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CONTENTS.

Editorials	193
(a) The C. M. I. Committee at Ottawa	193
(b) The Mining Society of Nova Scotia	194
(c) Tool Steel Direct from Iron Ore	194
(d) Editorial Notes	194
The Eighteenth Annual Meeting of the Mining Society of Nova Scotia, Halifax, March 15 and 16, 1910.	195
Canadian Mining Institute—Western Branch	197
Legal Column	198
Electricity in Mines	198
Cobalt in 1910	199
Canadian Iron and Steel. By Watson Griffin.	207
Steam-Driven Air Compressors in Cobalt. By H. V. Haight	209
Claims Assessment Work in the Province of Ontario. By James Rennie	210
The Eight Hour Day in Nova Scotia	212
Correspondence	212
Personal and General	213
Special Correspondence	213
General Mining News	218
Mining News of the World	220
Company Notes	221
Statistics and Returns	223

THE C. M. I. COMMITTEE AT OTTAWA.

Recognizing that the Select Standing Committee of the House of Commons on Mines and Minerals was on the right track in its recommendations to the Federal Government, the Canadian Mining Institute appointed a committee to wait upon the Prime Minister and urge that these recommendations be carried into effect.

To refresh the memories of our readers, we shall recapitulate the three aforementioned recommendations: "Your committee is of the opinion (1) That there should be assigned to the Federal Department of Mines, the administration of mines, including the issuing of title thereto, and of all mining laws; (2) That an Act should be passed consolidating all the laws relating to mines under Federal control; (3) That consideration should be given to a policy which will have for its objects the re-acquisition by the Crown of mining rights heretofore granted in patents of land."

The first two recommendations will meet the approval of all mining men. They apply with especial force to the distressing conditions that obtain in Alberta and the Yukon. The last recommendation we are inclined to view with doubt. Its practicability is extremely debatable.

The Institute was represented by Messrs. G. G. S. Lindsey, T. B. Caldwell, A. M. Hay, Clifford E. Smith, and H. Mortimer-Lamb. Accompanying the committee were Mr. F. T. Congdon, M.P., and Mr. Ralph Smith, M.P., both of whom are members of the Select Standing Committee. The delegation was introduced to the Prime Minister by Mr. James Conmee, M.P.

As chairman of the delegation, Mr. G. G. S. Lindsey presented the views of the Institute. Other delegates spoke to the point. These utterances were strongly supported by the Minister of Mines, the Hon. Mr. Templeman. Their reception by Sir Wilfrid Laurier was distinctly favourable. He promised specifically that the first and second recommendations would be put into effect, and he suggested that the Canadian Mining Institute take on its own shoulders the task of consolidating and codifying the laws pertaining to mining lands under Federal control. This, he assured the delegation, the Government would introduce at the next session of Parliament.

After interviewing the Prime Minister, the delegation waited upon the Minister of Mines. Arrangements were then made for appointing a sub-committee of the Select Standing Committee to draft the Act consolidating the present mining laws. It was decided that a suitable appropriation be asked for, so that the sub-committee might be enabled to secure information from every desirable quarter. The Canadian Mining Insti-

tute delegates assured the minister of the entire sympathy and support of that body.

Previous delegations to Ottawa have not been uniformly successful. Lack of harmony and want of preparedness have usually marred their interviews. This last delegation, however, appears to have been excellently handled. Superfluous debate was avoided. The speakers confined themselves to the matter in hand. And the issue was in every way excellent.

To Mr. G. G. S. Lindsey, the chairman of the delegation, much praise is due. Mr. Lindsey's clear insight into the principles involved, and his grasp of business details are as valuable as they are unusual.

Before the Select Standing Committee, or its sub-committee, lies a large and urgent task. The support of the Canadian Mining Institute may be counted upon. Equally certain is the gratitude of all Canadian mining investors.

THE MINING SOCIETY OF NOVA SCOTIA.

The Eighteenth Annual Meeting of the Mining Society of Nova Scotia, held recently in Halifax, N.S., was remarkable in more than one respect. In the first place, several of the papers evoked an unusual amount of discussion and general interest. More than one of these will probably incite industrial development.

Particularly inspiring was the paper read by Dr. Heinrich Ries, of Cornell University. Dr. Ries outlined the possibilities of the clay industry in Nova Scotia, and gave specific information as to the extent and workability of the principal deposits. Quite as important was Dr. Ells' paper dealing with the commercial value of the oil shales of the Maritime Provinces, and Mr. Faribault's brief presentation of the geology and potentialities of the Moose River scheelite veins was most timely. Rarely have three such significant technical pronouncements been made at such a gathering.

Whilst the papers presented by local mining men were all meritorious, they do not demand especial notice here. We feel, however, that reference to the President's annual address is called for.

The key-note of Mr. Brown's address is contained in one sentence. "To my knowledge," he declared, "not one coal seam of commercial value has been discovered in Cape Breton, nor, indeed, with perhaps one exception, in the whole Province of Nova Scotia, since the year of Confederation." With this statement as a text, Mr. Brown dilated upon the earnest, careful, deliberate character that distinguished the labours and records of the colliery engineers of fifty years ago. Contrasting modern and past practice, he alluded to the intemperate haste, the incomplete records, and the consuming commercialism that are being developed. Briefly, but most pointedly, he indicated the wastefulness of present methods, and the surprisingly small advance that has been made in fuel economy, both as regards mining and power-generation.

While it is comparatively easy to pick flaws in Mr. Brown's statements, we believe that his logic is fundamentally sound. His address will be found on another page of the Canadian Mining Journal. It deserves careful perusal.

TOOL STEEL DIRECT FROM IRON ORE.

It should be a source of gratification to Canadians that a citizen of this country, Mr. J. W. Evans, of Belleville, has been the first investigator to succeed in producing high-class tool steel in an electric furnace direct from iron ore. Further, in his small furnace of 150 lb. capacity, Mr. Evans turned out his product at a cost of 9.6-10 cents per pound. The steel was tested at Hamilton and at McGill University, and was proved to be superior to standard brands. At Belleville, where the furnace is installed, electric energy costs \$50 per horsepower per year. The cost per pound mentioned above is based upon this rate for power, and includes all charges, such as depreciation, briquetting, etc., etc.

So far as we can learn, Mr. Evans is the only metallurgist to solve the problem of making tool steel direct from titaniferous iron ores in the electric furnace. This he first accomplished in 1906. Since then he has been perfecting his process, until now it appears to be commercially feasible.

As a mark of its sense of the value of Mr. Evans' work, the Canadian Mining Institute, during its recent annual meeting, passed the following resolution: "Resolved, that the Institute desires to express its appreciation of the results achieved by J. W. Evans in his electric furnace, and regrets that illness prevents his attendance at this meeting."

We need only add that Mr. Evans has never sought to advertise himself or his work.

EDITORIAL NOTES.

Under the revised French tariff, it is proposed that certain asbestos goods are to be taxed as follows, per 100 kilos: Paper, 25 francs; cut up, other than rectangular, 50 francs; threads and cords, 60 francs; plaits and tissues (mixed or not), 75 francs. So far as Canada is concerned, the tariff on these articles will probably be modified by the application of the minimum tariff.

The fire that broke out in the Albion colliery, Stelarton, N.S., was fought and suppressed by ten men wearing Draeger breathing apparatus. These men had to be brought all the way from Glace Bay, Cape Breton. Without their aid, the loss would have been enormous. There could be no better illustration of the absolute necessity of establishing rescue stations at every Canadian coal mining centre.

The Western Branch of the Canadian Mining Institute, at a recent meeting, placed on record its high appreciation of the journalistic work done by Mr. E. Jacobs, of Victoria, B.C. The Canadian Mining Jour-

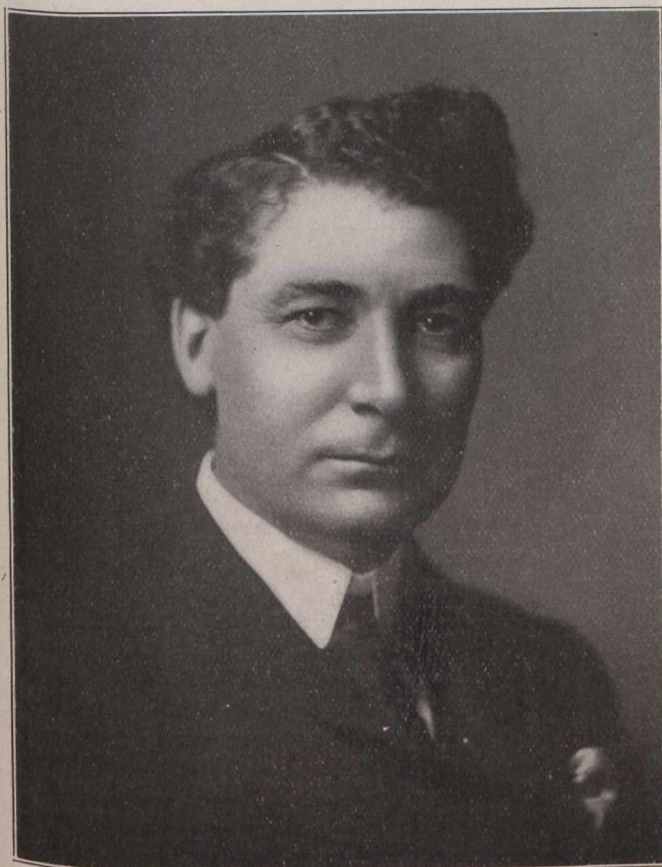
nal has more than once had occasion to commend the careful and conscientious articles written by Mr. Jacobs. It is pleasant to notice that his own associates are alive to the importance of his labours.

The prosecution in Toronto of the men accused of high-grading in Cobalt was conducted with lamentable

looseness. The prosecuting attorney, as might naturally be expected, had no grip of mining or mineralogical technicalities. Hence he could not meet the arguments adduced in defence of the accused. Better machinery is certainly needed. In cases like these, specialists should be appointed by the Crown to conduct the prosecution.

The Eighteenth Annual Meeting of the Mining Society of Nova Scotia, Halifax, March 15 and 16, 1910.

The Mining Society of Nova Scotia has taken a new grip on life. Its eighteenth annual meeting was well attended. Vigorous discussions followed the reading of papers, and the general tone of the meetings was commendably enthusiastic. Particularly noticeable was the attendance of students from the new Technical College. Moreover, a most representative lot of visitors added much to the sessions.



T. J. BROWN, PRESIDENT.

Proceedings opened at 10.30 o'clock on Tuesday morning, March 15. After the secretary, Mr. A. A. Hayward, had read the minutes of the preceding annual meeting, the president, Mr. T. J. Brown, delivered his address.

PRESIDENTIAL ADDRESS.

The president, instead of the conventional review of progress, harked back to the past. He compared the work of the modern coal mining engineer to that of the

men of half a century ago. His address was really a sermon against the haste and bustle of to-day as compared with the substantial accomplishment of fifty years ago. Whilst his criticisms of modern practice were severe, they were tempered by the fact that he himself is of this generation. Moreover, Mr. Brown's attitude was not didactic—he was merely indicating, with an occasional gleam of humour, the need of studying and respecting the pioneers of the profession. His address was, in part, as follows:—

“To my knowledge not one seam of commercial value has been discovered in Cape Breton, or indeed, with perhaps one exception, in the Province of Nova Scotia, since the year of Confederation. Mr. Richard Brown left us in book form the story of his work in prospecting the whole of Cape Breton.

“In this book, Mr. Brown has given geological information in connection with our coal seams in Cape Breton, and nothing of much importance has been added to this information, and nothing contained therein of any importance has been found in error.

“When we come to consider that the work this man did in Cape Breton was done through the wilderness on horseback, or around the shores in a small open boat, we get an idea of the thoroughness with which the engineers of the old school did their work, and the accuracy and the method with which they left us the benefit of their experience.

“Are we to believe that there is nothing more to discover in the way of coal seams? Or, are we to believe that no geologist of his experience and knowledge has devoted the time to it since? He was unaided at the time. He was the only mining engineer—or nearly so—on the Island. What have the host of modern, so-called, mining engineers now in Nova Scotia added in any way to the knowledge of our mineral possibilities, and where can their results be found?

“I believe that coal seams, as yet unknown, will be found in Cape Breton; and in Cumberland and Pictou counties, where the coal measures are not so regular as in Cape Breton, the possibilities are even greater. We have every facility offered in the way of Government boring machines. What do we lack? Is it men? Is it capital? Or is it knowledge? Let us think it over.

“Is it possible that the present miner is but a scavenger of coal, content to make the best of what he finds already staked out for him! Is it possible that the present generation are content to take the fruits of what previous giants of the province fought for and obtained for them—responsible government, confederation, discovery of all the coal seams of the province—all previous to 1867. Nothing doing since except enjoying or depleting our legacy.

"Perhaps the life the modern mining engineer is living to-day is too strenuous, and perhaps one of the lessons that we can learn from this comparison is that we are not giving enough attention to the literature of our mining doings of to-day.

"Such men as Brown, Routledge, Gilpin, Poole, Fletcher and perhaps some others, have left us the result of their work; but, strange to say, with the possible exception of Hon. Robert Drummond, who might be called the miners' statistician, very little has been done in preserving or giving us the literature of our mining and engineering progress during recent years.

The Province of Nova Scotia has been very fortunate—or, rather, unfortunate—in having had within its borders, at all times, but principally within the last twenty-five years, the greatest aggregation of visitors with scientific or mining titles, who were able to make coal seams grow where none existed, and able to make credulous investors put money where no possible returns could be expected. These men have come and gone in an endless procession. Each one the hero of the hour—duly honoured, dined and kowtowed to. The only visible record we have of them now is the country spotted here and there, in the most unlikely places, with mounds of fire-clay, and a once promising coal mine now surrounded by an old wire rope fence. We have been left the hole in the ground. The credulous investor has got the hole in his bank account. Still the never ending show goes on.

"The successful mining engineer to-day is the one who is near the capitalist, makes estimates of the cost of plant and dreams the assumed cost. The failure is the poor devil who is called upon to fulfil his dreams and to make the actual figures agree with those of the dream artist. One lives in a brown stone front in Tickerville, the other in a wooden row in Smokey Town.

"I know of a case where one of these high-class chaps offered the manager a sum of gold if he would undertake to have a certain piece of machinery working, and to keep it working while the president visited the plant. The manager succeeded and got the gold; but, needless to say, the machinery was scrapped and never made a revolution afterwards. Who was the success? And who was the failure?

"When we come to consider that God gave us 100 units of coal; that the modern mine engineer extracts about on an average of 50 per cent. of this coal, and wastes or leaves behind him 50 per cent.; that the modern engineer with his most modern boilers and engines extracts but 10 per cent. of the power, and loses in smoke and waste heat the remaining 90 per cent., we find that of God's gift we waste 95 units and utilize but 5 units. When we think this statement over we surely find no room, either as mining or mechanical engineers, to boast of our accomplishments.

"We have not made very much progress in the way of advance in the economical mining of coal during the last 50 years. I must admit that we have made considerable progress in methods of transporting, etc., but, as to the actual mining, we have not got far away from the old "bord" and "pillar" method of our forefathers.

"There are not enough bouquets to-day for the man with the safest colliery in the province, and there are too many halos for the fellow with the largest output.

"No progress has been made in the shipping of coal. We are still building wharves and expensive approaches to enable us to take coal up a height in order to let it fall down again.

"In connection with underground coal mining, we have still got the horse employed. We are still using blasting powder, making slack coal at one end and paying for expensive mechanical arrangement at the other for removing it.

"We are still boiling water at one end of an engine plant and allowing it to escape hot at the other.

"We are still using safety lamps only slightly better than that of Sir Humphrey Davies.

"We are generating enough power at the foot of a hollow brick stack to drive a small engine, and allowing sufficient to escape at the top to drive an Atlantic liner.



A. A. HAYWARD, SECRETARY.

"Our Mining Act, with its amendments, would remind one of a brick building surrounded with small, cheap, wooden out-houses, some of them connected to the main building and some of them not, and most of them added to get over the exigencies of the moment, and few of them having the architectural soundness of the original structure.

"We appear to be in an age where we have ever increasing requisitions and ever increasing scrap piles. The modern engineer searching for a spare part in a scrap pile would look as much out of place as he would in overalls.

"The predecessors of the mining engineers of yesterday had for their motto: 1st, safety; 2nd, quality; 3rd, a reasonable dividend on the money invested. We are afraid that to-day our motto has deteriorated into: 1st, quantity; 2nd, quantity; 3rd, quantity.

"Some of the coal mines of Nova Scotia to-day are unable to make a success of coal mining from a monetary point of view, owing to the fact that a large percentage of their coal is made into slack coal in mining and in handling. I will not say that this was not a

serious drawback to the mining of coal in olden times, but I do say that the fact that this coal has got to be sacrificed or left on dumps to burn or become deteriorated, owing to the fact that the mechanical engineers have not yet progressed enough so that the boiler equipment plants of all kinds in the Province of Nova Scotia are not fitted to burn this refuse instead of the best quality of coal now generally consumed under boilers.

"It is unfortunate for the industry that our politicians are all coal mining engineers, and the coal mining men are all politicians.

"I have no doubt that some of you will think that most of the foregoing remarks are somewhat exaggerated. And I must admit that to reach the point I set to make I intentionally exalted the virtues of the older engineer, and depreciated the virtues of the modern engineer, both mining and mechanical. But I do so with the idea that if these things were forcibly brought to our notice it might result in our being charitable in our criticism of others, and less blinded and more alive to our present-day weaknesses.

"As I am supposed to have been connected with both the mining and mechanical engineering of collieries all my life time, and am so engaged at the present time, and as all these criticisms are aimed at men such as myself, I do not think it can be said of me that I had taken the opportunity here afforded me at hitting at any class of men with whom I was not closely identified.

"I have to thank you, gentlemen, for your attention and forbearance, and will take my seat, wishing our society, and every individual member of it, the greatest possible amount of success."

The afternoon of Tuesday was occupied in the presentation of the following papers:—"Tungsten Deposits at Moose River, N.S.," by Mr. E. R. Faribault; "Scheelite, the Ore of Tungsten, at Moose River, N.S.," by Mr. A. A. Hayward; "The Clays of Nova Scotia," by Dr. Heinrich Ries; "Treatment of Boiler Water," by Mr. A. L. McCallum.

On Tuesday evening the annual banquet was held at the Halifax Hotel. The only two speakers were Dr. Magill, of Dalhousie University, and Mr. Arthur Hawkes, of Toronto. Only one toast was drunk and that was, of course, to the King. This curtailment of the usual appalling succession of toasts and oratory is entirely worth while. It is almost superfluous to add that the menu and music were excellent.

The Wednesday morning session was devoted largely to the reading and discussing of Dr. R. W. Ells' paper, "The Commercial Value of the Oil Shales of Eastern Canada, Based on Their Contents by Analyses in Crude Oil and Sulphate of Ammonia."

The papers read during the afternoon were as follows:—"Blast Furnace Slack Handling and Charging Apparatus," by Mr. W. H. Graham; "Practical and Economic Mining," by Mr. Neil A. Nicholson; and "The Use of Coke Oven Gas as a Fuel," by Mr. T. J. Brown.

Other papers read by title were:—"Description of Haulage System Installed to Take the Place of Horses at Nos. 3 and 4 Collieries of the N. S. Steel and Coal Company," by Mr. John Johnston; "Notes on the Use of Explosives and the Methods of Shot Firing," by Mr. C. E. Coll; "Description of Electric Endless Haulage at Colliery No. 5 of the N. S. Steel and Coal Company," by Mr. Robert Robinson; and "Use of Low Grade Fuel Under Boilers," by Mr. John Preston.

CANADIAN MINING INSTITUTE—WESTERN BRANCH.

At the recent meeting at Vancouver, Mr. Thomas Kiddie, in his address as retiring chairman of the Western Branch of the Canadian Mining Institute, stated that the total value of the mineral production of the coast district during the last ten years was rather more than \$50,000,000. While this represented only about one-fourth of the value of the mineral production of the province, it was a large amount, for it showed an average yearly value of slightly more than \$5,000,000.

Although the production of placer gold in the province had not shown any substantial increase in recent years, there were features to-day that warranted the expectation of considerable improvement in the near future. He need only make passing reference to the fact that in the Cariboo district there were two or three hydraulic mining enterprises on a comparatively large scale, either already established or being prepared for. In the Atlin district there was also good reason to look for an increase as operations were enlarged. Lode gold mining gave promise of yielding larger total returns both from stamp milling operations in the Hedley camp in the Similkameen district and in the Sheep Creek camp in the Nelson district. The considerable increase in the smelting of copper ores containing gold would also add to the production of the yellow metal.

"The production of silver is greater now than it was a year or two ago," continued Mr. Kiddie. "Operations in the Slocan district, Ainsworth mining division, are being extended, and the quantity of silver extracted from the ores mined in that district being added up. In this connection it is noteworthy that the Consolidated Mining and Smelting Company of Canada is producing comparatively large quantities of refined silver as well as gold at its works at Trail, West Kootenay, and is selling part of its product to the Ottawa branch of the Royal Mint, for use in coining Canadian money. The beneficial effect of the lead bounty paid by the Dominion Government on silver-lead and lead mined in Canada is seen in the continued operations of numbers of silver-lead and lead mines in both East and West Kootenay districts. At Trail, where is situated the only operating lead smelting and refining works in Western Canada, many improvements and enlargements have recently been made, these providing for the smelting of a larger tonnage of lead ores. In the increase of size of the lead blast furnaces, installation of more Huntington-Heberlein roasters and converting pots, and in the considerable extension of the electrolytic lead refinery, are evidences of substantial progress.

"The mining of copper ores on a large scale is being continued, notably in the Boundary district, where about 6,000 tons of ore a day are being mined, and the greater part of this large tonnage smelted at district smelting works. The important improvements lately completed at the Granby smeltery, bringing its total treatment capacity up to about 4,500 tons of ore a day, and its copper converting capacity to about 30,000,000 pounds of copper per annum, are indicative of the advance being made in this branch of mining and smelting. The smelting works of the B. C. Copper Co., too, are quite modern and of large capacity, while at Trail the Consolidated Mining and Smelting Co. has built the largest copper blast furnaces in Canada, and is also enlarging its copper smelting operations. On the coast important improvements have been made at the Tye Copper Co.'s works at Ladysmith, where there has been

installed a second blast furnace of larger capacity than previously in use at those works, and other additions to plant have been made to provide for the steady increase in copper smelting that this company is bringing about."

