, when the explosion occurred, would give out a large volume of carbon mon-oxide gas without large demonstration of force." Mr. Hudson says, "without a large demonstration of explosive force." What he infers from this it would be difficult to guess, after reading what he says Brownrigg told him (see pages 147-148), and also taking into account that two men were killed by violence outbye of No. 45 chute on the main gangway or haulage road.

Volume of Carbon Mon-oxide Gas or Afterdamp.

The writer differs from Mr. Hudson's conclusions on this point entirely, as everything found after the disaster tended to show that the volume or percentage of either carbon mon-oxide or afterdamp was extremely small. Thus the men, even those who were found dead, wandered about the roadway for a long time before a portion of them succumbed, and even these would have survived if the air compressing engines had been kept going; further than that the group of men who were found alive at the far end of the main gangway at 124 chute, were there for four hours without any ventilation whatever, and it was not until the lapse of this four hours that the high pressure air was sent into the mine, and eventually kept these men in safety.

The writer would like to know from Mr. Hudson, where the gas came from which he assumes was "exploded." Did it come down with the fall of rock or does he assume it was already standing there ready to be ignited? The only evidence that was brought forward at the inquest with regard to gas (firedamp),

suggested that it was far higher up in the mine, and this in a mine rising from 45 to 80 degrees, and vertical in some places. Then again it must be borne in mind, that the pillars between 70-71 were intact with stopings in the cut-throughs, and that it is quite clear that Mr. Hudson's theory needs a great deal of elaboration, before it can be accepted as in any way accounting for the demonstrated results of the disaster.

The writer would also like to ask Mr. Hudson if he examined under the microscope any of the dust which he calls "coked," and, further, he would like to ask, either Mr. Hudson or anyone else, what is the lowest heat which will cause tar to exude from such a coal, sufficiently to cause it to cohere in places?

He would also like to remind Mr. Hudson, that the majority of the dust had been exposed to two "effects," that is, on the 31st October and the 9th of December, and that after the latter disaster the witnesses said the mine was very dusty.

The writer would further like to know if it would surprise Mr. Hudson to learn that the loss of two lives was entirely due to some persons opening the main doors in the gangway, and thus cutting off the air from the rescue party. This allowed gas to come down into the roadway from the unventilated workings extending from No. 82 to 129. At the time of the inquest the writer was unable to account for this, but he has since found evidence that it was due to someone leaving the two main doors wide open for a considerable length of time.

Rescue Apparatus.

The writer entirely endorses Mr. Hudson's note on page 154, which is in effect that the possibilities of this class of apparatus is entirely over-estimated and that the average man expects more from it than it was ever constructed to perform—it is an aid to a rescue party and not the rescuer.

One of the principle adjuncts to an oxygen-breathing apparatus is the Pulmotor, if properly used. This apparatus is generally sent out in a box containing two means of applying oxygen, one of which can be applied in a vitiated atmosphere, whereas other types can only be used in fairly pure air. The writer would, therefore, suggest that these two should be so as to prevent confusion—one apparatus could then be taken in by a rescue party, and the other retained at the base of operations.

Mr. Hudson suggests that either the Dominion or Provincial Governments should see to the establishment of oxygen-breathing or rescue stations. He does not seem to be aware that these were already established in British Columbia, and are in course of establishment by the Albertan Government.

The writer would like to suggest as a proper subject for discussion the advisability of the Albertan and British Columbian Governments jointly providing a railway car fitted in a similarly efficient way as these in use in the United States, carrying a trained crew, who would move continually from place to place on the line of collieries extending from say Taber right through to Fernie or Morrissey. This crew might examine all apparatus at all collieries and see that they are kept in perfect order, and give demonstrations. The car might also be used as the means of transport of an official examining doctor under the St. John's Ambulance Association. This would ensure a uni-

formity of competency amongst the members of the different brigades, and might be carried one point further by training classes in nursing in the different colliery villages.

The writer is absolutely certain that there is not one man in charge of any colliery in Alberta or British Columbia who is in any sense, either so reckless, or so unmindful of the value of human life, as to risk either life or limb to the exigencies of output.

Yours, etc.,

JAMES ASHWORTH.

Exaggerated Statements from Nelson, B.C.

The Editor The Canadian Mining Journal:

Sir,—In The Canadian Mining Journal of March 1, there was printed a "Lettergram from the Nelson (B.C.) Board of Trade. This was signed "H. H. Currie, Secretary Nelson Publicity Bureau." May I be permitted to express the opinion that the publication of some of the statements—or, as I think, mis-statements—in that lettergram may be expected to cause those who know the facts to regret that The Journal has unwittingly permitted itself to be used as a medium of a character that it were better to avoid giving space to in its columns.

It may suffice to show that my protest is well warranted if I take three of what I deem to be mis-statements and contrast them with what I believe to be the facts of the several cases I refer to; it does not appear to me necessary to go into further detail to make clear the generally inflated nature of the statements made as a whole.

1. "The Standard Silver & Lead mine at Silverton, last year opened a width of 83 feet of clear ore on the fifth level."

Assuming that "clear" ore means clean ore, my information, and belief after having visited the Standard mine several times during the last eighteen months, is that certainly not more than one-fifth of that width of clean ore has been opened on the fifth, or any other, level of the mine. Members of the Western Branch of the Canadian Mining Institute visited the mine and examined the fifth level last September, but, so far as I know, none would have the hardihood to make such a grossly exaggerated assertion as that there was seen a width of 83 feet of "clear" or any other commercial ore. Those who shall meet Mr. O. E. LeRoy, of the Geological Survey of Canada, may ascertain from him whether on the occasion of his last visit to the mine three months ago, or at any other time, he saw even 20 feet of clean ore, that is ore that could be shipped to the smeltery without previous concentration.

2. "Eighty-seven properties shipped ore last year, and the output was thirteen million dollars."

It is true that shipments of ore, from a single ton upwards, were made from numerous properties, but if it were desired to show the facts of the situation some discrimination would be made between those that made a quite unimportant output and those that made production of appreciably large value. As to value of output of ore—the "Preliminary Review and Estimate of Mineral Production for Year 1911," made by Mr. Wm. Fleet Robertson, and published by the Government of British Columbia, shows an estimated value of the

“total metalliferous” production of the whole Province, not of Kootenay district only, of but \$12,224,316. This preliminary estimate was placed on the table in the Legislative Assembly of the Province on February 15, four days before the date of the Nelson “boost.” It includes nearly all the placer gold of the Province; and all the lode production of the big mines in Boundary district; that of the Hedley Gold Mining Co., Similkameen, and that of the Coast district (Britannia, Marble Bay and other mines.)

3. “The iron and asbestos deposits are still virgin.” It is true occurrences of iron ore are known, but, so far as I have been informed, no asbestos—that is, true asbestos, of commercial value—has yet been found in Kootenay district. Geological Survey officials inform

me that hornblende has been mistaken in Kootenay for asbestos, but they have not yet found the latter mineral there.

The platinum resources of Kootenay are generally regarded, outside of a few men interested in local mineral claims, as existing largely in imagination.

Perhaps Nelson may yet realize the unwisdom of subsidizing uninformed assertion and insist that it receive for its money subscribed for publicity purposes the full value that may be obtained by telling facts only, which are quite good enough as regards the mineral resources of the Kootenay, without having to resort to fiction.

E. JACOBS.

Toronto, Ontario, March 9, 1912.

REPORT OF THE DEPARTMENT OF MINES OF NOVA SCOTIA FOR 1911

The report of the Department of Mines of Nova Scotia has been received, and the following table gives a summary of the mineral production for the year ending September, 1911. It also compares those figures with the output for the year 1910.

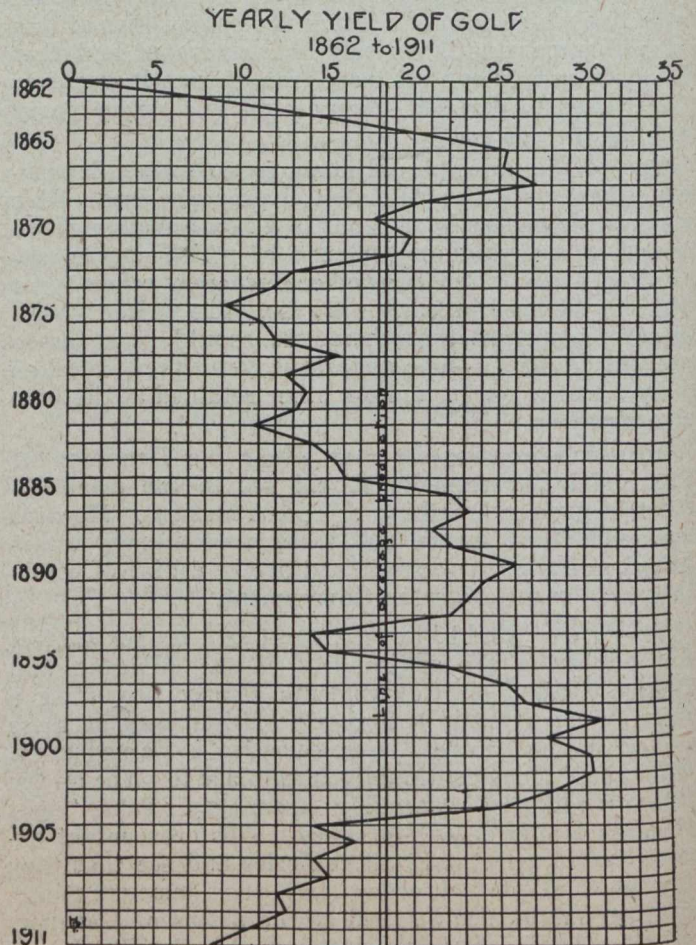
Mineral.	Quantity.	
	1910.	1911.
Coal raised (gross tons)	5,477,146	6,208,444
*Iron ore (net tons)	52,640	53,595
Pig iron made (net tons)	341,674	397,615
Steel ingots made (net tons) . .	409,663	438,922
Limestone quarried (net tons)	483,100	525,286
Coke made (net tons)	493,167	545,619
Gypsum quarried (gross tons)	322,974	297,641
Building stone quarried (net tons)	8,503	11,226
Bricks made	21,305,500	23,273,700
Drain pipe and tile made (ft)	974,819	1,431,761
Grindstone, quarried (net tons)	325	380
Gold bearing ore mined (net tons)	49,557	18,320
Gold produced (ounces)	10,675	8,389
Manganese ore (net tons)	25	150
Antimony concentrate (net tons)	203	191
Moulding sand (net tons)	180	380
Tungsten ore (net tons)	75	75
Sulphate of Ammonia	3,622	3,971

