THE CANADIAN MINING JOURNAL

VOL. XXIX. TORONTO, September 15, 1908 No. 18

The Canadian Mining Journal

With which is incorporated the
"CANADIAN MINING REVIEW"
Devoted to Mining, Metallurgy and Allied Industries in Canada
Published fortnightly by the
MINES PUBLISHING CO., LIMITED

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

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

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

CIRCULATION.

During the year ending with March 1st, 1908, 91,750 copies of "The Canadian Mining Journal" were printed and distributed, an average of 3,822 per issue.

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

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CONTENTS.

SHOULD MINING ENGINEERS ADVERTISE.

"Should Mining Engineers Advertise" is the title of a clear editorial exposition in the current number of the London Mining Journal. This is a question on which an English point of view is particularly valuable. In Canada we have a considerable body of mining engineers and mining geologists whose work will stand comparison with that of engineers from any other country. But neither our mining societies nor public opinion enforces distinction as between qualified men and charlatans. Whilst it is permissible for a Canadian mining engineer to insert a professional card in technical journals and in newspapers, it is recognized as distinctly bad form to seek louder means of attracting attention. For mining men of the lower grades the inspired newspaper interview is one of the chief means of advertising. Others, again, allow their names to be used on obnoxious prospectuses. Against both these latter devices self-respecting engineers set their faces. It is, then, probable that the limit marked for Canadian mining engineers is the professional card.

Our London contemporary, however, points out that "the mining engineer . . . is not assisted by analogy from other professions, and the question is one that must be decided upon its merits, as it affects the mining profession simply." After reference to the many indirect means of keeping one's name before the public, our contemporary alludes to the fact that the mining engineer, who has worked successfully in foreign fields, may be entirely forgotten by the very people at home to whom his services would be most acceptable. This opens up the way for a revision of the code.

Our own opinion is strongly opposed to countenacing anything but the most limited advertising. Attempts to establish a laxer code of professional etiquette must inevitably lead to demoralization.

This restriction may seem a hardship to the struggling engineer. But there remains a clean and profitable channel of publicity. A professional card does little more than actually remind the readers of public that a certain engineer is alive. But a signed technical or descriptive article, appearing in a suitable publication, places the author at once in a position of more or less prominence. If the article deals with mining or metallurgical problems encountered and overcome, and if is written simply and honestly, it constitutes the best possible introduction to that section of the public with which the engineer wishes to form an acquaintance. Moreover, the man who writes an article is, obviously, willing to risk the judgment of his fellows. Therefore a certain amount of confidence in himself (always a healthy symptom) is implied.

There is yet another equal benefit accruing to the engineer who takes thoughtfully to print. Writing clarifies the mind as nothing else can. For many it is a painful discipline; but discipline it is. The making of a well-written article involves looking up many references and consulting with as many professional friends as are available. Also the mere act of crystallizing one's thoughts on paper tends to fix what is essential and to delete what is superfluous.

Therefore we would urge Canadian mining engineers to form the habit of transferring their experience to paper, either for the purpose of publication or as a record for personal reference, or, better, to serve both these ends.

We have urged this before. Our contemporary's able editorial lends us a cogent argument wherewith to impress our point more deeply.

ONCE MORE A BOOM.

There is a tendency in well-informed circles to attribute the present boom in Cobalt stocks to the skilful tactics of certain Toronto and New York interests. That well matured plans have been formulated and carried out has been patent. Specialists in publicity, when retained by stock manipulators, do not hide their searchlight under a bushel. But, although these fluent gentlemen have undoubtedly assisted in precipitating the movement in stocks, there were other influences, far more potent, at work.

One of these was the fact that ore shipments from Cobalt during the first eight months of 1908 were greater by 4,211 tons than those for the corresponding period of 1907. The totals stand 13,217 tons for the first eight months of 1908, and 9,006 tons for 1907. If, as is probable, shipments continue at this rate, the total tonnage for 1908 will reach 20,000 tons, an increase of about forty per cent. over the preceding year. Moreover, it is possible that this tonnage may be increased, as the monthly returns have lately been growing consistently.

Last year the value per ton of ore shipped from Cobalt was approximately $500. There is reason to believe that the ore being shipped at present is worth slightly more per ton than this. The recognized tendency of shippers to concentrate before shipping, and the bonanza character of ore from several of the mines, support this belief. Arguing from such grounds, it is apparent that at the close of 1908 Cobalt will have an annual output worth at least $10,000,000 to her credit.

This is, naturally, a pleasant fact to contemplate. It means that steady, serious, and honest work is being done at most of the producing mines. But it also means that Cobalt is quite able to stand on her own merits. There is, therefore, no need of a flourish of trumpets. Indeed, Cobalt, as a reputable mining town, one that has already cleaned out much of the disreputable element that clings to the skirts of new and prosperous mining communities, does not welcome the boomster.

If we read aright the signs of the times, a general reaction in the direction of better conditions is setting in. The London Stock Exchange is witnessing a rapid appreciation in South African mining shares. Activity in our own mining stocks is apparent in New York, Montreal, and Toronto. These movements could not have been entirely caused by manipulators. But, especially in this country, they can be caried to an illogical and harmful extreme by men who can command the assistance of our venal daily papers.

The public should have learned its lesson two years ago. Probably it did not. Probably, also, a boom once started will not lose its momentum until grave mischief has been wrought.

In all stock excitements the public is the chief loser. When the wave of recklessness recedes the mining industry is invariably found to be in a worse condition than it was before the boom commenced. Therefore it is the duty of all those who have the good of Canada's mining industry at heart, who wish to see our mines and smelters firmly established in the confidence of the people, to do what they can to offset the extravagant methods of imported promoters and their hirelings.

We have all the elements of success. We have rich mineral deposits, capable mining men, good markets, and, in the main, honest government administration. Our progress to be constant must be reasonably slow. There is nothing to be gained by brain-storms.

ONE COMPANY.

To mark their interest in the visit of the Canadian Mining Institute to Nova Scotia, the directors of the Nova Scotia Steel and Coal Company issued a pamphlet in which is given a most interesting history of the beginnings and growth of their enterprises together with an account of the present condition of their plants and mines.

This is not only sound policy on the part of the Company, but is indicative of enterprise and enlightenment. The visitors, who represent the best mining interests of Canada and Europe, were deeply impressed with what they saw in Nova Scotia. But a record of the quiet and efficient development of the Nova Scotia Steel and Coal Company's undertakings is unquestionably more impressive than a mere inspection of their plants and mines in operation. When it is more fully understood that industries should be based upon organic growth and not upon the speculative hankerings of the public, then we shall have more business ventures and fewer incubated indiscretions.

The Nova Scotia Steel and Coal Company had its beginnings in a blacksmith's forge. To-day there are 4,200 men on its payroll. It owns and operates its own iron and coal mines, and pays dividends.

A PERVERSION.

Nothing could be more distasteful to the British and European delegates and to their hosts, the members of the Canadian Mining Institute, than to know that their visit to Cobalt or any other camp could be used by writers in the daily press for the purpose of influencing the stock-market. The summer excursion of the Institute had an object entirely remote from this. In fact it is not overstating the case to say that such excursions are planned as a corrective to the evil that stock-jobbers have already done.

We therefore feel called upon to resent certain paragraphs appearing in Toronto newspapers in which the statement is made that "the mining engineers' visit to Cobalt . . . will have a favourable influence upon market values."

THE CANADIAN NATIONAL EXHIBITION.

In the early months of this year the CANADIAN MINING JOURNAL called the attention of the management of the Canadian National Exhibition to the need of paying more attention to the mining industry. The result has been that five Provincial governments sent along mineral exhibits. Two of these provinces, Nova Scotia and Ontario, despatched full and representative collections of their economic minerals. Quebec, New Brunswick and Alberta exhibited on a smaller scale, but all of the display was most interesting.

On another page will be found an acount of the several features of the mineral exhibit. It marked a most praiseworthy attempt to round out the scope of the Exhibition.

But the growing importance of the mineral industry warrants a greater amount of space and attention. We would urge upon the Exhibition Commission that the matter of erecting a special mining building be taken into immediate consideration. The need is pronounced for suitable housing for mineral exhibits and mining machinery.

ACTS AND THE MAN.

The Lemieux Conciliation Act has become an instrument of no little importance. Whatever its present deficiencies may be, its provisions are sufficiently flexible to permit of its successful application to many different species of industrial disputes. Its operation has proved one thing, however, that cannot be overlooked, and this is that much depends upon the wisdom of the chairman.

Professor Adam Shortt, late of Queen's University, now translated to an official billet at Ottawa, won rapid fame as an arbitrator. Peace, perfect peace, followed him as a river follows its channel. Urbane, dispassionate, incisive, his skilful diagnosis was followed by simple and proper remedies. Our body politic is the better for his work. Canada would be the gainer were Mr. Shortt a fixture on all Conciliation Boards. But this is not to be. Ottawa, with its precedence and piffle, its gold lace and guff, its functions and futilities, has swallowed our peacemaker.

THE SUMMER EXCURSION OF THE C. M. I.

In our Special Correspondence columns appears a short account of the visit of the Institute and its guests to Nova Scotia. In later issues the remainder of the journey will be dealt with.

The Mining Society of Nova Scotia spared no pains to give its visitors a profitable time. So far as the Toronto visit is concerned, while every member of the Committee did his utmost, most especial thanks are due Mr. P. W. Ellis, of Toronto, through whose kindness and enthusiasm a complete inspection of the power plants that centre around Niagara was made possible.

Thanks also to the Canadian National Exhibition Commissioners the visitors were well entertained while in Toronto.

In all things the excursion has been undeniably pleasant and successful.

WHY NOT INCLUDE THE EAST?

The Hon. William Templeman, Minister of Mines, accompanied by the Acting-Director of the Geological Survey, Mr. R. W. Brock, has completed a tour of the mining regions of Alberta and British Columbia. Bellevue, Coleman, Hillcrest, and Frank were visited in Alberta. Fire-stricken Fernie was touched, and south-eastern British Columbia pretty well covered. No doubt the Minister and Mr. Brock, in whose hands lie in large measure the guidance of the Dominion's policy in these matters, will have acquired many new and useful facts. The Western Provinces may count upon added interest being taken in the growth of their mining interests.

We may suggest that a similar visit to Quebec and the Maritime Provinces would be timely.

In bridges and other structures of iron or steel, it often happens that some one of several parts in tension does not support its share of the load, and instead of the usual expensive and troublesome plan of taking down the parts and forging them in a blacksmith shop, Hasenkamp, a German engineer, purposes making the adjustments in lengths with the structure intact. His plan is to use thermit for heating the part in place. This material, a mixture of iron oxide and aluminum, is readily ignited, and it burns with an intense heat—which may reach 5,000 deg. F.—through the affinity of the aluminum for the oxygen of the iron oxide. Clamps are fastened to the steel part on each side of the spot to be heated. These clamps are connected by bolts, and when the right temperature is reached turning the nuts shorten the steel permanently to the extent desired. The operation, requiring but a few minutes, does not interfere with traffic.

AN INTERESTING OCCURRENCE OF SCHEELITE IN NOVA SCOTIA.

By A. L. McCallum.

Early this summer, while engaged on some work in the Moose River district, I was shown a small sample of a yellow mineral in quartz, which had been found the previous autumn by Messrs. Reynolds & Currie, of Moose River.

I must confess that at first sight I did not recognize the mineral, and not having the means at hand for testing it, I laid it to one side.

Shortly after this Dr. T. L. Walker arrived in Moose River, looking for occurrences in Tungsten, in association with the Nova Scotia gold ores. Together we tested this mineral, and pronounced it Tungstite. Later, on coming to make an anlysis of the mineral, I found it to be scheelite, partly altered to tungstite, the two minerals being present in nearly equal proportions.

I suggested to the finders that further search be made in the section where this was found, which was done, and resulted in the finding by Mr. Reynolds of several more pieces of quartz carrying tunsten.

I then recommended the taking up of the property under a prospecting license, which was done, and active prospecting commenced by Mr. Reynolds.

At first, search was made for the yellow altered mineral, but up to the present no more of this has been found.

Soon after starting prospecting, however, a boulder of nearly pure unaltered scheelite was found in the bed of a small brook. Subsequently a considerable quantity of drift was found in this brook, and i na larger one 600 feet further west.

At this point I wish to pay a justly merited tribute to the thorough, systematic, I was almost going to say scientific, manner in which Mr. Reynolds conducted the prospecting operations, with the result that two weeks after the first boulder had been found the vein from which it came was located and opened up in several places.

This is the vein on which, up to the present, most work has been done. It has been traced east and west for a distance of over 600 feet, and two small trial pits sunk on it, from which over two tons of ore have been taken. An average sample of this ore yielded the following result on analysis:—

Silica	29.29%
Tungstic acid (WO_3)	44.10"
Lime	12.70"
Arsenic	3.43"
Sulphur	1.46"
Oxide of iron and alumina	7.70"

The vein occurs in a slate belt 3½ feet wide, between whin walls, dipping north at an angle of 75 degrees. The vein is situated on the foot wall, and occurs in a series of lenses of varying sizes. These lenses are of all sizes from seven inches down, and will average about three inches. The scheelite is intimately mixed with the quartz, and is evidently contemporaneous with it. There is also generally some mispickel present.

Frequently lenses of pure scheelite are encounterd. An anlysis of this yielded the following figures:—

Tungstic acid	79.84%
Lime	20.11"
Specific gravity	6.10

The slate near the vein is heavily impregnated with crystals of mispickel, while that towards the hanging wall is practically free from it.

South of this vein four others have been located, running parallel to the first. Two of these are about the same size and quality as the first, and the other two are larger, 12-14 inches, and of lower grade, the scheelite occurring on the outside of the vein, and seems not to have penetrated to any great distance.

Quite recently some rich drift has been found north of the first-mentioned vein, thus indicating the presence of still another vein. As the glacial striae at this point runs almost direct north and south, I think it is safe to conclude that the vein from which this drift came is north of the point at which the drift was found.

I thought that this occurrence was of sufficient interest to warrant the foregoing brief description. It is the first time in Nova Scotia that a vein has been discovered in which the predominating mineral is scheelite. There was, I believe, an isolated occurrence of scheelite at Malaga, but not in convenient quantities.

There is no reason that I can see why it should not be found in some of the Nova Scotia gold districts, as there is no evidence of anything out of the ordinary in the formation when this scheelite occurs. The fact probably is that the mineral has been overlooked, as the only characteristic that would draw attention to it is its high specific gravity. In appearance it looks exactly like the calcite that frequently occurs associated with the quartz.

I have frequently had to test samples this summer before I could be sure whether they were calcite or scheelite.

UNIFORM AND SYSTEMATIC COAL MINE SAMPLING.

In "Contributions to Economic Geology," published by the U. S. Geological Survey, J. S. Burrows takes up the question of uniform and systematic coal mine sampling.

The tendency in coal mine sampling is to secure samples that are much cleaner than the coal as it is mined. Thus the sample does not correspond to the commercial product. Exhaustive tests , covering a whole year's work, show that the usual method of mine sampling cannot be relied upon to represent the average commercial product of the mine.

One of the important features of the work of the Survey's fuel-testing plant at St. Louis was the careful sampling of carload lots, and the checking of each car by means of comparison with corresponding mine samples.

The cars of coal were unloaded into a roll crusher with the rolls set 1½ inches apart, the coal falling into the boat of a bucket elevator. As the buckets of the elevator moved upward to the storage bin a sample was taken by a man with a small shovel from about every eighth or tenth bucket. This was continued until the car was emptied. The sample in a tightly covered iron bucket of 80 to 100 pounds capacity, was sent to the laboratory, and there pulverized and quar-

tered down to requisite size. This method gave the most uniform results.

In mine sampling the sample was crushed in the mine immediately after taking it, thus ensuring no loss of moisture, as in the mine atmospheric conditions are generally constant.

Two or more places were selected at widely separated points on the mine where the coal bed had an average development, and from which most of the coal was being mined for shipment. At one of these places the face was cleared of burned powder, loose coal and idtr for about five feet, and insecure pieces of the roof were taken down to prevent their falling into the sample. Then a waterproof blanket was spread on the floor of the mine close up to the face, and a perpendicular cut from floor to roof was made, including everything in the sample, except the parts of the bed discarded by the miner. Sufficient coal was cut to make not less than five pounds to the foot in height—that is, a sample weighing not less than 20 pounds would be cut from a 4-foot bed of coal, and a sample weighing at least 30 pounds from a 6-foot bed. When shale or other partings were to be included in the sample, great care was exercised to cut them the full width and depth of the groove, in order to preserve the proper proportion of coal and extraneous matter. After sampling, a careful measurement was made of the vertical section of the bed, every parting and variation being noted, and those not included in the sample being clearly shown. This formed a valuable check on the value of the sample.

The cuttings were at once weighed and then sifted through a half-inch mesh screen. The remaining lumps were broken on a portable buckboard and the entire sample put through the screen. After thorough mixing of the sample in the blanket it was quartered down to suitable size. It was then spread in a circular mass about two inches deep, and with a small trowel the mass was carefully sampled. The sample, being placed in a can, was hermetically sealed with insulating tape and despatched to the laboratory.

The entire operation was carried on with as great rapidity as practicable, so that there would be little or no loss in moisture.

From systematic tabulation some interesting general conclusions were arrived at and empirical factors adduced for correcting the results of the analysis of mine samples.

For instance, run of mine moal containing less than 5 per cent. moisture will, under normal conditions, gain moisture when exposed to the weather, and if the percentage of moisture in any mine sample of such coal be multiplied by the co-efficient 1.10, the probable amount of moisture in commercial run-of-mine will be found. Coals containing more than 5 per cent. moisture in the average mins sample show a decided loss of moisture in the car samples. The co-efficient for this class of coal is 0.93.

For coals containing less than 3 per cent. sulphur the co-efficient is 1.07. For correcting mine samples of coals containing more than 3 per cent. sulphur the co-efficient is 1.05.

