

THE CANADIAN MINING JOURNAL

VOL. XXXII.

TORONTO, Nov. 15, 1911

No. 22

The Canadian Mining Journal

With which is incorporated the
"CANADIAN MINING REVIEW"

Devoted to Mining, Metallurgy and Allied Industries in Canada

Published fortnightly by the

MINES PUBLISHING CO., LIMITED

Head Office - - - 17-21-23 Manning Arcade Annex, Toronto
Branch Offices - Montreal, Halifax, Victoria, and London, Eng.
London Office - - - Walter R. Skinner, 11-12 Clement's Lane,
London, E.C.

Editor:

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

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

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

CIRCULATION.

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

CONTENTS.

Editorials	717
(a) The National Mine Safety Demonstration	717
(b) Fabre Township, Quebec	718
(c) The Clays and Shales of Nova Scotia	719
(d) The Value of a Boom	719
(e) Editorial Notes	720
Correspondence	720
Personal and General	721
Concentration at Hudson Bay Mines, by H. G. Young	722
A Neglected Field, by F. P. Ronnon	725
Meeting of American Mining Congress, by T. W. Gibson	727
The Use of the Pulmotor, by E. T. Corkill	728
Stock Value and Mine Value (Continued), by Dr. A. C. Lane	729
Electrical Accidents in Mines, by H. H. Clark	731
High Grade Ore Deposits in Portland Canal	735
Minerals Found in Slocan District, by Wm. Thomlinson	737
Cuban Iron Ore Deposits, by Dwight E. Woodbridge	738
Industrial Section	742
Special Correspondence	743

THE NATIONAL MINE SAFETY DEMONSTRATION.

When the final history of social evolution is written, the first decade of the twentieth century will be noted as remarkable for the expansion of humanitarian movements.

Of all industries, that of mining has had to bear the obloquy of having the largest fatality rate. This damaging public belief is not founded on fact. The rate of casualties per one thousand men employed is higher in both the railroad business, and in the structural steel trade.

It is gratifying to know that in no industry other than mining is such radical action being taken to correct and control conditions that make for high fatality rates. In European countries, particularly in Germany, the government authorities have made it obligatory upon mine operators to provide amply for the comfort, moral well-being, health, and safety of the miner. Canada and the United States have fallen far short of the standard set by trans-Atlantic countries. So far as corporations are concerned, it is probable that among the coal mining companies the credit of the first systematic use of breathing-apparatus belongs to the Dominion Coal Company. Somewhat over four years ago that company established at Glace Bay a completely equipped life-saving station.

It remained, however, for the United States Government to take the initiative as a government. Last year, after the Technologic Branch of the Geological Survey had been organized as the Bureau of Mines, under the direction of Dr. J. A. Holmes, there was begun a national movement the object of which was to educate the miner in the use of first-aid methods and of breathing apparatus. Seven special cars were secured to cover the more important mining fields. These cars are used not only for demonstration purposes, but also for actual rescue work. Stations were established at various points, the large grounds of the United States Arsenal, an establishment dating back to 1814, being adapted at Pittsburgh.

Pittsburgh was chosen as the scene of the late National Mine Safety Demonstration. No better place could have been selected, nor could the time have been more opportune. Pittsburgh is the centre of a large mining population. The second day of the Demonstration, coincided with the Centennial Celebration of the introduction of steam navigation on the Ohio River. The presence of President Taft and of members of his Cabinet lent eclat to the occasion.

Our readers will be given in another issue of the CANADIAN MINING JOURNAL a full account of the pro-

ceedings at the Demonstration. It suffices here to accentuate the lessons that were there illustrated.

The vivid and spectacular experiments showing the danger of using any but permissible explosives in the presence of coal dust were exceedingly impressive. No one who was present at the belated explosion at the Bureau's Experimental Mine will easily forget the tremendous detonation and the huge volume of flame that resulted. Impressive also was the series of experiments at Forbes Field, and at the Arsenal. The first-aid competition at the former place was a wonderful exemplification of what training will effect. Working miners displayed a degree of skill and facility only to be expected from experienced surgeons. And, as the hundreds of competitors were selected from other thousands, the competition was doubly inspiring.

In these columns have been published many articles referring to the use of rescue apparatus in coal mines. The necessity of this work need not again be emphasized. Rather is it timely to allude to the wider application of certain newer devices.