The chairman also dealt with the prospects of iron mining and smelting on the coast and the problem of a profitable method of testing low-grade zinc ores. There had been much expansion in coal mining and the production of coke. In addition to a large output having been made from the older collieries, several new ones were now producing, so that the total output for the province would be substantially increased. In conclusion it might be said, with confidence, that there was much promise of greater progress in the near future, and that mining would become more profitable than it had been in the past.

The Secretary's report showed that the Western Branch started the year 1909 with a membership of 189 and ended it with a roll of 201.

On ballot being taken for the chairmanship, Mr. W. Fleet Robertson, the provincial mineralogist, was elected, receiving 65 ballots. Mr. E. Jacobs was re-elected Secretary.

It was decided to hold the next meeting at Grand Forks.

On motion of Mr. A. G. Langley, it was resolved to ask the Dominion Government to connect the Portland Canal with the main line of telegraph communication in Northern British Columbia. The meeting also resolved to petition the Provincial Government to establish a survey line and marks in the Portland Canal district for the convenience of surveyors there.

Mr. Trewartha-James raised the question of remitting the duty on life-saving apparatus in mines. At present there was 33 1-3 per cent. duty levied on such apparatus in Canada; but in the United States it was admitted free. The apparatus cost from \$100 to \$200 per unit, and several were needed in each coal mine, especially where gaseous vapour was prevalent. The remission of the duty would encourage mines to obtain such equipment, which was only manufactured in Europe. It was decided to request the Dominion Government to remit the duty, and Mr. E. Buchanan promised to induce the Vancouver Board of Trade, and Mr. W. H. Trewartha-James the Victoria Board, to support this request.

Subsequently the meeting discussed Mr. Kiddie's paper on "Cause of Variation in Ore Sampling," and Mr. S. C. Castleman read a paper on the "Classification of Nicola Valley Coals," which stimulated a great deal of discussion, Mr. Robertson remarking that the figures given showed that the coal was a low carbon bituminous. Mr. Kiddie also read a paper on "Metal Losses in Copper Slags."

LEGAL COLUMN.

The only amendments to the Mining Act of Ontario passed by the Legislature at its recent sitting relate to the performance of working conditions.

Sub-section 3 of section 78, relating to the report of performance filed by the holder is amended by requiring that "the report shall show in detail the names and residences of the men that performed the work and dates upon which they worked in its performance."

The next sub-section, sub-section 4 of section 78, is the section brought under judicial notice in the case re Perkins and Dowling, referred to in the issue of Feb-

ruary 1st. The section formerly read, "The Recorder, if satisfied that the prescribed work has been duly performed, may grant a certificate but he may first, if he deems proper, inspect or order the inspection of the work or otherwise investigate the question of its sufficiency and his decision thereon shall be final unless appeal is made to the Commissioner, whose decision shall be final." The contention was raised that the decision of the Commissioner was not final unless he had made an inspection or investigation under the foregoing provisions. The Divisional Court held that the decision of the Commissioner was final whether or not any inspection of investigation had been made by him before giving his decision.

The amendment of this section reads as follows: "Such certificate in the absence of fraud or mistake, shall be final and conclusive evidence of the due performance of the work therein certified, but where it has been issued in mistake, or obtained by fraud the Commissioner shall have power to revoke and cancel it upon the application of the Crown or an officer of the Bureau of Mines or any person interested. The question of the due performance of work shall not be appealable beyond the Commissioner."

It will be noted that there is no word "sufficient" in the original section, but it seems to be obvious that "sufficiency" is the word intended.

But apart from this the effect of the slipshod amendment is doubtful. The first part of it appears to set out that the Recorder's certificate is final except where there has been fraud or mistake—thus cutting out the appeal formerly allowed to the Mining Commissioner. The last clause of the amendment appears to give it the opposite effect. Then there are the nice questions of what "mistake" means, and what is a "person interested."

Thus the benevolent intention of the legislature to allow the cancellation of certificates where fraud or mistake is shown (the principle that the general law allows without statutory authority) is probably quite overshadowed with the new complications the amendment introduces.

ELECTRICITY IN MINES.

In addressing the Birmingham University Mining Society last month, Mr. R. Nelson, His Majesty's Inspector of Mines, referred to the rapid growth of the employment of electrical power in mines in recent years. He stated that electricity usually yielded 80 per cent. efficiency, as compared with only about 20 per cent. by compressed air. What was required where electricity was employed underground was a gas-tight fitting of strong glass in certain places as a protection against ignition of gas or coal dust.

The Sullivan Machinery Co. reports that it is installing four of its tandem Corliss compound steam and two-stage air compressors for the Mason & Hanger Company at Cornwall, New York, where the above company has a contract for one of the siphons or tunnels for the New York Board of Water Supply. Each of the above units has a capacity of approximately 2,500 cubic feet of free air per minute, so that the completed plant will furnish 10,000 cubic feet of free air per minute. These compressors operate on the same steam consumption as Corliss cross compound condensing engines of the same stroke, and owing to their tandem construction, the cost of freight, engine room and foundations is about half of a cross compound installation of the same capacity.

COBALT IN 1910.

Abstract of Report of Arthur A. Cole, Mining Engineer, T. & N. O. R. Commission, for Cobalt District, Year 1909

The following table will illustrate the steady progress of the Cobalt District since its discovery:

TABLE I.

Year.	Tonnage.	Value.
1904	158.55	\$136,217.00
1904	2,336.01	1,485,570.00
1906	5,836.59	3,573,908.00
1907	14,851.34	6,155,391.00
1908	25,362.10	9,133,378.00
1909	29,942.99	12,000,000.00 (Estimated)
	78,487.58	\$32,484,464.00

It will be seen from the above table that Cobalt has produced ore valued at \$32,484,464, and it is noteworthy that of this amount almost 50 per cent. has been repaid to the operators in dividends.

Cobalt now supplies about 12 per cent. of the world's silver production, being 24,000,000 ounces (estimated) for 1909, and this alone with the production from British Columbia easily places Canada in the third position as a silver producer.

Table 2 shows the silver production of the leading silver mining countries in the world for 1907, 1908 and 1909. The figures for 1907 and 1908 are taken from the Mineral Industry, and those for 1909 are estimated.

TABLE II.

Country.	1907.	1908.	1909.
	ozs.	ozs.	ozs.
Mexico	61,117.178	72,596.772	
United States	56,514.700	51,798.053	
Australasia	17,516.433	17,308.281	
Canada	12,779.799	22,070.212	27,700,000 (Est.)
Germany	5,088.086	5,200.000	
World's production	183,386,250	200,655,383	200,000,000

ORE SHIPMENTS FROM THE COBALT DISTRICT FOR THE YEARS 1904 TO 1909.

(Tons of 2,000 pounds.)

MINE.	1904	1905	1906	1907	1908	1909	Totals
1. Bailey			30.00		88.80	36.85	155.65
2. Beaver						51.38	51.38
3. Buffalo	200.80	992.80	1,241.54	536.90	648.86	3,620.90	
4. Casey Cobalt				10.00	8.50	18.50	
5. Chambers-Ferland				223.89	517.88	741.77	
6. City of Cobalt				50.61	761.04	556.82	1,878.47
7. Cobalt Central				77.33	187.99	339.01	604.33
8. Cobalt Lake					225.97	95.47	321.44
9. Cobalt Townsite				143.22	177.71	27.35	348.28
10. Colonial		15.00	40.38				55.38
11. Coniagas		30.60	422.02	2,447.37	610.25	806.93	4,317.17
12. Crown Reserve					657.35	3,167.52	3,824.87
13. Drummond	50	32.15	274.70	104.13	1,161.38	1,226.47	2,798.33
14. Foster		83.85	117.00	312.13	191.20	113.90	313.08
15. Green Meehan			37.03	98.39			135.42
16. Imperial Cobalt				14.61			14.61
17. Kerr Lake		54.95	158.35	319.76	680.24	1,173.42	2,886.72
18. King Edward (Watts)		19.00		31.12	338.19	146.58	534.89
19. LaRose	60.05	607.86	854.61	2,815.45	4,848.17	6,757.21	15,988.35
20. Lawson		14.61		61.12			75.73
21. McKinley-Darragh	20.00	447.09	80.45	742.42	1,508.39	1,056.49	4,154.84
22. Nancy Helen				30.10	201.32	116.32	347.74
23. Nipissing	57.00	486.02	2,125.08	2,538.26	3,571.96	6,470.52	15,248.84
24. Nova Scotia			43.95	272.21	237.95	224.79	778.90
25. North Cobalt						6.87	6.87
26. O'Brien		26.32	114.18	491.61	3,459.51	1,419.11	6,510.73
27. Peterson Lake (Leases) (Little Nipissing) (Nova Scotia)					40.67	39.62	80.29
28. Provincial					75.84		75.84
29. Princess					3.93		3.93
30. Red Rock				45.71			45.71
31. Right of Way			46.25	129.37	750.04	1,608.99	2,634.65
32. Silver Bar					58		58
33. Silver Cliff					160.44	149.06	309.50
34. Silver Leaf		9.00		46.36	197.03		262.39
35. Silver Queen		44.63	130.94	478.57	885.70	316.64	1,866.58
36. Temiskaming				204.32	795.20	852.14	1,851.66
37. Temiskaming Cobalt			20.47	67.98			88.45
38. Temiskaming & Hudson Bay				149.53	1,094.23	743.64	1,987.40
39. Trthewey	21.00	218.58	198.48	833.58	1,408.69	1,134.50	3,814.83
40. University		16.00	155.28	60.23			231.51
41. Victoria						47	47
42. Violet		16.00	20.00				36.00
43. White Silver Mg. Co		28.45					28.45
Totals	158.55	2,336.01	5,836.59	14,851.34	25,362.10	29,942.99	78,487.58

Of the 28 shippers for 1909, 14 paid dividends during the year amounting to about \$6,150,000.

The ore produced during 1907, 1908 and 1909 was shipped to the following countries for treatment:

Country.	1907.		1908.		1909.	
	Tons.	%	Tons.	%	Tons.	%
Canada	2,585.05	17.40	7,401.14	29.18	10,230.64	34.47
Great Britain	167.13	1.13	222.08	.88	30.25	.10
United States	12,098.95	81.47	17,439.42	68.76	19,575.59	65.08
Germany			229.46	1.18	106.51	.35
Totals	14,851.34	100.00	25,362.10	100.00	29,942.99	100.00

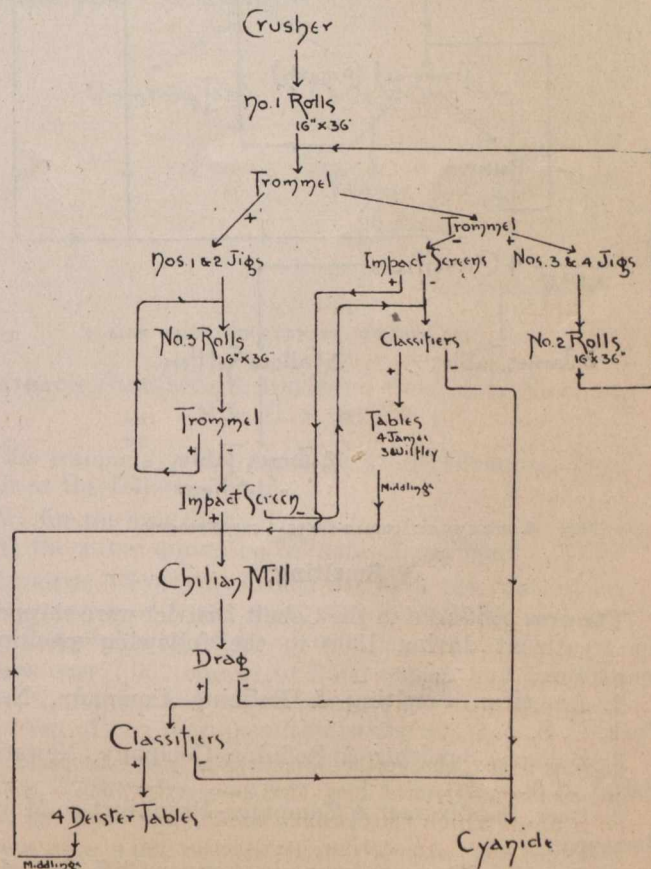
Silver.

Though the price during the year was low the fluctuations were not great, and it was continuously better than the low level reached in December of 1908.

The average price of silver for 1909 was 51.503 cents per ounce. The highest monthly average was 52.905 cents in May, and the lowest was 50.703 cents in November.

Cobalt.

Cobalt oxide is now produced in such comparatively large quantities as a by-product from the Cobalt silver ores that there has been no demand during the year for Cobalt ores solely for their cobalt contents. The market has been revolutionized. In 1907 the oxide sold for \$2.50 per pound. By the 1st of April, 1908, it had dropped to \$1.45 per pound, and at the close of 1909 it is being offered at 80 to 85 cents per pound.



1. FLOW SHEET. BUFFALO CONCENTRATOR.

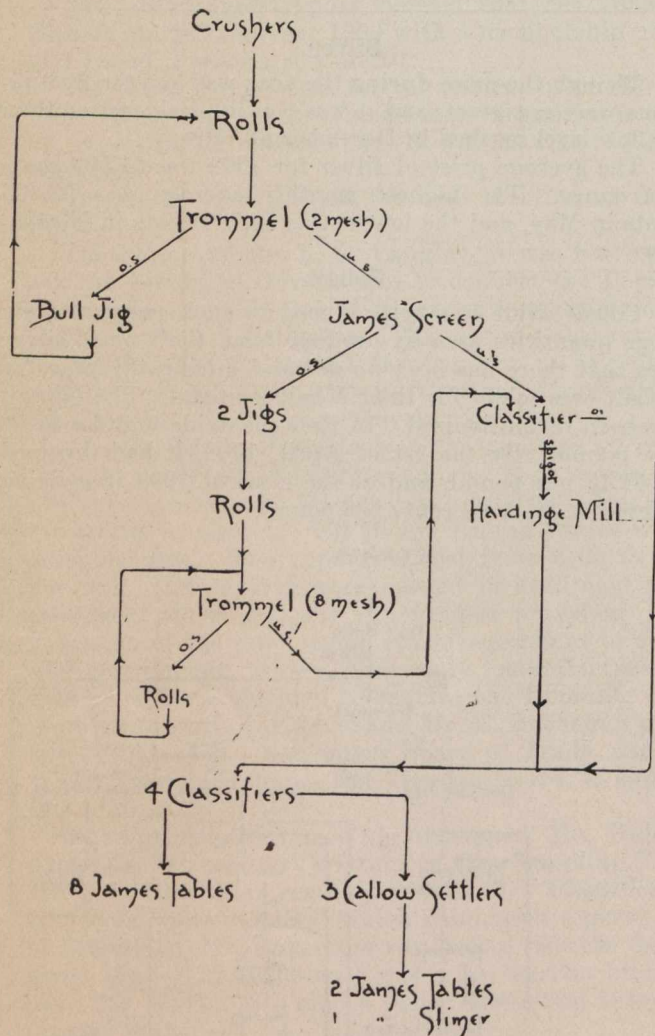
The three Canadian Smelting Companies treating high grade silver ores from cobalt pay a small amount for the cobalt contents in these ores under certain conditions, when they run over 6 per cent. metallic cobalt.

Nickel and Arsenic.

The other metals found in Cobalt ores besides the silver and cobalt, are nickel and arsenic. These are saved in part by some of the smelting companies, but are not paid for, but on the other hand they are both frequently penalized.

Sampling.

A customs sampling mill is now being erected in Cobalt by Messrs. Campbell and Deyell, of Cobalt. The mill is designed to sample both high and low grade ores, but only the high grade part is being installed at present.



2. FLOW SHEET, COBALT CENTRAL CONCENTRATOR.

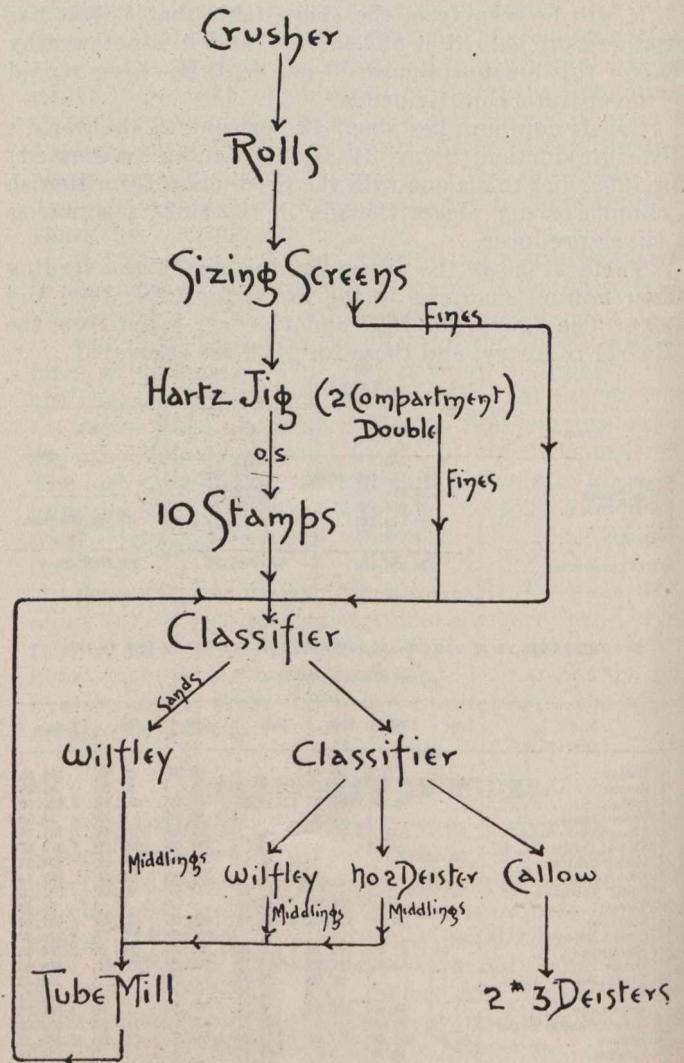
Smelting.

The ores produced in the Cobalt District were shipped for treatment during 1909 to the following smelting companies:

1. American Smelting & Refining Company, New York, U. S. A.
2. Balbach Smelting & Refining Company, Newark, N.J., U.S.A.
3. Beer, Sondheimer & Company, Frankfort-on-Main, Germany.
4. Canadian Copper Company, Copper Cliff, Ontario, Canada.

5. Coniagas Reduction Company of Canada, St. Catharines, Ont., Canada.
6. Deloro Mining & Reduction Company, Deloro, Ont., Canada.
7. Pennsylvania Smelting Company, Pittsburg, Pa., U. S. A.
8. Quirk, Barton & Company, London, England.
9. United States Metals Refining Company, New York, U. S. A.

The Montreal Reduction and Smelting Company of Canada, with works at Trout Mills, Ontario, also received some low grade ore from Cobalt, but this was treated by water-concentration, as this company has not yet commenced smelting operations.



3. FLOW SHEET, COLONIAL CONCENTRATOR.

1. AMERICAN SMELTING & REFINING COMPANY, NEW YORK, U. S. A.

This company received both high and low grade ores from Cobalt, the former being treated at the Company's works at Perth Amboy, N.J., and most of the latter at Denver, Colorado.

The following is the schedule offered:

For ores assaying 1,000 ounces or over per ton.

Silver.—Pay for 94 per cent. of the silver contents at the New York quotations.

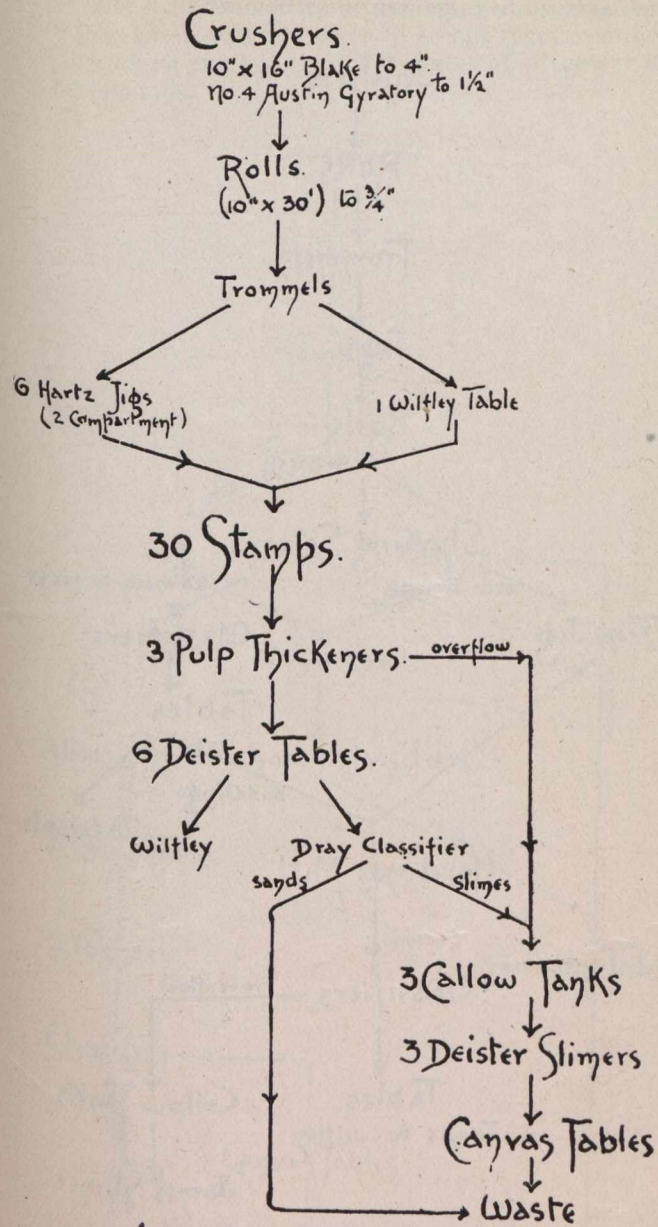
Treatment Charge.—\$8 per ton of 2,000 pounds, dry weight, plus one-half cent on each ounce of silver contained.