Similarly, for correcting a determination of ash in mine samples of coals containing less than 7 per cent. the co-efficient is 1.618, and for coals whose ash exceeds 7 per cent. the co-efficient is 1.283.

These figures are all for run-of-mine coal. Co-efficients were determined for screened and slack coal also. The following table gives all of these:—

Co-efficients for Correcting Mine Samples Approximately to Commercial Coal.

Moisture—

For run-of-mine coal with less than 5 per cent. in mine sample	1.19
For run-of-mine coal with more than 5 per cent. in mine sample	0.93
For screened coal (lump, egg, nut, etc.)	0.97
For slack coal	1.30

Sulphur—

For run-of-mine coal with less than 3 per cent. in mine sample	1.07
For run-of-mine coal with more than 3 per cent. in mine sample	1.06
For screened coal	1.10
For slack coal	(?.0.90

Ash—

For run-of mine coal with less than 7 per cent. in mine sample	1.62
For run-of-mine coal with more than 7 per cent. in mine sample	1.28
For screened coal	1.37
For slack coal	1.86

METHODS AND MORALS.

ALEX. GRAY.

The financial page of the Globe, Toronto, a journal ordinarily careful, yet unwilling to forego reading matter advertisements of very doubtful origin and purpose, contains the following among other things with special reference to Larder Lake district mines:—

"CANADA'S CHANCE. If Canada would only assist her miners by liberally investing in the stocks of her own good mines, or, in other words, finance the development of her own mines, she would soon be one of the richest countries in the world. But unfortunately her people lack to a great extent the knowledge, the money and the courageous enterprise necessary. Consquently millions, yes, hundreds of millions, of our own native wealth go to swell bank accounts of other countries. Is not this deplorable? Take, for example, the case of some of the mines at Larder Lake. Half a million dollars would put any one of these wonderful discoveries in a position to turn out by stamp mill and cyaniding process tens and even hundreds of millions of dollars of our native gold. However, if the general public had the knowledge and enterprise, I believe this money shortage would be overcome to a very favorable extent. But let Canada not lose sight of the fact that although some of her mines have failed, she has many of the best mines in the world, and many yet awaiting the assistance of investment.

"Wake up, Canada, ere your gold, silver and other valuable mines are all gobbled up by foreigners."

Because the Globe has never given its editorial sanction to what made Cobalt and Larder Lake unsavory, and for the further reason that it has refrained from questionable tactics so characteristic of some of its contemporaries,* the utilization of its financial page in the manner quoted has occasioned adverse comment. Not that Larder Lake ventures can be resuscitated by such ludicrous fanfaronades, or the despised "Sassenach" and "foreigner" influenced either way by crude tarradiddling. To the contrary, the palpable object has defeated the attempt. Alien ownership will be welcomed, since Canadians of wealth are really alienated from worthy mining ventures by reckless touts. Consequently, the volume of Canadian business in the Northern Ontario district shares is insignificant in comparison with that of the American, British, and German "foreigner," and were it otherwise, were Dominion capitalists relied upon to do the "gobbling" there would be "For Rent" signs on mining brokers' offices and little but snowballs on brokers' menus. The despised "foreigner," therefore, is not in the disfavor alleged, unless it be for his tardiness in not "gobbling" more of "the lemons" and leaving promoters the equivalent in cash—the kosher.

To "wake up" with "millions, yes, hundreds of millions," of "native gold" would not "swell" anything but the membership of violent patients in institutions for the incurably insane. Canadians have not heretofore been suspected of "lacking to a great extent the knowledge, the money and the courageous enterprise necessary." Larder Lake advocates might take issue with the discretion exercised by their compatriots, but of the latter's "knowledge" in this particular instance there can be no dispute. They "know;" they have "the money," and they have "the courage" to keep their money—until papers like the Globe voice the opinions of responsible engineers and veto the vapourings of the viciously *soufflant*.

Practically every mine at Cobalt was found by a Canadian. That "the foreigner" of England and the States was requisitioned for his money or to "wake the market" is no proof of ignorance or cowardice. The three great precious metal mines—the Leroi, St. Eugene and the La Rose—were discovered by French-Canadians. That they are held in the States and in England is no argument why "half a million" should be airily experimented with. Perhaps Canadians might have made more had long-distance telephone communication between New York, Buffalo, Syracuse and elsewhere been less convenient. Maybe Canadians were wise to take wholesalers' figures and leave it for others to make profits on "the turnover." Canada has benefited. The mining industry has its colicky features and teething troubles withal, but if "the foreigner" had "gobbled" more of Larder Lake and less of merit at Cobalt, mines and moose pasturage in the markets as mineralized areas, would be worth about fifty cents a mile for some time to come. However, Canadians have their share of shipping mines, courage and cash without recourse to the "hundreds of millions" in solution, *vide* the following:—

On the Cross Benches.

La Rose, University, Lawson, Violet, Princess

Canadian Control.	**"Foreign" Control.**
City of Cobalt,	Colonial Silver,
Cobalt Lake,	Townsite,
Coniagas,	Kerr Lake,
Crown Reserve,	King Edward,
Drummond,	McKinley-Darragh,
Foster,	Peterson Lake,
Nancy Helen,	Nipissing,
O'Brien,	Nova Scotia,
Right of Way,	Cobalt Central.
Silver Queen,	
Silver Cliff,	
Temiskaming,	
Hudson Bay,	
Trethewey.	

Is it possible that Canada is bereft of common sense in preserving the equilibrium at Sudbury, Cobalt, Copper Cliff, Doloro, Thorold, Perth Amboy and Denver, and leaving "fly belt" "multi"-millionaires to become maudin? Leave it to the Globe to decide!

*EDITOR'S NOTE.—We cannot agree with Mr. Gray's statement. The *Globe* has probably done more harm than any of its contemporaries because its pretensions are greater.

METHODS OF CONCENTRATION AT COBALT, ONTARIO

By Geo. E. Sancton.

Paper read at Cobalt Branch Meeting of Canadian Mining Institute, May, 1908.

At the present time there are three concentrators in active operation in the Cobalt Camp; namely, those at the Buffalo, the Cobalt Central and Coniagas Mines. In addition has been established an experimental mill at the McKinley-Darragh-Savage Mines of Cobalt, not at present in use, and the Muggley concentrator, a customs mill which is not yet in readiness for operation. All of these plants are wet concentrators, in contradistinction to those in which the ore is concentrated in a perfectly dry state. Of this latter class of mill there is one in the camp—a custom concentrator which has not yet been put into service.

In a great many respects all of the three first mentioned mills employ the same method of treating the ores from the mines. The veins in the camp being comparatively narrow, none of the mines are able to so mine their ore that the underground work is done in vein matter only. At the mines in which the concentrators are installed, it is the custom to make in the mine a rough separation of the high grade ore from the rest of the material. This high grade ore is hoisted to the surface and sacked, as on account of its richness it needs no concentration. The remainder of the material is composed of a mixture of high grade ore, rock and ore of low values, and is hoisted and sent to the mill without any further picking or sorting. From this point the methods of treatment vary slightly in the different mills. The following is an outline of the

manner in which the ores are concentrated in the three mills which are now working, and of the proposed method of treatment at the Muggley concentrator.

The Buffalo Mine.

The ore to be concentrated is lifted from the underground working to a trestle, from which it is trammed directly in, over the main ore bin, at the highest point in the mill, and dumped over a 1″ space grizzly, which removes some of the fine material, which it is unnecessary to pass through the coarse crusher. Passing through the main crusher, which is 6 x 20 Blake set to reduce ore to about ⅞″ size, the ore is elevated to a revolving trommel fitted with three sets of screens. These screens are of perforated metal with ⅝, ½ and ¼″ holes respectively. Oversize from the ⅝ screen and the product of the 1″ grizzly pass on to the fine rolls, which are spring rolls 20″ diameter by 20″ face. The materia lunder ⅝ and over ½″ and the material under ½″ and over ¼″ is treated separately on 3 compartment Hartz jigs. The material under ¼″ passes over an impact screen fitted with 20 mesh wire screen, the product over the screen going to a third Hartz jig and the fines through the screen going to cone settler and thence to a Wilfley table. The middlings from this Wilfley table are returned to the table; the tailings are split up, the coarser portion being treated on a Deister slime table.

The tailings from all the jigs feed into a six-foot Chilian mill and are reduced so as to pass through a 20 mesh slotted screen. The product of the Chilian mill passes over an impact screen fitted with 80 mesh wire screen, which removes the greater portion of the slimes, to be treated on a Deister slime table. The material which passes over the 80 mesh screen is fed on to four Deister tables, the tails from which, being of low value, go to the dump. These tails may later on be further treated by the cyanide process if sufficient silver remains in them to warrant it. At the present time about 40-50 tons of ore are being treated per twenty-four hours, the capacity of the mill being limited by the fine rolls. With fine rolls of greater capacity the mill would handle over 75 tons per twenty-four hours, provided more concentrating tables were insalled also. The amount of ore treated in a given time varies greatly, as ores from some parts of the mine will go through the mill much more quickly than ores from other parts. A Corliss engine of 150 h.p. is used in driving the machinery.

The Cobalt Central Mine.

The ore is trammed directly from the mouth of the shaft to a large bin from which the main crusher, a 10″ x 10″ Blake, is fed, the crusher discharging directly into the mill bin. From the mill bin the ore is fed by a plunger feeder to the roughing rolls, 42″ diameter by 14″ face, from which the ore is elevated to a 2 mesh trommel. The oversize from this trommel is returned to an oversize bin. When a sufficient quantity of oversize accumulates in this bin, the feed from the mill bin is shut off and the material from the oversize bin is fed into the large roughing rolls. The material passing through the 2 mesh trommel goes on to a No. 1 centripact screen fitted with 8 mesh screen cloth. The oversize from No. 1 centripact screen is treated on two Hartz jigs; the tails from the first are dewatered and reground by 10″ x 32″ finishing rolls, and the tails from the second are recrushed by 14″ x 30″ rolls, the products of the two sets of rolls uniting and being carried by a 7 x 12 elevator to the No. 2 centripact screen fitted with six mesh wire screens. This product, previous to being elevated, passes through dewatering screens to remove excess of water. The oversize from No. 3 centripact screen passes to one of these dewatering screens previous to being reground by the 14″ x 30″ rolls. The undersize from both the No. 1 centripact and the No. 2 centripacts feed on to No. 3 centripact screen, which is fitted with No. 16 wire screening. The oversize from this screen is reground in the 10″ x 32″ rolls, the material under 16 mesh meets the water from the dewatering screens and goes to two 20″ hydraulic classifiers and the sands from these classifiers are treated on four James tables. The overflow is settled in two Callow settlers and the thickened pulp is treated on two other James tables. The overflow from the Callow settlers, being practically clear water, goes to waste. The middlings from all six James tables are re-treated on the seventh James table; the tails from which, being of low value, go to the dump.

The mill, with average ore, is capable of handling about 50-60 tons per twenty-four hours. Of the values extracted about 70 per cent. are recovered by the jigs. In this mill all the fine grinding is done by rolls, the 10″ x 32″ rolls being set to crush to not over 16 mesh. The James tables are designed to also handle any slimes settling on a section of the table, which is left smooth and practically flat. On this section of the table most of the values in the slimes are extracted. There is, however, very little work for this part of the table to do and the quantity saved on it is not great. On the average the tails from the James table runs not over four to five ounces per ton. This mill is also driven by a 125 h.p. Corliss engine.

The Coniagas Mine.

The ore will eventually be raised from the mine in a skip and dumped directly into the mill storage bin through a long chute. Ore is first crushed in a 10 x 16 crusher, elevated, passed over a grizzly, recrushed by a 7 x 13 crusher and discharged into a storage bin. From this storage bin the ore is reduced to ¾″ by No. 1 rolls and elevated to No. 1 trommel, which has ¾″ and 5/16″ perforated steel screens. The oversize is returned to No. 1 rolls, which are 10 x 30; the oversize from the 5/16 and under ¾″ goes to two sets of Hartz jigs, the tailings from which are recrushed in No. 2 rolls. The undersize from the 5/16 screen goes to No. 3 trommel fitted with 3 millimeter screens. The oversize returns to No. 2 rolls; the product over ¼″ and size from this trommel goes to fine jigs, the tails from which go to a 5′ Huntington mill fitted with about 20 mesh slotted screens. The product from the 3 m.m. trommel, less than 3 m.m., is classified, the sands being treated on a Wilfley table and the slimes on a Frue vanner. The tails from the vanner also go to the Huntington mill. The tailings from the coarse jigs, after being recrushed in the No. 2 rolls, which are also 10 x 30, are elevated to No. 2 trommel, which is fitted with ½″ and ¼″ perforated metal screens. The over-under ½″ is ground in a ball mill fitted with about 20 mesh screen. The product from the trommel, which is under ¼″, goes to the No. 3 trommel previously mentioned. The materials from the Huntington mill and from the ball mill, crushed to 20 mesh and finer, unite and go to a classifier, the coarser product from which is treated on four No. 2 Deister tables. The tailings from the Deisters go to waste, the middlings being re-treated on a Wilfley table. The overflow from the clas-

sifier goes to a Callow settling tank and the thickened pulp is treated on a Frue vanner. The mill is driven by a Robb engine of about 100 h.p. capacity.

The Muggley Concentrator.

Ore to be concentrated will be taken up the incline tramway to the top of the mill and fed into a No. 4 style K. Gates crusher. From the crusher the ore will be fed into a set of Gates economic rolls, which crush to ¾" and under. The ore will then pass over a screen with 1⅛" openings and go to a two compartment bull jig. The tails from the bull jig will be elevated and discharged by a belt elevator to the ore bins from which they will be fed by Challenge feeders to twenty 1,250 pound stamps. The mortars will be fitted with screens approx. of 20 mesh and the stamped material will be elevated to Richards annular vortex classifiers. The spigot product will be treated on four Wilfley tables, the overflow going to two 8′ callow tanks. The tails from the Wilfleys will be re-treated if found of sufficient value. The thickened material from the callow tanks will be treated on corrugated belt vanners, the tails from which will unite with the middlings from the Wilfley tables and go to 8′ settling tanks. The sands from the settling tanks will go to 8 'amalgam pans and to four 8′ settlers. The amalgam will be retorted and the tails let go to waste. It is estimated that the complete cost of treating ores in this mill will from $4.00 to $12.00 per ton. It may be found necessary to roast the ore previous to amalgamation, and if this is done it will likely reduce the cost of treatment.

When the subject of the treatment of Cobalt ores was first considered, the main difficulty was thought to lie in the prevention of the crushed material from sliming, the general opinion being that the ore would slime to such an extent that the loss of values in the slimes would be very excessive, while the actual process of reducing the ore to a fine state was not considered as being a very important one. But as a matter of fact this order has been practically reversed, as there appears to be no great trouble in getting a good extraction, though the actual fine grinding of the material has proved a problem of great importance. The coarser reductions give little trouble, as the material breaks along its fractures and, furthermore, accurate crushing to size is not altogether important. When it comes to the fine grinding, the rock is particularly difficult to reduce. The small particles seem to be exceptionally hard and the wear on the roll shells, or Chilian mill tyres, as the case may be, is very great, grooving taking place to such an extent that the capacity of the machines in the case of the Chilian mills and the capability to give a fine product in the case of the rolls is greatly reduced.

In connection with the fine grinding there is one mill, the erection of which is contemplated, in which it is proposed to use stamps. This method has much to recommend it. The cost per ton of ore crushed would not likely exceed 30 to 40 cents per ton, and this we do not think can be bettered by either fine grinding with a series of rolls or with Chilian or Huntington mills. To drive either of these machines a much greater horse power is required and the upkeep is more expensive both for parts and the amount of labor required to keep the machines in order. Half a day's work on a small stamp battery putting in new liners and refitting with new shoes and dies will make the battery practically as good as new. To overhaul a Chilian or Huntington mill thoroughly would probably take over a week at the least. Some silver would no doubt accumulate in the mortar boxes, but this would be no serious disadvantage as it could be easily and quickly cleared out as often as was found necessary.

The assertion has been made recently by one of the mine operators in Cobalt that stamps have no place in a concentrator. This statement, in the writer's opinion, is very broad and possibly rash in view of the number of stamps working with apparent success in many parts of the world. His statement, it is understood, covered milling in general and not only the reduction of Cobalt ores. The success of stamps in general as a crushing medium has been well shown at the Michigan Copper Company and other properties in the Lake country. For the fine crushing in connection with the treatment of the jig tailings on tables, we think that stamps will ultimately prove to be the best device.

The treatment of the tailings from the concentrating tables from the various mills by the cyanide process is a matter which is open to a large amount of discussion. In Mexico this has certainly proved a success, but the conditions in that country are much more favorable than those in this district. Unless the tailings carry much higher values than is said to be the case, it will require very cheap treatment to justify the installation of the cyanide plants for the treatment of tailings solely. In Mexico the climatic conditions are more suitable, and the cheapness of labor also bears a strong influence on the success of the process. There the operations are largely in the hands of mining engineers from the Rand, who, having seen the great success of cyaniding in South Africa, have carried their ideas to Mexico, and introduced them there in the treatment of silver ores.

In the Republic Camp, in Washington, they are treating an ore in which the values of silver and gold are about the same. It is found that the gold is easily leached out, but that the recovery of the silver is a matter of three or four days.

The actual extraction that would ultimately be made on the tailings here in Cobalt by the cyanide process is not questioned, but it will be at the expense of a large consumption of cyanide and the leaching out will be very slow on account of the comparatively large pieces of silver—large by comparison with the minute state in which gold is disseminated through the low grade ores in the Rand—which will require to be dissolved. At a great many of the mines in Cobalt, chalcopyrite is found to some extent and it would all mix with the ore going to the mills. This, when it finally reached the cyanide tanks, would tend to increase the consumption of cyanide. The question, however, of the actual success of the cyanide treatment here will largely depend on whether the tailings are sufficiently rich to stand the cost of treatment.