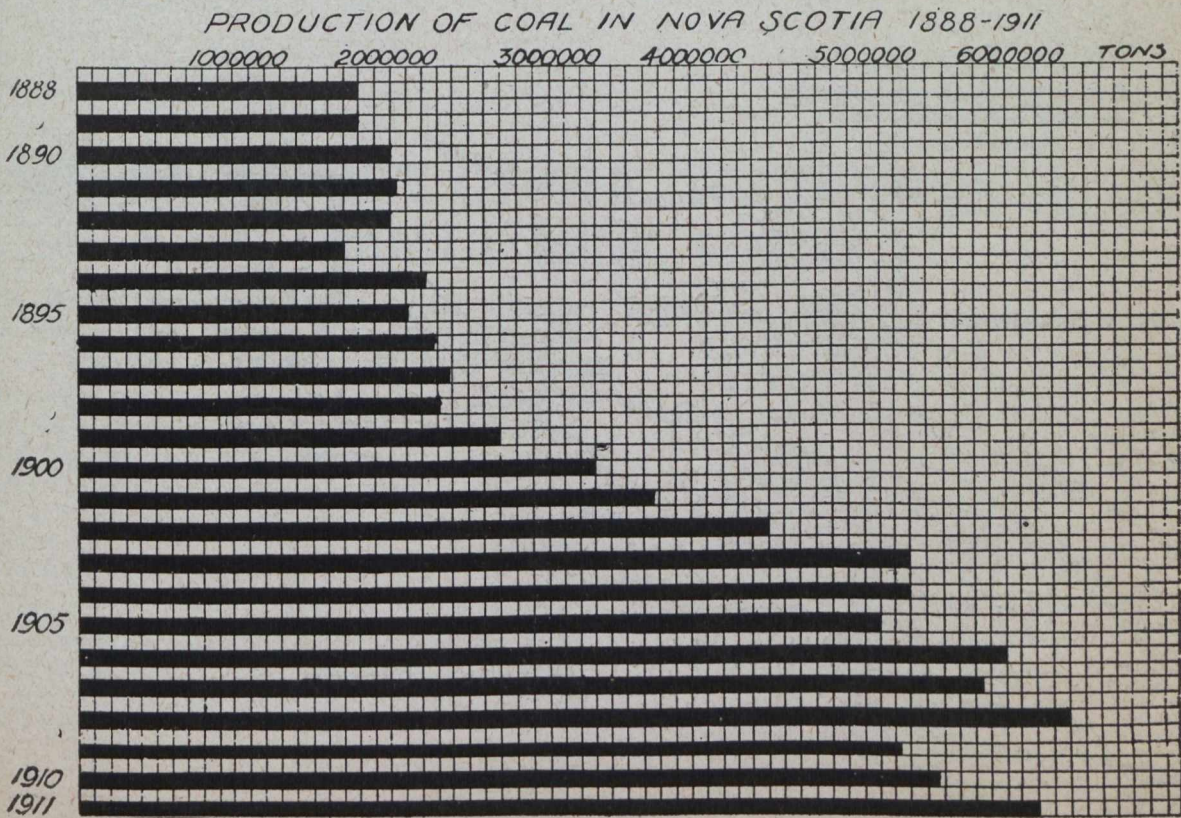
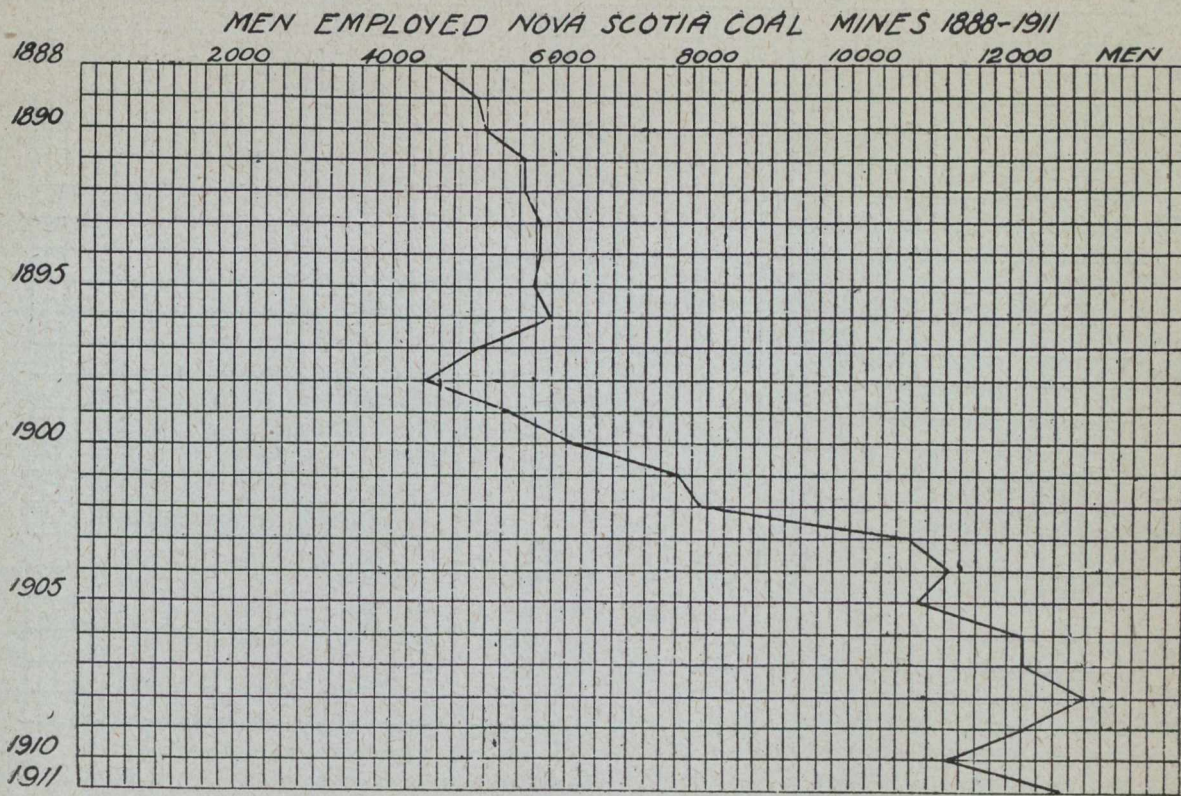
This report shows that, with the exception of gypsum, gold, and antimony, there was a general increase in the mineral industry of the province. The production of gypsum decreased 25,333 tons, or a little less than 8 per cent. The tonnage of gold ore decreased by 31,237 tons, or 63 per cent.; but the gold produced decreased only 2,286 ounces, or a little over 21 per cent. The production of antimony concentrates decreased 14 tons, or 7 per cent.

*Iron ore imported 1909-10, 705,351; 1910-11, 853,904 net tons.