Arsenic.—An addition to the working charge will be made at the rate of twenty-five cents per dry ton for each per cent. of arsenic in excess of five per cent. Sampling free.

Payment.—30 days after agreement of assays. For ore under 1,000 ounces and over 60 ounces per ton:

Silver.—Payment for 94 per cent. of the silver contents at the New York quotations.

Treatment Charge.—\$8 per ton of 2,000 pounds, dry weight.



4. FLOW SHEET, CONIAGAS CONCENTRATOR.

Arsenic.—An addition to the working charge will be made at the rate of 25 cents per dry ton, for each per cent. of arsenic in excess of 5 per cent.

Payment.—Forty-five days after date of sampling.

If a mine is willing to contract for a total year's output, or 1,000 tons, the following schedule is offered:

For ores under 1,000 ounces and over 60 ounces:

Silver.—Pay for 95 per cent. of the silver contents, at the New York quotations.

Treatment Charge.—\$7. per ton of 2,000 pounds, dry weight.

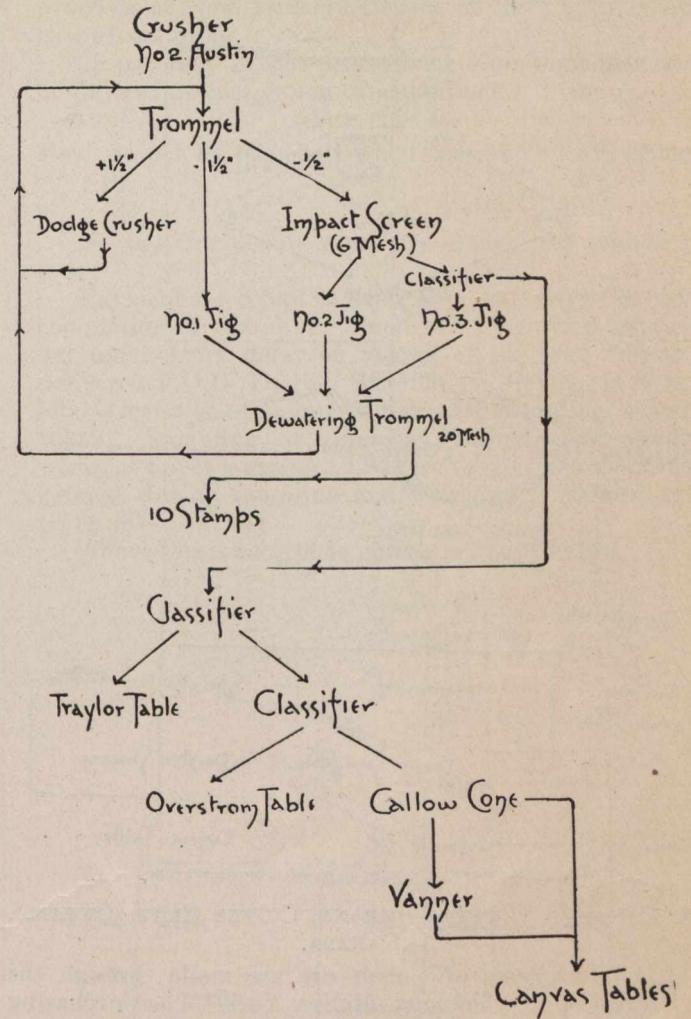
No payment for cobalt or nickel.

No penalties for insoluble.

Arsenic.—An addition to the working charge will be made at the rate of twenty-five cents per dry ton for each per cent. of arsenic in excess of 5 per cent.

Payment.—Payment forty-five days after agreement of assays.

The average freight from Cobalt to Perth Amboy is \$9.20 per ton, and from Cobalt to Denver, \$12 per ton.



5. FLOW SHEET, KING EDWARD CONCENTRATOR

2. BALBACH SMELTING & REFINING COMPANY, NEWARK, N.J., U. S. A.

This company is buying high grade silver ore from Cobalt at the following rates:

Pay for the ores thirty days after agreement of assays and at the silver quotation on date of payment.

Penalties.—Forty-five cents for each per cent. of arsenic in excess of 6 per cent., and 6 cents for each per cent. of insoluble in excess of iron.

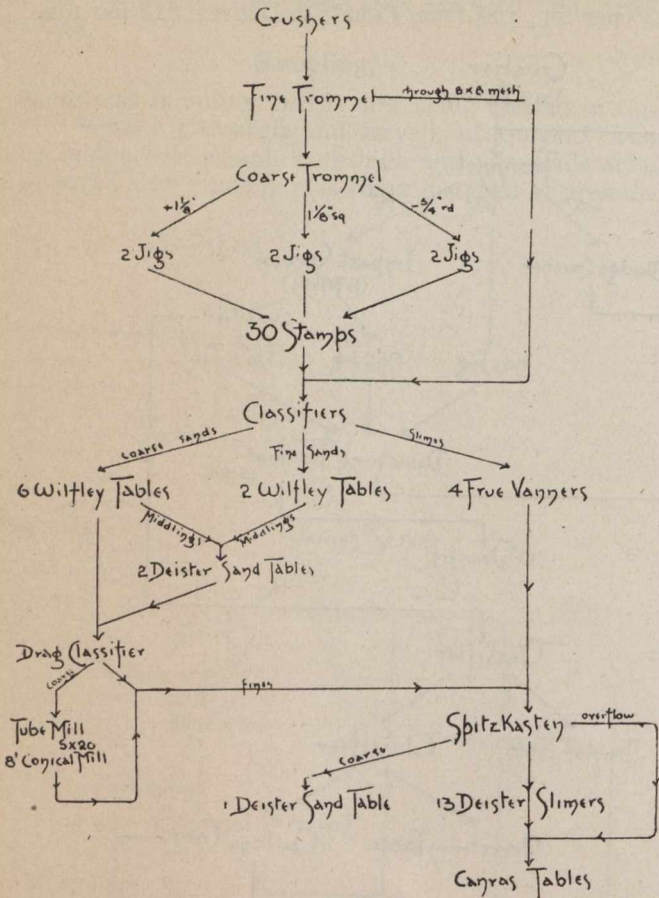
Ores over 1,000 ounces to 1,500 ounces pay for 93 1/2 per cent. of the silver contents and a smelting charge of \$4 per ton of ore, with penalties as above.

Ores above 1,500 ounces to 2,000 ounces pay for 93 1/2 per cent. of the silver contents, and a smelting charge of \$20.00 per ton of ore, with penalties as above.

Ores over 2,000 ounces silver per ton, pay for 93 1/2 per cent. of the silver contents and a smelting charge of \$19 per ton of ore, with penalties as above.

3. BEER, SONDHEIMER & COMPANY, FRANKFORT-ON-MAIN, GERMANY AND NEW YORK.

High grade silver ore is bought for this company as follows:
 Pay for 94 to 95 per cent. of the silver contents.
 Smelting charge, \$30 per ton.
 No refining charge,
 Ore to be delivered at New York.



6. FLOW SHEET. M'KINLEY-DARRAH CONCENTRATOR.

4. CANADIAN COPPER COMPANY, COPPER CLIFF, ONTARIO, CANADA.

All purchases of Cobalt ore are made through the Orford Copper Company, of New York. The purchasing schedule is as follows:

Purchaser to make payment for			
75%	silver per ton, when same assays 100 oz. and over.		
84%	" " (2,000 lbs.)	200	"
86%	" " "	300	"
87%	" " "	400	"
89%	" " "	500	"
90%	" " "	600	"
92%	" " "	800	"
93%	" " "	1,000	"
93 1/4 %	" " "	1,300	"
93 1/2 %	" " "	1,600	"
94 1/2 %	" " "	2,000	"
94 3/4 %	" " "	3,000	"

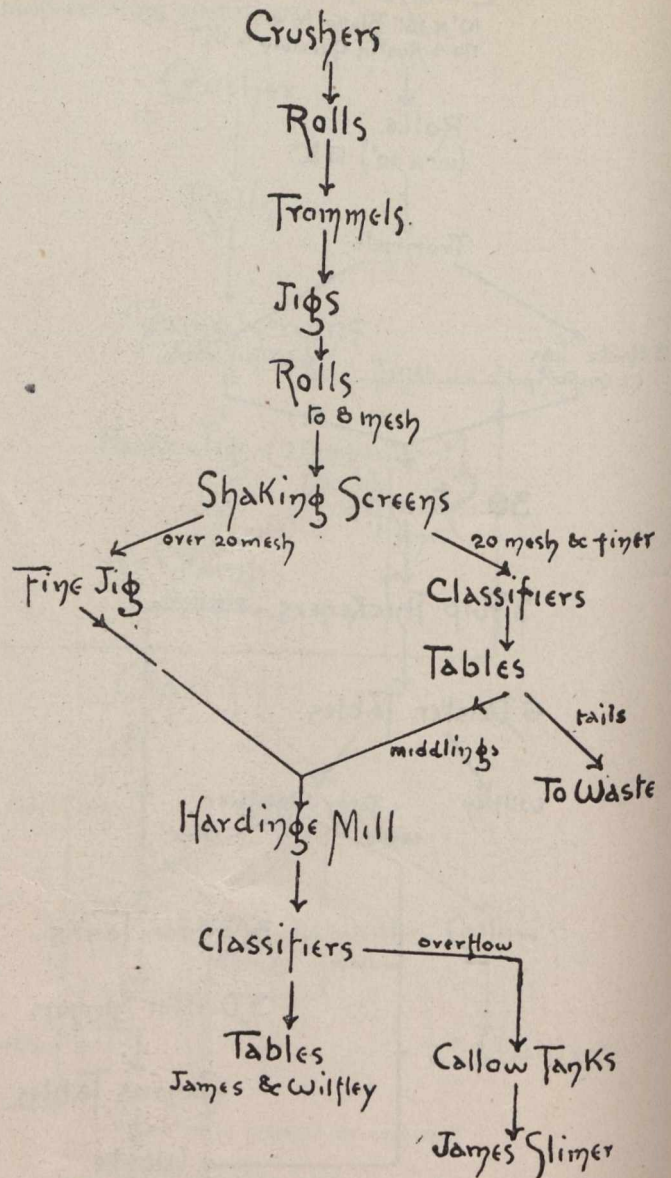
Purchaser to make payment of			
\$10.00	per ton when same contains 6% cobalt and over.		
\$20.00	" " " " 8% " "		
\$30.00	" " " " 12% " "		

No payment will be made for cobalt in ores containing less than 6 per cent. cobalt, nor in which the nickel contents are higher than the cobalt contents. Further, pur-

chaser reserves the right, to return at shipper's expense, any such ores (i.e., nickel contents higher than cobalt contents) received at Copper Cliff.

Ore to be delivered by seller to the Canadian Copper Company, f.o.b. cars, Copper Cliff, Ontario. Ore to be at shipper's risk until sampling is undertaken, as purchaser can assume no responsibility for the ore until same has been taken into its sampler.

Purchaser to sample at its expense, purchaser's and seller's representatives to be present. Assays to be made by Ledoux & Company, of New York, at seller's expense, which assays are to govern in settlement.



7. FLOW SHEET. NIPISSING REDUCTION CONCENTRATOR.

Payment for 70 per cent. of the silver returnable to the seller, as per the above scale to be made at the New York official price for silver on the first settlement date, which shall be thirty-five days after the date of which sampling of the ore is completed, and the balance 30 per cent. on the second settlement date at the New York official price of silver on that date, which shall be 90 days after sampling of the ore is completed. The purchaser, however, reserves the right to deliver upon either or both of the settlement dates above specified in lieu of cash, at its option, such silver bullion (commercial bar silver)

as is due the seller in settlement upon these dates, such delivery to be made in New York City.

Payment for cobalt will be made as per the above scale when the cobalt content of the ore comes within the specifications mentioned, settlement for same to be made on the first due date for silver, namely, in 35 days after completion of sampling of ore.

Purchaser has named a rate of 75 per cent. silver returnable to the shipper on ore running from 100 to 200 ounces per ton of 2,000 pounds. This is to be considered as a penalty clause and to apply only in such cases where ores under 200 ounces have been shipped by mistake.

Purchaser does not agree to accept regular shipments of ore which run less than 200 ounces of silver per ton of 2,000 pounds.

91%	"	"	"	750	"
93%	"	"	"	1,000	"
93½%	"	"	"	1,500	"
94½%	"	"	"	2,000	"
95%	"	"	"	3,000	"

Ores containing less than 100 ounces per ton are subject to a treatment charge of \$10 per ton of 2,000 pounds, unless ore contains 12 per cent. or over of nickel and cobalt combined.

Terms of Payment for Silver.—75 per cent. of net proceeds at New York quotations 30 days after completion of sampling.

25 per cent. of net proceeds at New York quotations 90 days after completion of sampling.

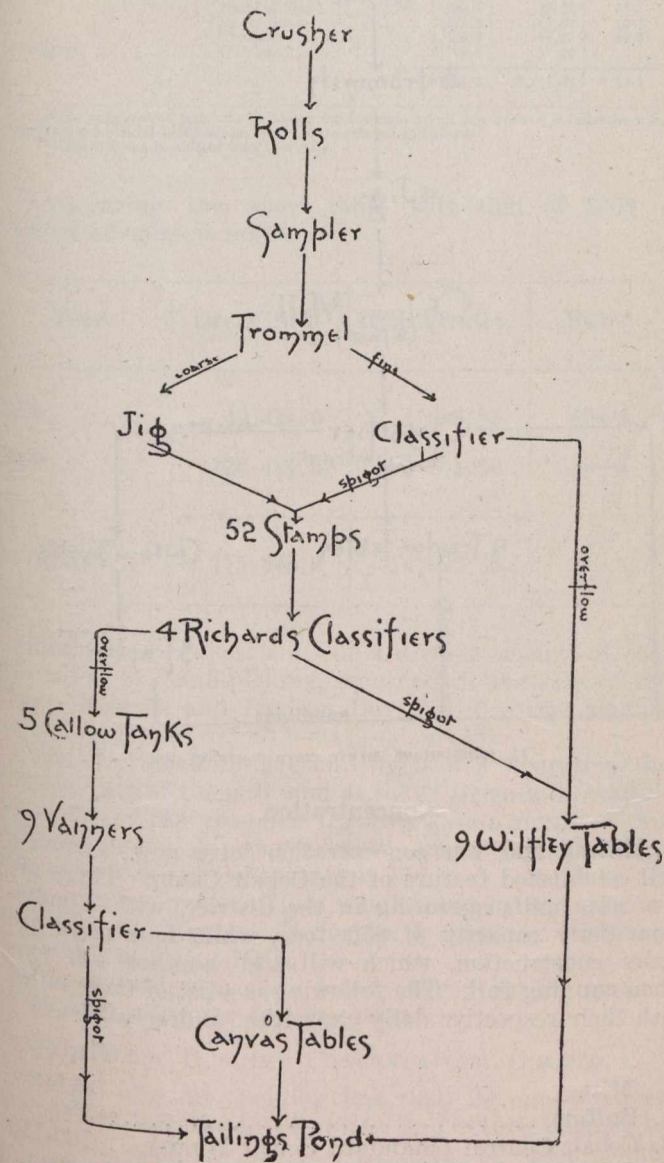
For cobalt.

Pay	8c	per lb. of cobalt	when ores assay	6%	or more.
"	10c	"	"	8%	"
"	12c	"	"	10%	"

No pay for cobalt when ore assays less than 6 per cent.

Payment for cobalt to be made ninety days (90) after completion of sampling, which will be carried out without unnecessary delay on receipt of the ore. Ore to be delivered F.O.B. Thorold Smelter, via G.T.R., in carload lots. Ore to be at shipper's risk until sampling is undertaken. Sampling at Coniagas Reduction Company's works at buyer's expense. Sellers to have representatives present during sampling and weighing. Weights to be taken after milling.

Above terms subject to change without notice.

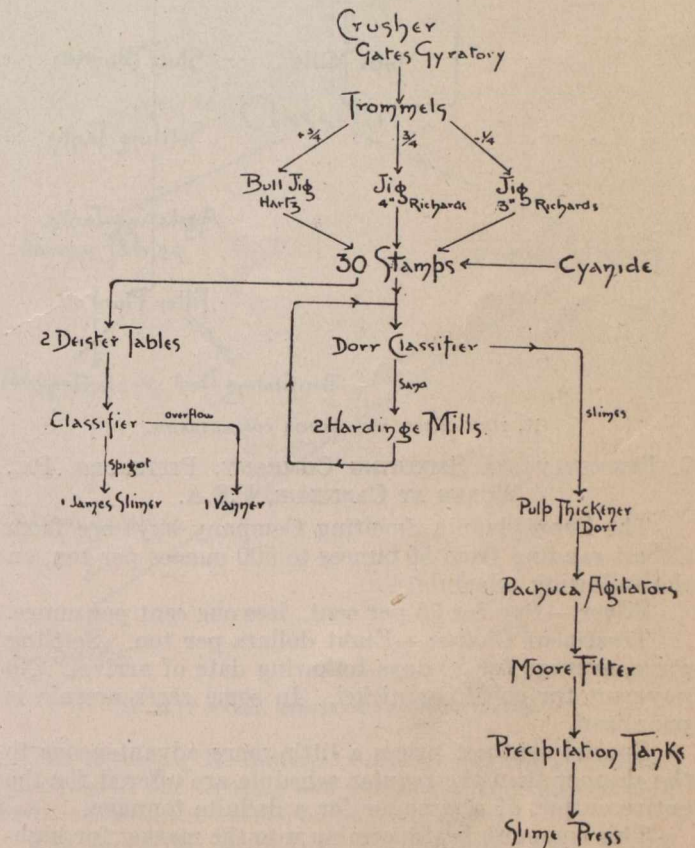


8. FLOW SHEET, NORTHERN CUSTOMS CONCENTRATOR

5. THE CONIAGAS REDUCTION COMPANY, LIMITED, ST. CATHARINES, ONT.

The above company will purchase cobalt and silver ores on the following schedule:

Will pay for:—				
75%	of silver contents	assaying over	20	ozs.
84%	"	"	200	"
86%	"	"	300	"
89%	"	"	500	"



9. FLOW SHEET, O'BRIEN CONCENTRATOR

6. DELORO MINING & REDUCTION COMPANY, DELORO, ONT.

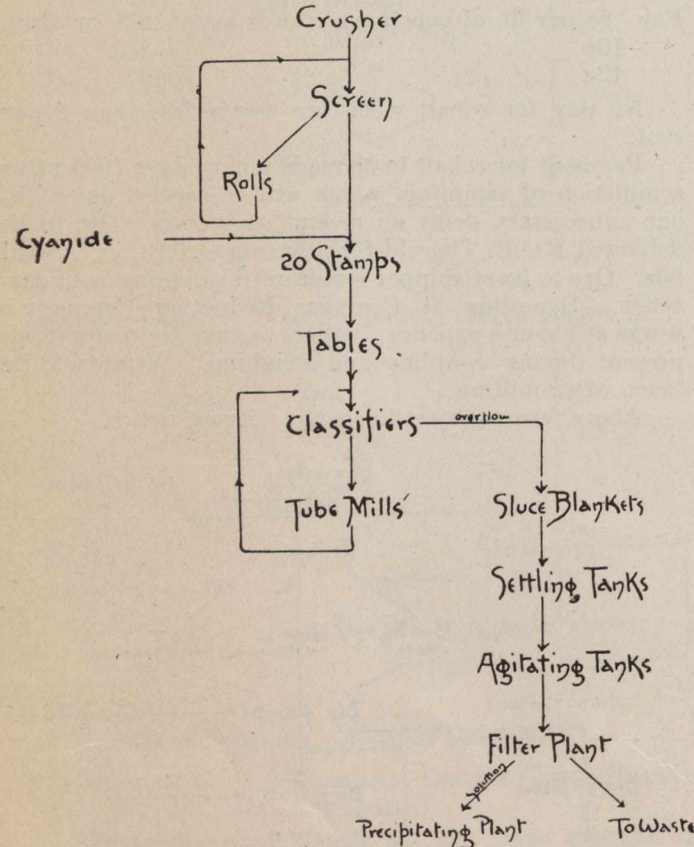
Tariff on Cobalt Silver Ores and Concentrates:

Silver.—Pay for 98 per cent. of silver contents.

Treatment Charge.—\$20 per ton of ore and a refining charge of one cent per ounce of silver contained.

Terms of Payment.—75 per cent. of net proceeds at New York quotation 30 days after completion of sampling; 25 per cent. of net proceeds at New York quotation 90 days after completion of sampling.

Cobalt.—On ore containing 6 per cent. and over, 10 cents per pound for cobalt contained. No payment will be made for cobalt in ores containing more nickel than cobalt. Payment for cobalt to be made with the second payment for silver. Ledoux & Company's assays accepted with the usual provisions as to umpire assays in case of unusual differences. Above assays to be made at shipper's expense. No charge for sampling. Ore to be delivered in carload lots F.O.B., Marmora Station, C.O.R. This tariff is subject to change without notice.



10. FLOW SHEET, NOVA SCOTIA CONCENTRATOR.

7. PENNSYLVANIA SMELTING COMPANY, PITTSBURG, PA., WORKS AT CARNEGIE, U.S.A.

The Pennsylvania Smelting Company buys ore from Cobalt ranging from 50 ounces to 500 ounces per ton, on the following schedule:

Silver.—Pay for 95 per cent., less one cent per ounce. Treatment Charge.—Eight dollars per ton. Settling price, average for 20 days following date of arrival. No payment for cobalt or nickel. In some cases arsenic is penalized.

Special contract prices a little more advantageous to the shipper than the regular schedule are offered for the entire output of a mine, or for a definite tonnage.