A quite mistaken idea prevails as to the scope of the breathing-apparatus. Whilst it is quite true that in coal mines the breathing-helmet has been principally used, it is equally true that its value in the metal mine is being more and more appreciated. For instance, in fighting timber fires in large mines there is no question as to the utility of the helmet. This has been proven many a time in the last year in the western States. In fact, many metal mining companies have established trained corps within and without their mines.

First-aid is part and parcel of the work. To be able to meet emergencies it is essential that the rescue party be equipped with a knowledge of the methods of resuscitation, of dressing wounds, and of reducing fractures.

But especially to be noticed is the latest application of compressed oxygen. In many cases of gas poisoning the victim is beyond resuscitation by ordinary means. Although a feeble spark of life may be observable, artificial respiration fails to do its part. It is here that the ingenuity of the inventor has come to the aid of humanity. The pulmotor, a contrivance as simple as it is ingenious, actually performs the function of breathing for the subject who is too far gone to inhale and exhale the oxygen himself. The average sufferer from gas poisoning will respond to this treatment in a very few minutes. Whenever there is a sign of vitality there is hope. Cases that defy all other means are amenable to the pulmotor. A full discussion of the use of the instrument, written by Mr. E. T. Corkill, will be found on another page.

* * * *

The co-ordinated subjects of control of explosives, rescue-work, resuscitation, and first-aid demand national interest. The Pittsburgh National Demonstration

was a wonderful exhibition in itself. Its true object, however, was to appeal to the common-sense of employers and employees, and to acquaint the public with the work of the U. S. Bureau of Mines. In this it was successful.

When the Dominion Mines Branch Station at Ottawa is constructed we would suggest that a similar public exhibition be organized.

In our next issue there will appear a complete description of each event.

FABRE TOWNSHIP, QUEBEC.

The geology of a portion of Fabre Township, Pontiac County, Quebec, is reported upon by Mr. Robert Harvie, Jr., in a late bulletin issued by the Quebec Mines Branch. Before proceeding to notice the contents of the report, we wish to compliment the Quebec Department upon the greatly improved typography and general make up of the bulletin. The coloured geological map is excellently done. It is quite on a par with the productions of the Ontario Bureau of Mines.

Fabre Township lies on the east side of Lake Temiskaming, just within the boundary of the Province of Quebec. In physiographical characteristics the country resembles the adjacent parts of Ontario.

In general, the geological features comprise types of the glacial, the post-Huronian, the Huronian, the Laurentian, and the Keewatin. There is no need of particularizing on this side. We shall notice, instead, the specific conclusions arrived at by Mr. Harvie. These are interesting for several reasons, but most especially from the facts that much activity has been centered round the whole region and many rumours of rich discoveries have emanated therefrom.

Summing up the economic aspects of the field, Mr. Harvie points out first that the veins are narrow, the average width, with the exception of a few Keewatin copper veins, being under three inches. Second, except in a few cases, the veins are short and pinch out quickly. Third, most of the veins are made up of almost barren calcite and quartz. Third, it is a matter of great difficulty to transport supplies. Fifth, no workable bodies of ore have been discovered, nor has any valuable ore been found even in the small veins. Sixth, work undertaken by responsible persons has been abandoned.

This would seem to be a sweeping condemnation of Fabre Township. And in very fact it is. While it will be a bitter pill for many prospectors to swallow, there appears to be no reason for seriously qualifying any of Mr. Harvie's statements.

A gleam of hope, however, irradiates the future. There are enormous bodies of workable clay in Fabre. Some day when other industries shall have been developed, this clay may be a source of wealth.

THE CLAYS AND SHALES OF NOVA SCOTIA.

Memoir No. 16-E, issued by the Geological Survey Branch, Department of Mines, Ottawa, embodies the results of an investigation of Nova Scotian clays and shales carried on by Dr. Heinrich Ries, assisted by Mr. Joseph Keele. Certain portions of New Brunswick were also included in the survey.

The important clay and shale deposits are limited to the lower Carboniferous, the Millstone Grit, the Cial Measures, the Permian, and the Pleistocene. While few in number, these bodies are of large extent.