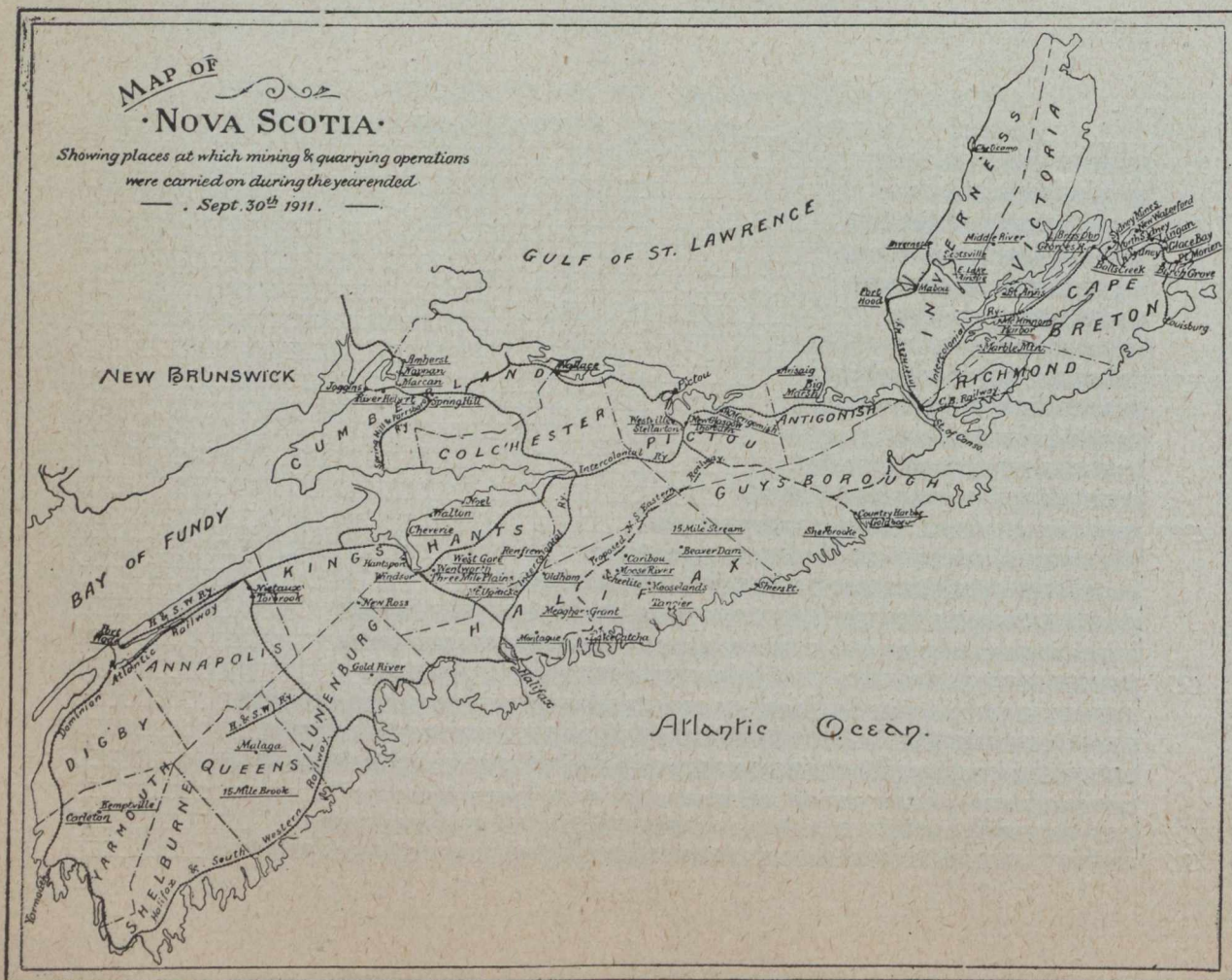
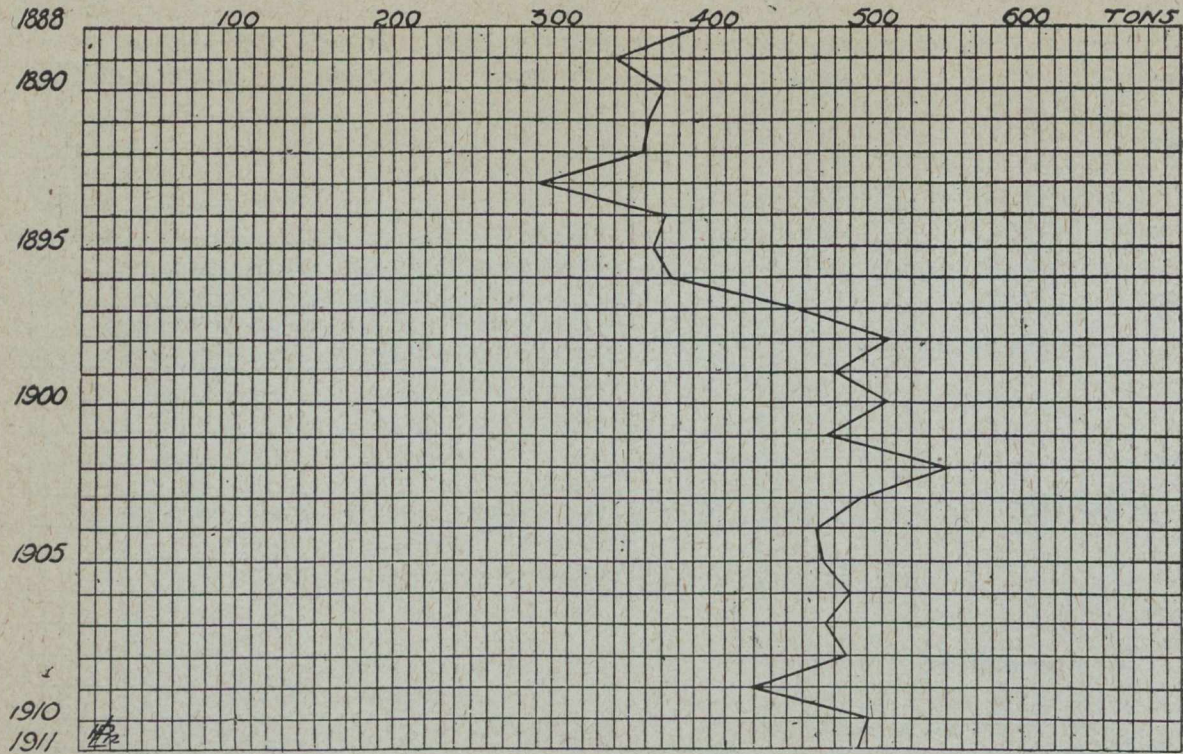
Coal Mining.

Coal mining, the most important mineral industry of the Province, shows an increased production of 731,298 tons, or a little over 13 per cent. over that of the previous year. The following table shows the distribution of coal sold during 1911, compared with the returns for 1910. This shows an increase in sales of 13.5 per cent.





OUTPUT IN TONS PER MAN PER YEAR 1888 - 1911



	1910.	1911.
Nova Scotia	1,806,999	2,108,665
New Brunswick	530,614	541,591
Newfoundland	176,986	184,195
Prince Edward Island	79,492	80,637
Quebec	1,786,948	2,067,831
United States	290,668	332,301
St. Pierre	7,504	9,024
Bunker	217,685	204,681
Time Charter Boats .....	.....	25,545
Other Countries .....	.....	1,992
Tons	4,896,896	5,556,464

The production of coal by counties shows an increase in all except Inverness County. This is relatively small, being 31,325 tons, and is due largely to the flooding of the colliery of the Port Hood-Richmond Coal Company, on June 23, 1911, a feeder of salt-water suddenly making its appearance through a cover of 942 feet and flooding the mine.

Production by Counties.

	1910.	1911.
Cape Breton County	4,205,131	4,736,026
Pictou County	630,049	727,944
Cumberland County	277,862	411,695
Inverness County	364,104	322,779

The Dominion Coal Co., Ltd., is by far the largest producer, and its product is considerably augmented by its lease of the Cumberland Railway & Coal Co. The production of the various companies operating is shown by the following table:

Company.	Output.	Sales.
Dominion Coal Co., Ltd.	3,892,958	3,545,784
N. S. Steel & Coal Co., Ltd..	757,823	695,818
Cumberl'd Ry. & Coal Co., Ltd.	191,849	139,765
Acadia Coal Co.	466,337	372,900
Maritime Coal, Ry. & P. Co...	163,763	14,371
Inverness Ry. & Coal Co.	291,587	268,722

Company.	Output	Sales
International Coal Co.	261,607	239,300
Sydney Coal Co.	3,687	3,363
MacKay Colliery	29,081	27,199
North Atlantic Collieries Co...	47,992	35,772
Port Hood Coal Co.	41,192	33,956
Minudie Coal Co.	54,481	46,134
Atlantic G'stone & Coal Co...	334	279
Colonial Mining Co.	4,485	3,140
Great Northern Coal Co.	1,267	618
	66,208,444	5,556,464

The importance of the coal industry can be judged by the number of persons employed in it. In the year ending September 30, 1911, the industry employed 12,522 men and boys in skilled and unskilled labour, with a total of 3,527,149 days' work. The number employed underground were 5755 skilled workers, 3491 labourers and 739 boys, with a total of 2,802,534 days' work. On the surface were employed 1,064 skilled workers, 1,272 labourers, and 183 boys, at a total of 721,858 days' work. Construction work took 8 skilled labourers and 10 labourers, giving 2,757 days' work. There also were used 182 horses on the surface, and 810 horses underground.

During the year there were 185 accidents in the coal mines and of these 36 were fatal. Of the fatal accidents 8 were due to a gas explosion on January 3rd, 1911, in the Sydney No. 3 mine.

The volume contains a special report by the Deputy Inspector of Mines on this explosion, and also one by a commission appointed to investigate it.

There is also a special report on the flooding of the Port Hood mine.

The reports of the Deputy Inspector contain much detailed information as to surface and underground equipment and timber used during the year in the different collieries operating.

(To be continued.)

ANNUAL REPORT OF THE TRETHERWEY SILVER-COBALT MINE, LIMITED

Directors' Report Submitted at the Annual Meeting of Shareholders Held on Wednesday the 28th Day of February, 1912.

The directors have pleasure in submitting herewith statement of revenue and expenditure, balance sheet and report for the year ended December 31st, 1911.

The gross revenue from the sale of ore and other sources during the past year amounted to \$372,622.45 while the total expenditure for the year was 212,316.04

Showing a surplus of \$160,306.41

The following figures show the production, gross revenue and expenditure since the inception of the company until 31st December, 1911:

	Gross Ounces	Gross Revenue
1906-7	467,992	\$249,262.61
1908	767,002	357,970.78
1909	710,092	350,257.39
1910	865,777	437,552.25
1911	770,838	372,622.45
Total.	3,581,701	\$1,767,665.48

Expenditure	Net Profit	Dividends Paid
\$124,739.82	\$124,522.79	\$ 75,636.00
147,446.47	210,524.31	141,817.50
150,449.75	199,807.64	144,545.00
199,751.83	237,800.42	100,000.00
212,316.04	160,306.41	200,000.00
\$834,703.91	\$932,961.57	\$761,998.50

The decrease in production in 1911 as compared with 1910 is accounted for by the fact that a large proportion of the milling ore dealt with during the year was taken from old workings from which the original high-grade veins had been removed, thus reducing the average value of the mill heads with a consequent reduction in the value of the jig and table concentrates produced.