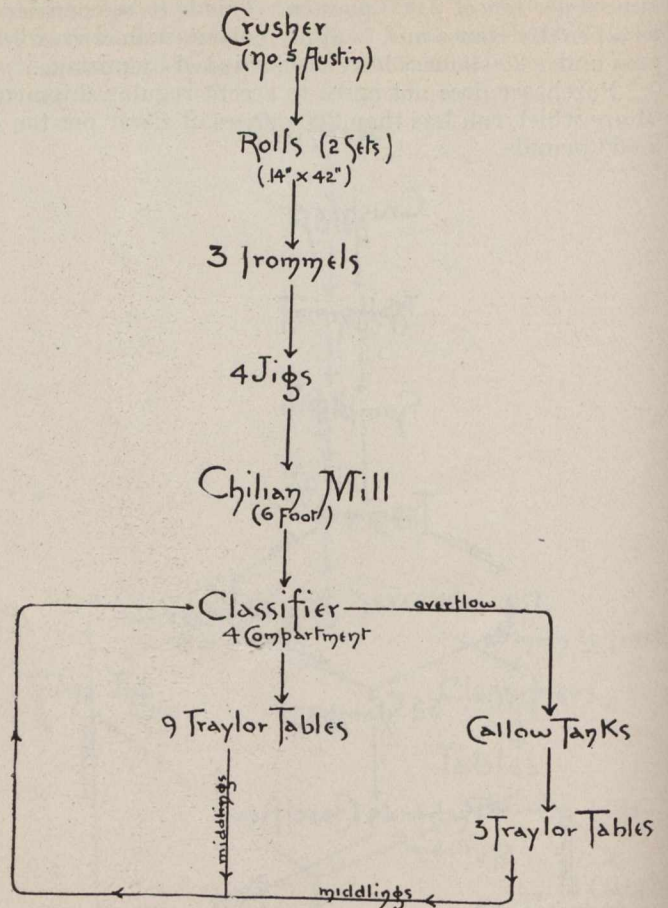
This company is also coming into the market for high-grade ores.

8. QUIRK, BARTON & COMPANY, LONDON, ENGLAND.

A contract was made for the buying of a limited amount of cobalt ores from one of the mines of Cobalt, but this was of a private nature, and no general schedule has been issued. At the present time they are not in the market, as the contract they have takes all their capacity.

9. UNITED STATES METALS REFINING CO., NEW YORK, WORKS AT CHROME, N.J.

The silver ores from Cobalt that are being purchased by this company are comparatively low grade, the richest containing 400 ounces silver per ton. No regular schedule is published, but the prices vary with the character of the ore purchased.



11. FLOW SHEET, SILVER CLIFF CONCENTRATOR.

Concentration.

Milling and wet concentration have now become a well established feature of the Cobalt Camp. There are now nine mills operating in the district, with a maximum daily capacity of 850 tons, while four more are under construction, which will add another 400 tons when running full. The following is a list of these mills, with their respective daily capacities, under full load:

Mill.	Capacity in tons.
1. Buffalo	150-
2. Cobalt Central (Standard Cobalt Mines) . . .	100-110
3. Colonial	50
4. Coniagas	90
5. King Edward	36
6. McKinley-Darragh	120-140
7. Nipissing Reduction	75
8. Northern Customs	140
9. O'Brien	90
Under Construction—	
10. Nova Scotia	100
11. Silver Cliff	125
12. Temiskaming	75-80
13. Trethewey	100

The following is a statement of the concentration tonnage for the camp during 1909:

CONCENTRATION IN COBALT FOR 1909.

Mill.	Mines.	Ore milled Tons.	Concentrates Tons.	Concentration ratio.
1. Buffalo	Buffalo	27,875.0	507.00	55-1
	Bailey	2,482.0	36.24	68-1
	Cobalt Central	21,273.0	362.40	59-1
2. Cobalt Central	Crown Reserve	45.0	1.02	44-1
	Foster	547.0	10.20	54-1
	Kerr Lake	1,093.0	104.79	10-1
3. Coniagas	Coniagas	19,671.4	465.70	42-1
4. Colonial	Colonial	1,500.0	25.00	60-1
5. King Edward	King Edward	4,769.6	105.43	45-1
6. McKinley Darragh	McKinley-Darragh	18,703.0	741.59	25-1
	Nipissing	9,597.0	229.00	49-1
7. Nipissing Red. Co.	Cobalt Lake	301.9	60.00	5-1
	City of Cobalt	2,576.3	57.01	45-1
	LaRose	5,988.2	255.62	23-1
	Nancy Helen	284.9	5.87	49-1
8. Northern Customs Con.	Nova Scotia	1,173.1	39.71	30-1
	Right-of-Way	1,289.7	28.22	46-1
	Silver Queen	2,371.9	132.68	18-1
	Trethewey	1,130.8	17.02	66-1
9. O'Brien	O'Brien	3,749.5	57.00	* 39-1
		126,421.3	3,241.50	

* No comparative ratio can be stated for O'Brien, as all low grade concentrates were cyanided and yielded 12,656 ounces, which were shipped as bullion.
 * The O'Brien is omitted from this ratio.

Comparing the above table with that of 1908, a marked advance is noted.

Year.	Ore Milled.	Concentrates.	Ratio
1908.....	49,424.0	1,093.85	45-1
1909.....	126,421.3	3,241.50	39-1
Totals.....	175,843.3	4,335.35	

The mines without mills do a certain amount of concentration by hand-picking, etc., and in the case of the Crown Reserve and Hudson Bay mines, coarse jiggling is employed.

The Buffalo Mining Company is now operating the cyanide part of the mill, and at the O'Brien mill cyaniding is one of the principal features. As a result of this these companies ship out a certain amount of silver bullion as well as raw concentrates.

A certain amount of ore was treated by wet concentration by the Montreal Reduction & Smelting Company of Canada at Trout Mills.

The following are the rates offered by the custom mills in the camp for treating ores:

NORTHERN CUSTOMS CONCENTRATOR, LIMITED.

Tariff.—On ore yielding less than 20 ounces silver per ton crushed, retain 10 ounces and return balance to the mining company with 50 per cent. of other metals that can be sold.

20 to 35 ounces silver,	pay 50 per cent.
35 to 50 " " "	55 "
50 to 70 " " "	60 "
70 to 90 " " "	65 "
90 to 110 " " "	70 "
110 to 125 " " "	75 "

Ore will also be treated on the tonnage basis of \$4 per ton, ore to be delivered at the mill and concentrates delivered to owners, in their sacks, dried and loaded on cars.

THE STANDARD COBALT MINES, LIMITED (Cobalt Central).

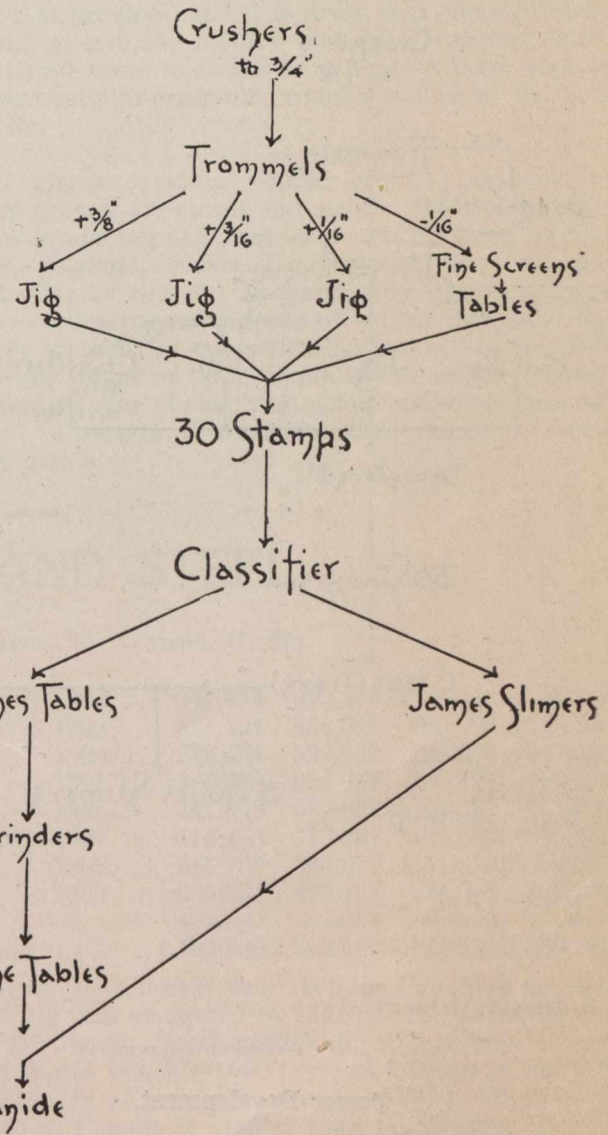
Makes the following schedule for milling ore:

Ore on dump running 30 ounces or better, 50 per cent. of the product from concentration.

Ore 60 oz. and under 80 oz., 55 per cent. of product.

" 80	"	"	100	"	63	"	"
" 100	"	"	125	"	70	"	"
" 125	"	"	150	"	77	"	"
" 150	"	"	200	"	82	"	"
" 200	"	"	250	"	85	"	"

The above company pays all charges of hauling and milling of ore, and will deliver at its mill the percentage of product due the mine furnishing the ore.



12. FLOW SHEET, TEMISKAMING CONCENTRATOR.

The Nipissing Reduction Company has not at present a fixed tariff for treating ore, but varies the rates to suit conditions and the nature of the ore.

The Montreal Reduction & Smelting Company of Canada at Trout Mills, Ontario, treated ores by wet concentration on the following schedule after the 1st June, 1909:

Settlement to be made on the thirtieth day after the agreement upon the assays, and at the New York quotation price of silver on the day of settlement.

Ores to be delivered f.o.b. at Trout Mills.

Charge for treatment, \$5 per ton.

Grade.	Percentage of assay paid.
Over 30 ounces	75 per cent.
" 70 "	76 "
" 80 "	78 "
" 90 "	80 "
" 100 "	82 "
" 110 "	83 "
" 120 "	84 "
" 130 "	85 "
" 140 "	86 "
" 150 "	87 "
From 180 to 200 ounces.....	88 "

is a large one. The following table shows the coal received in Cobalt for the years 1908 and 1909:

1908.	Tons.
January	5,067
February	1,429
March	8,670
April	3,568
May	1,401
June	2,827
July	4,318
August	3,561
September	2,713
October	5,740
November	7,407
December	9,058

Totals	55,759
1909.	Tons.
January	7,687
February	8,136
March	10,173
April	9,930
May	5,771
June	4,102
July	5,677
August	5,060
September	6,173
October	9,007
November	14,957
December	18,743

Totals 1908	55,759 tons.
Totals 1909	105,416 "

Total 161,175

As all this coal is brought in from the United States, the cost of freight is higher than the original cost of the coal at point of loading on cars. The average cost of coal to the mines is about \$5.50 per ton f.o.b. Cobalt.

The cost of power generation from coal in the camp is necessarily high, even in the most economical plants, and is particularly high in the smaller plants. In some plants it will run over \$175 per horsepower per annum, and the average price will likely be over \$150.

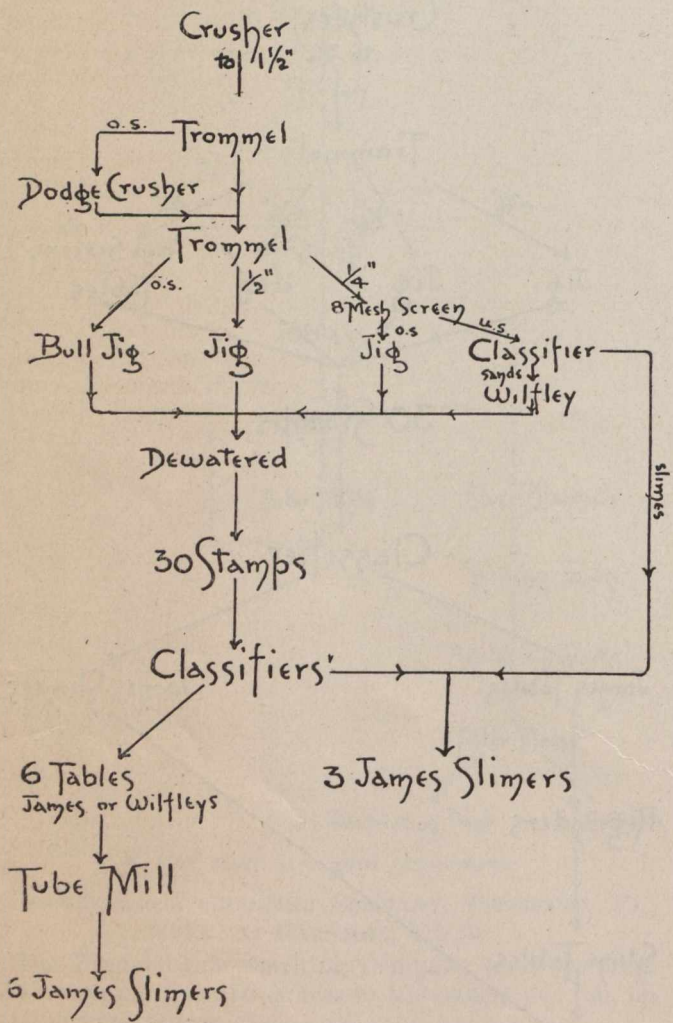
With this high cost of power production it was only natural that the great water powers in the vicinity of Cobalt should not long be unharnessed, and now three companies are installing plants and expect to be delivering power in Cobalt early in 1910.

These companies are:

1. Cobalt Hydraulic Power Company, Ragged Chutes, Montreal River.
2. Cobalt Power Company, Hound Chute, Montreal River.
3. Mines Power Limited, Matabitchouan River.

Leases.

Of the mining companies leasing mining property from the T. & N. O. Ry., four made shipments during 1909. The following statement shows the amount paid by these four companies in royalties to the T. & N. O. Ry. Commission from the time the leases were granted to the 31st December, 1909:



13. FLOW SHEET, TRETHEWEY CONCENTRATOR.

Power Development.

At the commencement of mining operations at Cobalt the exceptionally rich outcrops of silver ore made it a very easy matter for a mine manager to keep his returns from shipments above his cost of production, even if this cost might have been unreasonably high. With deeper mining and a handling of higher tonnages of lower grade material, this state of affairs has altered. The mine managers, who are men of proven mining ability, are looking closely after their working costs and in this connection the cost of power production takes a prime position.

The boiler horsepower of the district is now about 11,000 horsepower.

Practically all the boilers represented in the above amount are burning coal, so that the daily consumption

City of Cobalt Mining Company	\$87,251.24
Cobalt Townsite Mining Company	16,972.35
Nancy Helen Mines, Limited	1,640.27
Right of Way Mining Company	204,392.82
Total	\$310,256.68

On the other T. & N. O. Ry. leases a certain amount of prospecting work has been done, but with rather indifferent success.

Outlying Districts.

Silver.—During 1909 a large amount of prospecting and development work has been done throughout the silver belt of which Cobalt is a part. Several shipments of high-grade ore have been made from the South Lorrain District, and small shipments have gone from Maple Mountain and Gowganda. At Elk Lake and Gowganda a certain amount of rich ore is now ready for shipment.

The following are the shipments to the end of 1909.

District.	Mine.	Date.	Tons.	Total.
South Lorrain.....	Keeley Mine	June, 1908	12.50	44.84
		Dec., 1908	30.75	
		Feb. 1909	1.09	
	Wetlaufer	Sept., 1909	25.00	
		Nov., 1909	29.90	
Dec., 1909		26.50		
Maple Mountain.....	Canadian Silver Ores.....	Sept., 1909.....	6.50	111.50
				6.50
Gow Ganda	Bartlett Mines	June, 1909	2.00	2.00
				2.00
Total.....				164.34

Gold.—For more than a year back prospectors have frequently been bringing in specimens of gold-bearing quartz from the region around Lake Abitibi and from the Townships of Beatty, Munro and Guibord to the east of Matheson, but it was not until late in the year 1909 when the gold finds in the Porcupine Lake District became known, that the public really became aroused and interested. The district is situated west of Matheson in Tisdale and Whitney and the adjoining townships.

Although hardly any development work has yet been done in the district, there seems to be reason to regard it as one of great promise.

The change in the Mining Law of the Province of Quebec, which becomes effective on the 1st January, 1910, is already awakening keener interest in the mining industry in that province, and it is likely that many prospectors will go into the country that will be thrown open. The natural route to follow to get into a large area of this practically unprospected country will be by the T. & N. O. Ry.

The plants treating copper ores by the Elmore vacuum process are eleven in number. These are treating low-grade copper ores alone in Austria, Africa, France, England, Wales, Hungary, Norway, Sweden and the Malay States. In practically every instance they are operating on a grade of copper ore which by ordinary methods of concentration would fail to yield any profit. Some of these plants have been in continuous operation for about three years, a distinct encouragement to owners of other low-grade mines to install similar plants.

CANADIAN IRON AND STEEL.

Written for the Canadian Mining Journal by Watson Griffin.

I.

Many attempts to manufacture iron and steel in Canada were made in early times, but they all ended in failure largely on account of lack of tariff protection. No country ever established a great iron and steel industry without government encouragement in the form of high tariff protection or bounties, or both combined. The United Kingdom had the highest kind of protection until it lead the world in iron production. The iron industries of the United States, Germany, France, and Belgium were all developed by means of very high protection continued for a long period. For many years Canada gave practically no protection to its iron and steel industries. In recent years there has been moderate protection supplemented by large bounties, and as a result iron and steel industries of considerable magnitude have developed.

The great increase in the production of both pig iron and steel since 1896 is shown by the quantities on which bounties were paid. The figures are as follows:—

Years ended.	Pig Iron.		Steel.	
	Quantity.	Bounty.	Quantity.	Bounty.
June 30—1896....	Tons.	\$	Tons.	\$
“ 1897....	52,052	104,105	29,749	59,499
“ 1898....	33,254	66,509	8,683	17,366
“ 1899....	72,523	165,654	24,673	67,454
“ 1900....	76,496	187,954	23,342	74,644
“ 1901....	101,838	238,296	21,453	64,360
	150,339	351,259	33,352	100,058

“ 1902....	341,654	693,108	36,375	77,431
“ 1903....	321,191	666,001	260,668	729,102
“ 1904....	273,434	533,982	128,884	347,990
“ 1905....	386,719	624,667	300,421	676,318
“ 1906....	581,858	687,632	569,237	941,000
Mar. 31—1907....	416,265	385,231	454,932	575,259
“ 1908....	686,780	863,817	661,940	1,092,201
“ 1909....	609,431	693,423	570,588	838,100

Totals 4,103,834 3,261,638 3,124,297 5,660,782

During the calendar year 1909 the Canadian production of pig iron amounted to 724,016 tons. For the ten years 1851-60 the total production of pig iron in the United States was 6,600,000 tons, an average of 660,000 tons annually, so that the present annual production of pig iron in Canada is greater than the average annual production of the United States during that period. In 1850 the United States had a population of 23,191,876, and in 1860 it was 31,443,321. Canada has at the present time about seven and a half million people.

No country can be industrially independent until it has iron and steel industries of sufficient capacity to supply its own wants. The need of government assistance in the early stages is due to many causes. There is no other industry that requires such a large initial outlay for plant. What would be considered an immense investment in starting almost any other industry is sufficient to construct only a small iron and steel plant. The successful operation of a plant constructed

at such great cost is dependent upon the economical assembling of the raw materials, iron ore, limestone, and fuel. The materials must be of at least passably good quality; they must be found in sufficient quantities; they must not be too far apart; and the cost of transportation must be low. The present methods of making iron and steel require much larger and much more expensive plants than those used during the early history of the industry in the United States, and the supplies of materials must be greater. Thus iron ore deposits that would have been sufficiently large to have justified the establishment of a small plant in their vicinity fifty years ago would be considered too limited for local utilization now. Often after very great expense in development work an ore bed is found to be too limited in extent to be of value. Very costly experiments must be made in using the different materials together. It is seldom that any two deposits of iron ore or limestone are exactly the same. Coal also varies in quality. The materials assembled at a newly established smelting centre may be just as good taken together as the materials used at some older smelting centre from which workmen come, but they require a different method of handling. For instance, in one locality the iron ore may be low in sulphur and the coal high in sulphur. Iron ores from different localities must often be mixed. Sometimes the iron ore contains a high percentage of limestone, so that comparatively little limestone need be added for flux. Sometimes the limestone used for flux contains a percentage of iron, and this may make it possible to use with it iron ores having a rather low percentage of iron. All these and many other variations in materials must be taken into consideration.

The conversion of the materials into iron and steel requires many skilled workmen. The industry being new to Canada, the workmen had to be brought from abroad until Canadians could be trained for the work. To induce these workmen to leave remunerative employment in old-established smelting centres it was necessary to offer them higher wages than they were getting at a time when wages were at the maximum. This made the scale of wages higher than at any of the old centres, and added enormously to the cost of production.

Men gathered together at a new plant from a number of different plants in foreign countries had to learn how to work together and how to make use of materials to which they were not accustomed. Many mistakes were made at first, even by experienced men who had been very successful at old-established works. Men coming from different works where varied materials were used had each their own theories as to what was wrong. Of course, all these difficulties were most manifest at the largest plant established in Canada, that of the Dominion Iron & Steel Company, and it required very great organizing ability to get everything into good working order.

Fortunately, Canada has now passed the most critical stage in the development of an iron industry. The work has become systematized, the workmen from other countries understand the new conditions, and a number of Canadians have already become skilled workmen, but higher protective duties or a continuance of bounties will be necessary for the establishment of the industry in the different provinces of Canada on a permanent basis. The bounties have been steadily decreasing, and this is the last year for such government aid

unless a new arrangement is made. The unexpected abolition of the German surtax, coming at a time when the bounties have reached the minimum, exposes our iron and steel works to severe German competition.

In his budget speech December 14, 1909, Hon. Mr. Fielding made a statement showing the customs revenue collected at the ports of Sault Ste. Marie, Ont., Sydney, N.S., North Sydney, N.S., Sydney Mines, N.S., Glace Bay, N.S., New Glasgow N.S., and Hamilton, Ont., during the ten years 1890 to 1899, both inclusive, and for the ten years from 1900 to 1909, both inclusive, showing that in the latter period the customs revenue from these ports was over nine million dollars greater than in the former period. At all these ports, excepting Hamilton, nearly the whole increase was due to the establishment of iron and steel works, and at Hamilton a considerable portion of the increase was due to the same cause. Mr. Fielding did not mention Midland, Ont., Port Arthur, Ont., Deseronto, Ont., Radnor Forges, Que., and Londonderry, N.S., at all of which are blast furnaces and communities dependent upon them that have contributed largely to the customs revenue of Canada. Besides the direct payment of customs duties at the points where blast furnaces are located Mr. Fielding pointed out that the iron and steel companies and the communities dependent upon them purchased supplies largely in Toronto, Montreal, Quebec, St. John, Halifax and a number of other cities and towns of Canada, thus considerably increasing the customs revenue of these towns and cities. It is thus certain that as a direct result of the establishment of iron and steel industries in Canada the Government has received more revenue than has been paid out in bounties. In addition to the imported supplies purchased by the iron and steel companies and the communities dependent upon them, they have purchased vast quantities of goods made in Canada, upon which no duties were paid, thus indirectly giving extra employment to work-people throughout the country, stimulating every branch of trade and creating a large home market for Canadian farm products.