In connection with the primary crushing of the rock in most of the mills now running, and in most of the mills whose erection is contemplated, the Blake type of crusher seems to be preferred in preference to the gyratory crusher. In the Blake crusher the wear is practicall yconfined to two points, that is to say, at the lower ends of the jaw and wearing plates. For this reason the plates must be frequently renewed. In the gyratory crusher the wear is distributed over a far greater surface and the renewal of the concaves and the mantles is not necessary to the same degree. For a given amount of ore crushed the power taken is less; and, furthermore, the crusher head having a circular

motion in contrast to the reciprocating motion of the jaw in the jaw crusher, the strain on the supports for the gyratory is not nearly so great; and in case where the crusher is located in the upper part of the mill building the shaking and vibration due to the crusher is far less. This would enable the upper portion of a mill building to be made lighter, as it would not have to be so strongly braced to hold the crusher from oscillating.

For treating the Cobalt ores the simplest form of mill would first crush the ore to about 7/8" size in a Gates crusher. This product would then be passed over a bull jig, which to a great extent would displace the need of hand sorting. These tailings would then be crushed with rolls, roughly sized and treated on two jigs. The tailings from these jigs would then go to the stamps, so arranged that any of the tailings which were not of sufficient value to treat could be run directly to waste. The silver which accumulates in the mortars could be removed periodically, and the product after leaving the stamps, treated on Wilfley or other suitable tables and corrugated belt vanners. As the actual tonnage of concentrates produced would be comparatively small, it might be found profitable to treat these concentrates in amalgamating pans fitted with mullers for grinding. This would amalgamate a large amount of the native silver and the amalgam could be retorted and the buillion shipped. The concentrates from which most of native silver would be removed could then be shipped to the smelters and their treatment would cost far less than if the original concentrates had been shipped.

In this scheme very little mechanical screening is used, only a coarse sizing for the jigs being made. No fine jigging would be attempted on account of the leanness of the material; it would be better to allow the finer material to go direct to the stamps. Attrition of the small pieces might also be an objection to fine jigging. The extensive use of trommels, screens and other mechanical sizers, would add greatly to the costs of the upkeep of the mill as there is usually a great amount of wear attached to machines of this class. On account of the hardness of the ore milled the best and heaviest machinery on the market would be, there can be no doubt, the cheapest in the end.

NOTES FROM THE PROVINCE OF QUEBEC.

THE BROUGHTON ASBESTOS FIBRE COMPANY.

This company was the first in the Broughton district to build a mill, and has been operating continuously for over six years. The two principal pits are located along the southerly contact with the schist formation, and have now a depth of from 65 to 90 feet. The mill, which was entirely overhauled and enlarged last year, contains three cyclones, and treats from 350 to 400 tons of asbestos rock in double shift. The mill rock is transported in 4-ton self-dumping cars, and handled by small locomotives to the mill, a siding connecting also the latter with the main track of the Quebec Central Railway. The construction and layout of the mill embodies a number of effective designs and improvements especially adapted to the peculiar conditions governing the occurrence and extraction of the Broughton fibre, and are the result of diligent studies on the part of Mr. H. Williams, the energetic manager of the concern.

THE QUEBEC ASBESTOS COMPANY.

This mine has been in continuous operation since 1904, and has contributed largely to the asbestos output of the Broughton district. The main pit measures 300 by 100 feet, with a depth of 75 feet, and is located along the southerly contact with the schist formation, which strikes here northeast-southwest. The serpentine is much fissured, and little powder is used to break the rock. The fibre is the regular Broughton slip-fibre, and fills the fine cracks and slickensides of the bright green serpentine. The mill is in operation day and night, about 150 tons of rock being treated as an average, yielding from 7 to 10 per cent. of fibre. Forty-five men are employed.

THE FRONTENAC ASBESTOS MINING CO.

This company, which owns 108 acres of asbestos ground right near the station of East Broughton, is at present engaged in the construction of a 500-ton mining and milling plant. The asbestos deposit is located towards the middle of the property, and has been laid open along the southern contact of the schist formation in a northeasterly sense for a length of 600 feet and a width of over 100 feet. The mill building measures 102 by 60 feet, and the dryer building 70x40 feet. A fine piece of trestlework has been completed, upon which the receiving tracks for the mill rock will be laid. Four cable derricks are being installed, conveying the rock to dumping cars, hauled by small, geared locomotives to the ore bin of the dyer. A special feature of the mill is the ore bin, placed between dryer and mill. This bin is one of the largest in the asbestos district, its capacity being about 800 tons, and by reason of its extra solid, substantial construction on heavy concrete foundations, is favourably commented upon. Machinery will soon be installed, four cyclones will treat the rock, and the combined milling capacity will be 500 tons. Mr. H. Riehle, M.E., is the general manager of this company and the designer of the large surface plant. Thirty men are engaged in construction work.

THE BOSTON ASBESTOS CO.

This company commenced operations less than a year ago on the property adjoining the Frontenac to the east, and have almost completed a substantial 300-ton milling plant located alongside the track of the Quebec Central Railway. The main pit runs along the southern contact with the schist formation, at a distance of about 600 feet in a northerly direction from the plant. A cable derrick transports the rock to self-dumping cars on an inclined tramway leading to the dryer building. This contains a large Campbell dryer of the latest design and the necessary jaw crushers. The rock passes then into storage bins, then through a huge Sturtevant crusher, two fibrizes, and finally through two cyclones. The power plant consists of two Jenckes boiler and a straight compound Corliss engine of a capacity of 450 horsepower. A siding connects the railway with the mill. Mr. A. A. Normandin is the general manager of this company.

A recent noteworthy discovery is an asbestos deposit on lot 13c, range 5, Broughton, belonging to Mr. A. A. Normandin. This deposit is remakrable by reason of its peculiar deposition of asbestos fibre, and also its richness. A pit 15x25 feet on the surface in a highly fissured pale green serpentine discloses the nature of

the deposit; a decidedly white and silky fibre occurs abundantly throughout the rock, yielding, according to a conservative estimate, at least a fifteen per cent. extraction, besides a quantity of crude. There seems to be no question that this deposit is the richest individual occurrence in the district.

PROVINCIAL MINERAL EXHIBITS AT THE CANADIAN NATIONAL EXHIBITION.

The directors of the Canadian National Exhibition, which is the largest annual fixture of its kind in North America, have heretofore paid but little attention to securing a representative exhibit of Canadian minerals. Acting upon the suggestion of the Canadian Mining Journal the Commissioner determined to make a departure this year. To this end the Provincial Governments were approached and five of them sent creditable collections.

ONTARIO'S MINERAL EXHIBIT.

The Provinces that complied with the Commission's request were: Nova Scotia, New Brunswick, Quebec, Ontario, and Alberta. British Columbia and Yukon Territory will fall into line next year.

All of the mineral exhibits were attractive. Those of Nova Scotia and Ontario were particularly comprehensive and well arranged. Quebec and New Brunswick sent smaller consignments of minerals. Alberta's display, arranged in conjunction with that province's magnificent wheat exhibit, was composed of bituminous, coal, lignite, anthracite, coke, and briquettes. Descriptive literature was distributed by those in charge of the exhibits and there is no doubt that the mineral wealth of the provinces represented received wide advertisement.

ONTARIO.

Ontario's mineral exhibit was handled and arranged under the active direction of Mr. William Nicol, Professor of Mineralogy, School of Mining, Kingston, Ont. No more competent mineralogist can be found in Canada than Professor Nicol. Under his vigorous management the collection of minerals used at the Buffalo Exposition was augmented by important additions, and the whole was displayed with discrimination and sound judgment. It was fortunate indeed that the Ontario Bureau of Mines was able to secure the services of a

person so thoroughly enthusiastic and so unquestionably efficient.

We shall notice first the metallic minerals, and then the non-metallic, commencing, as might be expected, with the striking Cobalt ores and products.

O'Brien Mine.—From this famous mine came two slabs of native silver, and one magnificent mass of ore carrying native silver and cobalt bloom. Both of these exhibits were more than usually large and rich. The **Doloro Mining and Reduction Company,** whose smelter treats the O'Brien and other Cobalt ores, sent specimens of speiss, six silver ingots (999 fine), sample lots of dark and light crude arsenic, white arsenic crystals, refined arsenic, and cobalt-nickel residue.

Coniagas Mines, Limited, sent specimens of native silver and cobalt-nickel ores. **The Coniagas Reduction Company,** which bears the same relation to the Coniagas mine as does the Deloro smelter to the O'Brien mine, exhibited a silver ingot (998.4 fine), cobalt oxide, nickel oxide and refined white arsenic. The cobalt and nickel oxides are specimens of the first of these materials prepared in Canada.

La Rose Mines, Limited, displayed a large number of silver nuggets and four large masses of silver-cobalt-nickel ores, along with fine specimens of cobalt bloom.

Crown Reserve.—An imposing mass of native silver and calcite, calculated to contain about 33 per cent. of the metal and weighing 1,700 pounds, was purchased by the Ontario Government as a permanent exhibit. Its extreme width, as shown by the hanging and foot-wall faces, is approximately three feet, and it is typical of the Crown Reserve vein at its best. Ontario has made a good bargain in acquiring this magnificent and unique specimen. At the present low price of silver it will be a safe investment. The silver content will probably be estimated indirectly by a specific gravity determination. The specimen, in spite of its extreme bulk and weight, was ingeniously lowered upon a substantial plush-covered base and a glass show-case built around it. It is not probable that such an exhibit could be duplicated in any other part of the world.

The Laurentian Gold Mines, Wabigoon, Ont., had a rich exhibit of gold nuggets and gold in quartz, of a total estimated value of $4,000. Gold ores from other mines in western Ontario were included. Larder Lake was represented by specimens of ore sprinkled with visible gold from the Harris-Maxwell mine.

Iron Ores.—From the Bessemer mine, Hastings County, came exhibits of the fine granular, non-phosphatic ore of that region. Magnetites also from Moose Mountain and other localities were seen in this section.

Pyrite.—Specimens of the green ore, cinders and sulphuric acid prepared from the ore by the Nichols Chemical Company, Sulphide, Ontario.

Nickel and Copper.—A large and representative collection of ores, mattes, and metals from the Orford Company and from the Canadian Copper Company, Copper Cliff, Ontario. Copper ores were also exhibited from the McGowan mine, Sudbury District.

Zinc ores were displayed from the Richardson and Zenith zinc mines, Frontenac County, Ontario.

The **Canada Corundum Company** had a fine showing of crude ore of various sizes, corundum grains, and grinding wheels of different dimensions and fineness of grain, along with a collection of abrasive implements made from Canadian corundum.

Carborundum.—Samples of crystals of carborundum and various articles such as sandpaper, knife sharpeners, etc., were sent by the Carborundum Company, Niagara Falls, Ontario.

Mica.—Kent Brothers, Kingston, Ont., exhibited thumb-trimmed mica of commercial sizes, and large natural crystals. The General Electric Company, of Schenectady, N.Y., exhibited a collection of mica from their Lacey mine, Sydenham, Ontario.

Talc.—Masses of crude talc from the Henderson talc mine, Madoc, Ont., were accompanied by samples of crushed, ground, and bolted talc, prepared by Geo. H. Gillespie & Co., Madoc. This latter exhibit, from the only talc grinding mill in operation in Canada, attracted a great deal of favorable comment. Massive specimens of actinolite and soapstone from other parts of Ontario completed this section.

Gypsum.—Staff decorations and ornamental manufactured articles, manufactured from Haldimand County gypsum, by W. J. Hynes, of 16 Gould Street, Toronto, were shown in this section, along with a creditable exhibit from the Alabaster Company, of Paris, Ontario.

Portland Cement.—Samples of the raw material for both the dry and the wet processes as carried on by the Canadian Portland Cement Company at Port Colborne and Marlbank, Ontario. Also an exhibit of building materials manufactured from Portland cement by John W. Litton, Kingston, Ontario.

Graphite.—Specimens of ore from the Black Donald mine, Renfrew Ont.

Calcium Carbide.—Raw materials and manufactured products from the Ottawa Carbide Company, Ottawa, Ont.

Marble.—Two strikingly beautiful slabs of decorative marble and fifteen other samples brecciated marbles were contributed by the Ontario Marble Quarries of Bancroft, Hastings County, Ontario. The unique coloring of this marble caught the attention of visitors at once.

Sodalite from Princess Louise Mine, Bancroft, and **Fluorspar** from Madoc were also included.

The **Imperial Oil Company** had a complete exhibit of oils, paraffines, etc.

An important addition to the Ontario exhibit was a collection of the typical rocks and minerals of the Cobalt District. Mr. A. A. Cole, mining engineer to the T. & N. O. Commission, contributed this. Many of the cases used by Professor Nicol belonged to the School of Mining, Kingston, Ont.

NOVA SCOTIA.

Nova Scotia's exhibit, arranged and prepared by Mr. Harry Piers, Curator of the Provincial Library, Halifax, N.S., was exceedingly well displayed. The notable variety of minerals included the richness of the gold specimens, and the substantial character of the well-designed frame upon which the specimens rested distinguished this most creditable representation. The central feature of the exhibit was a gilded column resting upon a gilded plinth, which together represented the bulk of the total gold extracted from Nova Scotia gold mines since the first discovery of the metal. From this column depended streamers and bunting.

Detailed description of this exhibit will be found on page 138 of the Canadian Mining Journal for May 15, 1907. Among recent additions to this permanent exhibit are specimens of scheelite from Moose River, Halifax County, N.S.

Both the Province and Mr. Piers deserve great credit for the energy and taste that has been used in getting together this collection.

QUEBEC.

The Quebec Department of Mines, on account of delays and pressure of other work, was unable to send a suitably large mineral collection. What was sent, however, represented the most important industries.

NEW BRUNSWICK.

Iron.

Magnetic Iron Ore, Lepreau, Charlotte County. These ores occur in veins, from a quarter of an inch to eight inches in thickness, in schists of pre-Cambrian age, about two miles from the village of Lepreau. They contain 66 per cent. of metallic iron, and are free from titanius.

Magnetic Iron Ore, Deer Island, Charlotte County. The specimen exhibited is from deposits similar in age and character to those of Lepreau.

Magnetic Iron Ore, Nepisiguit River, Gloucester County. The ores of this locality, though long known, have but recently attracted attention. They are found on the left bank of the Nepisiguit River, about eleven miles from the town of Bathurst and seven from the line of the Intercolonial Railway. They occupy an extensive area, and are of good quality. They are the property of the Drummond Mines, Limited.

NOVA SCOTIA'S MINERAL EXHIBIT.

A gilded shaft from which streamers depend represents the total output of gold from the Province.

Asbestos.—Large exhibits of crude asbestos and the different grades of milled product were made by the following companies: Beaver Asbestos Co., Bell's Asbestos Co., Standard Asbestos Co., Dominion Asbestos Co., Johnston's Asbestos Co. Specimens showing the mode of occurrence of the mineral were also included.

Chrome Ore and concentrates from Black Lake.

Copper Ore from Eustis Mine, Capelton.

Mica from Templeton.

Magnetic Lands from Moisie, Saguenay County.

Next year teh Quebec exhibit will be much more comprehensive.

Hematite, Jacksontown, near Woodstock, Carleton County.

Copper.

Sulphide of Copper, Letete, Charlotte County.

Sulphides of Copper (Bornite, Chalcopyrite and Copper Glance), Simpson's Island, Charlotte County. The occurrence of copper ores on Simpson's (and Adam's) Island is similar to that of Letete, except for the presence of bornite and copper glance.

Sulphide of Copper (Chalcopyrite), Northampton, 4½ miles from Woodstock, Carleton County. Cobbler and Sexton Mine.

Sulphides of Copper (Bornite and Chalcopyrite), Goose Creek, St. John County. American Copper Co.

Sulphide of Copper (Copper Glance), Dorchester, Westmoreland County. These ores are peculiar as occurring in grey sandstones and conglomerates of carboniferous age, partly in the form of small veins, rarely more than a quarter of an inch in thickness, and partly disseminated through the rock in quantities not directly visible to the eye. There is also more or less of the green carbonate.

Nickel.

Nickeliferous Pyrrhotite, St. Stephen, Charlotte County. The New Brunswick ore is, like that of Sudbury, a pyrrhotite, and occurs in or partly replaces a highly crystalline diorite, probably of pre-Cambrian age.

Antimony.

Sulphide of Antimony (Stibnite), Native Antimony, Lake George, Prince William, York County. Canadian Antimony Co. of Lake George. Quite recently interest in these deposits has been renewed, considerable quantities of ore have been taken out, and the Canadian Antimony Company of Lake George (capital $250,000) is proposing to carry on operations on an extended scale. The average percentage of antimony is 20 per cent., with in some analyses from 1½ to 2 oz. of silver to the ton.

Manganese.

Manganese Oxides (Manganite and Pyrolusite), Markhamville, Kings County.

Manganese Oxides (Manganite and Pyrolusite), Shepody Mountain, Alberta, County; Jordan Mountain, Kings County; Quaco, (St. Martin's), St. John County.

Manganese Oxides (Manganite and Pyrolusite), Tattagouche River, near Bathurst.

Bog Manganese, Dawson Settlement, Albert County. The ores of Markhamville were remarkable for their richness, the best grades ranging as high as 98 per cent. of pure ore, and worth about five cents per pound, while lower grades, shipped without special treatment, brought in England $15 per ton. The ores from the locality were almost entirely used for chemical purposes. The Markhamville mine is said to have produced some of the highest grade manganese in the world.

At Dawson Settlement, Albert County, occurs a deposit of Wad, or Bog manganese, of remarkable extent and purity, containing by analysis about 45.81 per cent. of metallic manganese. They are therefore low-grade ores as compared with those of Markhamville, but are well suited for the manufacture of spiegel and ferro-manganese, employed in steelmaking.

QUEBEC'S MINERAL EXHIBIT.