The increased expenditure has been largely incurred in extensive underground exploration and development work, all of which has been charged to operating account.

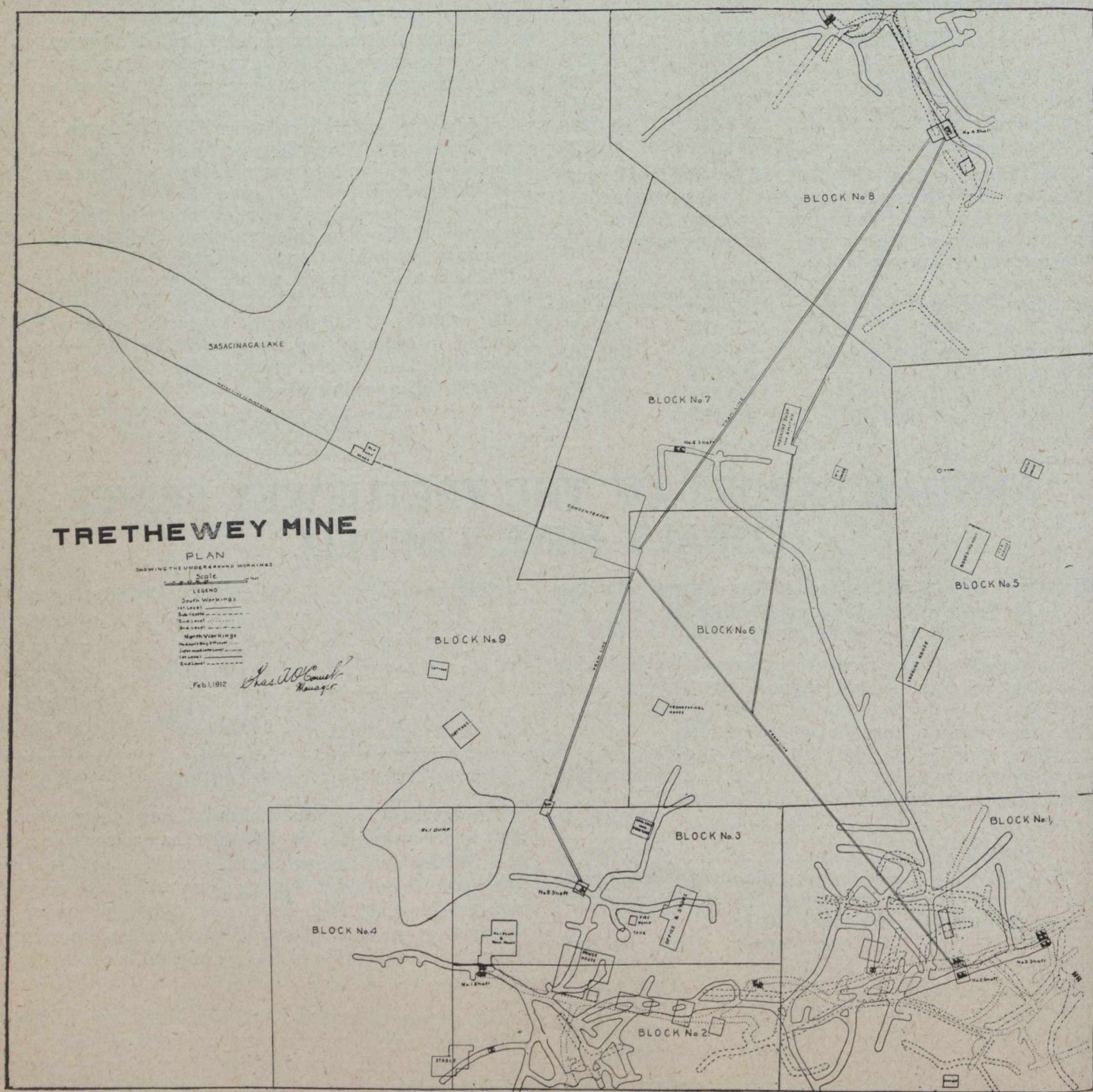
The shipments during 1911 were as follows:—

	Tons.	Ounces.
5 cars high grade ore and jig concentrates to Carnegie	125	272,309
4 cars high grade ore and jig concentrates to Deloro	92	141,172
4 cars concentrates and low grade ore to Carnegie	97	66,746
2 cars concentrates to Deloro.....	63	62,647
4 cars concentrates to Thorold.....	109	104,579
2 cars concentrates to Orillia.....	53	54,935
1 car slimes to Denver.....	32	7,300
Bullion to London .....	..	6,836
		716,464

Mining Operations.

A report and map prepared by the manager covering the development work and physical condition of the mine up to the present date accompanies this report, from which it will be seen that the east central portion of the property is still practically unexplored, and the possibilities of meeting with important ore bodies through the workings which have been opened up by the past year's development work are excellent.

Operations at the north end of the property have been temporarily suspended pending the continuation of the north cross-cut, which, when completed, will connect the north and south workings, enabling the northerly portion of the property to be operated more advantageously through No. 6 shaft, which is located close to the mill and near the centre of the property.



Milling operations have proceeded without interruption during the year, 33,339 tons having been treated, with a recovery of 486,431 ounces, added to which 284,407 ounces were recovered from high-grade shipping ore, making the total production 770,838 ounces for the year. Certain alterations are contemplated to be made in the near future which will enable a larger tonnage of ore to be dealt with so that the returns from this source should be augmented during 1912.

Water Supply.—During the past year water in Sasaginaga Lake, which is the source of supply for milling purposes, became dangerously low, and as the Town of Cobalt has the first right to this body of water for municipal purposes, it was necessary for the mining companies using it as a source of supply to take steps to protect themselves. By co-operation of the Coniagas, Buffalo, Hudson Bay and Trethewey Mining Companies, the Mines Water Supply Company was formed, and at an expenditure of about \$20,000, borne by these companies, a pumping station has been installed at Mud Lake, from which the supply of water in Sasaginaga Lake will be maintained to meet all requirements of the town and mining companies.

Power.—The service of compressed air for mining purposes, obtained from the Northern Ontario Light & Power Company has been improved, and while no further interruption is likely to occur, the company's compressor plant is available at an hour's notice to meet such a contingency. The electric power for milling operations, obtained from the same company, has been entirely satisfactory during the year.

Numerous properties have been submitted for sale to the company during the year, but nothing satisfactory to the directors has yet been found, so that the one million shares in the company's treasury are still intact, and no departure will be made by the directors from the policy already laid down of consulting with the shareholders before any purchase is made.

The average price received for silver during 1911 was 52.87 cents per ounce. The price of silver has recently advanced to about 60 cents per ounce, which, if sustained, will favourably affect revenue for the coming year.

ALEX. M. HAY,
President.

Toronto, February 17th, 1912.

* * * * *

Trethewey Silver-Cobalt Mine, Limited.

Mine Office,

Cobalt, Ont., February 12th, 1912.

To the President and Directors,
The Trethewey Silver-Cobalt Mine, Limited,
1428 Traders Bank Building,
Toronto, Ont.

Gentlemen:—

I beg to submit the following report covering past development, and the physical condition of the mine as at the present date.

Geology.—The geological conditions show that the Huronian conglomerate occupies about 29.30 acres covering the entire east portion of the claim, and extending from the north to the south boundary. The remainder, about 10.65 acres on the west side, consists entirely of the Keewatin rocks.

Veins.—There are two definite vein systems developed on the property to date. The vein system on the south part of the claim consists of a series of veins with a general east and west strike, covering an area of approximately eight acres. In this group or system there are 22 veins, although some of the smaller ones are branches of the larger and stronger veins.

For the purpose of this report I have divided the property arbitrarily into nine blocks, as follows.—

Block No. 1, being the southeast portion of the property, is bounded on the east by the "Fourth of July" and "Meyer" veins section of the Nipissing, on the south by the Coniagas mine, and contains about 3.02 acres. This block has been very thoroughly developed, and a large tonnage of high grade and milling ores have been extracted therefrom. Notwithstanding the large amount of work which has been done here, however, there are a number of small undeveloped areas within this block which are extremely promising, and I am of the opinion that there are excellent chances of encountering other bodies and lenses of ore in this section.

Block No. 2, lies west of Block No. 1, adjoining the Coniagas mine to the south, and containing about 1.44 acres. The westerly portion of this block is now being developed, and it is within this area that the "A" and "H" vein systems are at present being stoped. On "H" vein, which has been a steady and consistent producer for the past six months, a stope 255 feet long has been opened. As at this date the major portion of the available ore in the west end has been broken, but there remains the whole of the centre and east section still to be stoped.

Block No. 3, lies directly north of No. 2 Block, and embraces 1.74 acres. The only ore body thus far opened within the boundaries of this block is that contained in "D" vein. This vein produced some very rich ore during the time that Mr. Trethewey operated the property. During the past year some fair grade ore was stoped here, and some very fair grade ore still remains in the back of this stope, which will be extracted later. From the east face of "D" vein drift a short crosscut has been run to the south, where the vein seems to have faulted. Further exploration on this portion of Block No. 3 will be undertaken at an early date.

Block No. 4, lies directly west of Blocks Nos. 2 and 3, and contains 1.74 acres. In the west portion of this block the overlying Huronian formation is shallow, and little or no work has been done in this part of the mine for a number of years. Before the mill was erected, and at a time when only a shipping grade of ore could be profitably dealt with, work was confined to No. 1 vein in this area, and very little crosscutting was done. Profiting by recent experience, however, it is probable that additional ore bodies will be found, when development work is resumed in this section.