The value of the iron and steel produced was enormously greater than the bounties paid, and but for the establishment of iron and steel industries in Canada, an immense amount of money would have been sent out of the country to purchase iron and steel. By keeping these vast amounts of money in circulation at home instead of in foreign countries these industries contribute to the prosperity of every section of the community.

There are at present eight Canadian companies having blast furnaces, viz., the Dominion Iron & Steel Company, the Nova Scotia Steel & Coal Company, the Londonderry Iron & Mining Company, the Canadian Iron Corporation, the Algoma Steel Company, the Hamilton Steel & Iron Company, the Atikokan Iron Company, and the Deseronto Iron Company. There are four companies which have steel plants but no blast furnaces, viz., the Montreal Steel Works, Ltd., Montreal, the William Kennedy Sons, Ltd., Owen Sound, Ont., the Ottawa Steel Castings Company, Ltd., Ottawa, and the Ontario Iron & Steel Company, Ltd., Welland, Ont.

In future articles I shall describe the plants of the different Canadian iron and steel companies, the location of their raw materials, and their position as regards the home and foreign markets, discussing also the possibilities of future development of iron and steel industries in the various provinces of the Dominion.

STEAM-DRIVEN AIR COMPRESSORS IN COBALT.

Written for the Canadian Mining Journal by H. V. Haight.*

The article in the Canadian Mining Journal for February on "Costs of Producing Compressed Air in a Canadian Mining Camp," by Richard L. Webb, is very interesting. Mr. Webb has certainly made extensive investigations of the cost of compressed air, from which we may, with care, draw valuable conclusions.

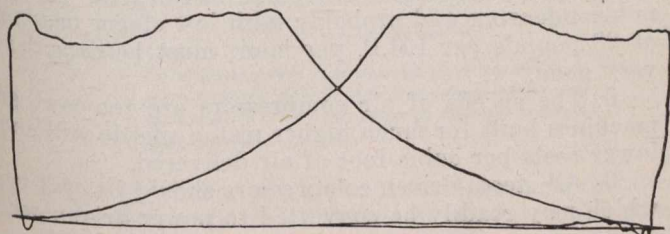
In justice to your readers, Mr. Webb should have explained that he was till lately in the employ of the Cobalt Hydraulic Company, which company is installing a hydraulic air compressing plant on the Taylor system to supply compressed air to sell at retail to the Cobalt mines, and that the information contained in his article was gathered while in their service. This would have enabled your readers to have appreciated Mr. Webb's point of view and the reason of gathering such information.

Mr. Webb has referred to many efficiencies, mechanical, volumetric, adiabatic, over-all and commercial. The point of greatest interest to the mine management is usually the commercial efficiency. This is hard to define exactly, but it is contained in the answers to the questions, Is the machine a profitable investment? Would some other machine be a more profitable investment? In regard to the first question there can be no doubt; compressed air for mining is cheap at any price, and any compressor is a profitable investment. This is indicated in Mr. Webb's paper where he says: "Many owners will not allow a plant to be shut down for repairs so long as it will turn over."

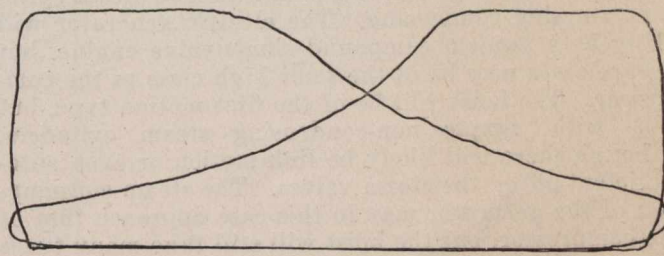
The second question opens up a large field. The cost of compressed air may be divided roughly into capital cost and operating costs. These will vary widely with the type of machine and equipment; when the capital cost is low, the operating cost is high, and vice-versa, and it is a nice problem for the mine manager to strike a proper balance between them. The usual stages of development of a compressed air mining plant are as follows:—

(1) A prospecting plant, usually a three to five drill straight-line compressor. It runs non-condensing with 80 pounds steam. This is low in first cost, easy to transport over the rough new roads, easy to erect, requires little foundation, and can be run by unskilled men, as it is nearly "fool-proof." The fact that its steam consumption is high is a minor consideration, for if the mine turns out well there will be lots of money later to buy a compressor which will take less fuel, while if the mine doesn't turn out well, no money will have been wasted on an expensive plant.

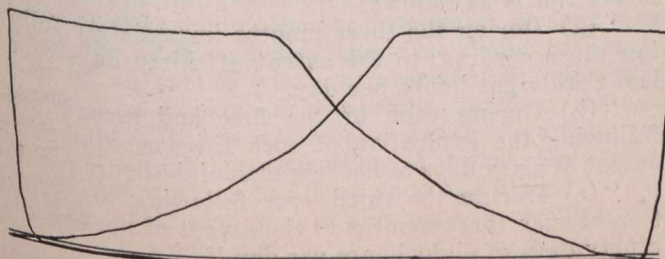
(2) The second stage in the mining plant is usually a duplex machine of ten to fifteen drill capacity, for thoroughly developing the mine. These machines usually have compound air cylinders and either simple or compound Meyer steam cylinders. The steam pressure is usually about 100 pounds, and some of them run condensing. The mine managers often exercise a false economy at this stage in buying a machine with simple steam cylinders instead of compound. With a duplex



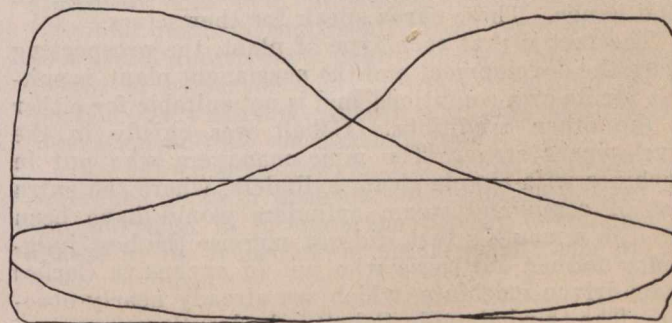
H.P. Air 22x48 80 R.P.M. 60 Spring



H.P. Steam 22x48 75 R.P.M. 60 Spring



L.P. Air 36x48 80 R.P.M. 20 Spring



L.P. Steam 40x48 80 R.P.M. 12 Spring

INDICATOR CARDS FROM RAND COMPRESSOR.

22 & 40 x 48 Steam. 100 lbs. Boiler Pressure—Condensing.
Crows Nest Pass Coal Co., Michel, B. C.

36 & 22 x 48 Air. 100 lbs. Air Pressure.

Cards taken by T. Truran, Master Mechanic, Oct. 1909.

machine, which must have two steam cylinders anyway, the extra cost of compound steam cylinders is less than ten per cent. of the cost of the machine, while the fuel saving is very large. This is shown in Mr. Webb's paper where compressor No. 1, which had simple steam cylinders, took fifty per cent. more steam than compressor No. 2, which had compound steam cylinders.

The final stage or permanent mining plants are usually of 20 to 40 drill capacity, and driven either by electric power from a hydraulic plant, or by cross-compound Corliss steam cylinders, running condensing with 125 to 150 pounds steam pressure.

At each of these stages the air compressor will usually show the lowest fuel consumption of the power generators of the plant. Take hoisting and lighting, for instance. The prospecting plant, with the straight-line compressor, will have a small steam-driven hoist, with plain slide valves, and the steam consumption per average indicated horsepower will probably be fifty to one hundred per cent. greater than in the air compressor. The lighting will be by candles and kerosene, of which the fuel consumption is remarkably high for the small amount of light produced. If the air compressor is "one of the most wasteful machines ever employed," words fail to describe the wastefulness of steam hoists and candles.

In the development plant, the compressor will, or should, have cross-compound Meyer steam cylinders; the electric light engine will be a simple high-speed single-valve engine, and the hoist will be a geared hoist with simple steam cylinders, plain slide valves and perhaps link motion. The air compressor is still much the lowest in steam consumption.

Taking the highest type of steam plant, we find the compressor having cross-compound Corliss steam cylinders, running condensing. The electric generator will likely be a tandem compound single-valve engine, but in rare cases may be of the same high class as the compressor. The hoist will be of the first motion type, but still with simple non-condensing steam cylinders, although there will likely be link motion or even automatic cut-off on the steam valves. The steam consumption of the generator may in this case approach that of the compressor, but the hoist will still take many times as much steam per horsepower.

To illustrate this latter stage of development, note the indicator cards shown herewith, taken from a large Corliss compressor recently installed by the Crow's Nest Pass Coal Co. These were taken by the master mechanic at the mine, and while some small improvements might be made in the valve setting, they represent what may be expected of a good compressor in good hands. These cards speak for themselves.

The fact is that each type of plant, the prospecting plant, the development and the permanent plant, is suitable for its own conditions, and is not suitable for either of the other conditions. Cobalt was chiefly in the development stage. The mine managers who put in machines with simple steam cylinders, where the extra cost of compound steam cylinders would have been saved in a month's fuel, did not exercise the best judgment; neither did those who put in expensive Corliss steam-driven machines, which are already nearly obsolete. The third stage in Cobalt is hydraulic power, and it is nearly there, but it should not be overlooked that in the meantime Cobalt mines have paid thirteen million dollars in dividends by the aid of the "wasteful" steam-driven plants.

Referring for a moment to the tests themselves, they

are open to criticism in several points, such as the absence of steam pressure readings, and the fact that in each test there is a mistake in the air cylinder sizes (14" for 22" in one case and 14" for 18" in the other case), but I wish to refer only to one point. The second machine was tested when the crank shaft was in such bad shape that over 38 per cent. of the power was lost in friction, and yet this is considered a sufficiently valuable test to publish. Would a test of a three-phase motor with one lead disconnected be considered typical of motors? An electric motor with the bearings in such bad shape would soon be disabled with either burnt coils or babbitt run out of the bearings. Must a compressor be blamed as an extremely wasteful machine because it will continue to do its work under adverse conditions, where another machine would quit? Which is the more profitable miner, a man who demands fifty cents a day more to work in a wet shaft, or a man who gets sick when he gets his feet wet?

But let us see what are some of the lessons to be learned from Mr. Webb's tests and from the experience of the Cobalt camp generally in the matter of air compressors. They might be summed up in a few sentences.

1. Any air compressor is a good investment, or "commercially efficient."

2. Each type of plant is suitable for certain conditions; for prospecting, the simple straight-line compressor; for development, the cross-compound Meyer compressor; for a permanent plant, the cross-compound Corliss or the power-driven if water-power is available.

3. A duplex machine should always have compound steam cylinders.

4. The steam consumption of a cross-compound Meyer machine is very satisfactory. An average steam consumption from two-thirds load to full load running non-condensing and probably with low steam pressure, of 28 pounds per I.H.P. per hour, must be considered very good.

5. The speeds of air compressors are too low, and machines built for much higher piston speeds will show lower costs per cubic foot of air delivered.

6. All steam-driven compressors should be of a type which may readily be converted to power-driven when electric power becomes available, as it surely will.

*Chief Engineer, Canadian Rand Company, Limited.

CLAIMS ASSESSMENT WORK IN THE PROVINCE OF ONTARIO.

By James Rennie.*

Subsequent to the staking and recording of mining claims in Ontario, the assessment work required by the Mines Act is as follows:—

"(a) During the three months immediately following the recording, to the extent of thirty days of not less than eight hours per day.

"(b) During each of the first and second years following the expiration of such three months to the extent of sixty days of not less than eight hours per day.

"(c) During the third year following the expiration of such three months to the extent of not less than ninety days of eight hours per day."

It will be observed that a very reasonable working day is called for, and no objection could be made by the prospector who has contracted to carry out the required number of days' assessment work for any

*Mining Engineer, New Liskeard, Ont.

owner, but there have been cases where objection could be taken to the amount of work executed in the time allowed.

It would be unfair to blame the prospector for the conditions under which these complaints have arisen. The objection usually occurs when the prospector has no retaining interest in the claim, but has simply contracted to do so many days' assessment work at either a lump sum or daily wage, the amount of work to be performed being left an open question between the owner and prospector.

SHEET N^o
Assessment Work on Claim N^o

Total Area of Claim Acres or thereby

Name of Party on whose behalf Claim is stated

Address of D^r

Number of License of Claimholder N^o

Location of Claim

Minerals found in place
Rock formation in which
the Minerals were found }

Give approximate Total Area of } in Acres :

Date of Recording Work	- Statement of Assessment Work -			
	Reference Letters on plan	Nature of Work done	Number of Days Work	Approximate Amount of Work by average measurement in Cubic Feet
		Trenching		
		Stripping overburden, Soil, etc.		
		Rock opening cutting		
		Shaft sinking		
		Adit Tunnels		
		Total		

- Note -
The amount of Work to be derived from approximate measurements, with the figures in average marked at the various parts of the work shown on plan and denoted by the reference letters.

When the owner of a claim is resident some distance from the district in which the claim is located, the prospector is usually called upon to record the assessment work on the owner's behalf at the recording office of the district. Here he states the nature of his work and the number of days in accordance with the Mines Act. These statements are sworn to under affidavit, but the amount or nature of the work executed is not called for. Nevertheless this is an important factor, and if some approximate idea of the actual work done, together with the location of such work, were shown upon a sketch plan and filed similarly to the sketch plan showing the position of the discovery post upon a mining claim, with the approximate measurements given, the additional data would no doubt be appreciated by all parties who are interested in prospecting work. The industrious prospector would at the same time appreciate the statement showing the amount and result, if only in approximation, of the number of days' assessment work he has done upon any claim.

This would also tend to eliminate the feckless prospector who sometimes spends a month or more of congenial camp life at the expense of the owner during a season of the year that prospecting can be carried out most expeditiously.

As suggested, some definition of the amount or quantity of work might be established under a common measure in conjunction with the number of days and

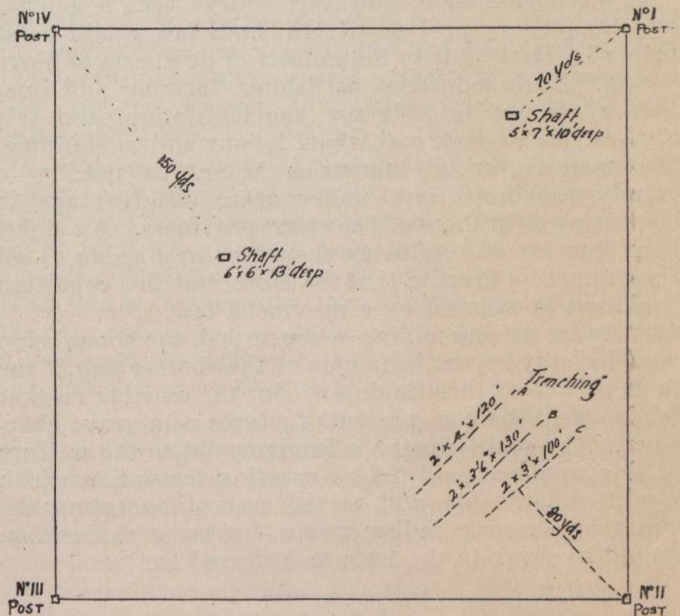
nature of the work which would be advantageous to all interests.

The general sphere of prospecting work is known to those who take an active interest in mining and may be classified as follows: surface trenching, stripping overburden, soil, etc., rock open cutting, adit tunnels, and sinking of trial shafts.

One common measure could be taken for some of the above work namely the cubic contents, given by the average measurements of the work and stated in cubic feet. To arrive at this common measure of work done, the prospector would be called upon to take the average measurements in width, depth and length for the first three classes of work, for adit tunnels the average width, height and length, and for each shaft sunk the average breadth, length and depth. The figures representing the average linear measurement for each portion of the assessment work could be marked upon the sketch plan of claim with the approximate distance from the nearest corner post of the claim to the location of the respective portion of the assessment work.

Plan of Assessment Work on Claim N^o

Referred to in Sheet N^o



A suggested form of record is shown by the blank statement and plan appended, including the nature, time and quantity, and result of the prospector's work to a useful approximate degree of definition. The prospector or owner of a claim when recording his first portion of the assessment work might also state the rock formation and all the minerals found.

The information described, if placed on record, with reference given or abstract obtainable as desired, cannot but tend to promote the further development of claims by the record of the actual result from the prospector's pick.

The Broken Hill Proprietary Company, New South Wales, was incorporated twenty-five years ago. Its capital is £384,000, in 960,000 shares of 8s. each. Since incorporation £11,500,000 has been distributed in dividends.

THE EIGHT HOUR DAY IN NOVA SCOTIA.

A commission, appointed by the Government of Nova Scotia to enquire into hours of labour in that province, recently submitted a careful report. The section referring to the eight-hour day as applied to coal mines is particularly interesting. The commission, in a most unqualified manner, declared the eight-hour day to be an economic impossibility. Here is the formal opinion:—

"The investigation of the probable effects of a statutory limitation of the hours of labour in the industries of Nova Scotia is a difficult work, even when confined to the industries that are subject to the control of the Provincial Government. The commission undertook to work in sympathy with the effort to shorten the working day, believing that every humanitarian interest of the workers would be promoted by lessening the hours of manual toil. It is the first investigation of the kind attempted in Nova Scotia, and there were many difficulties in conducting it. They were difficulties arising from the lack of statistics, and the lack of detailed and accurate evidence on some of the most relevant subjects, from the fact that employers of labour had given little attention to the question, from the fact that labour organization is limited, and from the fact that there were controversies and strikes in the coal industry.

"The commission, however, believe that a general and compulsory provincial eight hour law would be at present a fatal blow to the industrial prospects of Nova Scotia. Such industries as fishing, farming and lumbering are not suitable for the legislation, and this applies also to dock and wharf labour and to shipping. The manufacturing industries would be put, by a merely provincial law, under great disadvantage in competing with those of the other provinces. An eight-hour law for any industry should be applicable to all the competing firms in that industry; but this condition could not be secured by a provincial law.

"So far as coal mining is concerned, the commission would gladly report in favour of the shorter day if the facts permitted them to do so. But the existing market for Nova Scotia coal presents features of a grave character. The coal industry is fundamental to the welfare of this province, and before enacting legislation which would undoubtedly add to the cost of operating the mines, or seriously reduce wages, further consideration should be given to the features referred to."

CORRESPONDENCE.

Fitzroy Harbor, Ont., Feb. 26th, 1910.

The Editor of the Canadian Mining Journal:

Sir,—In your issue of February 15th you attack, in a leading article, certain statements made by the Hon. Clifford Sifton before the Commission on the Conservation of Natural Resources.

As the recognized organ of the Canadian mining industry, it is of national importance that such leading articles as you may, from time to time, publish, shall be absolutely correct in fact, entirely impartial in tone, indeed like "Caesar's wife, above suspicion."

Certain of the statements made by Mr. Sifton and to which you object, had already been published in the report for 1909, issued by the Bureau of Mines of the Government of Ontario, Vol. xviii, Part 1, 18th Annual Report, which report should have been in your hands some weeks ago.

If these statements be wrong, and I cannot believe

that they are, it is not against Mr. Sifton, nor against any Department of the Government of the Dominion of Canada, the vials of your wrath should have been poured forth, but against the Government of the Province of Ontario.

On page 10 of this report, it is stated "that so far as tonnage is concerned" "the bulk of the ore" "was exported to the United States" "as follows:"

	Tons	Per cent.
Canada,	7,401.14	29.18
Great Britain,	222.08	88
Germany,	229.46	1.18
United States,	17,439.42	68.67

On page 12, after naming the reduction plants then operating in Canada, the report states:—"Through these works there were passed an aggregate of 6,958 tons of ore, containing 11,658,008 ounces of silver, of which 8,972,958 fine ounces were recovered, the remainder, 2,685,050 ounces being contained in the speiss product reserved, or exported for further treatment." Page 13, "The elements other than silver, in the ores of the Cobalt camp, are at present of comparative little value, at any rate to the miners of the ore."

Such reports, if correct, justify any and every Canadian's desire to find processes by which the metals contained in Canadian ores may be recovered in Canada, and entirely justify the remarks made by the Honourable Clifford Sifton.

The unfortunate question of accidents you will find fully dealt with by Mr. Corkhill on pages 69-78 of this report. If you will refer also to page 14 of the same report where Mr. Gibson gives data as to the number of men employed underground in the Cobalt district, you will find that Mr. Sifton's statement as to the ratio per 1,000 employees of fatal accidents underground is in accord with the data given in this report.

I desire to think that with these explanations before you, there will be no hesitation on your part to make the "amende honorable" due under the circumstances from one honourable man to another. I am,

Yours truly,

LOUIS SIMPSON.

Editor the Canadian Mining Journal:

Sir,—A half-page advertisement of the Willow River Timber Company in the Toronto Globe of 2nd inst. includes the assertion that Fort George, in British Columbia, "is the centre of one of the largest and richest agricultural districts in the world, as well as being contiguous to one of the most extensive coal and mineral deposits in America."

May I point out that to date there has been little, if any, production on a commercial scale, from either the agricultural or the alleged mineral resources of the district surrounding Fort George, whatever may be its potentialities, which, though as yet unproved, may possibly be considerable. My particular purpose in writing to you now is to state that, so far as I am informed, there has not yet been done any large amount of development work such as would be necessary to determine whether or not there really does exist in the district above-mentioned "one of the most extensive coal and mineral deposits in America," neither has there been any production of coal or other mineral on a scale which would in even slight degree warrant such an assertion. I regard that assertion as a gross misstatement, and its being made in an advertisement designed to induce the public to buy shares in the company first

above named, to my mind constitutes an offence which should be punishable by law. I therefore suggest that the proper authorities in Ontario make the necessary inquiries and take such action as shall thereafter be deemed advisable.