Coal.

..Bituminous Coal, Minto, Queens County, N.B.; Beersville, Kent County, N.B. The coal is of the caking variety, and as such is highly esteemed for black-

smiths' use. When properly screened it is also a good house coal. It is largely used upon the I. C. R., as well as for electric light works, water works and factories. It is worth, in Fredericton, from $3.50 to $4 per ton.

Albertite.

Albertite is closely related to petroleum in its properties, though differing somewhat in chemical composition. When subjected to distillation it yields about 100 gallons of oil to the ton, while the gas product was 14,500 cubic feet of superior illuminating power. It was chiefly employed as an enricher of coal gas, and was valued at from $15 to $20 per ton.

Bituminous Shale.

A considerable band of highly bituminous shales, probably of Devonian age, traverses the counties of Kings, Albert and Westmoreland, and in the vicinity of Baltimore, Albert County, assumes something of the character of cannel coal.

Quite recently renewed attention has been directed to these shales in consequence of the very succesful treatment of similar shale in Scotland, and a considerable shipment from Baltimore has been sent to the latter country under the direction of the Canadian Geological Survey, to test more thoroughly its capacity for similar treatment. The results of this experiment are not yet available in detail, but from reports so far received the prospects are very encouraging.

Petroleum.

Memramcook, Westmorland County. Not only are the bituminous shales of Albert County largely impregnated with oily matter, but at various points fluid petroleum has been found to occur in these and the associated rocks.

Graphite.

St. John. Bands of impure graphite are found, associated with Laurentian limestone, at several points afforded material for foundry facings and the manufacture of paint. They are not, however, at present being utilized. The material contains a little less than 50 per cent. of graphite carbon, but its state of physical aggregation is apparently unsuited for the higher uses to which graphite is often applied.

Gypsum.

Snow White Gypsum or Alabaster, Translucent Gypsum, Pink and Salmon-red Gypsum, Grey Gypsum,

NEW BRUNSWICK'S MINERAL EXHIBIT.

Crystallized Gypsum or Selenite, Fibrous Gypsum, Anhydrite, Hillsboro, Albert County. Albert Manufacturing Company. New Brunswick has long been noted for the extent and character of its gypsum disposits. These always occur in connection with red sediments and limestones of Lower Carboniferous age,, and are found at many localities, of which Hillsboro, Albert County, is by far the most important. The plaster beds here cover a large area, and many quarries have been opened, showing faces of from thirty to one hundred feet, but without revealing the base of the deposit. The larger part of the rock is a pure white opaque gypsum of exceedingly fine grain, but with this are to be found in places all the varieties enumerated above. Anhydrite, or "hard plaster," is irregularly

distributed through or with the softer gypsum, but large bodies free from such admixture are met with. Selenite or crystallized gypsum is of rare occurrence. The analysis of the Hillsboro plaster shows 98.88 of pure gysum.

The United States duty on manufactured plaster is $2.25 per ton, and were it not for the superior quality of the Hillsboro rock, would be well nigh prohibitive.

Gypsum, Plaster Rock, Victoria County. On the Tobique River, in Victoria County, are large beds of gypsum, which have for many years been used for fertilizing purposes by the farmers of Carleton County and Aroostook County, Maine.

Building Stones.

Grey Granite, Spoon Island, St. John River, Hampstead, Queens County.

Red Granite, St. George, Charlotte County.

Black Granite (Mica-diorite), Bocabec, Charlotte County. Granite is a very abundant rock in New Brunswick, occupying large areas, and presenting several varieties.

Freestones.

Freestones, Dorchester (Budreau quarries).

Grey Freestone, Chatham (French-fort quarries).

Red Freestone, Sackville (Sackville Freestone Co., Ltd.).

Ornamental Stones.

Feldspar Porphyry, Chamcook Lake, Charlotte County.

Marble and Serpentines, St. John, N.B.

ALBERTA.

The general exhibit of the Province of Alberta, whose fuel supply is now a large factor in the industrial development of the West, was handled by Mr. Richardson, the Director of the Alberta Provincial Exhibition. Wheat and coal, the two staples of the province made up most of this admirably arranged exhibit. Bituminous coals, lignites, anthracites, coke and briquettes surrounded the field of wheat. The coal specimens were of surprising size and purity. The Briquettes from Bankhead, Alberta, served as a gentle reminder that Alberta is keeping pace with the best in the conservation of her natural resources.

Drummond Mines, Limited.—Prominent among the mineral exhibits were two large pyramids of iron ore from this company's extensive deposits at Bathurst, N.B., and at Torbrook, N.S.

The Bathurst ore, a high-grade magnetite, as shipped, contained 60 per cent. iron and low phosphorous and sulphur. The Torbrook ore, ranging from 52 to 58 per cent. iron, contains about one per cent. phosphorus. These exhibits represent two of the most important iron ore deposits of Eastern Canada. Both are situated near tidewater. They will form the basis of large industries. In both localities the visible supply is enormous.

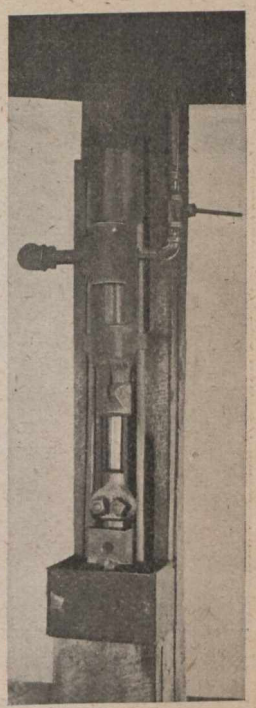
A USEFUL DEVICE.

By Fred Cotton, Sulphide, Ontario.

The accompanying cut illustrates a useful air-hammer for making drill shanks for rock-drills. The whole apparatus is simple and inexpensive.

Before hitting upon this idea I was turning shanks on the lathe. This took up so much time that this simpler method occurred to me.

I took an old drill cylinder that was of no other use on account of the feed not long having broken off; also a C. I. block 12″ x 12″ x 14″, and put the side rods through the block, leaving a shoulder on the rods between the cylinder and block. Cast steel dies, one half fastened to block, the other made with drill shank to fasten to chuck, completed the outfit.



HOME-MADE SHANK MACHINE.

I also removed ratchet and rifle bar, filled the piston with babbit, slotting out the chuck to fit side rods and keep dies in position. This also acted as crosshead.

This hammer is set up on a 12″ x 14″ timber, cemented to the ground. It has been working all summer to perfection, and makes a good drill-shank in less than one minute.

Steel bands or belts, as a substitute for ordinary leather belts or rope drives, have been introduced by a factory of Charlotteburg, Germany. Such belts may be reduced to about one-sixth of the size required for leather belts, they do not stretch, pulleys may be made narrower, and in some cases may be smaller. Either ordinary pulleys or pulleys with a special covering to increase friction may be used. A belt 4 inches wide and 1-5 inch thick transmitted 200 to 250 horse-power at a belt-speed of 5,400 feet per minute, and tests have shown that steel belts may run 12,000 feet per minute.

The smoke-density meter of Edmund J. Kunze comprises a short length of one-inch brass tube, to one end of which is pivoted a revolving disc of transparent celluloid in four sections. These sections are tinted different shades of gray to correspond to densities between no smoke and jet black, and each has a hole in the centre. The observer, looking toward the smoke, turns the disc until the tint nearest the smoke is found.

THE CANADIAN EXHIBIT AT THE FRANCO-BRITISH EXHIBITION.

As a contrast to the mineral exhibits of the Provinces at the Canadian National Exhibition, we give herewith three views of Canadian exhibits at the Franco-British.

Plate No. 1 illustrates the Manufacturers' Exhibit. In an alcove to the left of the exit may be seen a display of coal, iron ore, etc., and steel rails from the Algoma Steel Company.

Plate No. 2 represents the agricultural section. Engines from E. Leonard & Sons and from Fairbanks, Morse & Co. are shown. Plate No. 3 shows the mineral section. Fifty-one cases, similar to those seen in the photo, were used to display these exhibits.

In the left foreground is seen a pyramid of building stones, slate, brick, cement, etc.; in the centre fore-

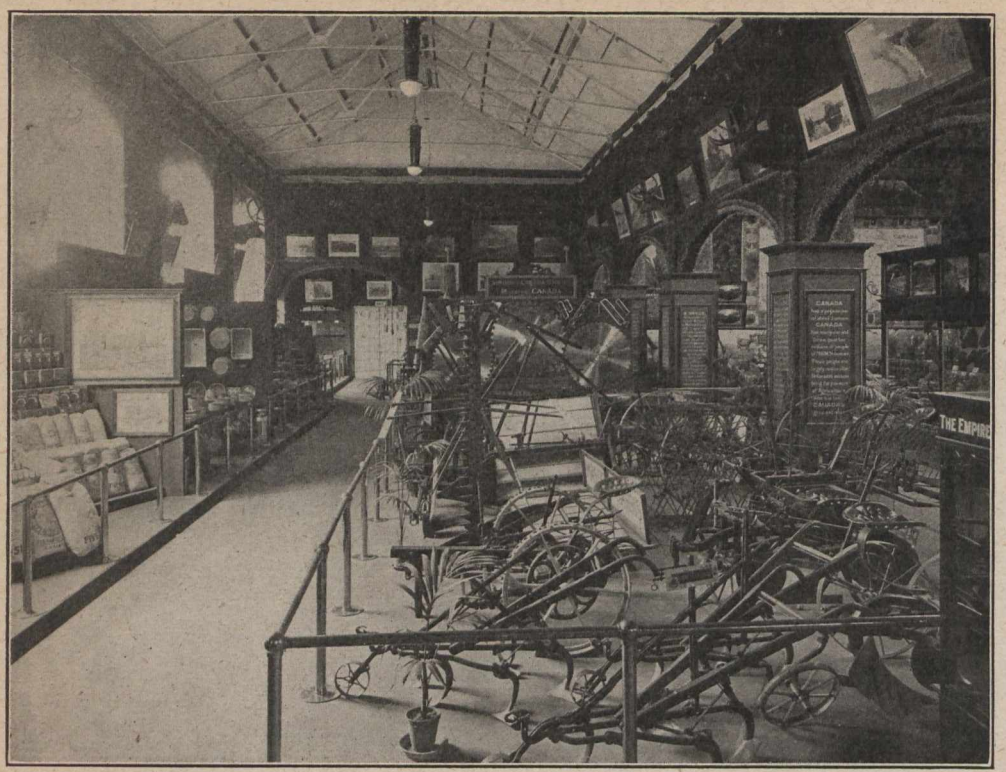


PLATE 1.—MANUFACTURERS' EXHIBIT. COAL, IRON ORE, AND ALGOMA RAILS IN ALCOVE TO LEFT OF EXIT.

PLATE 2.—CANADIAN ENGINES, ETC.

PLATE 3.—MINERAL SECTION.

ground a pyramid of silver-lead ores and silver-zinc ores from British Columbia.

In the central large case the Mond Nickel Company displays nickel-copper ore and products. There are also here cobalt-nickel and silver ores, mica, pyrite, and a large exhibit from the Canadian Copper Co. Apatite, corundum, talc, and asbestos are also included.

Thirty transparent photographs of mining plants embellish to crown of the large case.

QUARTZ AND FELDSPAR.

BY EDSON S. BASTIN.

From Advance Chapter Mineral Resources of the United States.

QUARTZ.

Introduction.

Quartz, the most abundant of all minerals, occurs in a great variety of forms and is utilized commercially in many different ways. Certain transparent colored varieties, such as rose and smoky quartz and amethystine quartz, have a gem value and are discussed in the chapter on precious stones. Sand used for building, molding, and in glass and pottery manufacture, is also discussed in other parts of this volume, as are tripoli and sandstone and quartzite used for building purposes, and quartz used as an abrasive, although all these materials are nearly pure quartz. This chapter deals only with massive crystalline quartz (often called vein quartz), with flint, and with quartzite which is used for other than building or paving purposes.

Massive Crystalline Quartz.

Quartz of this variety is usually white, though occasionally rose colored or smoky. It occurs in vein or dikelike masses, unmixed with other minerals, or as a constituent of pegmatite. In the latter occurrence it is produced as an accessory in the mining of feldspar. The States now producing massive crystalline (vein) quartz in commercial quantity are Connecticut, Illinois, Maryland, New York, and Pennsylvania. Small quantities were formerly marketed from Maine, but these quarries are so far from the principal markets that the quartz can not now be sold at a profit.

Quartzite.

This rock may be described as a sandstone in which the spaces between the quartz grains have been completely or almost completely filled, either through a further deposition of quartz between the grains or through a recrystallization of the quartz of the original grains. The result is a solid mass of quartz. In Cherokee County, N.C., a hard, vitreous quartzite of Cambrian age is extensively quaried for use as a flux in copper smelting.

Flint.

The name flint is properly applied only to quartz of exceedingly compact texture, dull surface, and perfectly conchoidal, splintery fracture. It commonly occurs in the form of more or less irregular nodules in limestones. Chert is another name applied to flint occurring in this way. Flint or chert nodules occur abundantly at several localities in the United States, notably in the Cretaceous limestones of central Texas, a locality in the west portion of the city of Austin being the most accessible. So far

as known very little domestic flint has ever been commercially utilized except as road material, though its quality appears to be equal to that of the imported flint. All the true flint consumed in this country comes from France, Greenland, Norway, and England, and is imported cheaply as ballast. Many of the smaller and nearly spherical nodules are used in tube mills, but much of the material is fired in kilns and then ground for use in the pottery trade. The flints, which are usually gray to nearly black in their natural condition, become perfectly white on burning and fracture somewhat, so that grinding is facilitated.

Methods of Grinding.

In the grinding of the massive forms of quartz two general processes are used, which may be called the "wet process" and the "dry process."

In the wet process the quartz may be crushed just as it comes from the quarry, or it may first be highly heated in kilns and then fractured by turning upon it a stream of cold water. The first crushing is effected by jaw crushers or if the quartz has previously been burned it may be crushed in chaser mills. In a few mills the chasers revolve in wet pans and are periodically stopped to allow the crushed quartz to be shoveled out. After crushing, it is ground in "wet pans" provided with a pavement of flat-faced quartz or quartzite blocks over which move several large blocks of similar material, the crushed quartz being pulverized between these blocks and the pavement. The grinding in wet pans usually occupies about twenty-four hours, the load ground in a single pan varying from 1,200 to 1,800 pounds. From the wet pans the paste-like mass of quartz and water is drawn into settling troughs, the first settlings being in some cases returned to the pans for finer grinding. From the settling troughs it is shoveled out upon drying floors heated by steam or hot air or else is dried in small pans which are placed tier on tier on heated racks constructed of steam pipes. Finally the dried material is bolted to various degrees of fineness and packed in bags for shipment, or it may be shipped in bulk.

In the dry method of treatment the quartz is usually crushed first in a jaw crusher and then between steel rollers, though in some cases it goes from the jaw crushers to a gyrating crusher before passing to the rolls. Quartz to be used for filters and for abrasive purposes is then screened to various degrees of fineness, usually through revolving screens, and is packed in bags for shipment. In the manufacture of the finer grades for use in pottery, wood fillers, scouring soaps, etc., the material after leaving the roll crushers is ground in tube mills, either of the continuous or of the intermittent type. It is then graded to various sizes either by bolting or by a pneumatic process whereby the quartz powder is carried by a strong air current through a series of tubes and receptacles, the distance to which the quartz is carried being dependent on its fineness.

Uses.

Quartz of the kinds dealt with in this report is used for a great variety of purposes, the principal uses being in the manufacture of wood filler, pottery, paints, and scouring soaps. In pottery the quartz serves to diminish shrinkage in the body of the ware and is used also in many glazes. Quartz for these purposes should be nearly free from iron-bearing minerals. In general the analysis should show less than one-half of 1 per cent. of iron oxide. Finely ground quartz is used in paints in various proportions up to one-third of the total pigment used. Its chemical inertness prevents it from combining with other constituents of the paint and increases the resistance of the paint to the weather. Crystalline quartz is superior to silica sand for this purpose because the ground particles are highly angular and tend to attach themselves more firmly to the painted surfaces, thus giving the paint what is known as a "tooth" and after some wear affording a good surface for repainting. This angularity of the grains also renders the ground crystalline quartz superior to silica sand in the manufacture of wood fillers. In scouring soaps and polishers ground crystalline quartz is preferred to silica sand, not only because of its greater angularity, but because of its superior whiteness.

Massive quartz, crushed and graded to various degrees of fineness, is extensively used in the manufacture of sandpaper, sand belts, as a scouring agent with sand-blast apparatus, etc. The qualities which render it particularly serviceable for these purposes are its hardness (No. 7 in the Mohs scale), which is slightly greater than that of steel, and its conchoidal fracture, the absence of definite cleavage planes causing it to crush to fragments with sharp, angular edges and corners. For such abrasive purposes massive quartz is far superior to sand or crushed sandstone, since the grains of the latter are likely to be more or less rounded. Blocks of massive quartz and quartzite are used in the chemical industry as a filler for acid towers and to some extent as a flux in copper smelting. Much ground quartz is used in filters, and some of the most finely pulverized grades are used in tooth powders and in place of pumice as a cleaner by dentists.

Within recent years crystalline quartz and also sand has been used to some extent in the manufacture of silicon and ferrosilicon by electrolytic processes, much of the output being produced at Niagara Falls. The metal silicon, which is a crystalline metallic substance of bright silver luster, has a specific gravity of about 2.49 and a melting point of about 1,430° C. Various grades are produced, running from 90 to 98 per cent. silicon, the purity depending for the most part on the purity of the crude materials used. It can readily be cast into rods, and because of its high electrical resistance, which is about five times that of carbon, it is used in the manufacture of rheostats and electrical heaters. Silicon and ferrosilicon are extensively used as a hardener in steel manufacture and in the manufacture of alloys for copper and bronzes. Another important use of metallic silicon promises to be in the manufacture of chemical ware, its resistance to nearly all acids, combined with the fact that it can be cast in molds, making it suitable for these purposes. Chemical ware made of fused quartz has been on the market for some time, most of it being of European make. These wares are usually white and semi-transparent. They soften only about 1.400° C. (2,552° F.) and show great resistance to sudden changes of temperature, the coefficient of expansion being extremely small. The principal drawback to the use of these wares, especially in quantitative chemical work, is that the somewhat rough character of their surfaces makes it difficult to wash thoroughly all material from the dishes.