Block No. 5, occupies the east central portion of the property, and contains 2.52 acres. There has been no work done within its boundaries, other than surface trenching, which uncovered a number of fissures, but none of them showed any ore at their outcrops. This condition, however, does not mean that ore will not be found at depth, as many of the best producing veins on the property have been barren at, or near, the surface. The Huronian formation being deeper here than in any other portion of the property, it is reasonable to expect that further development work in this block

will result satisfactorily, and the same will be undertaken during the present year.

Block No. 6, lies almost in the centre of the location and has an area of 2.66 acres. The only work done in this area is the "North Crosscut" which was run on the first level through the block, from the southeast corner, in a northwesterly direction into Block No. 7. No ore body has yet been found, but further aggressive development will be undertaken in this section at an early date.

Block No. 7, lies to the north of No. 6, and contains 2.72 acres. In this block a wide vein known as the "Mill Fissure" was encountered in November, 1911, in the "North crosscut" above mentioned. At the point of intersection the fissure contained only patches of calcite, with occasional small silver values, the balance of the vein filling being mostly clay gouge. So far as development work has proceeded, no rich ore has been encountered at this horizon, but I am of the opinion that such will be found by further drifting and sinking. Owing to the long distance which the North Crosscut has been run from the working shafts, it became necessary to make a raise to the surface on this block in order to dispose of waste rock extracted during the process of development and to obtain ventilation. This raise was holed through last week, and will be designated No. 6 shaft. This will enable development work to be carried on advantageously from this point. The plan for further development on the mill fissure contemplates drifting east where the vein in the face looks very promising, and is heading towards several fissures in Block 5, which will be developed through these workings.

Block No. 8. This block is situated on the northeast corner of the property, and contains 4.18 acres. It has within its boundaries all of the work done from No. 4 shaft. In this vein system considerable high grade ore has been encountered, but it is a peculiar fact that the veins here do not produce any large quantity of milling ore. Further development of this block is contemplated by the continuation of the North Crosscut from the mill fissure, connecting up the second level

of the No. 4 shaft by a raise, which will give a complete underground connection from the south end of the property to the north boundary.

Block No. 9. This block, consisting of 19.46 acres, contains practically all of the Keewatin area. So far as exploration has gone, no ore bodies of any importance have been found in this area, but further exploration is contemplated during 1912.

The development work during the past year and to date is as follows.—

Drifts and crosscuts	2,801	12,369
Shafts	102	740
Raises and winzes	168	1,239
	3,071 feet	14,348 feet

A large proportion of the work done during 1911 was unprofitable, but necessary crosscutting, which will enable future development work to be conducted more advantageously.

Owing to the irregular occurrence of veins and values, it is impossible to estimate with any reasonable degree of accuracy, the tonnage and value of ore rendered available by development work, but judging from the operations conducted during 1911, the amount of ore placed technically "in sight" is about equal to the amount of ore mined during the period.

The total production from the areas already developed and worked to January 1st, 1912, has been slightly over four million ounces, including the ore mined by Mr. W. G. Trethewey before the property was taken over by the company. It is not unreasonable to expect that a large production will be obtained from the ground still to be explored and developed within the confines of the property.

The physical condition of the company's plant is in excellent shape, and I look forward to the year 1912 with every hope and expectation of an increased production and profitable operation.

Yours very truly,

CHAS. A. O'CONNELL,

Manager.

CANADIAN MINING INSTITUTE—WESTERN BRANCH

The twelfth general meeting of the members of the Western Branch of the Canadian Mining Institute was held in Vancouver, British Columbia, on Thursday and Friday, February 15th and 16th. Mr. Robert R. Hedley, of Vancouver, chairman of the branch, presided, and the arrangements for the meeting, in connection with which four sessions were held, were made by the branch secretary, Mr. E. Jacobs, of Victoria, B.C.

Other members present beside the chairman and secretary, were: Messrs. W. H. Armstrong, W. M. Brewer, B. Browitt, S. J. Castleman, Neil McL. Curran, James Findlay, C. F. J. Galloway, Chas. Graham, Thos. Graham (chief inspector of mines for British Columbia), E. A. Haggen, A. E. Hepburn, A. G. Larson, Alex. McKillop, P. J. Moran, E. Priest, W. F. Robertson (provincial mineralogist), Alex. Sharp, W. J. Sutton, T. J. Smith, Bruce R. Warden, and others. Among the non-members present were: Mr. E. W. Parker, of Washington, D.C., statistician of the Division of Mineral Resources, United States Geological Sur-

vey; Mr. H. M. Wolfen, engineer in charge of Mine-Rescue Training Stations and associated work of the United States Bureau of Mines; Prof. Milnor Roberts, dean of the College of Mining, University of Washington, Seattle, Washington, and Prof. J. Daniels, also of the faculty of that university; Mr. W. T. Perkins, of Seattle, vice-president for the State of Washington of the American Mining Congress; Mr. H. E. Metcalf, of Pittsburgh, Pennsylvania, first vice-president of the Draeger Oxygen Apparatus Company; Mr. F. Napier Denison, of the Dominion Meteorological Office, Victoria, B.C.; W. J. Mazay, Crow's Nest Pass, B.C., and the following among many more, residents of Vancouver. Messrs. James Ashworth, Philip Billingham, R. J. Drinnan, D. Morkill, — Shannon, and Dr. McTavish.

Thursday Morning Session.

The meeting was opened at 11 o'clock in the hall of the Vancouver Board of Trade. The secretary read expressions of regret at inability to send official repre-

representatives from Mr. R. W. Brock, director of the Geological Survey Branch, and Dr. Eugene Haanel, director of the Mines Branch, of the Canada Department of Mines; also regrets at inability to be present, by reason of pressure of official duties, from Mr. D. C. Botting, of Seattle, Washington, State inspector of coal mines, and Mr. John T. Stirling, provincial inspector of mines, Edmonton, Alberta.

Welcome Address by the Mayor.—A welcome was extended to the members of the Western Branch and the visiting non-members, on behalf of the City of Vancouver by Mayor Findlay, who delivered a brief address. He paid a particular compliment to the United States mining men present, it being, he said, to the men and capital from the other side of the International Boundary Line that the province is indebted for a large measure of activity in the mines of British Columbia. He referred to a recent visit to Porcupine camp in Ontario and expressed the opinion that there are as many promising mining propositions offering for investment in this province as in that Eastern mining camp.

The chairman suitably acknowledged the mayor's courtesy, and then expressed the hearty appreciation of the presence at the meeting of official representatives of the United States Geological Survey and Bureau of Mines, respectively, and of the visiting professors from the University of Washington College of Mining. These several gentlemen, having stated the pleasure they felt in attending the meeting and voiced their good wishes for its success, were followed by Mr. Perkins, who brought greetings from the Seattle section of the American Mining Congress, and by Messrs. Robertson and Sutton.

Chairman's Address.—After a few introductory words, Mr. Hedley said: "It is understood the chief subject of papers and discussion at this meeting shall be coal and associated matters, so I shall refer to new coal fields in the northern interior of British Columbia.

"One of these northern fields has been little spoken of, and its importance has been overshadowed by recent developments in the anthracite field at the headwaters of Skeena River. I refer to the Copper River coal field, also in Skeena district, in which latter field much progress in development has been quietly made under the direction of competent men in the employ of a leading financial company of the City of Vancouver, which company holds seventy-five sections at Copper River. This field may be connected with the Grand Trunk Pacific by a railway 32 miles long to Hazelton, which is said to offer no serious difficulties to construction. It has been reported on by Mr. Edward Dinan, of Seattle, who pays high tribute to the character and occurrence of the coal, and calling attention to the large area of undisturbed coal-bearing formation, argues a vast tonnage. Mr. Rees Treharne, of Cardiff, who reported for an English company, to which the property has been under option for the past 15 months, stated that 12,000,000 tons are available from openings on Coal Creek, of seams already proven. Seven commercial seams have been proven on the property, if one may include as commercial three seams 28 to 30 inches in thickness, having a favourable mining gouge. Six of those are contained within approximately 300 feet of measures.

"The lowest seam is shown by open-cut only; it is 10 feet wide, but rather mixed as to quality. The

next, known as the main seam, though but little developed, shows 5 feet 6 inches of excellent clean coal. The next higher is developed by a drift, probably now more than 200 feet in length. This seam is 6 feet thick, with 5 feet 9 inches of clean coal and three inches of good mining dirt. Again, higher up, there is a 30-inch seam, having 28 inches of clean good coal, and this has been driven on for 103 feet. Above these seams, possibly a mile and a half to two miles up Coal Creek, a fine coal seam outcrops; this has six inches of mining dirt on the floor, and 30 inches of excellent coal.

"The coals vary in ash up to 10 per cent., and give an expanded analysis of lowest and highest determined:—

Fixed carbon	54 to 64 per cent.
Volatile combustible matter....	41 to 30 per cent.
Water.....	3 to 5 per cent.

This gives the coal from the main seam a good standing among the bituminous coals, but relegates the other to the low-carbon bituminous class according to Dowling's split volatile ratio. While no conclusive tests for coking quality have been made with Copper River coals, Mr. J. O'Sullivan, of Vancouver, classifies them generally as coking coals, and Mr. Godfrey, under whose direction the development work has been carried out, conducted a rather severe test by coking in a pit, obtaining as a result a brilliant, firm coke, of long texture, that promised excellent commercial results. So far as has been observed, the measures have a dip of 28 to 30 degrees and generally afford favourable roof and floor.

"I should like to talk about the coal areas of Groundhog Basin, but the only authentic information I could give you would be by quoting Mr. G. S. Malloch, of the Geological Survey, who states that the measures have a thickness of 3,000 feet and contain coal in commercial seams only near the top and bottom, and that the coal is anthracitic in character. An average of analyses obtained by the British Columbia Anthracite Company expands to

Fixed carbon	91 per cent.
Volatile combustible matter....	5 per cent.
Water.....	4 per cent.