Of all the above-mentioned horizons, the Coal Measures comprise the most important clay and shale formations. Examination of these measures failed, incidentally, to reveal the presence of considerable quantities of fire clay. Generally, large bodies of clay and shale in north-eastern Cape Breton will yield common brick, face brick, and, in some cases, low-grade fire-brick. From the Pictou shales and clays tile and brick of very fair quality are produced. In the Inverness field, on the west coast of Cape Breton, is found a particularly good clay that could be used for pressed brick, for fire brick, and for general stoneware manufacture. Its fusing point is about 3,000 deg. F. The body is from 18 inches to nearly three feet in thickness, and would have to be worked along with a 13-foot coal seam. It is highly plastic and possesses dense burning qualities. Common brick shale is found near the Port Hood colliery. Large exposures of tile and earthenware shale occur directly on tide water between Port Hood and Judique Harbour. No work has been done in this region.

The plastic, tough, red burning clays of the Pleistocene period are the basis of most of the present establishments. These industries are spread pretty well over the Province. Common brick is made largely for local demand, although from plants situated near tide water shipments are made to foreign countries.

Dr. Ries expresses the opinion that there is positive room for development. Between Ontario and Nova Scotia there are few pressed brick plants. Ontario produces more than 300,000,000 common brick, about 50,000,000 pressed brick, nearly 4,000,000 paving brick, and about 20,000,000 tiles. Quebec is credited with nearly 130,000,000 brick, and with a considerable quantity of tile.

Compared with these figures, Nova Scotia's output is small. The official returns for the year 1910 place the number of bricks manufactured at 21,305,500; and the number of feet of drain-tile at 974,819. It is probable that Montreal is the largest extra-Provincial consumer of Ontario's products. It is obvious, also, that Quebec is not producing on a scale sufficiently large to supply her own demands. Nor, for that matter, is New Brunswick.

Apart from the possibility of developing well-situated industries at strategic points on Nova Scotia's coastline, there are other fields to exploit. The Syd-

ney and North Sydney iron and steel plants consume large quantities of fire brick. Fire brick made at Westville by the Intercolonial Coal Company is used satisfactorily in lining ladles. There are, however, presumably large deposits of fire clay near Shubenacadie and in the Musquodoboit Valley that, with the construction of the Musquodoboit Valley Railroad, will be given industrial value.

The opinion of an expert of Dr. Ries' standing commands attention. We have long been convinced that the clay industries of Nova Scotia would repay larger investment. The wide distribution of Dr. Ries' report should bring results.

* * * *

The report concludes with a highly instructive chapter on the origin and properties of clay, supplemented by a complete statement of the composition and fusing points of Seger cones, and by an exposition on the influence of the various chemical constituents.

It may be worth while mentioning that the photographs are hardly up to the mark. This mars an otherwise excellent publication.

THE VALUE OF A BOOM.

The mining boom is an inherent part of the growth of the industry: Much as we may deplore its attendant evils, the boom appears to be necessary to the successful establishment of any mining camp. This applies more, of course, to the mining of the precious metals. Iron, coal, and the like, can be exploited without a rise of public temperature.

The Rossland boom, the Lake of the Woods fiasco, and, in later years, the Larder Lake and other excitements, illustrated very completely the disastrous consequences of inadequate publicity and the lack of clean professional talent. To these elements must be added the presence of unscrupulous vendors, visionary promoters, and a quite unsophisticated public.

Times and manners have changed. It is not easy to "do" the Canadian public to-day. Responsible publicists, having at heart their duty towards the nation, will not permit themselves to be used by the fakir. Every flotation must meet fair criticism. The subsidized press carries less and less weight.

Yet the fact remains that the normally constituted human being wishes to be in the fashion. If one camp or district happens to hold public interest, the investor is more easily persuaded to take a chance.

Nova Scotia gold mining started in the early 'sixties of last century. There was at the time a local effervescence, a disturbance that by no stretch of the imagination could be called a boom. Inordinate amounts of gold were won from small quantities of ore, particularly at Waverly, a small settlement near Halifax. As is nearly always the case, no provision was made for the future. The mining that was done was crude, mostly open-cast. The milling was, if one

may judge from the records, execrable. Yet many thousands of dollars were netted in clear profit. It will be easily understood that no stable industrial foundations were built.

The early methods obtaining in Nova Scotian gold mining tainted the whole history of the industry down to the present day. Individual initiative, in which inadequate capital has been a restrictive factor, and foolishly inflated corporate enterprises have marked the two extremes.

Mr. F. P. Ronnan's article, re-printed on another page, is timely. Mr. Ronnan accentuates the indubitable fact that gold mining in Nova Scotia must be taken on its own merits. Unquestionably a boom is needed. But, if good is to ensue, that boom must be carefully directed in the proper channels.