Mode of Occurrence of Feldspar.

The feldspars are among the most widely distributed minerals and occur as constituents of nearly all rocks. In these occurrences, however, the feldspar is usually in too small grains and too intimately associated with other minerals to be of commercial importance. Com-

mercial feldspar usually occurs as a constituent of pegmatites. These are rocks of extreme coarseness and irregularity of texture. In mineral composition they may vary greatly, but those of present commercial importance belong chiefly to two types—(1) the granite pegmatites, which are essentially giant granites, their minerals being the same as those most abundant in ordinary granites, namely, quartz, potash-feldspar, muscovite, biotite, tourmaline, etc.; and (2) the soda pegmatites, which contain no quartz, no tourmaline, and little or no mica, but consist mainly of the soda feldspar, albite, with small quantities of hornblende. By far the larger number of the feldspar quarries of the United States are in deposits of granite pegmatite; only a few in southeastern Pennsylvania and adjacent parts of Maryland belong to the soda pegmatite type.

Pegmatites occur in or near most areas of crystalline rocks, usually as dikelike masses, following whatever planes of foliation or easy fracture may be present in the surrounding rocks, though in some cases cutting across these and often forming irregular bodies of considerable size. Different pegmatite masses even in the same region often differ considerably in coarseness, and even a single mass may vary greatly in coarseness from point to point. In general only a small part of the pegmatitic material of a region is sufficiently coarse grained or sufficiently free from iron-bearing minerals to be of commercial value. The geologic evidence generally supports the view that the pegmatite is really but one type of igneous intrusion, the molten rock magma being characterized by the presence of large quantities of gases or water vapor, which facilitated the formation of large crystals. The relative proportions and the quality of the different pegmatite constituents vary in different deposits, some being valuable chiefly for their mica, others for their quartz, and others for their feldspar. In some, two or all three of these minerals can be exploited. In a few cases the pegmatite is exploited principally for its gem minerals and its compounds of the rare metals.

The feldspar may occur as large crystals, occasionally 15 to 20 feet across, unmixed with other constituents, or they may be intergrown with quartz or with other minerals. The intergrowth with quartz is in some cases irregular, but in other cases it consists of crystals of quartz and feldspar, from several inches to several feet across, which penetrate one another in such a manner that on certain cleavage faces of the feldspar the quartz forms peculiar patterns somewhat resembling the cuneiform inscriptions on ancient monuments. To such intergrowths the name "graphic" granite has been given, from the Greek verb *graphein*, to write. Analyses of many specimens of graphic granite have shown that it is characterized by a very nearly constant proportion between the quartz and the feldspar, the feldspar forming from 70 to 80 per cent. of the rock and the quartz from 20 to 30 per cent. Two specimens of a graphic intergrowth of potash feldspar and quartz analyzed in the laboratory of the United States Geological Survey showed, respectively, 72.9 and 73.7 per cent. of feldspar, with 27.1 and 26.3 per cent. of quartz, although one specimen was approximately four times as coarse as the other. A graphic intergrowth of potash feldspar and quartz from Elfkarleo, in Sweden, which was so fine grained that the graphic structure could be seen only under the microscope, showed upon analysis about 79.2 per cent. of feldspar and 20.8 per cent. of quartz.

The finer-grained types of graphic granite are utilized commercially in some districts, as, for example, in southeastern Pennsylvania; but among many feldspar miners the opinion prevails that the finer-grained varieties contain so much quartz as to render them commercially valueless. This opinion probably has its origin in their somewhat deceptive appearance, the fineness of grain causing them to appear richer in quartz than is actually the case. From the evidence furnished by analyses it would seem clear that from the commercial standpoint at least the proportion between quartz and feldspar in graphic granites of all textures may be regarded as nearly constant, so that the finer-grained types are as valuable commercially as the coarse. Graphic textures are not observed in any of the soda pegmatites.

Methods of Mining.

The methods of feldspar mining are very simple. The excavations are nearly always open pits, usually of rather irregular form, the valueless portions of the pegmatite being avoided wherever possible in the mining work. In a few Pennsylvania quarries where the pegmatite masses are rather flat-lying and are overlain by a roof of worthless rock short tunnels have been driven from the open pits.

In Maine, Connecticut, and New York the pegmatite is usually firm and undecomposed, even in the surface outcrops, and it is necessary to sink drill holes and to blast out most of the material. In Pennsylvania and Maryland, however, the pegmatite is in most cases much decayed at the surface and the materials can frequently be excavated with the aid only of picks, shovels, and crowbars. In a few of these quarries kaolin produced by the decay of the feldspar has been found in the past in sufficient quantities to be of commercial importance, though none is now produced. This difference in the character of the pegmatite deposits in the two regions is due to the fact that the Pennsylvania-Maryland region is unglaciated, while in the more northerly region glacial ice planed off most of the products of rock decay.

In the smaller quarries where the rock is firm the drilling is usually done by hand, but in most of the larger quarries steam drills are used. The large masses are then broken with sledges into pieces about 6 inches in diameter, the more micaceous and quartzose parts and the portions carrying iron-bearing minerals being at the same time sorted out and discarded. In most of the Pennsylvania and Maryland quarries where the weathered materials near the surface can be excavated with the aid only of the pick and shovel, screening and sometimes washing is often necessary to separate the dirt from the spar. In some of the larger and deeper quarries derricks and drags are used in hoisting the spar to the surface, the material being then loaded into wagons and hauled either to the railroad for shipment or to the mills for grinding. In some quarries the wagons descend into the pit along an inclined roadway.

Commercial Availability of Deposits.

The question whether it will pay to work a given feldspar deposit depends upon a number of different factors, chief among which are (1) distance from the principal markets, (2) distance from the railroad, (3) quality and quantity of the material, (4) market conditions, and (5) ease of working. Favorable conditions with respect to some of these factors may counterbalance unfavorable conditions with respect to others. The deposits of Connecticut, New York, Pennsylvania, and Maryland are worked at a considerable advantage when compared with those of Maine, being much nearer the principal markets. Because of this advantage, hauls by team of 6 or 8 miles

from the mines to the railroad are permissible in certain of the more southerly districts, while under present conditions in Maine a deposit to be worked profitably must usually be within 3 miles of a railroad or of navigable water.

The requirements of the potter's trade demand that in general the percentage of free quartz associated with the feldspar shall not exceed 20 per cent. in the ground product, and certain potters demand a spar which is nearly pure, containing probably less than 5 per cent. of free quartz. In order to be profitably worked, in most feldspar mines between one-fourth and one-half of the total material which must be excavated should contain less than 20 per cent. of free quartz.

A factor of the utmost importance is the quantity of iron-bearing minerals, black mica, hornblende, garnet, or black tourmaline, which is present and the manner in which these minerals are associated with the feldspar. The requirements of the pottery trade demand that the spar be nearly free from these minerals, which if present produce brown discolorations in white wares. In order that a deposit may be worked profitably these minerals if present in any appreciable quantity must be so segregated in certain portions of the deposit that they can be separated from the spar without much more hand sorting and cobbing than is necessary in the separation of the highly feldspathic material from that which is highly quartzose or rich in muscovite. A number of pegmatite deposits of coarse grain are rendered worthless for pottery purposes by the abundance of one or more of these iron-bearing minerals. The presence here and there of minute flakes of white mica (muscovite) is characteristic even of the highest grades of commercial feldspar, and chemically this mineral is not injurious. It is, however, exceeedingly difficult to pulverize the thin, fiexible mica plates to a fineness equal to that attained by the feldspar, and it is therefore necessary in mining to separate carefully as much of the muscovite as possible from the spar.

Methods of Grinding.

The methods used for grinding feldspar are similar in a general way in all of the Eastern States and are very simple. The soda spar quarried in southeastern Pennsylvania is first burned in kilns, which serves to fracture it and thus facilitate grinding. Most feldspar, however, is fed just as it comes from the quarry into a chaser mill consisting of two buhrstone wheels about 3 to 5 feet in diameter and from 1 to 1½ feet thick, attached to each other by a horizontal axle, as are the wheels of a cart. The horizontal axle is attached at its center to a rotating vertical shaft, which causes the buhrstone wheels to travel over a buhrstone bed, the feldspar being crushed between the wheels and the bed. In a few mills the spar before going to the chaser mills is crushed in a jaw crusher.

The material as it comes from the chasers is screened, the tailings being returned to the chaser mills for recrushing, while the fines go to tube mills for their final grinding. The tube mills consist of steel cylinders revolving on a horizontal axis. They are usually lined either with hard-wood blocks or with blocks made of natural or artificial siliceous brick, and are charged with Norway or French flint pebbles 2 to 3 inches across. Feldspar for pottery purposes is usually ground for from four to six hours, and in that time is reduced to a fineness of at least 200 mesh. Some of the poorer grades of feldspar used in glass manufacture are ground only for from two to three hours, great fineness not being required in such material. Feldspar for use in abrasive soaps is sometimes ground for as much as ten hours.

The type of tube mill used by most feldspar grinders is about 6 feet in length, and it grinds from 2 to 3 tons of spar at one charging. Certain millers' however, claim to effect a considerable saving in power by the use of larger mills, which grind from 4 to 6 tons at one charge. After grinding, the spar is ready for shipment either in bulk or in bags. The red spars from Bedford, N.Y., and Bedford, Ontario, have a faint pinkish tint when ground, but the cream-colored and white spars grind to a pure white. In a few mills the ground spar is allowed to settle slowly in water, so as to separate the finer from the coarser material, but this method is now rarely employed. Two hundred mesh to the inch is the figure usually given as the fineness required by pottery manufacturers, and it is probable that most of the material placed on the market comes within this limit.

In a new mill of large capacity recently erected near Middletown, Conn., the feldspar is crushed first in a gyratory crusher and then between steel rolls. It then goes to a rotary dryer and to aerial jig screens designed to free the material from mica flakes and iron-bearing minerals. After this it is ground in continuous-feed tube mills.

Uses.

The principal consumers of feldspar are the pottery and enameled brick and electrical ware manufacturers, its main application being as a constituent part of both body and glaze in true porcelain, white ware, and vitrified sanitary ware, and as a constituent of the slip (underglaze) and glaze in so-called "porcelain" sanitary wares and enameled brick. The proportion of feldspar in the body of vitrified wares usually falls between 10 and 35 per cent., though sometimes less and sometimes more. Its melting point being lower than that of the other constituents, it serves as a flux to bind the particles together. In glazes the percentage of feldspar usually lies between 30 and 50. The trade demands that feldspar for pottery purposes be nearly free from iron-bearing minerals (biotite, garnet, horneblende, tourmaline, etc.) and contain little if any muscovite. In regard to the percentage of free quartz, the requirements vary with different potters. A few manufacturers of the finer grades of pottery demand less than 5 per cent. of free quartz, and may even grind the spar themselves so as to be sure of its quality, preferring to insure a constant product even at higher cost by themselves mixing the requisite quantity of quartz with the spar. Most potters get satisfactory results with "Standard" ground spar carrying 15 to 20 per cent. of free quartz, and in some cases the percentage runs even higher. In the finely ground mixture as it comes from the mills it is difficult to separate the quartz from the feldspar by physical methods on account of the extreme fineness of the material. Chemical analysis seems to be the readiest means of determining whether its percentage is high or low.

Feldspar is also used in emery and carborundum wheel manufacture as a flux to bind the abrading particles together.

Small quantities of feldspar are used in the manufacture of opalescent glass. The feldspar used for this purpose is ranked as No. 3 by the miners; it usually contains more free quartz and muscovite than that used for pottery purposes, and in most cases also contains fragments of iron-bearing minerals. Most of the spars known to the writer which are used for opalescent glass are notably richer in soda than in potash. They are usually ground only to a fineness of 50 to 60 mesh.

Small quantities of carefully selected pure feldspar are used in the manufacture of artificial teeth. Some is used in the manufacture of scouring soaps and window washes, the fact that feldspar is slightly softer than glass rendering these soaps less liable to scratch windows or glassware than are the soaps in which quartz is the abrasive substance. One firm in New York State crushes pegmatite for poultry grit and for a covering for concrete and tarred surfaces to give the appearance of granite.

Much interest has recently been aroused in the use of potash feldspar for fertilizing purposes. Potash is an important plant food, which, in fertilizers, has usually been applied in the form of wood ashes or of easily soluble potash salts (sulphate, carbonate, or chloride) imported from Germany. The Department of Agriculture has recently conducted preliminary experiments to determine the availability of finely ground potash feldspar as a substitute for the more soluble potash salts. The following statement is quoted from the report on these tests:

> The evidence so far obtained appears to indicate that under certain conditions and with certain crops feldspar can be made useful if it is ground sufficiently fine. On the other hand, it is highly probable that under other conditions the addition of ground feldspar to the land would be a useless waste of money. At the present stage of the investigation it would be extremely unwise for anyone to attempt to use ground rock, except on an experimental scale that would not entail great financial loss.

If further experimentation shows that ground feldspar has a wide efficiency as a fertilizer, it will undoubtedly lead to the utilization of many of the pegmatite deposits which, because of insufficient coarseness, too large a percentage of quartz, or too great an abundance of iron-bearing minerals, are not valuable as a source of pottery material. Deposits of this kind, favorably situated with respect to the railroads, are numerous, especially in the vicinity of the active feldspar quarries. An equally important result will be the utilization of much of the material which is discarded at the present feldspar quarries.

A number of processes have been patented in this country for the dissociation of potash feldspar to obtain the more readily soluble potash salts, but none of these have as yet been successfully applied on a commercial scale. What is perhaps the most promising method effects the decomposition through electrolytic methods.

EXCHANGES.

The Mining and Scientific Press—August 29, 1908.

The editor of the *Mining and Scientific Press*, Mr. T. A. Rickard, has completed a tour of inspection through the Yukon dredging region. To the current issue of the Press he contributes the first of a series of articles, in which it is his evident intention to clear away misapprehensions. Mr. Rickard's statements do not support those made in the columns of the *Engineering and Mining Journal* of New York. To some of the latter the CANADIAN MINING JOURNAL had occasion to take exception.

The Mexican Mining Journal—September, 1908.

The *Mexican Mining Journal* asserts that the outlook is favorable for satisfactory mining legislation. "It cannot be denied," remarks our bright contemporary, "that great harm has been done the country by the mere proposing of a restrictive policy on foreign very much the benefit of the new capital, both for private enterprises and to sustain the public revenues. In fact, this very need, which is becoming more evident daily, in public and private affairs, is a strong assurance that the restrictive features of the proposed law will not be enacted."

The Engineering and Mining Journal—Sept. 5, 1908.

Percy E. Barbour has an article in this number on the Goldfield Consolidated 600-ton mill. This large mill will commence treating ore during the latter part of this year. It embodies the last word in modern mill design and equipment. The ore will be crushed by stamps and tube mills, concentrated on Deister tables, and the pulp will be acynided in Pachuea agitation tanks. We can here notice but a few of the features of the plant. A Vezin N. 3 sampler, handling 2-inch material and taking a 5 per cent. or 10 per cent. cut. The mill building is entirely of steel construction. The roof and side material is asbestos-protected corrugated metal. The foundations of the mill building alone contain 7,000 cubic yards of concrete. The mortar block is entirely of concrete.

The Mining World—September 5, 1908.

Mr. Alex. Gray, late of the South African Journal, now of Montreal, writes in this number of the property and plant of the Right of Way Mine, Cobalt. The physical condition of the mine is outlined, and Superintendent Houston's methods are critically and favorably commented upon. Referring to the original agreement under which the property was acquired by its present owners, Mr. Gray remarks that, hopeless as the bargain seemed at first, "one carload extracted from a surface cutting on the Right of Way, about 500 feet from the La Rose shaft, . . . reimbursed the Ottawa promoters of the project and gave impetus to an enterprise . . . that has paid to June, 1908, 20.99 per cent in dividends.

The South African Mining Journal—August 8, 1908.

This number of our contemporary contains an editorial on "The Problem of Drill Steel." Having discussed the matter with a visiting American mining engineer, the *S. A. Mining Journal* supports his contention, that inferior drill steels are in use on the Rand. It is stated that this conclusion could have been reached independently by watching the results of the stope-drill contest. "Many thousand pounds a year" could be saved "by the use of better steel, and the improved tempering of steel." Five out of the nine machines that competed experienced trouble with their drill steels. If, under special conditions, this was the case, how much more loss and trouble must there be in working the year round?

PERSONAL AND GENERAL.

Dr. Milton L. Hersey, Montreal, has given $10,000 to endow a fellowship in the Chemistry Department of the Kingston School of Mining.

Mr. T. A. Rickard, of the Mining and Scientific Press, San Francisco, recently made a trip to the Yukon and Alaska in the interests of his journal.

President J. H. Plummer, of the Dominion Iron and Steel Company, has purchased a $50,000 mansion in Rosedale, Toronto, to which he will shortly remove.

We regret to announce the death of Mr. George G. Blackwell, the senior and founder of the firm of George G. Blackwell, Sons & Co., Limited, Liverpool, England. Mr. Blackwell's death took place at Waterloo on August 26th.

Mr. A. A. Hassan, mining engineer, has returned from a professional tour of Mexico and California. After visiting the Right of Way and Victoria mines in Cobalt, Mr. Hassan will proceed to Larder Lake, where he will examine several properties. Mr. Hassan's headquarters for the present will be the Victoria mine, Cobalt.

CORRESPONDENCE.