Applying Dowling's split volatile ratio, this coal is placed by its high water in the semi-anthracite class. This coal is from seams of the upper measures, and is purely superficial. It is reasonable to expect an improvement in the water content. Indeed, Mr. James McEvoy, who has done some development work on the upper seams, obtained better results, averaging: Fixed carbon, 83.95 per cent.; volatile combustible matter, 6.75 per cent.; water, 1.90 per cent., and ash 7.40 per cent., expanding to: Fixed carbon, 90.7 per cent.; volatile combustible matter, 7.3 per cent., and water, 2 per cent., therefore classing as anthracite.

"Mr. R. C. Campbell-Johnston, who is developing the seams of the lower measures, quotes an analysis which expands to:

Fixed carbon	92. per cent.
Volatile combustible matter....	6.5 per cent.
Water.....	1.5 per cent.

gaining it a place among the anthracites. "Some interesting samples, said to have come from the back of the Babine country—a wide field—were brought to me recently; these gave an expanded analysis of:

Fixed carbon	54 to 65 per cent.
Volatile combustible matter....	24.5 per cent.
Water.	1.5 per cent.

"Turning to metalliferous mining—while I do not wish to be unduly optimistic, I must be permitted to say that I feel a measure of optimism as to the future, especially the immediate future, of metal mining in British Columbia. There is in all parts of the Province mineral wealth awaiting development. That it still waits is our own fault—we have not tackled it in the right way.

"Given favourable opportunities, there is capital from Eastern Canada, Great Britain, France, Germany and the United States available, on suitable terms, for exploiting our mineral resources, but their value must be properly brought to the notice of capitalists in those countries. Prospects must be opened, and partially-developed mines got in order so that visiting mining engineers, after making their examinations, may be so well informed as to be in a position to do justice to the properties. In this direction lies the opportunity for the smaller capitalist of this Province, whether by syndicates or development companies. The owners of mining properties must learn to realize the requirements of the situation and assist by asking only suitable terms.

"Last year we had visits from mining engineers of high reputation, who either made flying visits of observation or spent much time in the Province. Capital, the greater part of which comes from the United States, is being invested liberally in Slocan district, and mines that, for one reason or another, have for years lain dormant or nearly so, are now being developed with most promising results. In other districts, too, the position shows marked improvement. The Britannia, within 40 miles of Vancouver, is to-day a profitable producer, due entirely to the faith of New York capitalists in its great mineral resources, backing with ample money the competent engineering talent employed in their development. By United States capital, represented by Mr. M. K. Rodgers—whom we have every reason to admire and emulate, and to whom must be credited the successful development of the Nickel Plate group of the Hedley Gold Mines. Limited, both in its initial and re-organized and splendid condition as a dividend-payer to-day—the Hidden Creek copper mine was sufficiently developed to attract the attention of the Granby Company, its present owner. I could easily multiply instances where capital from our neighbour to the south is doing pioneer work in the Province as well as others where it is providing for the extensive development of British Columbia mines.

"At home, the Consolidated Mining and Smelting Company of Canada, Limited, is similarly doing important work in Kootenay and Boundary districts, as witness the St. Eugene mine, East Kootenay (the known ore bodies of which, however, have been nearly exhausted); the Sullivan, also in East Kootenay; the Richmond-Eureka, in the Slocan; the No. 1 and the Tiger, in Ainsworth camp; the Molly Gibson, near Nelson; the H. B. group and the Silver Dollar, near Salmo; the Snowshoe, Phoenix Amalgamated, and No. 7 in the Boundary district; as well as the important Centre Star group (to which has lately been added the once famous Le Roi), in Rossland camp. It is noteworthy, too, that the Consolidated Company is doing effective metallurgical work, as well in research as in practice.

"Then, Vancouver capital is courageously developing gold-copper claims on Khutze Inlet, and gold claims at Surf Inlet, Princess Royal Island. Also, there are several purely provincial companies engaged in exploiting silver and silver-lead properties in Hazelton district, Skeena, while others are giving attention to mines in Sheep Creek camp, and to some in Lillooet district. Should the development of any of these properties prove too big an undertaking for local companies, there will not be any difficulty in obtaining outside capital for them, if it first be demonstrated they have sufficient reserves of profitable ore, and suitable terms be offered. Beside the above-mentioned Vancouver exploitations, there is the development and equipment as a producer of the old Monarch mine, near Field, and there are numerous coal enterprises—notably in Nicola Valley, on Vancouver Island, on Graham Island, and in fields in Skeena River country.

"Opportunities are numerous, there is no doubt of it—in our Coast district, in Lillooet and Northern Yale, in the Similkameen-Tulameen district, and in many parts of East and West Kootenay. And in this connection it should be observed that mining is a legitimate business if properly conducted as an industry and not, thereby, as a speculation or a gamble.

"One factor that will aid the seeker after opportunities for investment in the mining field is the marvelously great railway extension in progress throughout the Province—the Grand Trunk Pacific passing through all that great field in the Skeena, generally referred to as the Hazelton district, and rendering accessible the northern coal fields; the Canadian Northern Pacific from Yellowhead pass down the valley of the North Thompson, that will bring the old Cariboo and the Clearwater districts more within reach; the Canadian Pacific, from Golden along the valleys of the Columbia and Kootenay Rivers, down to the Crow's Nest Railway below Fort Steele; and the Kettle Valley line from Nicola to Midway—these railways will bring us into touch with most promising mining fields. Last, but not least, to-day's newspaper informs us that "the British Columbia Government proposes to send engineers to the country between Stewart, at the head of Portland Canal, and Groundhog Mountain, to secure data for the proposed construction of a railway from the present inland terminus of the 12-mile line from Stewart to the Groundhog Mountain coal fields, this line to eventually form a link in another transcontinental railway system.

"Finally, I shall quote some figures that strikingly illustrate the progress of mineral production. Since 1852, or in '60 years, the value of the mineral production of British Columbia, has aggregated \$397,000,000, of which comparatively large value, \$123,000,000, or 31 per cent., is the production of the last five years. 1907-11."

Mineral Production in 1911.—The Provincial Mineralogist, Mr. Wm. Fleet Robertson, presented to the meeting a "Preliminary Review and Approximate Estimate of Mineral Production for the Year 1911." He directed attention to the leading features of progress in the year and explained that the net decrease of \$3,165,250, as compared with 1910, was almost wholly accounted for by the strike of employees at the Crow's Nest Pass coal mines, which extended over nearly two-thirds of the year, and not only affected the production of coal and coke, but, through the consequent cutting off of the coke supply for the blast furnaces of the

smelteries, materially reduced the production of gold, silver, and copper as well. Further, the destruction by fire in the summer of 1910 of railway trestles and bridges, and of mine and concentrating mill plants in Sloacan districts, which essentials for production had as yet been only in part replaced, had detrimentally affected the output of silver, lead, and zinc. The total value of the mineral production was estimated at \$23,211,816, as against \$26,377,066 in 1910.

Incidentally, British Columbia's proportion of the mineral production of the whole of Canada for the period of 26 years—1886-1911—covered by the published official records, was shown, as follows: "Placing the aggregate value of the production of Canada at \$1,245,000,000 (which allows for 1911 a Dominion total of \$115,000,000, an amount \$10,000,000 greater than that of 1910), and British Columbia's proportion for the same period at \$333,000,000, it follows that this Province has to be credited with nearly 27 per cent.

of the value of the mineral production of the whole of Canada in the 26-year period under notice."

Death of Mr. John B. Hobson.—The secretary reported the death, on January 7th, ultimo, of Mr. John B. Hobson, who was one of the first members of the Canadian Mining Institute and one of its applicants for incorporation by the Dominion Parliament in 1898. He was a member of the Council of the Institute in the years 1898-99 and 1901-02, and a vice-president in 1903-04. The nature of the work he did in inaugurating on a large scale hydraulic placer mining for gold in Quesnel mining division of Cariboo district, and the prospective great value of his having demonstrated that much gold is contained in the enormous gravel deposits of that part of the Province—officially estimated at approximately \$300,000,000—were briefly pointed out, and the loss to the placer gold mining industry of British Columbia in Mr. Hobson's death was deplored.

(To be continued.)

SPECIAL CORRESPONDENCE

ONTARIO.

Porcupine, Swastika and Larder Lake.

Three stamp mills will be running in Porcupine before the end of March, marking the opening of the productive history of the camp. The McIntyre mill dropped stamps for the first time on March 1, although the excavations were not commenced till the middle of December. It should be running at its full capacity of 50 tons by the end of the month. This is actually the first stamp mill to produce in the northern gold area. A small test plant at the little Pet mine will also be in operation before the end of the month. Although the official opening of the Dome mill is not until March 30 there is so little now to finish that the first trial runs will be made on or before March 20, and adjustments should have been made and the stamps dropping in tune by Dome Day. The South Porcupine Board of Trade and the Dome directorate are combining to make the occasion memorable. Already there have promised to come the Hon. Frank Cochrane, best known in the North as late Minister of Lands, Forests and Mines for Ontario, and with him in a private car he will have a number of Ottawa notables, interested in the North country. From Toronto the Hon. W. H. Hearst, Minister of Lands, Forests and Mines, has promised to attend, and with him will undoubtedly appear a large number of members of the Legislature; the T. & N. O. Commission will charter two private cars for the trip, and the Dome directorate will patronize the gathering en bloc. There will be a ceremony of dedication at the mill, and afterwards a banquet at the King George Hotel.