Yours, etc.,

E. JACOBS.

Victoria, B.C., March 11, 1910.

PERSONAL AND GENERAL.

Mr. W. G. Miller has returned from a visit to Porcupine.

Mr. J. E. McAllister, general manager of the British Columbia Copper Company, is in New York.

Mr. R. W. Leonard is in England.

The Hon. C. R. Devlin, Minister of Mines for the Province of Quebec, has returned from Europe.

Mr. P. W. Lover, formerly superintendent of the Oro Denoro mine, at Summit camp, is now foreman at the Mother Lode mine, in the place of M. Edgren.

Mr. F. Hille, Port Arthur, was in Toronto on March 29th. Control of the Laurentian gold mine, which is soon to be put in operation, has been secured by Mr. Hille.

The Hardinge conical mill is invading the Orient. One mill was recently shipped to the Philippines, and another to New Zealand. The Mines Trials Committee has also ordered one for experimental purposes on the Rand.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

The Albion Mine Fire.—We understand that a Draeger apparatus was exhibited before the members of the Canadian Mining Institute at their Annual Meeting recently held in Toronto, but the members did not have the same opportunity of deciding on the utility of these devices as fell to the lot of several of the members of the Nova Scotia Mining Institute who attended the annual meeting at Halifax. One or two of these gentlemen who had evidently been looking forward to the annual relaxation for which the Nova Scotia Mining Society's annual dinner is justly renowned, were called to a fire in the Albion Mine at Stellarton, and although they missed hearing President T. J. Brown's jocular jeremiad—of which, more another time—they witnessed a very practical demonstration of the utility of oxygen breathing apparatus in fighting mine fires.

For some little time the Acadia Company has had trouble with a fire in the workings of the Albion Mine, which is supposed to have its origin in an abandoned upper seam that has been on fire for some years past. On the 12th of March the fire showed itself through a stopping at the foot of a "balance." The stopping was reinforced, but the fire made its way into the level and showed in the roof coal. Stoppings were commenced to isolate the district affected, but on the afternoon of the 15th the fire seemed to be making headway, and the work of building the stoppings became increasingly difficult through the heat and the fumes given off from the fire. Effective work upon the fire was out of the question, although two good streams of water were available, as it was impossible to get within working range of the fire with the hose. The assistance of the Draeger corps of the Dominion Coal Company and the Nova Scotia Steel & Coal Company was asked for about 3 p. m. In response the Dominion Coal Co. despatched seven experienced men with three apparatus and refills sufficient for eighteen hours' work. The Nova Scotia Steel Co. sent five men with four apparatus and refills, in charge of Mr. Robert Robson, a veteran of many mine fires. The combined corps arrived at Stellarton at midnight by special train, which thanks to the Interoceanic Railway officials, made very good time from Sydney. On arrival, the corps were met by Mr. John Johnson, of the Nova Scotia Steel Co., Mr. Blackwood, the Inspector of Mines for Pictou County, and Mr. Coll, the General Manager of the Acadia Company, and his assistants. The corps divided into two parties, and seven men immediately descended into the mine, getting to work about 2 a.m. They were able to get within close range of the fire and played the hose on the blaze until 7 a.m., when they were relieved by the party of five who had remained on the surface.

By noon of the 16th another stream of water was available with better pressure, and the fire was gradually got under control. At the time of writing—18th March—the work of confining the fire area within permanent dams is proceeding rapidly, and flooding will then be undertaken. While it cannot be said that the situation was beyond control when the Draeger corps were asked for, it is certain that their presence enabled the fire to be tackled effectively at short range, and rendered it possible to confine the flames within a much smaller area, as otherwise it would have been necessary to undertake much more extensive damming operations.

As only two streams could be used, the whole of the apparatus or the men was not necessary. The men relieved each other at intervals. There was good ventilation in the deep not more than 80 yards away, and the work was not by any means so strenuous as that done with the aid of the same apparatus at Sydney Mines in September 1908. In the case of this fire, as in many other mine fires, all that was needed was some means of enabling the fire-fighters to bring a stream of water to bear at a sufficiently short range to be effective.

A joint rescue station for the mainland mines of Nova Scotia has been under consideration for some time past. It is to be hoped that the scheme will now be proceeded with, as Cape Breton is rather a distant base of supply for the Nova Scotia mainland, and should a really serious fire or explosion occur in Pictou or Cumberland necessitating a prolonged fight, the Cape Breton collieries dare not denude themselves of their own apparatus and the necessary oxygen and potash refills beyond a certain limit. In the present instance, the Nova Scotia Steel Co. despatched their oxygen refill pump and a supply of oxygen, which they probably would not have been justified in doing had they not known that the Dominion Coal Co. also possessed a refill pump and oxygen stores. So far the Nova Scotian government has not granted any aid to the coal companies of the province in the matter of rescue stations, and it might be suggested that a little financial aid or recognition of the work that has been done by the coal companies, would be more appreciated by them than the present persistent persecution and baiting of our coal industry, which appears to be the favourite amusement of the Legislature, or certain members thereof.

Glace Bay.—During the first fortnight of March, the weather in Cape Breton was unusually mild and open, and there were none of the interruptions to production which the month of March generally brings with it. The outputs were large and shipping was carried along in Sydney Harbour as well as at less a task, and it is hardly likely that the proposal will com-

Louisburg. The mines of the Dominion Coal Company produced more coal than in any similar period since the strike. The output to the fifteenth was 125,000 tons, or at the rate of 250,000 for the month. The production for the six days ending the twelfth was 59,600, or very nearly a daily average of 10,000 tons. When it is remembered that the daily average of the Coal Company in July 1909, the first month of the strike, was only 4,600 tons, it should not be difficult to form a conclusion as to the effectiveness of the U. M. W. strike.

The troops which have been stationed at Glace Bay since the disorders in July last were withdrawn on the 3rd of March. The Coal Company have now a very efficient and numerous police force which will be quite adequate to guard the Company's property. The lessening of breaches of the peace must be attributed very largely to the salutary lesson administered at the last term of the Supreme Court in Sydney.

The attempt of the clergymen of the district to find acceptable terms of settlement, and to bring the strike to an end, came very nearly to success, but unfortunately it was not found possible actually to reach the desired conclusion. As a result of the efforts of the ministers a conference took place between Messrs. Butler and McDougall, the General Manager and the Assistant General Manager of the Dominion Coal Company, Mr. John C. Douglas, the Mayor of Glace Bay, the Rev. Dr. Thompson, Vicar-General of the Diocese of Antigonish, and two of the former employees of the Coal Company, who, it was understood, attended the conference in their individual capacities as men out of work and seeking employment. As a result of this conference the company reiterated their refusal to recognize the U. M. W. and offered to take back their former employees, without discrimination within thirty-five days, and as far as possible to reinstate them in their old positions. The company stated that any employee who had a just grievance had the right to present his complaint to his superior, with an ultimate right to appeal to the President of the Company if necessary. The statement further read that "for such purpose, the aggrieved employee may be accompanied by a committee of his fellow-workmen from the mine where the grievance is alleged to exist." The representatives of the U. M. W. wished to add conditions tantamount to complete recognition of their organization, whereupon the company withdrew their statement in its entirety, announcing that no further steps would be taken by them.

Since the new heads of the Dominion Coal Company took charge at the mines they have shown a spirit of reasonableness, and have evinced a desire to meet their former employees. The local President of the U. M. W. some time last summer wrote a long, open letter to the newspapers, the gist of which was the statement that the members of the U. M. W. on strike at Glace Bay did not insist on formal recognition, but would be content with an undertaking on the part of the company that the management would meet committees of its employees to consider and adjust grievances. Great publicity was given to this letter, and although the untruthfulness of its general tenor was pointed out at the time, a good deal of capital was made out of the fact that the Dominion Coal Company refused so reasonable a request as that to meet a committee of employees. Whoever counselled the men on strike to refuse the very liberal and honourable offer which was made by the management of the company in their desire to end a situation disastrous to all alike assumed a grave responsibility. The strike was always unnecessary, and those who called it were guilty of crime, but its continuance under present conditions is merely foolishness. The individual strikers are beginning to realize this, and the increasing outputs tell their own unmistakable tale.

Legislation.—As usual, the Nova Scotia Legislature is being asked to devote a large amount of its time to consideration of matters affecting the coal industry. These included the report of the Eight-Hour Commission, of which Dr. Magill was the chairman. This is said to be a valuable document, and from what

we know of the painstaking nature of Dr. Magill's work on this Commission will repay careful reading and mature study. The report has not yet been distributed to the public, and we hope to refer to it in detail at a later date. It is sufficient to remark that the Commission were unable to recommend any statutory limitation of the present hours of work in Nova Scotian coal mines.

A government measure dealing with compensation to injured workmen, and the dependents of men fatally injured at work, was introduced, and if it should become law it will have a more important bearing on the mining industry than on any other. The proposed measure is practically a copy of the first enactment passed by the English Parliament, except that the maximum and minimum limits of compensation payable to relatives of those fatally injured are higher than provided by the British statute. The Nova Scotia statute provides for a period of two weeks' disability before compensation becomes payable, and for a minimum payment of \$1,000 and a maximum of \$2,000 to dependents. This matter also calls for comment in full, but space will not permit. There can be no valid objection to the principle of compensating those injured in their work, and it is but right that each industry should carry its own victims. The injustice of the measure proposed by the Nova Scotia Legislature and of the measure which is now the law in Britain, is that it places the entire onus on the employer, and relieves the employee of practically all responsibility for his own safety. The British Act has put a premium on malingering, and the general indefiniteness of the measure has given rise to endless litigation. It has killed the colliery relief societies, which once formed so large a part of the British workmen's interests. There is at present on the statute books of Nova Scotia, legislation, which may become effective upon proclamation, that is indefinitely preferable, both for the master and the man, so far as the coal industry is concerned, to the Compensation Act as known in Britain and Newfoundland. This legislation arose out of the work of the Commission appointed to enquire into the Relief Societies and an old age pension scheme for miners, and we know of no more provisions more likely to be of lasting benefit to coal mining and the workmen employed in this industry than is the legislation referred to.

The Compensation Act, and the legislation which provided for a consolidation of the colliery relief societies, the formation of a permanent fund for the relief of dependents, etc., cannot exist together. If the Compensation Act should become law the relief societies will die, and any old age pension scheme which might be formulated, will die also.

The report made by Mr. T. E. Forster of Newcastle-on-Tyne, on the submarine coal areas of Cape Breton and the proposed methods of extraction was laid on the table of the House, but so far no legislation has been proposed. There is no necessity for any further legislation on this matter, as it is within the power of the Commissioner of Mines to approve or otherwise of systems of coal extraction. It is quite impossible to frame legislation to cover matters which experience can only elucidate. What is the Commissioner of Mines appointed for if not to act as Commissioner?

Dr. Arthur Kendall again moved for a Commission to investigate the coal trade, root and branch, and delivered an exhaustive and forceful speech in the House in support of his contentions. Many of the evils pointed out by the member for South Cape Breton are only too apparent, but the remedies proposed seem in some cases worse than the disease. We gather from the newspaper reports of Dr. Kendall's speech that he is of the opinion that the Government should decide which of two warring labour unions should be favoured with recognition, and that the Government should be empowered to enforce their choice upon the employers of labour. Surely it would be a very disingenuous Government that would impose upon itself so obviously thank-

mend itself to such acknowledged "sideshowers" as the politicians of Nova Scotia.

The word "recognition" seems to have achieved a great vogue of late in Nova Scotia. It has remained, however, for Mr. Paul, M. P. for Cumberland, to prepare a bill providing for compulsory recognition of labour unions by employers of labour on penalty of fines of from \$100 to \$200 per day, the fines to be collected by the union asking recognition. This is rather an ingenious way of raising strike funds. The bill is a very crude attempt to force the Nova Scotia Government to forcibly intervene in the present U. M. W. strikes at Glace Bay and Springhill, but nevertheless it is but a sorry compliment to the N. S. Legislature to present to them a bill so manifestly unconstitutional and at variance with common law. Mr. Paul's bill, if passed would not only legalize the "closed shop," but would force the acceptance of this condition upon the employers of labour. The position is unthinkable and absurd, but it shows how much of a shibboleth "recognition" has become in Nova Scotia, when it is possible for so ridiculous a proposal to be gravely submitted to Parliament. The bill is stated to be introduced at the request of the "Halifax Trades and Labour Council, the U. M. W., and organized labour generally." That is to say, the bill is the offspring of the U. M. W. alone, and the baby is very like its father.

QUEBEC.

Thetford.—Mining operations have been carried on extensively during the past winter and general business conditions have shown a marked improvement over preceding years. New mills are being erected on several properties that were exploited last season, and nearly all the old companies are increasing their plants very considerably. New mills that will be ready for early production are the Black Lake Consolidated, Black Lake; Jacob's Asbestos, Thetford Mines; Berlin Asbestos and B. & A. Asbestos, Robertsonville. The milling plants that are being largely increased are the several plants of the Amalgamated Asbestos Corporation at Thetford Mines and Black Lake, the Bell Asbestos, Thetford Mines, and the Robertson Asbestos at Thetford North. Although there is promise of a rapidly increasing production, shipments are improving steadily and large sales are being put through at high prices.

Interest is again being directed towards the development which is taking place in the placer deposits of the Chaudiere Valley. An engineer with large experience in the California placers has been engaged to supervise the operations and the installation of modern hydraulicking machinery. The syndicate handling the enterprise is composed of strong business men and the intention is to carry on the work on a large scale. Mr. J. R. Duckith exhibits magnificent samples of alluvial gold recovered from the test work done last fall and is sanguine in the belief that large profits will be realized from the operations in the near future.

The International Asbestos Association was recently formed in New York for the purpose of extending the knowledge and use of asbestos. The Amalgamated Asbestos and many of the private companies are associated with the movement, which promises to be an important factor in the growth of the industry.

A movement is on foot to organize a branch of the Canadian Mining Institute at Sherbrooke, having for its purpose the healthy growth and development of the existing mining industries and the further expansion of the natural resources of the province. The comments of the local press and public expression generally heartily endorse the formation of the local branch.

ONTARIO.

Kenora.—At a recent meeting of the Prospectors' and Mine Owners' Association of the Kenora Mining Division, it was decided, in view of the present movement in mining circles in the

district and the present difficulty of giving inquirers some correct idea as to the rock formation and type of ore to be found in this district that the members of the Executive Committee should as far as lies in their power, make a collection of average samples of ores of this district and that such a collection should be on view in some public building in the town so that any bona fide prospector could obtain from it information that might be of inestimable service to him in deciding his course of action. A discussion then took place upon the possibility of moving the Government to act in a similar manner to the Governments of the Australian States. It is in these Australian States the habit of the Government to install small stamp mills at central points so that the prospector can obtain from the official in charge of such plant a certificate as to the value of his ore. The cost of fire outlay of such a plant is paid by the Government, the plant is then made to be self-supporting by making a charge for putting through sample shipments practically at cost. The first sample sent from any mineral claim is put through absolutely at cost, while any further samples from the same claim are put through at a slight advance over the cost so as to insure the Government plant being self-supporting. In Australia many poor prospectors have been enabled to sink a sufficient depth thoroughly to show up their properties by having their output milled in this manner, since the gold extracted by the Government mill is the property of the prospector putting through the ore, once the charges for milling and treating have been deducted. These plants are often in charge of only one man since the prospector for his own sake as well as the saving in cost usually supplies the man to feed the battery. When the gold has been recovered from the ore the Government official gives the prospector a certificate showing the value of the ore and deducts from the gold recovered a sufficient amount to pay the Government charges for the treatment, while the balance is handed back to the prospector. In many cases where a prospector has been too poor himself to purchase and erect a battery the fact of being able to procure the services of such a mill established by the Government has been a means of permitting him not only to know at once the value of his prospect, but also to do such work as to enable the capitalist to see what he is buying, and consequently lessen the possibility of fraudulent practices. In very few cases it has been known that the Government has been left with such a plant upon its hands when the day for its use has passed in as much as almost in every case where one of these plants has been erected some one or other of the claims at work in the vicinity has found it either expedient or necessary to purchase this plant for its own use. The amount of good which has been done by the Australian Government is incalculable, nor is there any reason why our Canadian Government should be backward in opening up the mineral wealth of the country.

It seems as if the West Hawk Lake District is at last getting that notice from capitalists that it has so long deserved but been without. A Winnipeg syndicate has, we have been informed on good authority, taken an option on some prospects in that vicinity for \$50,000. This news, together with the now almost certain opening of the Mikado gold mine this spring, will mean such a revival of mining industry in this district as almost to amount to a rush.

Cobalt.—The condition of the lower level of the Crown Reserve, since it was known to have passed into the Keewatin formation, has been the subject of much speculation, and in view of this, it is interesting to note what is said regarding it by the manager. Mr. Cohen reports as follows:—

"However, it cannot be said that the vein at this level is as phenomenal as it was in the conglomerates above, although it is better than the average high-grade vein in the Cobalt district. The east winze at the present time is being sunk from the 200 to the 300-foot level, and shows the vein strong at the bottom

at a depth of 225 feet. In the development work on this vein about 8,000 ounces were obtained and stoping on this vein during the year produced 2,750,000 ounces."

This mine produced 4,034,325 ounces of silver in 1909, having a gross value of \$2,080,155, at a cost of 10.31 cents an ounce. This amounts to about one-sixth of the total production of silver from this camp for the year; but notwithstanding this the manager states that the mine is in a better physical condition and has more ore blocked out than it had a year ago. The average value of the ore was as follows:

	Ounces per ton.	Value per ton.
High-grade	4784.7	\$2466.96
Low-grade,	184.4	75.81 ..

In addition to this, 76,152 ounces of bullion were produced that ran 869 thousands fine. The total cost of the silver produced is given at 10.31 cents per ounce, and the average price received for silver was 51.56 cents per ounce.

The Buffalo mine has declared the first dividend for this year, the same being 5 per cent. payable April first and a bonus of 3 per cent. payable May sixteenth. Up to date, the Buffalo has declared and paid dividends to the extent of 58 per cent, with additional bonuses of 15 per cent., making 73 per cent, in all. The President in speaking of the property, stated that although they had been greatly handicapped for lack of power, they had last year put in sight 3,000,000 ounces for the 1,000,000 ounces produced. The additional territory opened up to the west has added largely to the ore reserves.

The report of gold discoveries to the west of Matachewan is still arousing considerable interest among the prospectors in the vicinity of Elk Lake. The discoveries were made in quartz veins, in a country rock of schist, to the south west of the Township of Holmes. This formation is practically the same as that found in Porcupine. Some of the quartz veins or dykes are very wide. The territory is stated to be of large extent, and a number of parties have been sent in, within the last couple of weeks. These discoveries, coupled with the recent good finds made in several of the Elk Lake properties, have given a considerable impetus to operations in that district. The town of Elk Lake has unfortunately suffered another serious fire, which is stated to have done about \$100,000 damage.

The City of Cobalt has again shipped high-grade ore, sending out 21 tons. All the low-grade is in the future to be treated in the Northern Customs Concentrator. A tramway has been built from the mine to the mill, a distance of 800 feet, which will greatly facilitate handling the material.

The Ophir Cobalt has cut what is believed to be the main vein, at the 200-foot level. On the upper levels this vein carried native silver, and where level this vein carried native silver, and where cut at 200 feet, the values are believed to be high.

An option has been given on the McAlpine property at Shanty Lake in the Gowganda district to New Liskeard men, most of whom are interested in the Hudson Bay Mine in Cobalt. Up to date, but little work has been done on the property although some good veins showing smaltite and native silver have been found. Should the option be taken up, the necessary machinery to open up the property will be sent in at once.

A new company, known as the London and Gowganda Exploration Co., with headquarters in London, England, has been formed for the purpose of developing properties in various parts of the country. In all, twenty-one claims have been acquired, and a gang of men will be sent in immediately to start work on the Gowganda properties.

About the first of April sinking will be started in the No. 2 shaft of the Provincial Mine. It will be put down to open up the vein located with the diamond drill before the present owners took charge. The shaft is now about 60 feet deep. The property is being systematically developed and has a good chance of making ore. To the east of the main shaft a long cross-cut is being run to explore the ground underneath the

swamp. The two shafts are also to be connected up on the 125-foot level. During the coming summer the surface will be thoroughly trenched.

The main shaft on the Badger property is to be sunk an additional 200 feet from the present 200-foot level. This shaft was sunk on a vein that can be traced on the surface for about 1,700 feet. The silver contents of this vein are, however, low. There is another shaft down 200 feet on a vein from which about fifteen tons of high-grade ore has been produced, but the ore is pockety and not consistent. The property consists of about 82 acres on which a number of promising surface veins have been found.

The management of the Victoria Mine have decided to do a considerable amount of diamond drilling as underground work has been stopped until such time as the power companies are ready to turn on the air. The drill will be operated from the bottom of No. 1 and No. 2 shafts, and will test the veins that have been discovered on the surface.

At the Hargraves property there is at the present time nearly a carload of high-grade ore ready for shipment, besides a couple of cars of low-grade ore. Nearly all this ore came from the 375-foot level of the No. 3 shaft, from the extension of the Jacobs vein. Some time ago high-grade ore was found in the No. 1 shaft and considerable work has been done on the vein, which is showing up well. On the 175-foot level of the No. 3 shaft, a cross-cut is being run to cut the vein.

The recent discovery of high-grade ore on the 120-foot level of the Moosehorn Mine in the Elk Lake district has decided the management to install additional machinery. The equipment will consist of a six-drill compressor and two 75-horsepower boilers. When the plant is installed, development work can proceed much more rapidly. The main drift is only about 150 feet from the Pardon vein which shows high-grade ore on the surface. The Elk Lake district has been considerably excited lately over the discovery of free gold in the township of Bryce, near the trail between Elk Lake and Charlton. The finds were made within a short distance of the road. The country rock is schist and the gold is found in quartz veins. The formation is said to be very similar to that of Porcupine.