Editor's Note.—The following letter we are glad to reproduce. To gather the opinions of men in the field is exactly our object. So far we have received many letters, not for publication, some of which have been merely personal complaints or expressions of individual animosities. Such communications do not lend themselves to use in the CANADIAN MINING JOURNAL. Whilst it is our clear duty to help in every way to remove difficulties, only harm results from undue bitterness. But the letter printed hereunder contains a practical suggestion, and comes from a man actually in the "bush":

NEW LISKEARD, Sept. 7, 1908.

The Editor of the Canadian Mining Journal.

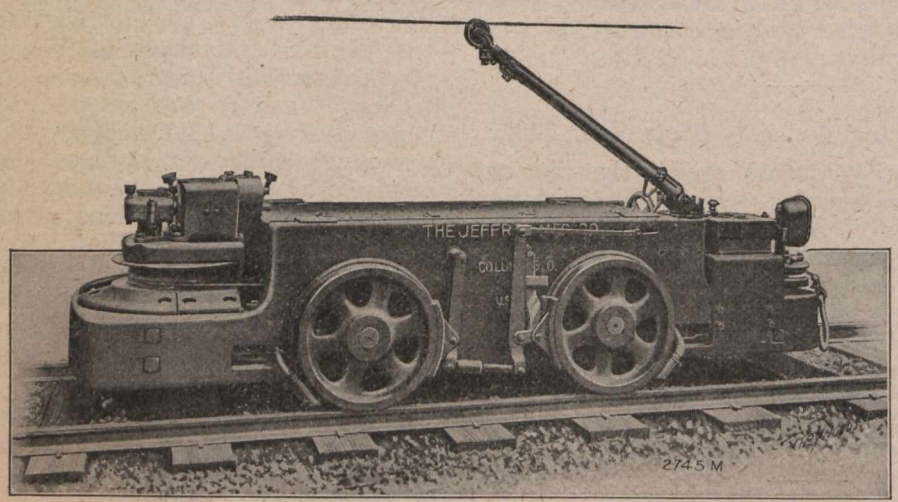
SIR,—I have been reading up my arrears of the MINING JOURNAL, and I find several things that as a prospector interest me. You ask the man from wayback his opinion as to "Discovery before Location." The Mines Act say (if there is no order-in-council lately changing it) that a license-holder can stake out and record three mineral claims in any mining division in Ontario, and he can also stake and record on as many licenses as other people will supply him with, and the result is that the District of Nipissing is staked out with thousands of claims that have never been prospected, and the syndicate of lawyers, doctors and storekeepers who furnished the licenses, recording fees and grub stakes are lighter in pocket and sore on the mining business, or else they form a wildcat stock company and soak their neighbors. If we are to have "Discovery before Location" there must be more prospecting and less staking.

I would suggest that a license-holder be not allowed to stake on the license of anyone but himself three claims and no more, and I think you will agree with me that if a prespector gets one claim in a season that is worth developing he is doing well.

Yours truly,

License-holder 1575. THOS. S. TAYLOR.

INDUSTRIAL PAGE.



THE JEFFREY CRAB LOCOMOTIVE.

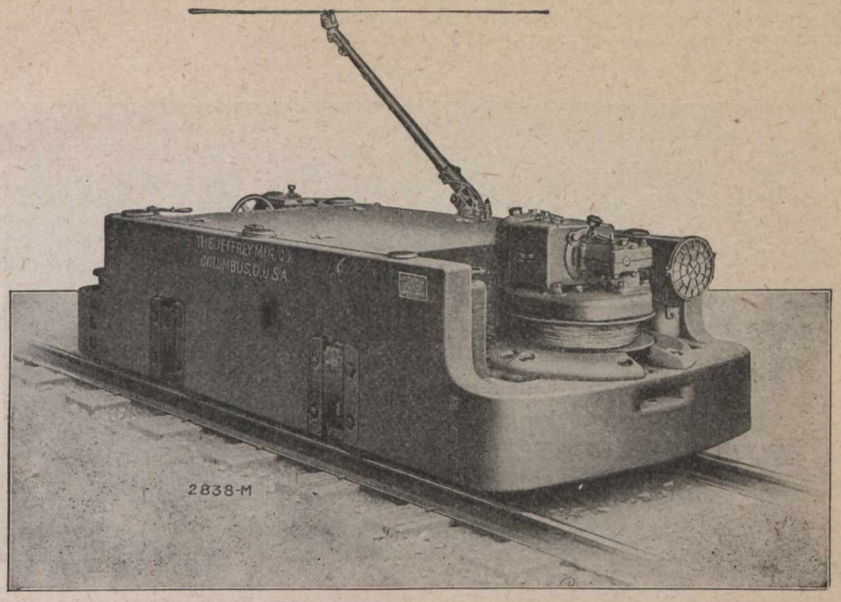
The Jeffrey Manufacturing Company, of Columbus, Ohio, has recently added to its line of electric mine locomotives, a new type of gatherer, known as the Jeffrey Crab Locomotive. The gathering locomotive commonly used is provided with a reel of flexible insulated conductor, which enables it to enter the rooms for the purpose of delivering empty mine cars to the working places, and for hauling out the loaded cars. When the rooms are driven to the dip on steep grades, however, it is difficult for a locomotive which has to enter the room, to work efficiently against the grade. Again, where the tracks are practically level and the cars are not heavy, it is found economical to push the empty into the room by hand, so that mechanical means are required only for hauling out the loaded cars.

The advantages of employing, in such cases, a locomotive capable of pulling out the loaded cars without entering the rooms has prompted the Jeffrey Mfg. Co.

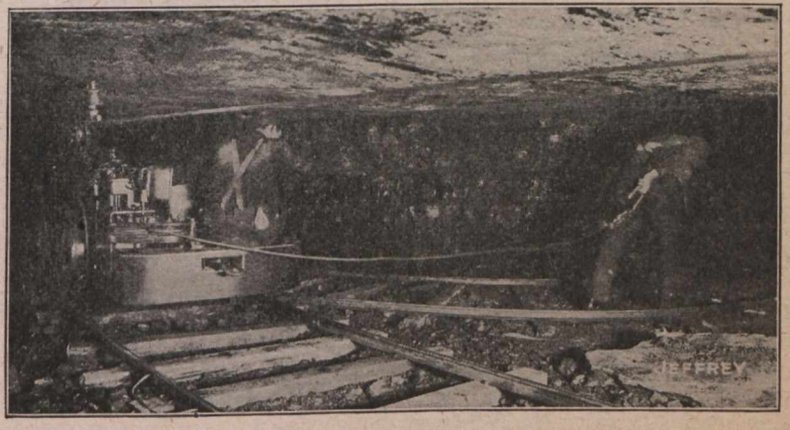
to bring out this crab locomotive, so named from a small winding drum, or crab, which is mounted on the forward end of the locomotive; 350 feet of ⅜-inch flexible wire cable wound on this crab is used for pulling the loaded cars from the rooms and out onto the entry tracks.

There are several methods of operating this locomotive to advantage, the choice depending upon the system of mining followed where the locomotive is used. With the double entry system, the locomotive usually hauls a trip of empty cars into one entry and drops them off at the rooms where they are required. Returning on the other entry, it stops in front of each room where a loaded car is ready. The trip rider then drags the cable into the room, attaches it to the car and signals the motorman, who starts the crab motor and pulls the car out to the entry track. The locomotive then either pulls it to the next room or leaves it standing until as many cars have been drawn from the rooms as are required to make up a trip. Then it pushes them together, they are coupled up, and hauled to the partings. On the return trip the entry cars are distributed in the entry from which the loads have just been removed, and the locomotive gathers the loaded cars from the entry which was supplied with empties on the preceding trip.

Where the single entry system is employed, the locomotive usually runs in with a train of empties. Stopping successively in front of the rooms in which loaded cars are ready, it hauls each car to the entry track and pushes it ahead to the next room, dropping off an empty to replace each loaded car taken out. When all empties have been distributed, it then proceeds to the parting with the loads gathered. By each of these methods a locomotive can gather from 75 to 200 cars per day, depending upon local conditions.



The crab device is made as compact as possible, to avoid crowding the rest of the locomotive equipment. It consists of a cast-iron drum, upon which a steel cable is wound. This is mounted on a vertical axis, and is contained in a frame, the top of which supports the motor, which is connected by suitable gearing and a friction clutch to the drum. The motor drives this gearing through a worm and worm-wheel, so that when it stops, the gearing is locked against further motion. The drum is driven by the gearing through a friction clutch, which acts not only as a smooth starting device for the cars, but also as a safety device in case a car becomes derailed or the motorman fails to throw off power until the car bumpers strike those of the locomotive. Without this friction arrangement the cable would, in such cases, break, or serious injury would result to the gearing or to the motor itself.

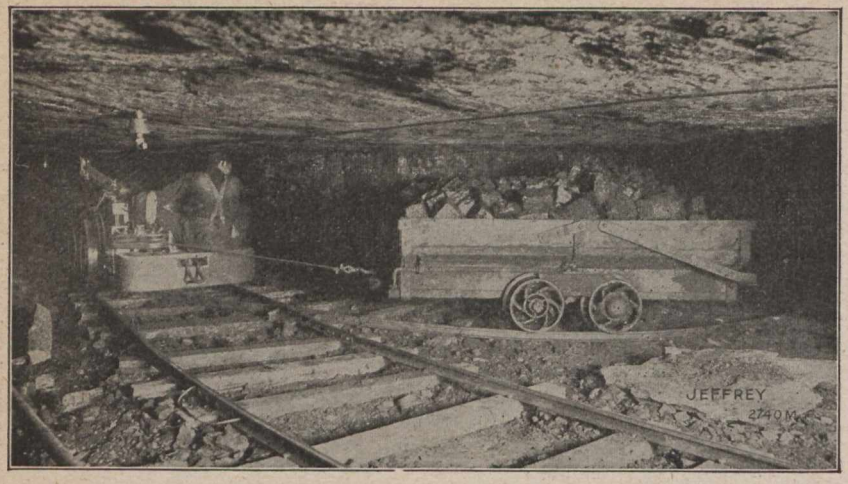


The motor that actuates the crab, being entirely

separate from the locomotive motors, is controlled by a separate starting box, and when the car approaches the entry tracks the motorman starts the locomotive ahead. As it advances past the switch points the car follows and runs out upon the entry tracks without either the locomotive or the winding of the crab being stopped.

The crab may be stopped when the car stirkes the locomotive, but the locomotive need not stop until the room is reached from which the next load is to be hauled. Then the trip rider uncouples the cable and drags it into that room for the car. The arrangement is such that the cable may be paid out from either end of the locomotive. Ordinarily, however, it is more convenient to take the cable out past the motorman, as that end of the locomotive is then opposite the room mouth, and the motorman can watch the light carried by the trip rider, and can see him signal to start winding. He can also watch the car to better advantage, as it takes the switch, and can stop instantly if it should become derailed.

One great advantage claimed for the crab locomotive is that, except where there are rooms driven to the rise at so great a pitch that the cars cannot be pushed into them by hand, it may replace animal haulage at once without making any changes in the tracks or conditions in the rooms.



When the rooms are driven to the rise and it is necessary for the locomotives to enter them in order to push the empty cars to the working places, a gathering locomotive, many types of which are made by the same company, is necessary, as ordinarily it is impracticable to use the crab device for hauling cars into rooms.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

Glace Bay—September 3.

The visit of the representatives of the Institution of Mining Engineers (England) who were invited over to Canada by the Canadian Mining Institute is, so far as Cape Breton is concerned, a thing of the past. The visitors were cosmopolitan, including three German gentlemen and one Belgian engineer. Scotsmen predominated largely in the British representatives, and these gentlemen were naturally quite at home in Cape Breton, which had more aptly been named "New Hebrides" than the islands to which this name has been actually given. Accompanied by a host of gentlemen more or less intimately connected with the coal trade, and by the Governor and Premier of Nova Scotia, the visitors on the 26th inspected, or rather attempted to inspect, the mines of the Dominion Coal Company. They made a hurculean attempt, visiting No. 2 Reserve, the Hub, and No. 6 Colliery, relieved by a mid-day luncheon provided by the Coal Company. It is to be feared the visitors obtained a very hazy idea of the geography of the Glace Bay neighbourhood, as they rushed all day from point to point by special trains. Some of the visitors showed great interest in the submarine workings of No. 2, particularly Herr Bergrat Goebel, a genial gentlemen from Westphalia, who found even our eight foot Phalen seam to be a tight fit for his height and girth.

On the following day the party visited the works of the Steel Co. in Sydney, which is a tidy day's work when done thoroughly. In the evening, nothing daunted by the lavish hospitality of the Steel Co. during the day, the visitors partook of a banquet given in their honour as the guests of the Canadian Mining Institute, by the Mining Society of Nova Scotia. Governor Fraser elcomed the guests of the evening, and proposed the toast of Canada, which he humourously said no man but himself was large enough to do justice to. Those who know the Nova Scotian Fraser will appreciate this remark, for in every sense of the word Governor Fraser is a big man. Speechifying went on until some time in the wee sma' hours ayont the twal, including two speeches in their own language by our visitors from the Fatherland. One gentleman from London, Eng., hoped that next time he visited Canada the "town" of Sydney would have grown into a "large city." However by two-thirty international misunderstanding was reduced to a minimum, and the general flavour of "Scotch" which had pervaded the songs and the evening generally culminated in the singing of Auld Lang Syne in the orthodox manner.

On the Thursday the Nova Scotia Steel and Coal Co. took charge of the visitors and showed them all the wonders of Sydney Mines and its environs. The guests were each presented with a small and tasteful brochure containing a concise and well written account of coal mining at Sydney Mines from

the beginning on. Rumour has it that this brochure was not even written in manuscript a week previous to the visit of the British party. If so it is but another sample of the way they hustle on the other side of the water when occasion calls. Sydney Mines from its old associations with old country men and methods through the General Mining Association possesses more than ordinary interest to such a party as have recently honoured us with their presence, and the distribution of the little pamphlet referred to was no doubt appreciated as it surely deserved to be. Next day, declining the pressing invitation of the President of the Nova Scotia Steel Co. to visit Wabana, the visitors left for the West, and for rest we hope.

The visit of such an assemblage of mining men from across the water will be likely to prove of far greater value to industrial Canada than cart-loads of prospectuses and flotations on the London market. "When," to use the words of Governor Fraser, "these gentlemen have seen the sun arise out of his cold bath in the waters of the North Atlantic, and have followed his course past the Great Lakes, across the prairies, through the foothills, and over the Rockies, until they have seen him set in the warmer waters of the Pacific," they will understand somewhat of Canada's prospects, and of its mineral wealth, and they will go home to tell the news with the sure confidence of men who have seen what they are talking about. That is if they survive the trip across! It is no light task that these gentlemen have undertaken, and it is to be hoped that they will not be rushed around in quite such a breathless fashion for the rest of their journey as was the case in Cape Breton.

The "Times" has recently published a series of articles on "Industrial Canada" by Dr. A. Shadwell, and in the issue of August 15th Nova Scotia was dealt with. It is rather interesting at times to see ourselves "as others see us," and Dr. Shadwell's article is on the whole a fair and appreciative one. All the same it must be disconcerting to Haligonians to know that their city wears "a shabby, decayed, dead-alive air," and that Halifax "has not stirred for fifty years." In the portion that refers to Sydney, it is stated that this city is in the centre of the chief coal mines in the Dominion, "which is singularly poor in this most important source of wealth." Dr. Shadwell says that "there is, for all practical purposes, no coal between the Atlantic seaboard and the Rocky Mountains." We think this is not exactly true, but it is sufficiently true to accentuate the importance of our Cape Breton coal fields to the Dominion at large. Referring to the dispute between the Coal and Steel Companies, Dr. Shadwell makes some pertinent comments on American mehtods of finance, and refers to "a gentleman from Boston, of the name of Whitney, who seems to be a born promoter of the true adventurous type," the lagacy of whose financial enterprise Dr. Shadwell thinks affords "an instructive object lesson in the difference between American and British methods of promoting industries." If by "British" is meant Canadian methods we are inclined to agre with the writer in the "Times," and that this is the writer's intention is evidenced by his contrasting the works of the Nova Scotia Steel Co. and their development with the works and rise of the Dominion Iron & Steel Co., which latter Company our writer evidently thinks was originally handicapped by the mistakes of its American promoters, to whose door he lays three errors—first, too lavish capital expenditure, second, the launching of so huge a concern in pure anticipation of business to come, and third, incompetent management. Dr. Shadwell writes "In Canada they have a way, which does more credit to their courage than to their prudence, of taking hold of enterprises without any proper training or experience. They stick to it, learn from their own mistakes, and pull through; but it is very costly." Well, we have the consolation that Dame Experience charges high fees for her schooling, buf then the instruction is very thorough. After devoting about two columns to Sydney, our writer dismisses Glace Bay in about a dozen lines as " a mining settlement, situated in a singular region," and tells of a party of Yorkshiremen who came, "took one look, and the next train back." We remember those same Yorkshiremen. Their fares out had been paid by the Coal Company, and this was their idea of honesty. We may further remark that there are a good many Yorkshiremen around the same singular region, who not only remained themselves, but sent for their families, their brothers' families, their mothers and fathers, and the third and fourth generation. The particular sort of Yorkshireman Dr. Shadwell has heard of is one that we can spare at any and at all times.

However it may hurt the civic pride of Sydney Mines and Glace Bay to contemplate the fact, we think Dr. Shadwell is right in regarding Sydney as the natural metropolis of Cape Breton. Its central position and its magnificent harbour mark it out for this destiny. Dr. Shadwell rather unnecessarily says that Sydney is "a long way from everywhere, and on the road to nowhere, except Newfoundland." We have an idea that Sydney is on the road to a good many places, and that it will not long remain under the stigma of being unknown in the old country, where Dr. Shadwell says the name is "usually associated with Australia."