The work at the Dome has made very rapid headway in the last six weeks both on the mill and under ground. Before the stamps drop there will be blocked out above the 50-foot level two years ore reserves if the mill were allowed to remain at its present capacity of 400 tons per day. Ore has been blocked out for over a length of 300 feet by 200 feet in 100-foot sections, and a raise has been broken through to the surface to connect with the tramway to the head of the mill so that this ore is now immediately available. The company is so confident that underground development will more than justify diamond drilling results that there will be no immediate attempt to rush the shafts down to any depth but level after level will be opened up and developed systematically.

There is sufficient ore on the 50-foot level in sight for all present needs. At a depth of 200 feet in No. 7 shaft some of the best ore in the mine has been found.

For the present the company will generate its own power. The deal to take power from the Porcupine Power Co. fell through, and it is likely that the auxiliary plant at present on the property will be used until other arrangements can be made, possibly with the Waiwaiten Power Company. There are at the present time nearly 500 men employed at the Dome altogether.

Since Mr. P. A. Robbins issued his first annual report developments underground have been, without exception, most satisfactory.

On the No. 4 vein there has been great improvement. In the annual report it was stated that values in the northeast drift at the 100-foot level had fallen off. Since its issuance it has been found that the wrong vein was being followed and to-day the vein in this drift runs \$22.50 to the ton. No. 2 vein has also shown improvements. On the 100-foot level it now varies from five to fifteen feet, and there are five faces of ore. On the 200-foot level there are two faces in ore. There are nine drills running on the Hollinger alone, making about 700 feet a month. Two shafts are to be sunk as connecting links between the 200-foot level of the Hollinger and the Dixon and Miller Middleton, making it quite plain that shortly all three properties will be merged and worked from one central shaft. The mill building is now completed, but delivery of machinery is slow and stamps are not likely to drop before June.

Development on the No. 2 vein of the Vipond at both levels is proving up good ore bodies. At the 200-foot level at the beginning of the month the vein showed five feet wide of ore which on the surface ran about \$50. Altogether sixty feet have been opened up in two sections of thirty feet. A raise is now being put through to the surface from the 100-foot level of No. 1 vein, and the ore in it is six feet wide.

On the Altogether on the 100-foot level about 600 feet of drifting has been done, of which about 530 feet is in ore. Later exploration on the 200-foot level has shown that what was at first believed to be No. 3 vein is probably a stringer, and the vein is now being sought by a cross-cut.

At a meeting of the Porcupine branch of the C. M. I. at the Hollinger mine a very interesting paper given by G. W. Thomson, of the Pearl Lake mine evoked a spirited debate on the value of

diamond drilling in the Porcupine camp. Mr. Thomson exhibited some carefully compiled charts on the work at the Pearl Lake mines, prefacing his remarks with the statement that he did not regard any conclusions arrived at as accurate but only approximate. Messrs. Stewart Thorne and H. Y. Russell, took a strong position against diamond drilling. In a paper read by Mr. Thorne, Porcupine, was placed last on the list as an area where the results of diamond drilling was of value. Results obtained in the Porcupine section as a whole did not justify the expense involved. In the course of discussion Mr. Globe, of the Hollinger, stated that in relocating a vein that had been lost the diamond drill had been quite successful with them. While not combating in its entirety the contention of the critics, Capt. Anchor, of the Dome Extension, stated that he believed the diamond drill was economical in low ground covered with heavy overburden and adjacent to a known ore body.

It has been announced that on March 11 the T. & N. O. service will be continued to Timmins Townsite, a local meeting the afternoon train and taking out passengers to their destination. An agent has already been appointed for the Schumacher station. Until further ballasting can be done in the spring it will be impossible to give a Pullman service farther than South Porcupine.

A shot drill is now at work on the Wright Hargreaves claims at Swastika, which have been optioned to Weldy Young, of Haileybury.

At the McEnaney property of the Crown Reserve the ore body first struck in the shaft is now being drifted upon at both the hundred and the 200-foot levels. It shows a considerable amount of gold, but its values are mainly in fine grained sulphides. The ore runs between \$20 and \$30 to the ton.

The shaft at the Rea mine has now reached the 400-foot level and crosscutting for the vein will commence at once. The result will be looked for with a great deal of interest. At the 200-foot level, and at the 100-foot there was a good body of \$20 ore, but at the 300-foot level while the vein was much wider it was so lean as to offer little promise of mining at a profit. The results obtained at the 400-foot level will decide to a very considerable extent the future of the mine.

Results at the lower levels of the Swastika have been reassuring enough lately to permit of the erection of a small mill. Plans and specifications are now being obtained for a ten-stamp plant. The old five stamp plant previously used was so ancient that it had to be altogether discarded.

Cobalt, Gowganda and South Lorrain. — After a sharp assault the opponents of the Cartwright regime in the Temiskaming Mining Company had to acknowledge defeat at the annual meeting. The great stumbling block to agreement was the option on the North Dome property in Porcupine, but the majority interests were stubborn on this point and successfully held to their new acquisition.

What appears now to be the most important event in the history of the West Ridge properties for years has been the discovery that the Coniagas is getting silver in considerable quantities out of the Keewatin rock in a vein followed beyond the contact with the conglomerate. So well established has it been that values would cease in the underlying Keewatin that exploration has ceased altogether or has been of a very half-hearted nature when the contact was reached so that the new find opens up important possibilities. The discovery was the result of an accident to the drill-runner following the vein into the Keewatin for some distance after the contact had been reached and without the mine captain's knowledge. The shots revealed such good ore that the vein has been followed and for a hundred feet has held strong, a carload of high-grade ore being taken out of it. That other companies in a similar position will now be induced to further explore their Keewatin is certain, and it will be very interesting to learn what the results of their efforts are.

Another Cobalt company has sought alien ore reserves. The Right of Way has purchased an option to the Bishop claims in the Silver Mountain district of the Port Arthur. A considerable gang of men will be at once put on the property and systematic prospecting started.

In the South Lorrain field there are spring stirrings. The Wettlaufer, which has just declared its fifth dividend of 5 per cent., has taken an option on the Keeley and bought all the adjoining properties that could be economically acquired. Development will be confined to the diabase at the Keeley. The Bellellen mine, the only other producing property last year, has shut down owing to a split on the directorate of the company. The Alice Lorrain is to instal a six-drill plant and the Gailey property is opening up again.

The Dr. Reddick Larder Lake Mining Company has made an assignment, the assignee being D. Smiley Sawyer, a brother of the president of the company, Bannell Sawyer. During the past six months an honest attempt was made to work the mine at a profit and it was producing regularly, but the weight of its indebtedness has dragged it down to insolvency.

It is understood that the Canadian Gowganda Company will this spring instal a considerable plant at the mine. The Canadian Gowganda found a small pocket of high-grade ore, took it out and shut down till it could resume operations on a larger scale.

At Gowganda there are signs of a slight revival. The Mann on the West Ridge is taking out some remarkable ore from an old open cut and an American company has acquired the O'Brien property and the Burke Remy claims with a view to development this year. The Temiskaming and Hudson Bay Company is taking in a large supply of provisions for operations at its property at Hangingstone Lake, and the Powerful Mining Company is producing good ore from its property at Calcite Lake. The Miller Lake O'Brien is making a shipment of high-grade ore every six weeks, and the Millerett is despatching concentrates and mine ore at regular intervals. The camp is now in urgent need of \$27,000 from the Government to patch up the road between Elk Lake and Gowganda. The mine managers state that if this money were economically spent it would be sufficient to cut down freight rates from \$30 a ton to \$10.

BRITISH COLUMBIA.

Two months of the New Year have passed, and now that the worst of the winter weather is over the opinion that mining activity will be general is being confirmed.

In East Kootenay, the largest production of ore from the metal mines may be expected from the Sullivan Group mine, near Marysville, which is controlled by the Consolidated Mining and Smelting Company, and at which much new machinery and plant was added to the mine equipment last year. A comparatively small production of lead concentrate may be expected from the St. Eugene, while the Aurora and Society Girl are also likely to ship some ore. It is hardly probable the construction of the Kootenay Central Railway will be sufficiently advanced to induce the owners of mines in Windermere division to resume production this year. Some notes on the Monarch mine, in North-east Kootenay are given below. Coal mining should be on a larger scale than in earlier years, provided no interruption shall take place to restrict output.

In West Kootenay the outlook is promising in Ainsworth, Slocan, Nelson, and Trail Creek divisions. Among the operating mines in Ainsworth division are the No. 1 and Tiger, which the Consolidated Company is working; those of the Mabry Syndicate and Silver Hoard Company, respectively; Mr. A. D. Wheeler's Gallagher mine; and the Krao Group, owned by a company having its headquarters in Butte, Montana. The Blue Bell is again being worked after more than a year's inactivity, while the Utica and the properties of The Deep Mine, Ltd., and Retalack

& Co. (formerly the Whitewater Group) should also be at work. It is probable, too, that work will be again done on several properties situated up the valley of the south fork of Kaslo Creek. In Slocan division, the Lucky Jim, near Bear Lake; the Rambler-Cariboo, Rambler-Cariboo Extension, and Rio, all in McGuigan basin; the Payne, Slocan Star, Ruth-Hope, and Richmond-Eureka, near Sandon; the Noble Five Group, Twilight, Reco, Sunset, and Surprise, all above Cody Creek; the Standard, Van-Roi, and Hewitt-Lorna Doone group, in Four-mile camp; the L. H., a few miles from Silverton; the Eastmont, the Lily B., and several other mines in Slocan City division; together with a number of other mines in different parts of Slocan, will all be worked, some continuously throughout the year and the remainder during such period as work shall be reasonably practicable. Then in Nelson division, the Molly Gibson, mine and concentrating mill, will be regularly operated by the Consolidated Company; the Granite-Poorman gold mines and 20-stamp mill are expected to increase their output; the Silver King and other mines of the Lennie-Rand Syndicate, are to have development work done on them; several mines in Ymir camp, and others at Erie, will be among the working properties; while about Salmo, the Emerald lead mine, and several promising prospects will also have attention. The gold mines—Queen, Mother Lode, Nugget, Kootenay Belle, and others—of Sheep Creek camp, also in Nelson division, should together make a larger production than in any previous year. In Trail Creek division, the several regular producers near Rossland—the Centre Star group, Le Roi, and Le Roi No. 2 group—with a small output from two or three mines in the South Belt region, may be expected to make a better showing on the whole than that of several recent years; and the Consolidated Mining and Smelting Company's copper and lead smelting works and lead refinery at Trail, are likely to have a busy year.