Last summer on the Rochester property, a vein was discovered on the surface that gave high assays in silver. In underground development from No. 2 shaft a vein that was believed to be the one on the surface, was cut, and a considerable amount of work was done on it, without any results. A short time ago a cross-cut was started to the north, which cut the original vein at a point about thirty feet from the other. Where opened up by the cross-cut it shows from four to five inches of ore that carries a good deal of native silver. In the No. 1 shaft a drift is being driven on a large calcite vein, which so far has proved unproductive. This is the first time in the history of the company that pay ore has been found in the underground workings.

In recent developments at the Princess mine of the La Rose consolidation the best ore shoot that has yet been discovered on that property was opened up on the 135-foot level. This is known as the No. 4 vein, on which a stope is being carried up. The ore in the back of the stope has been steadily improving until now it will carry in the neighbourhood of 2,000 ounces of silver to the ton. Conditions in other parts of the mine have been improving steadily, and it is probable that before long the shipments from this property will be an important factor in the La Rose production.

Although development work on the Little Nipissing has been greatly retarded for lack of power a very creditable showing has been made in the last few months. Last January rich ore was struck on the 160 foot level, and since that time a drift has been run on the vein for over sixty feet and a winze has also been sunk on the vein to a depth of 60 feet. The face of the drift and the bottom of the winze are both in good ore. The winze will be sunk 75 feet, and from that point a cross-cut will

be run to open up a parallel vein that lies about 20 feet distant. When power is available the management will carry out an extensive scheme of development.

The mining companies in South Lorraine are again agitating for the construction of a summer road and they wish the Government to do it. That part of the road that is most badly needed is from the Government docks back to the mines. The companies have already spent many thousands of dollars in road building but feel that as they are the ones who are opening up the country they should not be expected to shoulder all the expense. That the road is badly needed there is no question, but it is doubtful if the Government will give much aid, as that is not their way in this north country.

The Haileybury Silver Company has paid another dividend of 50 per cent., payable on April 5th. This makes a total of 100 per cent. paid to date. The money was raised by the sale of the south half of their property to the Haileybury Frontier Company, on which some good finds have lately been made.

In connection with the high grading cases now before the courts, true bills have been returned against several of those implicated. The information in all the charges has been changed so that the defendants are now charged with having in their possession ore which was the legal property of the Crown. This is in conformity with the statute, which declares that any ore for which an owner cannot be found lays in the name of the King. By this means it is hoped to circumvent the old clause, which throws the proof of ownership on the complainant.

The Airgoid Cobalt, which is situated to the east of the Nova Scotia, has been purchased by Seattle capitalists for \$200,000, and the first payment of \$25,000 has already been made. This year one-half of the total amount, or an additional \$75,000, is to be paid. This property, which is advantageously situated, has never been developed. A small plant was at one time installed and a shaft sunk for a short distance, but later the company got into financial difficulties and work was stopped. Work will be started this spring and it is understood that a plant is to be installed.

Good ore is now being produced from the 185-foot level of the Meyer shaft of the Nipissing. The vein left the shaft at 75 feet, and from the bottom of the working a cross-cut was run to cut it. The vein has now been drifted on for about 30 feet and in places shows about 12 inches of high grade ore.

The famous suit of the Florence Mining Company against the Cobalt Lake Company has finally been settled. Before the Privy Council in England the appeal of the Florence was dismissed and the Cobalt Lake has now a clear title, although the outcome was never in doubt. The Florence Mining Company maintained that they had been sold the mining rights under twenty acres of the south end of the lake before the Ontario Government put the whole lake up at auction. The case has been carried from court to court and finally dismissed before the Privy Council.

Mr. H. L. Timmins, who owns the Hollinger properties in Porcupine, has taken an option on another group of claims in the same immediate vicinity. The option was only given in consideration of a large cash payment being made. Free gold has been found in more than one vein on these properties and they will be developed as rapidly as possible. The plant for the Timmins is on its way and will soon be installed. A trial shipment of ore has also been made and a mill test will be made to find out the best means of treating it. The McArthur properties are now being developed and shafts are being sunk. One of these is down about 30 feet and there are high values in gold at the bottom. Three carloads of machinery and supplies have been sent up by men closely identified with the Buffalo Mine. These people own several claims and will develop them as quickly as possible. Several deals are under way for well-known properties in the district, among them the Higginson claims, which are being negotiated for by New York men.

BRITISH COLUMBIA.

Phoenix.—The Granby Consolidated, pursuing its expansive and far-sighted policy, has just made another important deal in Phoenix district, whereby it acquired the Summit group of twenty claims comprising nearly 1,000 acres. The claims were acquired of G. W. Rumberger and associates, and are known to contain large deposits of low grade copper-gold ore similar to that now being mined at the Granby property. A contract has been awarded to Boyles Bros. for extensive diamond drilling on the Summit claim of the group and work will be started at once.

It is now definitely announced that the Canadian Pacific Ry. Co. will extend its line from Midway to Penticton and across Hope Mountains to the coast. As the Great Northern has already awarded contracts for its line from Princeton to the coast, with possibly the exception of a piece over Hope Mountains, this puts the two companies vying with each other in a race for Vancouver. No doubt inside of two years the Boundary and Similkameen districts will have two competing outlets to coast points and the benefits of such facilities cannot be over-estimated. The extension of the C. P. R. will particularly benefit the Crow's Nest district, and East and West Kootenay, as well as the sections named above, and the mining industry will not be one of the least important recipients of the benefits that will accrue.

The Columbia Coal & Coke Co., owning an extensive area of ground said to contain a good quality of steam coal, is now opening up its property with a view to active mining operations. Mr. Geo. L. Fraser, erstwhile of the International Coal & Coke Co., Coleman, is at the property in charge of the work. The mine is situated on Granite Creek, not far from Princeton, and the extension of the Great Northern line will soon afford it transportation facilities.

The new Rand compound condensing compressor and other heavy machinery recently bought by the Daly Reduction Co. are now at the Nickle Plate Mine, Hedley, and the main efforts of the mine force are being put forth toward erecting the addition to the plant.

Rossland.—The Le Roi 2, Ltd., during the week ending March 5th, shipped 800 tons of ore and concentrate, which constituted a record shipment for the year to date. Of 58 tons of concentrate shipped to Trail smelter by this concern in January the returns were \$26.12 per ton, and of 2,382 tons of ore the returns were \$17.14.

Nothing of an unusual character has developed during the past ten days in the work at the Le Roi, Centre Star, I. X. L., or Mayflower, at all of which work is proceeding along regular lines.

Nelson.—The men who are interested in the future of the zinc industry of this district are much gratified to learn that the Dominion Government is considering the matter of appropriating \$50,000, to be spent in experimental work, toward a solution of the zinc smelting question here. There is no doubt about this being a problem of paramount importance to the province of British Columbia and to the Dominion, in more ways than one, while the success of lead-zinc mining here in the immediate future hinges upon its solution. This sum, along with that already expended by the interests here and the Provincial Government, should place the matter on a satisfactory plane and result in some definite action toward the smelting of zinc ore in this district.

The annual report of the Van-Roi Mining Co. shows that the company failed to earn a profit during the last year; in fact, have gone behind nearly \$20,000. Owing to the lack of smelting facilities in British Columbia—or in Canada—for zinc ore, the plans of this company made at the beginning of the year were somewhat upset by the imposition of a higher tariff on zinc products entering the United States. This aided toward

the deficit. A profit on the year's operations, however, was not really striven for, as the main efforts of the operating force at the mine were concentrated upon the development, and particularly upon the driving of a straight 1,300-foot adit, 200 feet below previously existing openings, which has opened up the ore at depth and will be of economical importance in the future mining operations of the company. With the steady operations of the Van-Roi Mine and mill in the future it is estimated the property can be made to pay about \$175,000 per annum on its capital stock.

The Yankee Girl mine, near Ymir, which has shipped nearly 1,500 tons of ore since the beginning of the year, has temporarily ceased shipments, owing to the bad conditions of the road from mine to railway siding.

The mines of the Crow's Nest Pass Coal Co. are probably shipping more coal than ever before. During the month of January the daily average was 4,100 tons per day, which was a record. The Hillcrest mines are busy just now on a contract for coal to the Great Northern Ry. Co. at Michel.

At Moyie, while no large finds of new ore are reported from the St. Eugene mine of the Consolidated Co., work is proceeding along regular lines and already this year the mill has made 3,195 tons of concentrate which was shipped to the company's smelter at Trail. During the past six weeks this company has also shipped 1,440 tons of lead ore to Trail smelter from the Sullivan mine.

At the Aurora mine it is said there is a tonnage blocked out of 35,000 tons and that shipments will shortly be begun to the smelter. The Society Girl mine, not far from the St. Eugene, is looking quite promising and ore shipments are to be started at no late date. The ore in the three-foot lead recently opened up carries 60 per cent. lead and approximately 30 ozs. silver per ton.

Vancouver.—While mining on the coast has been advancing

gradually during the past several years the stimulus that has been and will be given to the situation this season will tend to a banner year. It is now seen that a lot of development work will be done on the copper deposits of Morseby Island; diamond drilling on the Ikeda property; work on the Sullivan group, the Swede group, in which that ubiquitous capitalist, J. P. Morgan, has bought an interest; drilling for coal on Graham Island, the development of the Portland Canal, Telkwa, Babine, Texada and Valdez Islands, and the probable working of the iron deposits on Vancouver Island. The plant at the Red Cliff Mine, Portland Canal, is rapidly being erected. An air compressor and electric lighting apparatus are being put in at the Perreault, in the same district.

On the Silver Cup group, near Hazelton, the work carried on during the winter has resulted in the opening up of ore valued at several hundred thousand dollars, and the property bears all the appearance of becoming a mine. Work on the Dibble group, in which Jas. Cronin is interested, has also been successful in opening up the ore shoot in the tunnel, and it begins to look as if this property would turn out a second St. Eugene or better.

At the Marble Bay mine, Texada Island, on the 1,000-ft. level, the company is working a 250-ft. shoot of bornite twenty feet wide, that carries approximately 9 per cent. copper, \$7 gold and 25 ozs. silver. The Britannia Mining and Smelting Co. is going to have a good year. The Tyee Co. has added another and larger smelter to its plant and will no doubt enjoy a profitable and busy season. In fact, the outlook for coast mining is brighter than it ever was.

It is somewhat disappointing to British Columbians to learn that the Dominion Government does not intend to extend the bounty on iron and steel, for so far this province has had little or no benefit of this bounty, and at this time when several companies are about to open up our iron deposits it would undoubtedly prove of benefit.

GENERAL MINING NEWS.

NOVA SCOTIA.

Halifax, March 9.—It is reported that the Dominion Iron and Steel Company intend to commence work sinking two stopes on the areas of the Cumberland Railway and Coal Company, often referred to as the Cowan and Drummond areas.

The Steel people took an option on these properties during their recent law-suit with the Dominion Coal Company, with the ultimate object of securing their own coal supply should the contract between the two companies be broken. Since that time, it is said that the Steel Company have completed the purchase of the areas from the Cumberland people. Stopes are to be located from the town of Port Morien. It is estimated that there are thirteen square miles of good, clean coal in areas which have been secured by the Steel Company, containing 150,000,000 tons of coal.

Stellarton, N.S., March 16.—The fire in the Albion slopes is now completely under control. Thirteen fire fighters with fire extinguishing apparatus arrived early on Wednesday morning from Cape Breton by special train, and they have succeeded in controlling the flames in the colliery. While these men have been working others have been busy building a substantial wall between the burning portion and other parts of the mine, and to-night it is thought that the loss will not be a very great one, although perhaps it will take a day or two more of steady work before the fire is completely extinguished.

Mr. John Johnson, assistant manager of the Nova Scotia Steel and Coal Company's mines at Sydney Mines, who has been here assisting at the fire, leaves on Thursday, but the fire fighters and the Draeger fire fighting equipment will probably

be kept over for a few days. The mine workmen of this slope and the other collieries of the company have valiantly assisted in checking the progress of the flames, all working diligently towards this end, and some have been assisting with the fire fighters' equipment.

Sydney, N.S., March 18.—Judge Lawrence this morning granted an injunction restraining Harry Bousfield, D. McDougald, and other officers of district No. 26 United Mine Workers, and the officers and members of Mullins, Victory, Patterson, Bridgeport, Power, Caledonia, and McPherson locals from besetting and watching places where the Dominion Coal Co. carries on its business, or from interfering with its workmen.

Halifax, March 18.—The Government pronounced itself today as opposed to the appointment of a commission to enquire into the advisability of passing a law compelling recognition of labour unions or of investigating the price of coal in this Province. The vote showed three Government members—Kendall, Gillis and Paul—besides the Opposition, in favour of the resolution for the commission.

Premier Murray, in conducting the debate, said that New Zealand was the only part of the British Empire which made recognition of labour unions compulsory; that the United Mine Workers had not been recognized in any State of the Union and that it would be more becoming in them to obtain such recognition at home before coming to this Legislature asking for it. He was opposed, he said, to any enquiry into the price of coal, which he thought would be as unwise as an enquiry in the West into the price of wheat, or in Nova Scotia as to the price of fish. No one thought of asking for such enquiries; why,

then, should an enquiry be demanded regarding the price of coal? Under the amendment that carried, the matter was referred to the Government. An amendment moved by the leader of the Opposition, that the Government at once pass a compulsory recognition law, was voted down. Mr. Paul, a Government supporter, voting with the Opposition.

Amherst.—The Maritime Coal, Railway and Power Company is making rapid development. The output from their collieries recently exceeded 1,000 tons in one shift. This is about three times the output of this company a year ago.

The coal from the new slope at Joggins seems to be particularly popular. The sales in Amherst during January and February of this year were about four times greater than in these months of last year.

The electrical power department of the company is also advancing. For the installation of the new power unit which the company is adding at Chignecto, a new set of four 150 h.p. boilers have been lately placed, a new 750 h.p. generator, manufactured by Canadian General Electric Company, is now ready for wiring, and the Robb Engineering Company to-day shipped a 750 h.p. engine which is to be coupled to the above generator.

The company expects to add the additional power about the first of April. In the meantime the electric load is rapidly increasing. Among the large concerns which have lately taken power from the colliery are the McLean Milling Company and the Hewson Woollen Mills.

ONTARIO.

Toronto.—At Osgoode Hall, Toronto, judgment was given by Chief Justice Falconbridge last week in the case of John W. Casler against the Grace Mining Co., Ltd., and Messrs. G. J. Blake, Adam Witzel, Wm. J. Casler, and John F. Vogt for \$12,000 and interest, secured by mortgage upon the company's mining claims in the Eagle Lake mining district.

The personal defendants disputed the mortgage and counter-claimed for \$100,000 damages loss through the excessive price paid for the claims, \$25,000 for sums wrongfully taken, \$25,000 for carelessness in managing the property, \$4,500 for amounts wrongfully paid directors, \$10,000 for 20,000 shares wrongfully converted, besides \$450 on subscriptions of stock.

The plaintiff was given judgment for the amount of his claim, but the defendants were held to have established their defence as bearing on their counterclaim and a reference was directed to the Master-in-Ordinary to ascertain the extent of the plaintiff's liability to them for large sums wrongfully converted while acting as their manager.

The plaintiff, his Lordship remarked, was an extremely plausible, presentable and intelligent witness, but (his only corroborators being his brother and his brother-in-law, and those only on minor points) he is contradicted by too many witnesses, too many circumstances, and too many writings. The plaintiff, while acting as manager of the company, and in the employ of the company, obtained large sums for the purpose of being applied in operation upon the company's property and he wrongfully and improperly converted to his own use large amounts of the money so entrusted to him.

Dealing with the mortgage, the judgment points out that by agreement of April 25, 1908, the time for repayment had been extended for three years from Feb. 25, 1908, four years after its execution. The plaintiff had been president of the company and resigned after a stormy meeting in 1907. After that, the company had practically ratified the mortgage and plaintiff was therefore entitled to judgment for the \$12,000 and interest.

Cobalt, Ont., March 19.—Silver Bar lost its plant and blacksmith shop by fire yesterday afternoon. Superintendent Brown, who keeps steam up and water pumped out, now that no development is in progress, had just left the plant when the flames broke out, the fire being over within half an hour.

Elk Lake, Ont., March 15.—Disastrous fire at Elk Lake this

morning destroyed the Woods hardware store, Chamandy Bros.' general store, King Edward Hotel, Smythe Hotel, and the Strong drug store. The total loss is about \$155,000; insurance \$80,000. Cause unknown.

Sudbury.—The Cheeney mine, north of Thessalon, is being pumped out, and it is probable that mining operations will be shortly resumed. The ore is very high grade, and the vein of good width and continuous for considerable length. The distance from railway is a drawback.

Fort William.—It is announced that the controlling interest in the Northern Pyrites Co., operating the well-known pyrites mine near Lake Superior Junction, has passed to the General Chemical Company of Chicago and Detroit, the company that had contracted for a large quantity of the output and took several cargoes of it last fall. This has somewhat changed the general policy of the shipment of ore and it is understood that the Grand Trunk Pacific Railway has arranged to take care of the product this year, and in the meantime the engineers of the General Chemical Co. will look over the ground at Fort William with a view to building a permanent dock.

BRITISH COLUMBIA.

Fernie.—Several important cases came before Stipendiary Magistrate J.S.A. Alexander in connection with breaches of the Coal Mines Regulation Act. The regulations strictly forbid any one working in them with matches, pipes, or tobacco, but, notwithstanding this fact the law has often been broken in this respect and the lives of many endangered by the practice. To-day six delinquents appeared before the court for having disobeyed this law with the following results:

Edward Ellis, charged with taking matches into the mine, found guilty and fined \$10 or 21 days in jail.

N. Dosepan, \$10 or 21 days in jail.

Luigi Ventura, \$10 or 21 days in jail.

A. C. Stephenson, \$10 or 21 days in jail.

The magistrate in passing the sentence pointed out the seriousness of the offence, explaining that this sort of carelessness placed in jeopardy the lives of those working in the mines and intimated his intention in future cases of this nature to send those charged and proven guilty to jail without the option of a fine.

Phoenix.—The Granby Consolidated Mining, Smelting and Power Company has secured a working bond on the Summit group and a number of adjoining claims, covering about 1,000 acres. It is one of the most important mining deals in the history of Phoenix camp.

The acreage of the bonded claims is about equal to the acreage of the Granby's present holdings in Phoenix camp. Very little development has been done on the Summit claims, but from indications it is expected that exploratory work will reveal large bodies of ore similar to those of the Granby mines. The Granby company will spend a large sum of money prospecting the properties under option with the diamond drill. The contract has already been let to Boyle Bros., of Spokane, and drilling will commence immediately.

YUKON.

Dawson, Yukon Territory, February 28th.—The Klondike has been roused to a storm of protest over interviews given the press of Canada and the United States recently by Albert J. Beaudette, formerly in the Mining Department of the Government of the Yukon, in which he is quoted as saying that prospecting is a thing of the past in the Yukon, and that the prospector is a rare bird in the Yukon, and that the Yukon Gold Company is the only outfit washing gold. The citizens have voluntarily subscribed to a fund to contradict this assertion as widely as possible.

Acting Governor Arthur Wilson, on receiving copies of interviews, immediately volunteered the following statement:—

"There is more systematic prospecting being done in this territory now than at any time since the advent of the white man. The faith of our people in the permanency of this country as a great mining district is more firm to-day than at any time since Robert Henderson made his discovery. More money is being spent by our citizens generally now in legitimate and systematic prospecting than in any other period of our history."

Mr. Wilson also names many other large dredging concerns besides the Yukon Gold now operating in the Yukon and washing and marketing gold.

The Klondike is just opening some of the richest quartz ever found in Canada, and it is believed by many here to be on the eve of a boom that will rival Tonopah, Cobalt, and Cripple Creek.

MINING NEWS OF THE WORLD.

GREAT BRITAIN.

The reports of some of the leading South Wales collieries for the past year show in nearly all cases a substantial reduction in profits as compared with the previous year or two. This is largely attributable to the unsatisfactory conditions prevailing in the second half of the year. Nearly all collieries suffered from stoppages of a more or less prolonged character; working costs have increased considerably, and there has been a heavy reduction in outputs consequent upon the lessened hours of labour. Prices ruling for coal on the open market have been satisfactory, but this has been more than counteracted by the low-priced contracts almost generally held by colliery owners. In fact, in the autumn contract season of 1908 orders were booked for delivery over the whole of 1909 at prices ranging from 3s. to 5s. per ton below those obtained for 1908 contracts. This fact in itself has been sufficient to interfere with the earning powers of all undertakings, and, in a large measure, has been responsible for the decline in profits. Had the conditions governing business in the second half of the year, however, been more favourable, there is no doubt that a much better showing would have been made by all companies. The prospects for the current year are much more favourable. The coal sold under contract for shipment in 1910 has been at advances of from 2s. 6d. to 4s. per ton, which alone should mean a marked increase in profits, whilst, in addition, there is every indication of comparatively high prices ruling on the open market for all classes of coal.

RUSSIA.

Oil producers in the Baku fields have hitherto been considerably hampered by the high rates of export to the port of Batoum, and it is satisfactory to learn that representations to the Russian Government have had the desired effect, and in future the rate will be reduced to 12 copecks per pood, instead of 19 copecks as hitherto.

During 1909 the total losses of oil through leakage while being exported from Baku by rail amounted to 117,320 poods of fuel oil, 92,500 poods of crude oil, 78,900 poods of kerosene, 168,200 poods of lubricating oil and 4,500 poods of benzine.

RHODESIA.

Bulawayo.—The development of the Surprise is proving highly satisfactory, the reef showing a width of 30 ins. and yielding over an ounce to the ton.

Further reports of a satisfactory nature are to hand from the Umkondo copper mine of the Consolidated (Africa) Copper Trust, the development data being consistently good.

News is just to hand of an important discovery on the Buntorne (Bulawayo) property. It is stated to consist of a lode of auriferous schist 6 ft. wide, carrying visible gold.

The Aladdin block of claims has just been acquired by the Rhodesia Exploration Company. The rock at 100 ft. is stated to be giving 5 ozs. to the ton. The Arcturus, the Slate and the Grand Blocks belonging to the Rhodesia Exploration Company are looking very promising. Energetic development is being carried out on this line for a distance of nearly six miles.

The new mill of the Bucks Reef Company will start crushing in April. The development work continues to be quite satisfactory.