The conclusion of the "Times" article is more to the point. It is as follows: "Nova Scotia, with its valuable mines, its admirable harbours, and the marked industrial capacity of its people, canot fail to carry its already considerable manufacturing interests into a very important position in the economic development of Canada."

Sydney—August 26.

Early this morning, August 26, the European and American delegates, along with the representatives of the Canadian Mining Institute, arrived in Sydney. Last evening a large body of members and ojcials of the Mining Society of Nova Scotia, together with Lieut.-Governor Fraser, Premier Murray, and other Government officials, had gathered to welcome the visitors, who, throughout their journeyings in Nova Scotia, are to be the guests of the above mentioned Society.

At 9.30 this morning the whole gathering left on a special Sydney and Louisburg train for Glace Bay. Here they were taken in hand by the Dominion Coal Company, represented by President Ross, General Manager Duggan, Sales-Agent Alex. Dick, and others. A luncheon was given at the Technical School building. The excursionists returned to Sydney at 5 p.m.

A smoker was tendered the visitors at the Sydney Hotel at 8 o'clock this evening. Addresses of welcome were read by Lieut.-Governor Fraser, and by Mr. C. J. Coll, President of the Nova Scotia Mining Society.

To-morrow, August 27, the visitors will be the guests of the Dominion Iron and Steel Company, who will also be their host at a luncheon.

Sydney—August 27.

The banquet tendered this evening by the Mining Society of Nova Scotia in honour of the Canadian Mining Institute and their British and foreign guests was eminently successful. At 9.15 p.m. the banquet commenced. Covers were laid for 175 guests, and the menu was a practically good one

Mr. C. J. Coll, President of the Mining Society of Nova Scotia, occupied the chair. He was supported on his right by Lieut.-Governor D. C. Fraser and upon his left by Premier Murray.

Shortly after eleven o'clock the toast list commenced. "The King" was hailed with loud acclaim.

"The German Emperor" was proposed by A. C. Ross, M.P., and responded to by Dr. Kraynik and Herr Bergrat Goebel.

President Coll proposed the toast of "Canada" and Lieut.-Governor Fraser responded becomingly, expressing the sincere hope that this visit would result in the encouragement and further development of Canada's great mineral industries.

Proposing the toast of "Sister Societies," Premier Murray touched upon the mutual benefits to be received from such excursions of distinguished industrial authorities as the gentlemen who were now visiting Canada.

Mr. Hugh F. Marriott responded for the Institute of Mining and Metallurgy; Mr. Walter Johnson for the Iron and Steel Institute. Mr. James Barrowman, on behalf of the Institute of Mining Engineers, made grateful allusion to the "superabundant hospitality" extended to him and his companions. Responding on behalf of the South of Wales Institute, Mr. W. J. Rees predicted that in a hundred years Great Britain would be importing her coal supplies from Canada. He alluded in appreciative terms to the plant and product of the Dominion Iron and Steel Company.

Dr. Herman Wupperman, representing foreign sister societies, spoke in German. He congratulated Canadians upon possessing in such abundance those natural resources that are in such world-wide demand.

Dr. William Campbell spoke for the American Institute of Mining Engineers.

Dr. W. G. Miller, President of the Canadian Mining Institute, paid a warm tribute to the hospitality extended to the excursionists by Quebec and Nova Scotia. Other speakers were Dr. Frank Adams, Mr. R. E. Harris, Professor F. H. Sexton, and Mr. Alex. Dick.

Last night, August 26, the visitors were given a luncheon by the Dominion Iron and Steel Company. They leave to-morrow morning for Sydney Mines, where they will be the guests of the Nova Scotia Steel and Coal Company.

Sydney—August 28.

The visiting mining men spent the last day of their stay in Cape Breton in visiting the plant of the Nova Scotia Steel and Coal Company at Sydney Mines and in enjoying the hospitality of that Company and of President James Ross of the Dominion Coal Company. The party, numbering in all about 80 persons, left here for North Sydney at 9 a.m., where they took special cars for Sydney Mines. There they were taken in charge by President R. E. Harris, General Manager Thomas Cantley, and Superintendent John Johnston.

Returning at noon to North Sydney, they were entertained at luncheon by the N. S. Steel and Coal Company in the rooms of the Eastern Club.

Lieutenant-Governor Fraser, Mr. James Ross, Premier Murray and other prominent citizens were present.

Later the visitors were taken on Mr. Ross's yacht "Shiela" to Mr. J. K. L. Ross's residence, where a garden party was given in their honour.

They leave for Quebec to-morrow morning.

ONTARIO.

Cobalt—September 5.

The Miller Lake (20 miles west of Elk Lake City) discoveries are most encouraging. The Miller Lake Syndicate claims show a number of healthy veins. Smaltite and niccolite are the chief vein constituents. The chief need of the district, after further prospecting is the making of good roads. Prospecting will be carried on by several groups until snow interferes. After this attention will be directed to underground work. Small shipments of picked ore will be made as soon as the rivers and lakes are frozen. Silver is reported on one of the claims of the Moore-Logan syndicate. The three Gates claims are being actively opened.

A purse of three hundred and fifty dollars has been subscribed for prizes for the drilling contest on Labour Day, September 7. The first prize will be $200, the second $100, and the third $50. Diabase, not granite, will be the rock drilled this time.

Cobalt.

Hargreaves.—The litigation which has prevented the development of the Hargreaves lot which adjoins the Kerr Lake Mine on the south has been settled. The Government is to receive a royalty of 25% and costs of litigation. The title to the property is put in E. R. C. Clarkson's name. This property is very favorably situated and should prove valuable.

Silver Bar.—Work on this property, which adjoins the Savage on the south, has been suspended. The prospects seem to warrant the expenditure of a considerable sum of money in development work, as the physical condition of the property is excellent. The discovery of a very rich vein on the Savage and the locating of a strong vein of cobalt in shaft No. 2 on the Silver Bar indicate that further prospecting will develop a paying mine.

City of Cobalt.—Five cars of ore, a total of 127 tons, were shipped during the first week of September. One car of high grade ore went to Copper Cliff and three cars of low grade and one of medium grade to the American Smelting and Refining Co. at Denver, Col. The mine is in first class shape. At the 200 foot level work is being pushed on a 10 in. vein of high grade ore. Power has been obtained to date from the Cleveland Cobalt, but at the last meeting of the directors it was decided to purchase a 12 drill Sullivan Compressor. 13,157 shares of Treasury stock have been issued to shareholders at $1.00 per share.

Chambers-Ferland.—The first shipment made, consisting of 30 tons of high grade ore, went to Denver, Col., on September 2. Drifting has been started in both directions in shaft No. 1. A cross cut has been started at 80 feet in shaft No. 2. On September 5 a new vein was located in the northern part of the property from which a number of silver nuggets have been taken.

Trethewey.—Last month a dividend of five per cent. was declared. The statement made by the Directors of the financial position of the Company was as follows:

"Sept. 1, cash in bank, $123,543.96; due from smelters, $41,794.94; ore sacked and in transit, $23,112.79; a total of $188,451.69. The dividend takes $47,272.50, leaving a balance of $141,179.19.

The financial statement, August 31, 1907, showed cash in bank of $56,903.86, and ore on hand and in transit of $23,353.40. The net earnings of the Company have been at the rate of over 23% on the total issued capital of the Company. The physical condition of the mine has been greatly improved by recent development work."

The Company's financial year will be made to correspond with the calendar year. The annual meeting will be held in January.

The improvement in general conditions and the very encouraging development in the Cobalt District have resulted in the resumption of work on many properties in the outlying districts and a material increase in the working forces on many "prospect properties."

A force of men has been at work for some weeks trenching on the Cullen Cobalt property in Lot 1, Con. 12, Lorrain.

Several good calcite veins have been located on the Ritchie claim in Lot 2, Con. 12. A shaft has been sunk 20 feet on a calcite and quartz vein with niccolite and smaltite.

At the Big Fissure Mine, in Lot 3, Con. 11, Lorrain, work is being pushed on shafts No. 1 and No. 2. 35 men are employed.

A small compressor, boiler and hoist have been ordered by the St. Lawrence Cobalt Company and will be installed on the property on the south shore of Sasaginaga Lake.

Montreal River.—The past month has seen a very noteworthy improvement in the new camps in this District. The most important of which is the development of a rich vein of shipping ore on the Motherlode Mine, in James Township. This property was purchased this spring from Herbert Gates by a syndicate represented by W. R. Mowery. Mr. Gates had located a vein of decomposed calcite from which he took several hundred pounds of nuggets of very pure silver. A test pit sunk on the vein showed six to eight inches of vein matter but very small values. When the property passed to Mr. Mowery, it was decided to develop it by driving a tunnel in from the side of a hill with the expectation of cutting this vein at a depth of 80 feet. 36 feet from the mouth of the tunnel a cross vein was encountered and this was followed to the main vein. At the junction a vein of calcite, smaltite and silver, assaying from two to six thousand ounces was cut and a drift of 120 feet on the vein shows from 4 to 6 inches of shipping ore which for 25% of this distance will assay two to three thousand ounces. This is specially important, as many surface showings in this district are very similar to the original Gates discovery.

Cragg Claims.—These claims, which comprise 1,156 acres, are located in a narrow tongue of a diabase which extends from the Montreal River through Con. 6 in James and 1 and 2 in Smythe. They are controlled by Shirley Cragg, who is one of the pioneers of the Montreal River District. Six of the claims are passed, four on native silver discovery and two on cobalt with small silver values. On the S. W. ¼, N. ½, Lot 7, Con. 1, Smyth, three important veins have been located. Vein 1 has been uncovered for over 300 feet. The vein matter is calcite, decomposed on the surface, in which nuggets of native silver are found in a black muck. At a depth of 1 or 2 feet the calcite carries high silver values. The mineralisation and width of the vein are both irregular, running from one to six inches in width and from small values to 5,000 oz. in silver. On the S. W. ¼, N. ½, Lot 3, Con. 6, James, a vein has been uncovered for 400 feet on the contact between the diabase and conglomerate. The vein matter is calcite, from one to twenty inches wide, with occasional enrichment of cobalt and native silver. A shaft has been sunk on this vein. A comprehensive plan of development has been made and is being carried out under the direction of Mr. Cragg and Morgan C. Milne, his superintendent.

Gow Ganda Lake.—The latest discovery in the Montreal River District is near Gow Ganda Lake, four miles west of Miller Lake, between Miller Lake and the east branch of Montreal River. Rich ore has been sacked and brought into town.

BRITISH COLUMBIA.

Rossland.

Mr. W. Y. Williams, consulting engineer for the Granby Co., was in the city a few days ago looking over the work that has been done on the California-Giant since his last regular inspection. Development work has been in progress in the depths of this property for over a year, and the work is rapidly approaching a point where the sought-for ore body should be encountered. Mr. Williams, who is well-known by all the old-timers throughout this district, having for years been connected with the Granby mines at Phoenix, also has charge of the development work being done on the Independence group in the Similkameen, the Holden group in the State of Washington, and other promising properties. The Indepedence group is under bond to the Granby Co. for $100,000. Mr. Williams states that the work on the California-Giant is progressing in a satisfactory manner, and that good results are being obtained.

The Hattie Brown mine in the South Belt has been leased by two Rossland miners, and a good body of ore has been opened up during the preliminary work. The shaft on the Golden Rule is now down over thirty feet. The St. Elmo has joined the shipping list, having sent a car of picked ore to the smelter.

The big mines are maintaining a good average output for the present condition of the metal market. Shipments will be augmented as soon as copper reaches a normal figure. The ore shipments continue to run over 5,000 tons per week, the Centre Star shipping over 3,000 tons of this.

The following lead receipts at the Trail smelter (for the month of July) give a good idea of the amount of lead ore the different mines of the district are shipping to Trail and the proportion of lead in the ore of each mine:

Mine.	Net. weight. Pounds.	Lead contents. Pounds.
Arlington	228,204	5,975
Alpha	39,939	15,650
Blue Bird	29,106	1,863
Blue Bell	809,294	489,722
Curlew	13,479	566
Empress	2,138	17
Ferguson	170,015	47,260
Giant-Golden	35,564	24,118
Keystone	15,283	397
Little Robert	1,040	172
No. 1	27,432	823
Reco	81,162	33,982
North Star	1,408,949	290,298
Ruth	152,676	50,948
Sally	38,352	2,148
Slocan Star	46,586	17,796
Rambler-Cariboo	122,396	522,980
Richmond-Eureka	347,425	70,190
Sunset	163,407	110,274
Silver Glance	9,648	96
St. Eugene	4,622,696	2,657,835
Standard	372,769	241,730
Whitewater	577,963	260,668
Whitewater Deep	88,507	40,495
Westmount	86,758	6,770
	9,480,798	4,422,732

Boundary.

Ore shipments from the big copper producers of this district fell off to a considerable extent during the last couple of weeks of August. This was owing to the uncertainty of the coke supply. For the week ending September 6th the Granby shipped but 13,741 tons, the B. C. Copper Co. maintained about its average, 13,483 tons; the Snowshoe sent out 1,270 tons, and 60 tons came in from the Mountain Rose, making 28,554 tons for the week, and a total shipment from the Boundary District this year to that date of 881,378 tons.

It will be noted that the Snowshoe is now shipping ore to the Consolidated smelter at Trail, having sent out over 400 tons per day for three days of the week. Only a small amount of Snowshoe ore is to be shipped, while the price of copper remains as low as it is at present. This ore will be sent to the Trail smelter for fluxing purposes. Extensive development work is now in progress, and will be maintained on both the War Eagle and Snowshoe holdings of the Consolidated in Phoenix camp, and ore will be blocked out preparatory to heavy shipments the moment the condition of the metal markets warrants such action.

Seven of the furnaces at the Granby smelter are now in full blast, a fairly steady supply of coke being available from the Michel coke ovens, where the shipping facilities have been put in working condition again after the fire. No coke is coming in from Fernie yet, but it is expected that shipments will be

made from that point in the next week or ten days. Granby ore shipments will, no doubt, be up to their average during the present week. The furnace now cold at the Granby smelter is being enlarged. It will be made 4 ft. 4 in. longer than at present, or 22 feet in length, and it will take about three weeks to complete the job. All of the furnaces will be changed over in this way, and it will be well on into February of next year before the work can be completed, as they can only work on one furnace at a time.

The Granby directors in convention at Boston took no action upon the dividend question. It is stated that the dividend paid three months ago was not designated as "quarterly," and that a division of profits at this time was not necessarily due. While local stockholders, naturally, feel a little disappointed, still they recognize that action of this kind is to be expected immediately after a crisis such as has just been passed.

Mining operations have been resumed at the Brooklyn and Rawhide mines of the Dominion Copper Co. after a shut-down of several weeks. The big furnace at the Boundary Falls smelter will be blown in shortly as some coke is beginning to arrive on the ground. No shipments to the smelter were made by the Copper Co. last week, but their mines will, no doubt, show up on the shipping list during the current week.

The B. C. Copper Co. was affected but little by the big Fernie fire, as their supply of coke is obtained from the International Company at Coleman. They have maintained steady, average shipments while the Dominion Copper Co. was closed down, and the Granby Co. mines did not work Saturdays or Sundays lately.

Hon. Wm. Templeman, Minister of Mines, and W. R. Brock visited the mines of the Boundary during the past week.

G. P. Jones, superintendent of the Nickle Plate, Hedley, has secured an option on the Golden Zone for around $65,000. The Golden Zone is a promising mine and the 5-stamp mill recently erected is now giving satisfactory results.

The Apex, which the B. C. Copper had a bond on a short while ago, had now been bonded to W. D. McMillan. There is a good body of ore on the Apex. Development work is to be continued on the Fortune. The extensive gypsum deposit near Spence's Bridge is to be opened up in the near future. Operations will be begun shortly.

Charles Camsell, Dominion Geologist, has been looking over the platium bearing zone of the Upper Tulameen River. Topographical work is now being done in this district by the survey. As soon as proper transportation facilities are built into this district it will make a name for itself with its rich mineral deposits.

Nelson.

Ore shipments from this district for the past week amounted to 1,545 tons, making 61,585 tons for the year to date. Good results are being gained at the Blue Bell. A recently shipped car of ore returned over $600. A test car of Hewitt ore has been put through the zinc separating plant of the Kootenay Ore Co.

GENERAL MINING NEWS.

NOVA SCOTIA.

Sydney, Sept. 9.—At 2 p.m. to-day fire was discovered in the extreme southern part of Section 5 of No. 1 Colliery of the Nova Scotia Steel and Coal Company. It was found impossible to approach within 100 yards of the fire. The section is filled with smoke and is being flooded. Flooding will take 48 hours. Work will be delayed for less than a week. It is thought that the fire is due to carelessness on the part of miners.

ONTARIO.

Sault Ste. Marie, Sept. 9.—The plant of the Algoma Steel Company will be re-opened on Sept. 15. Rush orders from the Transcontinental Railway are reported.

Cobalt, September 4.—The Temiskaming, in sinking a new shaft, supposed to be away from the ore bodies, where it could be used for the main shaft, struck a rich blind vein at a depth of 75 feet, of calcite, niccolite and native silver.

Port Arthur.—Fine specimens of ore showing chalcopyrite, hornite and visible gold have been brought into town lately from Sturgeon Lake district.

A winding-up order in the matter of the Atikokan Iron Company, Limited, of Port Arthur, has been granted at Osgoode Hall, and John Dix Fraser, manager, of Port Arthur, was appointed provisional liquidator.

The petitioners were Mackenzie, Mann and Co., Limited, creditors, for moneys advanced, to the amount of $2,523.

The Canadian Fairbanks Co., Ltd., got judgment some time ago for $1,241, and $38 costs. The sheriff made a seizure on August 28, and a sheriff's sale was advertised to take place on Sept. 10. According to the petitioners, the Atikokan is unable to pay its debts.

The Atikokan Iron Company, Ltd., was incorporated on April 14, 1905, "for carrying on the business of a mining, milling, reduction, and development company." The capital stock was $1,000,000, divided into 10,000 shares at $100 a share. "All subscribed, and fully paid," reads the petition.