The copper mines of the Boundary district—those of the Granby, British Columbia Copper, and New Dominion Copper Companies—will probably make the largest total output this year the district has ever made. The smelteries at Grand Forks and Greenwood, respectively, having a combined treatment capacity of between 6,000 and 7,000 tons of ore a day, are expected to turn out a larger total quantity of copper in 1912 than in any previous year in their history. The small mines of this district having high-grade ore are unlikely to add much to the production of the year, though several of them may be worked. The construction of the Kettle Valley Railway may not be far enough forward to allow of shipment of ore from several small mines up the west fork of Kettle River before next year, so these may hardly be regarded as probable producers in 1912.

Notes on several individual properties in different parts of the province follow. Taking all these mines, and the coal mines of Nicola and Vancouver Island, it would appear that, as has already been stated, there is good reason to look for much mining activity in the province.

Field-Golden Division.—The Mt. Stephen Syndicate, which commenced operating its concentrating plant early in January, was unable to make much concentrate that month, owing to the water freezing and power for driving the mill machinery being consequently cut off. In February, though, the mill was running practically the whole month. Two more jigs have been added to the equipment. The products are a lead and a zinc concentrate. The latter is nearly clean zinc, ranging up to 55 per cent. spelter, but averaging 45 to 50 per cent. The first car of zinc concentrate is ready for shipment; this will probably be sent to reduction works in the United States, prices and terms offered by zinc-buying firms in that country appearing more advantageous to the mine owner than those quoted by old-country buyers. It is expected that by the end of March the treatment capacity of the mill will be up to about 60 tons of ore a day, and that the daily output of concentrates will be 10 to 12 tons. There is a considerable quantity of ore available, and it is hoped that hereafter production will be regularly maintained,

operations in both mine and mill being supervised by experienced practical men. Mr. I. J. Crothers is mine superintendent, and Mr. Ed. Milward mill foreman.

Similkameen.—The Hedley Gazette reports an increase of tonnage of ore crushed and treated at the Hedley Gold Mining Company's 40-stamp mill. It is expected the company's report and statements of accounts for the calendar year 1911 will soon be made public. While it will doubtless be read with much interest, when it shall be published, its main facts are already known, namely, that approximately 57,000 tons of ore was mined and put through the mill during the year, and that between \$300,000 and \$320,000 net profit was made, of which \$300,000, being 25 per cent. on the issued capital of \$1,200,000, was paid to shareholders as dividends and bonuses.

Other properties in Hedley camp that are having attention are the Apex group, under working bond to Mr. T. A. Pickard and others; the Sacramento and Kingston groups, be operated by C. H. Brooks and associates; and the Oregon, on which more development is being done.

The British Columbia Copper Company is continuing the development of the Voigt Group, on Copper Mountain, a few miles from Princeton; The Princeton Coal and Land Company has been busily engaged installing a new coal-handling plant and making other substantial additions to its facilities for regularly maintaining an output of coal; and the Columbia Coal and Coke Company has been energetically preparing to make a considerable production.

Coast District.—The Britannia mine in larger and the Marble Bay mine in smaller degree, are the only producing metalliferous mines in the lower part of the Coast district. As some information of these is given under another head, only this passing mention of them will be made here.

A company known as the Surf Inlet Gold Mines, Limited, is developing the D. L. S. group of claims, situated near Surf Inlet, Princess Royal Island. Late in 1911 Mr. Fred. M. Wells took up a well-equipped part of men to do more development work, and has since extended one of the tunnels about 200 feet. During 1910 Mr. A. B. Clabon and Mr. Wells, with some associates, acquired the D. L. S. group, on the Bluff claim, of which two parallel veins had previously been opened, chiefly by adits and a shaft. The adit on the upper, or west, vein was driven 140 feet, while the length of that on the lower, or east, vein was 293 feet. The shaft was commenced at an elevation of about 265 feet above the lower tunnel, and it was sunk 60 feet, which left a distance of 205 feet between the bottom of the shaft and the lower adit. The difference in elevation between the two adits is about 100 feet. The veins are stated to run more than 6,000 feet on their course through the claims. The ore varies in width, usually between 18 inches and 4 feet, though in places it has been found of much greater width. It is quartz with iron pyrites containing gold and a small quantity of silver. More development work was done in 1910, additional to that first above mentioned. The reports of several mining engineers who have examined the property indicate that, with proper development and suitable equipment, a profitable mining enterprise should be established here.

In Portland Canal district, the Red Cliff is reported to be the only property tributary to Stewart on which development work was continued throughout the winter. The Portland Canal Mining Company did not find it practicable to operate its concentrating mill, so it was closed for the winter. On Observatory Inlet, the Granby Company employed a number of men doing underground development in the Hidden Creek mine, but no important progress could be made towards carrying out the extensive surface improvements the company intends to have completed as soon as conditions shall permit of construction work being proceeded with.

STATISTICS AND RETURNS

SHARE MARKET.

(Courtesy of A. E. Bryant & Co.)

March, 19th, 1912.

New York Curb.

	Bid	Ask
B. C. Copper	4¾	4¾
Giroux	4¾	4⅞
Greene-Cananea	7½	7¾
Inspiration	19⅞	19¾
Yukon Gold	3¾	3½
Miami	24¼	24½
Tonopah	7¼	7½
Ray Cons.	17¾	17¾
Chino	25¾	26
United Copper	1¼	1¾
Utah	57¾	58¼

Cobalt Stocks.

	Sales	
	Low	High
Bailey	.02	..
Beaver Consolidated	.46½	.47
Buffalo	*1.40	..
Chambers-Ferland	.13	.13¾
City of Cobalt	*09½	..
Cobalt Lake	.28	..
Coniagas	7.10	..
Crown Reserve	3.21	3.26
Great Northern	.10	..
Gould	*.02½	..
Gifford	*02	..
Green-Meehan	.01¾	..
Hargraves	.06	.06¼
Kerr Lake	..	**3.00
La Rose	3.84	..
McKinley-Darragh	1.84	..
Nipissing	7.65	..
Nova Scotia	..	** .05
Ophir	.08	..
Otisse	..	** .01
Peterson Lake	*.07	..
Rochester	..	** .02½
Right of Way	.08¾	.09
Silver Leaf	.05	.06
Temiskaming	.34½	.34¾
Trethewey	..	..
Wettlaufer	.73	.74

Porcupine Stocks.

	Low	High
Apex	.06½	.07
Dobie	.50	..
Crown Charter	.18	..
Dome Extension	.48	.49
Eldorado	.06½	..
Foley-O'Brien	.34	..
Hollinger	10.70	11.00
Jupiter	.44	..
Moneta	..	** .18
N. Ont. Exp.	..	** .43
Pearl Lake	.18	..
Porcupine Central	3.90	3.92
Porcupine Imperial	.05	.05¼
Porcupine Northern	1.05	1.08
Rea	.89	.91
Standard	..	** .20¼
Swastika	.23	.24

	Low	High
Vipond	.44½	.45
United	.02¾	.02¾
West Dome	.52½	.53

Sundry.

	Low	High
Island Smelters	.09	..

SILVER PRICES.

	New York cents.	London pence.
February 21	58⅞	27 1/8
" 22	Holiday	27 1/8
" 23	58⅞	27
" 24	58½	26 1/8
" 26	58½	26 1/8
" 27	58½	26 1/8
" 28	58⅞	27 1/8
" 29	58⅞	27
March 1	58¾	27 1/8
" 2	58⅞	27 1/8
" 4	58⅞	27
" 5	58⅞	26¾
" 6	58⅞	26⅞
" 7	58⅞	..

TORONTO MARKETS.

Metals.

March 11.—(Quotations from Canada Metal Co., Toronto.)

- Spelter, 6.85 cents per lb.
- Lead, 4.25 cents per lb.
- Antimony, 7 to 9 cents per lb.
- Tin, 45 cents per lb.
- Copper, casting, 14.75 cents per lb.
- Electrolytic, 14.75 cents per lb.
- Ingot brass, 7 to 12 cents per lb.

March 11.—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, \$19.00 (f.o.b. Toronto).
- Midland No. 2, \$18.50 (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, \$1.85 to \$1.95 per ton.
- Foundry coke, prompt, \$2.20 to \$2.50 per ton.
- March 7.—Tin, straits, 42.80 cents.
- Copper, Prime Lake, 14.62½ cents.
- Electrolytic copper, 14.55 cents.
- Copper wire, 15.00 cents.
- Lead, 4.00 cents.
- Spelter, 6.90 cents.
- Sheet zinc (f.o.b. smelter), 8.25 cents.
- Antimony, Cookson's, 7.25 cents.
- Aluminium, 18.50 to 19.00 cents.
- Nickel, 39.00 to 40.00 cents.
- Platinum, ordinary, \$46.00 per ounce.
- Platinum, hard, \$48.50 per ounce.
- Bismuth, \$1.80 to \$2.00 per lb.
- Quicksilver, \$46.00 for 75-lb. flask.

*Bid, **Offered.