SOUTH AFRICA

Johannesburg.—There is promise of tremendous activity in the near future in that cluster of three Far East farms Modderfontein, Benoni and Brakpan. The whole of the Modderfontein of which only the new Modderfontein portion is at present producing gold, will then be either developing or producing. Modderfontein is a triangle with its base or northern side corresponding with the line of outcrop on the new Modderfontein and Modder B properties. To the dip of Modderfontein are the 326 claims of the Modder deep levels and the triangular block marked Kitzinger of 51 claims. Below this, in the apex of the triangle, are the two areas of some 1,250 claims each leased by the Government to Messrs. Barnato Brothers in terms of the State Mines scheme. Areas aggregating over 5,500 claims will thus be either developing or producing in quite a short space of time.

Johannesburg.—The repatriation of the Chinese has been completed; the last batch of labourers have left for home.

AUSTRALIA.

Queensland Mining in 1909.—Although the gold yield of Queensland, like that of all the other Australian States, showed a shrinkage during the past year—the return being 450,937 ozs., against 461,359 ozs. in 1908—the outlook is considered distinctly brighter for 1910. On the Charters Towers field important developments are reported to be taking place. In this district the total output for the past year increased, the value of the yield being £756,977, as against £722,557 in 1908. Official statistics show that the dividends for the twelve months amounted to £156,819, as compared with £100,980 in 1908, and the calls to £57,475, as against £60,522. At the close of the year came the long-looked-for news of a find in the new Brilliant Freeholds, and if this development opens up in a satisfactory manner it should much improve the prospect of the mines to the eastward, particularly Brilliant, Brilliant Block, Victory, Clark's Brilliant, Day Dawn Fine, Day Dawn and Brilliant St. George. At the Mount Morgan Company's mine at Rockhampton, the difficulties which for a time checked production have been surmounted, and the normal output has again been reached. The change in the system of mining has now been completely carried out, with the result that there is a larger output of average grade ore. In the annual report submitted to the directors by the general manager it was stated that as a result of exploration work carried on in the last half-year the reserves of the auriferous ore in the mine showed a very substantial increase, amounting to 530,000 tons blocked out. The completion of the Mount Chalmers, the Boyne Valley, the Mount Elliot and the Etheridge railways will undoubtedly be attended by increased activity in the various districts served by these lines.

UNITED STATES

Richmond, Va.—By dismissing the appeal of the United Mineworkers of America, the U. S. Circuit Court of Appeals has made permanent a temporary injunction of sweeping

character. The case is that of president of the Mineworkers, as an individual, and as vice-president of the Union against the Hitchman Coal and Coke Company of West Virginia.

It is an appeal from the decision of the Circuit Court for the northern district of West Virginia.

The injunction restrains the Union from interfering with employees of the company for the purpose of unionizing the mine; from interfering and conspiring to interfere with employees of plaintiff; so as knowingly to bring about in any manner the breaking by the plaintiffs' employees of contracts for service, existing at the time or thereafter entered into; from trespassing on the company's property; from compelling by threats of violence any employee to leave; from establishing pickets around the property of the company for the purpose of using violence or threatening or persuasive language to induce the company's employees to leave.

Wilkesbarre, Pa., March 12.—Seven miners lost their lives in the No. 5 shaft of the Lehigh and Wilkesbarre Coal Company near here to-night in an explosion of gas. There were eight men in the party, but one of them was away from the scene of the explosion getting some tools and was not injured.

The officials have the theory as to the cause of the explosion. General Manager Huber said it did not cause much damage.

De Lamar, Nev.—Mining engineers representing both the Newhouse and the Guggenheim interests have been in De Lamar for some time examining the old De Lamar mine and properties adjacent to it, especially the Magnolia.

The Magnolia, to the depth of 300 feet, carried large values in free-milling gold. Below that depth silver and copper values came in to such an extent that the company's mill was unable to handle it. A reduction plant had been planned by the company's engineers when came the order to close down.

This property, near the surface, produced several fortunes from its gold ores, the product being of such grade as to make its marketing profitable even after it has been hauled across the desert to Milford, Utah, and from there placed on the local market via the railroad.

The ground was eventually taken over by the Delamar company, the management of which started the sinking of a deep shaft. As depth was attained, however, the gold values apparently gave out and were replaced by silver and copper ores, for the treatment of which there was no nearby plant.

Goldfield, Nev.—A petition has been filed in the supreme court at Carson in the case of the state of Nevada on relation of O. C. Moore against the Manhattan Verde Mining Company and R. P. Dunlap, its president, for a writ of mandamus compelling the company to stamp certain certificates of its stock treasury or promotion as required by the act passed by the last legislature, commonly known as the wildcat law.

The act went into effect on March 5, 1909.

Juneau, Alaska, March 3.—Twenty three miners were killed last night by an explosion of a powder magazine in the 1100-foot level of the Mexican mine, one of the group of Treadwell gold properties on Douglas Island. Eight men were seriously injured and four of these may die.

The last shots had been fired by the night shift 20 minutes before the men were assembled at the elevator to go on top. The magazine, which contained 275 pounds of powder, was 30 feet from the place where the men were standing, but every man was killed or injured.

Most of the miners were foreigners. The man in charge of the magazine had locked the door where the explosives were stored, and was standing with the other men. He was also killed.

Company Notes

YUKON GOLD.

The Annual Report of the Yukon Gold Company, in which a large number of Canadians are interested, for the year ended December 31, 1909, is issued. President Guggenheim says in part:

“It is to be noted that the company finds itself practically one season behind in its hydraulic operations, which will necessitate some modification of the estimates, heretofore made of probable earnings for 1910. This, however, does not affect the estimates which are of paramount importance, such as the value per cubic yard of the property owned by the company, operating costs, etc., which have been verified by actual results.

“During the year the company was placed upon a dividend-paying basis at the rate of eight per cent, per annum, and this rate should be maintained until the earnings justify an increase.

“Mr. Yeatman, consulting engineer of the Guggenheim Co., made a very favourable report during the year, summarized as follows: ‘To sum up, I may say after carefully looking into conditions, that your undertaking in the Yukon Territory is a wonderful piece of work; from an engineering point of view, one of great promise, whose success is now being satisfactorily proved.’”

The balance sheet as of Dec. 31, 1909, follows:

ASSETS.

Property and investment	\$11,857,000
Equipment	6,073,045
Deferred charges	491,244
Supplies and material	434,579
Accounts collectable	300,931
Cash	9,863
Total	\$19,166,662

LIABILITIES.

Capital stock	\$17,500,000
Guggenheim Exploration Co.	1,050,266
Accounts payable	120,849
Depreciation	142,731
Surplus	352,816
Total	\$19,166,662

BRITISH COLUMBIA COPPER COMPANY.

The report of Mr. J. E. McAllister, general manager of the company, is as follows:

“Production was interrupted for a period of three months from May 4th to August 8th; a strike of the coal miners of the Crow's Nest Pass District (from which our fuel supply is obtained) causing a cessation of coke shipments, and the cost of fuel from more distant points being prohibitive when taken with the price of copper.

“The material handled at mines and reduction works during nine months' operation was:

	Tons. Shipped	Tons. Shipped
Mother Lode Mine	338,639	337,089
Oro Denoro Mine	11,771	13,384
Napoleon Mine	16,614	11,950
	367,024	362,423
Custom Ore		6,964
Converter Slag		3,939
Total		373,336

“**Mother Lode Mine.**—Operations are under the direction of Mr. Paul S. Coudrey, superintendent, and the greater portion of ore shipped has been from above the 200 foot level. During the year the open cut workings have been extended in two directions, and stoping in the underground workings has further increased the ore reserves beyond the estimates, this being particularly the case on the 400-foot level, where the largest amount of development work has been performed. This property has furnished the bulk of the supply, and the workings, as well as the surface plant, have been maintained in excellent condition. Additional receiver capacity has been added for the purpose of equalizing the pressure of the compressed air supply with very satisfactory results. The diamond drill exploration has consisted of 3,680 feet.

“**Orc Denoro Mine.**—The ore from this mine being more basic than that of the Mother Lode, it has only been drawn upon as required. Mr. P. W. Lover is in charge at the property, and during the year 1,181 feet of diamond drilling has been done.

“**Napoleon Mine.**—This property has been worked intermittently, its production being drawn upon as required to make up for the deficiency of sulphides in the other ores. Of the 16,614 tons shipped from the mine, 2,120 tons were sold, the balance coming to this company’s own reduction works.

“**Jack Pot Group.**—Comprises the Jack Pot, Athelston Fraction, Molly Pritchard, Coronet Fraction, Iron Clad Fraction, Florence and Prince, located in Wellington Camp, operations being in charge of Mr. H. Johns. The claims were secured under a working bond in September of 1908, since which time prospecting and development have been carried on continuously. In all 2,532 feet of drifts, tunnels, and raises have been driven and a large tonnage of ore opened up, the grade of which will be somewhat better than the average of the other properties, the values being chiefly gold.

“Developments having justified completing the purchase, surface buildings are in course of construction, and the Canadian Pacific Railway is now building a line to the property which will be completed early in March, 1910, after which shipments will be regularly maintained. The company undoubtedly has here a valuable asset, all of which has been established during the past year.

“**Lone Star Mine.**—Work has been suspended throughout the year awaiting transportation facilities, although a railway line has been surveyed to the mine by the Canadian Pacific Railway Company.

“Operations at the reduction works are under the superintendence of Mr. E. G. Warren, and various improvements have been added to the plant, chief among which is the additional storage bin capacity for 1,000 tons of coke. The three blast furnaces (48 in. x 240 in. at the tuyeres) were in operation for 623 furnace days, the failure of the coke supply previously mentioned causing a loss of approximately 290 furnace days.

“The average tonnage handled exclusive of coke during the period of operation was 599.2 tons per furnace each twenty-four hours, making a total of:

	Tons
B. C. Copper Co.’s Ores	362,423
Custom Ores	6,964
Converter Slag	3,949
	373,336

“Included in the item of converter slag is an amount of 1,588 tons of custom ore and clay used in converter linings. From the above material handled, blister copper to the amount of 6,366,318 lbs. has been recovered, containing:

“A comparison of figures with those of the year 1909 is as follows:

Fine Copper	lbs... 6,325,000
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Gold	ozs... 18,244
Silver	ozs... 64,234

“Appended will be found Balance Sheet as at November 30th, 1909, and Profit and Loss Account as rendered by the auditors.

Yield of Copper per ton of B. C. Copper Co.’s Ores	17.7 lbs.	17.8 lbs.
Yield of Gold and Silver per ton, B. C. Co.’s ores	\$1.06	\$0.985
Average price realized for copper	13.03c	13.504c
Cost of Producing, Refining and Marketing per pound of Fine Copper, after crediting expenditure with Gold and Silver Values..	9.829c	9.996c
Cost per ton of Ore handled including all charges from Ore in place to sale of the contained metals	\$2.683	\$2.632

“In general the standard of operations has been higher than the previous year, as the expense of closing and re-opening, including the period of three months’ cessation on account of coke shortage, has all been borne by the balance of the year when operations were in progress. All expenditure at the mines and reduction works for additions, improvements and maintenance has been taken up in the operating cost for the year, and the various plants have been maintained in as high a state of efficiency as possible.”

PACIFIC PASS COAL FIELDS CO.

A report was presented to the shareholders of the Pacific Pass Coal Fields, Ltd., at their first annual meeting held on March 1.

The directors stated that the company had had an engineering and prospecting party on the property all last summer, and that the coal had been tested in numerous places. It was proved beyond doubt that an immense quantity of coal existed in the property, running into the hundreds of millions of tons, and from Government analysis the quality was found to be equal to the best grades of the well known bituminous coals of Cape Breton and the United States.

The directors were also pleased to be able to report to the meeting that they had signed on behalf of the company a contract with the Grand Trunk Pacific Railway Company, by which the railway company undertakes to build a branch line from their main road through the Yellowhead Pass to the property of the Coal Company, the Grand Trunk Pacific Company guaranteeing to have the branch line completed by December 1st of this year.

Further development work will be done this summer and there seems to be no doubt that the mines will be shipping coal almost immediately after the branch railway is completed.

The following directors were elected for the year: E. B. Greenshields, Hon. Robt. Mackay, W. Molson MacPherson, J. Theo. Ross, H. A. Lovett, K.C., A. H. Cook, K.C., F. L. Wanklyn, J. W. McConnell, R. Brutinel, A. De Bernis.

At the subsequent meeting of the directors Mr. E. B. Greenshields was elected president of the company, Hon. Robert Mackay vice-president, and George C. Cousins secretary-treasurer. An executive committee was also appointed consisting of the president and Messrs. H. A. Lovett, K.C., and J. W. McConnell.

BUFFALO.

The Buffalo mine has declared a quarterly dividend of 5 per cent. payable on April 1st and a 3 per cent. extra dividend on May 16. This is the same as the last dividend declared.

Including the dividend just declared the Buffalo mine has paid to the shareholders 73 per cent. of the total capitalization. Up to last year a rate of three per cent. quarterly was maintained and eleven dividends at this rate totaling \$297,000 dollars was paid. In 1909 the dividend was raised to the present rate.

According to a statement recently made by the president of the company, three million ounces of silver were put in sight in addition to the million ounces mined during last year.

The Buffalo Mines Co. has declared the regular quarterly dividend of 5 per cent., payable April 1, and an extra quarterly dividend of 3 per cent., payable May 16.

Directors of Crown Reserve have declared the regular dividend of 6 per cent. and a bonus of 9 per cent. on their company's capital stock, making a total of 15 per cent., payable April 13, to shareholders of record April 1st. The books close from 1st to 15th of April.

The International Nickel Company directors have declared the regular quarterly dividend of 1 per cent. on the common stock, and one half of one per cent. extra was declared.

The Canada Cement Company has been awarded an order by the Dominion Steel Company for 40,000 barrels of cement, delivery during 1910.

This order was procured in competition with the English cement companies, it is said.

The shipments of the Canada Cement Co. up to March 1st are 40 per cent. greater than they were for the corresponding period in 1909.

STATISTICS AND RETURNS

The official report of the Temiskaming and Northern Ontario Railway is a most satisfactory one. The freight earnings for 1909 amount to \$944,000, as against \$471,000 in the previous year, while the passenger receipts were \$592,000, as compared with \$366,000 in 1908. The total net earnings for the year, including ore royalties, were \$739,451, as against \$419,488 in 1908. The ore royalties were \$113,301, as compared with \$134,820 the previous year.

The output of gold at the Transvaal mines in February, as reported by the Johannesburg Chambers of Mines, was 575,622 ounces, fine, valued at \$12,232,000. London estimates at the close of February had, as reported by cable, been 555,000 ounces. The month's total was, nevertheless, the smallest in a year.

The Consolidated Mining and Smelting Co. of Canada report ore receipts at Trail Smelter for the week ending March 5 and year to date (in tons), as follows:

Company's Mines—	Week.	Year.
Centre Star	4,168	33,639
St. Eugene, (con.)	602	3,311
Snowshoe	4,471	35,719
Richmond-Eureka	33	894
Sullivan	261	1,444
Other mines	1,721	17,715
Total	11,256	93,222

ROSSLAND ORE SHIPMENTS.

Following is the tonnage of ore crushed at and shipped from the mines of Rossland for the week ending March 5th, and for the year to date:—

Mine.—	Week.	Year.
Centre Star	3,580	36,533
Le Roi Two	455	4,467
Le Roi	105	1,548
I. X. L. ....	.....	26
Velvet .....	.....	220
Totals	4,140	42,794

COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending Mar. 11, and those from Jan. 1, 1910, to date:—

	Mar. 11.	Since Jan. 1.
	Ore in lbs.	Ore in lbs.
Buffalo .....	.....	292,453
City of Cobalt	42,000	235,970

Cobalt Central .....	.....	165,286
Cobalt Lake .....	.....	132,000
Colonial .....	.....	63,660
Coniagas .....	.....	295,757
Crown Reserve .....	.....	951,350
Drummond .....	.....	664,200
Hudson Bay .....	.....	62,365
Kerr Lake	119,360	1,193,849
King Edward .....	.....	93,129
La Rose	375,615	2,427,516
McKinley-Dar.	166,000	437,860
Nipissing	311,892	2,260,946
O'Brien .....	.....	328,806
Peterson Lake .....	.....	170,450
Right of Way	67,000	320,436
Silver Cliff .....	.....	66,010
Temiskaming .....	.....	180,000
Trethewey, .....	.....	127,000

Ore shipments for week ending March 11, were 1,081,868 pounds, or 540 tons.

Total shipments from Jan. 1 to March 11 were 10,469,052 pounds, or 5,234 tons.

COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending Mar. 18, and those from Jan. 1, 1910, to date:—

	Mar. 18.	Since Jan. 1.
	Ore in lbs.	Ore in lbs.
Buffalo	124,500	416,953
City of Cobalt .....	.....	235,970
Cobalt Central .....	.....	165,286
Cobalt Lake .....	.....	132,000
Colonial .....	.....	63,660
Coniagas .....	.....	295,757
Crown Reserve	61,110	1,012,460
Drummond .....	.....	664,200
Hudson Bay	61,330	123,695
Kerr Lake .....	.....	1,193,849
King Edward .....	.....	93,129
La Rose	238,974	2,666,490
McKinley-Dar.	150,561	588,421
Nipissing	65,381	2,326,327
O'Brien .....	.....	328,806
Peterson Lake .....	.....	170,450
Right of Way .....	.....	320,436
Silver Cliff .....	.....	66,010
Temiskaming .....	.....	180,000
Trethewey .....	.....	127,000

Ore shipments for week ending March 18 were 701,856 pounds, or 350 tons.

Total shipments from Jan. 1 to Mar. 18, were 11,170,908 pounds, or 5585 tons.

The output of gold at the Transvaal mines in February, as reported by the Johannesburg Chambers of Mines, was 575,622 ounces, fine, valued at \$12,232,000. London estimates at the close of February had, as reported by cable, been 565,000 ounces. The month's total was, nevertheless, the smallest in a year.

SHARE MARKET.

Courtesy of Warren, Gzowski & Co.

Miscellaneous.

	Bid.	Ask.
Amalgamated Asbestos	28½	..
Dom. Coal, Com.	..	81¾
Dom. Steel, Com.	69⅞	70½
N. S. Steel	88¾	..
Granby	84	85
Consol. Smelting	85	90
Crow's Nest Pass	82	86

Cobalt Stocks.

	Bid.	Ask.
Wettlaufer	1.02	1.07
Amalgamated	.07	.07½
Beaver Consolidated	.35¼	.35½
Buffalo	2.40	2.70
Chambers Ferland	.39⅞	.40
City of Cobalt	.39	.40
Cobalt Central	.17	.18
Cobalt Lake	.24⅞	.25
Coniagas	5.40	5.75
Crown Reserve	3.75	3.80
Gifford	.17¾	.18
Foster	.24	.25
Green-Meehan	.06½	.07½
Great Northern	.09¾	.10½
Hudson Bay	103.00	110.00
Hargraves	.37½	.38
Kerr Lake	8.70	8.80
La Rose	4.47	4.48
Little Nipissing	.28	.28½
Mekinley-Darragh-Savage	.97	1.00
Nancy Helen	.10	.12
Nipissing	10.41	10.50
Nova Scotia	.41	42¾
Otisse	.08½	.08⅞
Peterson Lake	.27	.27¼
Right of Way	..	..
Rochester	.20	.20⅞
Silver Leaf	.10¾	.10½
Silver Bar	.12	.13
Silver Queen	.17	.18
Temiskaming	.64½	.65
Trethewey	1.39¾	1.40
Watts	.12	.13
Ophir	.70	.75

New York Curb.

	Bid.	Ask.
Boston Copper	19	19½
Brit. Col. Copper	6¾	6⅞
Butte Coalition	24½	25
Chino Copper	15⅞	15¼
Davis-Daly Copper	3⅞	3¼
Ely Consolidated	1⅞	1 7-16
Gila Copper	7¾	8¼

Giroux Mining	9¼	9¾
Goldfield Consol.	8 7-16	8½
Greene-Can.	10¼	10½
Hareuvar Copper	..	no market
Inspiration Cop.	8 7-16	8⅞
Miami Copper	22⅞	23
New Baltic Copper	8½	9
Nevada Con. Copper	23¾	24
Ohio Copper	4¾	4½
Rawhide Coalition	16	18
Ray Central	3 7-16	3 9-16
Ray Consolidated	22⅞	23⅞
Union Mines	1½	1⅞
Yukon Gold	4¾	4½
Calumet & Hecla	605	610

TORONTO MARKETS.

Metals.

Mar. 22.—(Quotations from Canada Metal Co.)

- Spelter, 6 cents per lb.
- Lead, 3.70 cents per lb.
- Antimony, 8 to 8½ cents per lb.
- Tin, 34.00 cents per lb.
- Copper, casting, 14.20 cents per lb.
- Electrolytic, 14.20 cents per lb.
- Ingot brass, 9 to 12½ cents per lb.

Mar. 22.—Pig Iron, (Quotations from Drummond McCall Co.)

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

Coke.

Mar. 18.—Connellsville coke, (f.o.b. ovens).

- Furnace coke, prompt, \$2.00 to \$2.25 per ton.
- Foundry Coke, prompt, \$2.65 to \$2.75 per ton.

Mar. 18.—Tin (Straits), 32.12½ cents.

- Copper, Prime Lake, 13.35 to 13.75 cents.
- Electrolytic copper, 13.35 to 13.45 cents.
- Copper Wire, 15.25 cents.
- Lead, 4.52½ cents.
- Spelter, 5.72½ cents.
- Sheet zinc (f.o.b. smelter), 7.75 cents.
- Antimony, Cookson's, 8.50 cents.
- Aluminium, 23.50 to 25.00 cents.
- Nickel, 40.00 to 49.00 cents,
- Platinum, ordinary, \$29.00 per oz.
- Platinum, hard, \$34.50 per oz.
- Bismuth, \$1.75 per lb.
- Quicksilver, \$50.00 per 75-lb. flask.

SILVER PRICES.

	New York cents.	London pence.
March 8	50⅞	23 7-16
" 9	50¾	23¾
" 10	50⅞	23 7-16
" 11	51¼	23⅞
" 12	51⅞	23 11-16
" 14	51¼	23⅞
" 15	51⅞	23 11-16
" 16	51½	23¾
" 17	51⅞	23 11-16
" 19	51½	23¾
" 21	52	23 15-16