Directors from Toronto were D. D. Mann, vice-president; William Mackenzie, and Z. A. Lash.

BRITISH COLUMBIA.

Fernie, Sept. 4.—Great progress is visible on the reconstruction of Fernie. Bricks are being made from a local deposit of clay, recently discovered, by the Fernie Brick Company. All buildings are to be fireproof, and a more beautiful city will arise on the site of the old. Brick and stone are used in the business buildings, and concrete for many residences.

Nelson.—The Silver King mine resumed shipments of ore to the Consolidated smelter at Trail on August 27 after some months of idleness.

During the fortnight ending August 22 there were upwards of 39 mineral locations recorded in districts centreing in Nelson. This is a cheerful indication of the general activity.

A rich find of gold is reported from the Granite-Poorman mine. Mr. J. Laing Stocks brought some specimens into Nelson on the 12th of August.

The mining industry has almost completely recovered from the temporary effects of the recent Fernie fire. While there has been a marked falling off of ore outputs and the Dominion Copper Company has temporarily shut down, an immediate recovery is certain.

Fernie, Aug. 26.—The corrected list of fire losses that are covered by insurance shows a total of $1,448,000. The largest

loss will be suffered by Lloyds, $235,000. The Phoenix Company of London comes next with $136,000.

Kaslo.—The Hon. Wm. Templeman, Minister of Mines, and Mr. R. W. Brock, Acting-Director of the Geological Survey, were informally entertained by a committee of business men on Monday evening, August 24.

Grand Forks, Sept. 1.—Plentiful supplies of coke have arrived and six of the Granby Company's furnaces are now in commission. The seventh and eigth will be started shortly.

Rossland.—A fifteen-stamp mill is to be erected at the Jewel mine on the Boundary.

Victoria.—There are now at the wharf bunkers of the Ikeda Mining Company more than one thousand tons of copper-gold ore awaiting shipment to the Ladysmith smelter. Monthly shipments at this rate are now possible from the Ikeda mines.

The B. C. Provincial Government has appropriated $35,000 for public improvement purposes in the re-building of Fernie.

YUKON.

Dawson.—The miners of Black Hills Creek are to have a road constructed. The local administration has made an appropriation and work already is well advanced.

MINING NEWS OF THE WORLD.

GREAT BRITAIN.

The Institute of Metals, founded June 10th, is established on a firm basis with Sir Wm. White as president and an influential council. Its membership includes representatives of the leading firms interested in the British metal trade, in addition to many prominent foreigners, and it is expected that when the first general meeting is held in November the number of members will have reached 500.

Valuable experiments are being carried out by the Mining Association of Great Britain at Altofts, in accordance with a recommendation of the Royal Commission on Mines, to ascertain the causes of dust explosions and the best means of preventing them. Some important results have been already obtained, showing the most promising preventive to be stone dust.

SPAIN.

A Parisian company has undertaken the working of the grey copper and argentiferous mines of Calcena, known for some centuries past, which have from time to time been extensively operated. An electric plant will be installed.

BELGIUM.

Prof. Nuel states that there are 17,000 miners in Belgium afflicted with nystagmus—an involuntary laberal oscillatory movement of the eyes said to be caused by working in a dim light. The remedy is the employment of improved lamps in place of the candle.

RUSSIA.

A number of English capitalists and Transvaal gold miners have gone to Eastern Siberia for the purpose of acquiring gold-bearing areas. A staff of mining engineers is included in the party.

A new branch of the Siberian Railway is projected from Irkutsk northwards into the gold-producing regions of Vitirusk and Olekminsk.

The Russian Dnieprovskiy Metallurgie Co. has contracted to supply 360,000 poods, or 5,806 tons, of steel rails to the Papanese government for the southern sections of the Manchurian Railway.

SOUTH AFRICA.

Efforts to locate the extensions of the famous Johannesburg vein or Main Reef series have met with but slight success. On the western end the series runs into the great Witpoortje Break, and the continuity of formation ceases, though auriferous patches may be found, and towards the east the series becomes spotted in value with stretches of barren ground interspersed.

The Zaaiplaats State mine experiment in the Transvaal has failed. The government attempted to solve the unemployed problem by finding the men with work in the tin fields, but the results were not satisfactory, and the government sustained a net loss of £4,000.

An eight hours bill, providing that eight hours shall be the maximum length of a work day and punishing all violations with fines or imprisonment for both employer and workman, has been introduced into the Transvaal Legislature. It applies to nearly all forms of industry, and is strongly opposed by the mining interests.

UNITED STATES.

Messrs. J. V. Thompson and I. W. Semans, of Uniontown, Pa., have sold 5,288 acres of coal land in Green County in that State to a syndicate who are organizing the Emerald Coal Co., the price being reported at $1,463,000. Plans for mine development and the construction of coke ovens are under way.

The mining town of Chisholm, Minn., of about 4,000 inhabitants, on the Mesaba iron range, was destroyed by bush fires on the 5th inst. The Pillsbury and Nartley mines of the U. S. Steel Corporation, six miles west of Hibbing, in the same neighborhood; were devastated.

A new and rich gold field, 37 miles from Cripple Creek, Colorado, and about 1½ miles west of the copper belt, is being developed. A rush of prospectors has set in and all available ground is being staked.

A strike of the union coal miners of Wyoming involving 10,000 men began on the 1st inst. owing to the reduction of wages by the Mine Owners' Association.

About 30 coal miners were suffocated in Hailey-Ola coal mine No. 1, near Haileyville, Oklahoma, on August 26th, when fire destroyed the hoisting and air shafts, cutting off air from the mine.

AUSTRALASIA.

The gold yield of Victoria for 1907 amounted to 695,576 oz. fine, valued at £2,954,617. This is a decrease of 76,714 oz. as compared with the previous year's output, which is accounted for by several of the lode mines working out, the closing of some of the deep lead mines and the lack of new discoveries.

Good reports are received from nearly all the Tasmanian

tin mines, recent rainfalls having furnished an ample supply of water.

CHINA.

A company has been formed at Shanghai, China, with $20,000,000 capital to take over the Hauyang iron and steel mines and the Ping Hsing collieries. One-third of the amount has been already subscribed.

MEXICO.

The Kansas-Cananea Copper Co., capitalized at $10,000,000, has been organized by a merger of the Mexican holdings of the Silver Mining Co., Cons. Gold and Copper Co. and the Miller Mining Co. The properties included are 1,350 acres in extent.

The burning oil well of S. Pearson & Sons, near Tampico, has been extinguished after some 3,000,000 barrels of oil had been destroyed.

STATISTICS AND RETURNS.

OUTPUT FOR AUGUST, DOMINION COAL CO.

	Tons.
1	42,985
2	58,156
3	25,739
4	36,197
5	40,308
6	18,825
7	18,113
8	20,754
9	39,997
10	15,462
	306,536
1st January to 31st August, 1907	2,296,269
1st January to 31st August, 1908	2,609,488
Gain over 1907	313,219

The August shipments from the Dominion Steel Company's plant broke all previous records in the history of the company. The details of the company's output (not shipments) for the month are:

	Tons.
Pig iron	21,000
Ingots	26,511
Steel rails	15,246
Wire rods	5,070

It is expected that a showing equally good will be made in September as the company has plenty of orders on the books.

North Sydney, N.S., Sept. 2.—The output of coal at the mines of the Nova Scotia Steel & Coal Company for the month of August exceeded that of the previous month by about 400 tons. The figures would have gone over 60,800 had not a break occurred in the working days caused by the men observing the annual P. W. A. day. On that day the mines were closed.

Following are the figures for the different collieries:

No. 1	19,344
No. 2	4,010
No. 3	23,359
No. 4	1,444
No. 5	9,731
Total	58,068

Coke blast furnace and open hearth are running full force. Prospects for the company's continued prosperity were never brighter than at the present time. The hearth resumed operations a few days ago and the first output from that department came out on Monday.

The output of the Crow's Nest Pass Coal Company for the week ending August 28 was 19,847 tons, a daily average of 3,308 tons. For the corresponding week of 1907 the figures were respectively 22,132 tons and 3,688 tons.

The output of the Crow's Nest Pass collieries for the week ending September 4th was 20,108 tons, a daily average of 3,351 tons.

COBALT ORE SHIPMENTS.

Cobalt ore shipments were rather light last week, totalling 1,018,000 lbs., or 509 tons, against 711 tons the previous week. Only eight mines shipped, the La Rose being the biggest shipper of the lot.

Total shipments for the year to date are 26,850,949 lbs., or 13,425 tons. Shipments for the week and year to date are:—

	Week ending Aug. 29	Since Jan. 1.
Buffalo	91,000	850,950
Kerr Lake	61,000	583,794
La Rose	414,000	4,758,612
McKinley	61,000	2,206,040
Nova Scotia	40,000	351,775
O'Brien	141,000	4,437,627
Townsite	40,000	211,700
Temiskaming & H. B.	120,000	1,108,500

A new shipper appears in the list of mines shipping from Cobalt Camp last week, the Chambers-Ferland property joining the shipping list with a shipment of 61,650.

Nine mines shipped 1,304,460 pounds, or 652 tons. The total shipments for the year to date are 28,155,408, or 14,077 tons. Shipments for the week and year to date are:—

	Week ending Sept. 5,	Since Jan. 1.
Buffalo	.....	850,950
**Coniagas	64,700	842,960
Cobalt Lake	.....	341,683
Crown Reserve	.....	182,000
*Cobalt Central	.....	283,685
City of Cobalt	.....	831,240
Drummond	302,490	977,790
King Edward	.....	127,240
Foster	.....	288,100
Kerr Lake	82,200	666,174
La Rose	255,700	5,014,312
McKinley	.....	2,206,040
Nipissing	187,910	2,902,160
Nova Scotia	40,500	392,275
Little Nipissing	.....	40,110
Nancy Helen	.....	367,427

O'Brien	189,000	4,626,627
Peterson Lake	.....	41,427
Right of Way	.....	736,180
Provincial	.....	143,210
Silver Leaf	.....	258,030
Silver Cliff	.....	52,000
Silver Queen	.....	1,123,990
Townsite	.....	211,700
Temiskaming	.....	645,680
T. & H. B.	.....	1,100,500
Trethewey	120,310	910,476
Watts	.....	790,166
Chambers-Ferland	61,650	61,650

*Concentrates. **Concentrates and high-grade ore.

Shipments of ore from the Cobalt Camp in the month of August totalled 2,366 tons, the largest output of any month so far in the history of the camp. By months, the shipments, in tons, with comparisons, were:—

	1907.	1908.	Inc.
January	980	1,325	345
February	903	1,173	270
March	1,027	1,832	805
April	533	1,317	784
May	1,158	1,601	443
June.	1,939	1,581	*358
July	1,327	2,022	695
August	1,139	2,366	1,227

*Decrease.

B. C. ORE SHIPMENTS FOR WEEK ENDING AUGUST 29.

BOUNDARY SHIPMENTS.

Mine.	Week.	Year.
Granby	13,471	685,845
Mother Lode	10,492	119,091
Oro Denoro	1,580	37,888
Rawhide	220	10,740
Brooklyn	160	6,800
Sally	22	108
Other mines	.....	4,807
Total	25,945	865,279

SLOCAN-KOOTENAY SHIPMENTS.

St. Eugene	1,152	14,981
Whitewater	161	1,100
Whitewater, milled	280	10,660
Poorman, milled	250	7,850
Queen, milled	815	6,280
North Star	152	2,430
Richmond	251	1,439
Arlington, Erie	71	998
Bluebell	159	994
Standard	127	994
Rambler-Cariboo	39	882
Silver Cup	118	632
Idaho	89	362
Reco	21	228
Monarch	31	160
American Bay	20	20
Other mines	.....	14,736
Total	3,107	64,692

ROSSLAND SHIPMENTS.

Centre Star	3,149	111,455
Le Roi	1,586	50,541
Le Roi No. 2	682	19,449
Evening Star	30	718
Other mines	.....	192
Total	5,847	182,355

The total shipments for the week were 34,899 tons, and for the year to date 1,112,326 tons.

GRANBY SMELTER RECEIPTS.

Grand Forks, B.C.

Granby	13,471	685,845

B. C. COPPER CO.'S RECEIPTS.

Greenwood, B.C.

Total.	12,072	159,519

DOMINION COPPER CO.'S RECEIPTS.

Boundary Falls, B.C.

Total	380	21,812

CONSOLIDATED CO.'S RECEIPTS.

Trail, B.C.

Total	8,103	190,071

LE ROI SMELTER RECEIPTS.

Northport, Wash.

Le Roi	1,586	50,541
Other mines	2,240	4,538
Total	1,826	55,079

The total selter receipts for the week were 35,852 tons, and for the year to date 1,118,056.

Kaffir houses in London estimate the current month's gold production in the Transvaal at 600,000 ounces. This would be a new high record, comparing with 584,455 ounces officially reported for July, which was itself a new record, and with 355,037 ounces in August, 1907.

Value of the August output, calculated on the basis of the above estimate, compares as follows:—

August, 1908.....	*$12,600,000	August, 1907.....	11,560,000
July, 1908.....	12,413,000	August, 1906.....	10,812,915
June, 1908.....	12,211,000	August, 1905.....	9,102,485
May, 1908.....	12,360,000	August, 1904.....	6,634,340
April, 1908.....	11,924,000	August, 1903.....	5,775,195
March, 1908.....	12,210,000	August, 1902.....	3,456,610

* Estimated.

COMPANY NOTES.

The Dominion Coal Co. declared the regular quarterly dividend of 1 per cent. on the common stock. It is payable October 1 to shareholders of record on September 18.

The Right of Way, which pays its fourth dividend this month, will have disbursed $140,000 to its stockholders. The price paid originally for the property was $50,000.

The regular quarterly 3 per cent. dividend has been declared on Temiskaming stock, payable October 1, to holders of record Sep-

tember 15. Owing to an error, this dividend was yesterday credited to the Tretheway company.

The directors of the Trethewey-Cobalt mine, in sending out dividend cheques for the 5 per cent. dividend recently declared, enclosed a brief statement, giving the financial position of the company at the 1st of September as follows:—

Cash on hand, $123,543.96; due from smelter, $41,794.94; ore sacked and in transit, $23,112.79; a total of $188,451.69.

The dividend takes $47,272.50, leaving a balance of $141,179.19.

The financial statement on August 31, 1907, showed cash in bank of $56,903.86, and ore on hand and in transit of $23,358.40.

The directors say: "During the past few month, notwithstanding the low price of silver, the net earnings of the company have been at the rate of over 23 per cent. per annum on the total paid-up capital."

La Rose Consolidated has issued a preliminary statement of production and earnings for the month of August, 1908:

	Tons.	Contents.	Net. value.
Shipments	645	278,570	$123,356
On hand August 31	40	78,000	40,050
Production	685	356,570	$163,406
Less on hand July 31	57.94	79,739	38,803
August production	627,06	*276,831	$124,603
Estimated expenses			16,000
Net profit for August			$108,603

*Ounces.

The La Rose Mines, Limited, reports the following preliminary statement of production and earnings for the months of June and July:—

June production—	Tons.	Contents. Ounces.	Net. value.
Shipments	178.7485	116,088	$55,600
On hand June 30th	41.991	77,711	38,267
Production	220.7395	193,799	$39,867
Estimated expenses			$11,000
Net profit for June			$82,867
July production—			
Shipments	507.110	305,459	$140,793
On hand July 31st	57.940	79,739	38,803
Production	565.050	385,198	$179,596
Less on hand June 30th	41.991	77,711	38,267
July production	523.059	307,478	$141,329
Estimated expenses			$14,000
Net profits for July			127,329
Total for June and July.	743.7985	501,286	*210,196

*Net profit.

The Kerr Lake Mining Co. has declared a regular quarterly dividend of 3 per cent., payable September 19. Books close September 14, and reopen September 21.

The annual report of the American Smelting and Refining Company for the year ended April 30 shows that 7 per cent. was eanred on the common stock. This covers the period during which the dividend was reduced from 8 to 4 per cent.

With the payment of a dividend of $5 just declared and calling for $500,000, the Calumet and Hecla Mining Company will have distributed to its stockholders a total of $107,350,000 since is organization. Three and six months ago the disbursement was $5. In the quarter before that it was $10, and a year ago $15.

MARKET REPORTS.

Coke.

Sept. 9—

Connellsville coke, f.o.b. ovens—

Furnace coke, prompt, $1.50-$1.60.
Foundry coke, prompt, $1.90-$2.00.

Metals.

Sept. 9—

Tin, Straits, 28.65 cents.
Copper, prime Lake, 13.875 to 14 cents.
Lake arsenical brands, 13.875 cents.
Electrolytic copper, 13.75 to 13.85 cents.
Sheet copper, 18 cents.
Copper wire, 15.25 cents.
Lead, 4.575 to 4.60 cents.
Spelter, 4.825 cents.
Sheet zinc, 4.825 cents.
Antimony, Cookson's, 8 to 8.125 cents.
Aluminium, 32 cents.
Nickel, 45 to 47 cents.
Platinum, $23.50 per oz.
Bismuth, $1.75 per lb.
Quicksilver, $42.50 per 75-lb. flask.

SILVER PRICES.

	New York. Cents.	London. Pence.
August 22	51 3-4	23 7-8
August 24	51 1-2	23 13-16
August 25	51 1-4	23 11-16
August 26	51 1-4	23 11-16
August 27	51 1-2	23 13-16
August 28	51 1-4	23 11-16
August 29	51 1-8	23 5-8
August 31	51 1-8	23 5-8
September 1	51 1-8	23 5-8
September 2	51	23 9-16
September 3	51 1-8	23 5-8
September 4	51 1-4	23 11-16
September 5	51 5-8	23 7-8
September 7	Holiday	24
September 8	51 7-8	23 15-16
September 9	51 1-2	23 3-4