If any situation can be fairly gauged in a few words, it is not beyond the mark to affirm that dozens of Nova Scotian gold mines, if properly and fully reported upon, would show up better than prospects in other parts of the Dominion that have been floated for millions.

To those investors, engineers, and others who find no resting place for their feet in the camps that are now popular, we would suggest that they turn towards the unadvertised fields of Nova Scotia.

EDITORIAL NOTES.

India's coal output for 1910 was 12,000,000 tons, of which quantity less than 1,000,000 tons left the country. The domestic use of coal is trifling. Cow dung is used extensively as a fuel in agricultural districts.

Since the year 1900, Japan's annual mineral output has increased in value by 60 per cent. The total nominal capital of mining companies is about \$100,000,000.

The Elusive Bill Miner, for whom iron bars and stone walls do not a prison make, has been re-captured. Bill's subliminal self was seen on a T. & N. O. train on its way to Porcupine. It is still at large.

The Toronto Branch of the Canadian Mining Institute at a recent meeting passed unanimously a resolution felicitating the Dominion Government upon the appointment of Mr. R. W. Leonard to the position of Chairman of the Transcontinental Railway Commission.

Politics apart, it rouses the ire of every decent Canadian when he reads of the public utterance of Dr. J. A. Macdonald. In the course of a speech in an American city, the reverend editor of the *Globe* is reported to have explained that reciprocity had been defeated by the United States interests. He calmly assured his hearers that Canada's verdict had been purchased for \$1,500,000. The devout doctor couldn't buy even Larder Lake with that sum. Why not accept defeat in a sportsmanlike spirit? Even Canadian mining men possess a certain love of country and pride of race. Canadians, as Canadians, should demand an explanation of the immoral and extravagantly silly assertions of a man who is supposed by foreigners to represent advanced Canadian thought.

CORRESPONDENCE

A SUGGESTION FROM THE WEST.

THE EDITOR:—

Sir,—I see nothing original in the proposal of Robert Hedley and others to saddle the Government with the correction of bad mining companies. Such propositions assume that the Government is a wise and benevolent parent, alert to guard its children from burning their fingers with incautious mining investments. As a matter of fact, governments are almost as sinfully human as mining companies, and experience shows us often enough how easy it is for governmental interference with private industry to degenerate into persecution or downright blackmail.

The licensing of surveyors and assayers under the laws of British Columbia certainly restricts competition and increases the cost of such service; whether it improves the quality of the service is doubtful. I believe it is the common opinion that without the protection of their government certificates some men of these professions would be seeking other fields of endeavour. As it works out, every provincial land surveyor whose business warrants, employs unlicensed men to do their work, pays them at competitive rates, and by virtue of the Land Surveyors' Act, gets a rake-off from the

public for each employee's services. If a professional man can not stand on his own legs, why bolster him up with a government certificate? There is a touch of humour in the recent amendment to the Land Surveyors' Act, whereby the canny B. C. Government is permitted to employ its surveyors in the open market while the common people are required to patronize the P. L. S.

We are all agreed that mining promotions need regulating, but why take our troubles to an already overburdened Government when there is a simple and effective remedy right at hand? In the Canadian Mining Institute we have a company of public-spirited gentlemen who know what they are about in mining matters as no government ever can. Let them issue a monthly bulletin by authority of the Institute, a sort of Investors' Guide, wherein discreditable promotions are plainly pointed out, with concise reasons why they are discreditable. Fear of libel suits would keep the publishers close to facts and the inevitable criticism would induce among the Institute's own members a salutary caution with respect to participation in dubious enterprises. If the gentlemen of the Institute should undertake such a public service without

first exacting a large fee, they would appear in an entirely new and by no means unfavourable light. Such an undertaking would vastly increase their importance in the eyes of the general public and might even become profitable.

WILLIAM W. BUSH.

Stewart, B.C., Oct. 17, 1911.

TORONTO BRANCH C. M. I.

Toronto, November 9, 1911.

Editor CANADIAN MINING JOURNAL:

Sir,—In connection with the two motions passed by the Toronto Branch of the Canadian Mining Institute, at its meeting in Toronto on Saturday, October 28th, the following will be of interest.

The first motion was in the form of a resolution of congratulation to the Dominion Cabinet on the appointment of R. W. Leonard, Esq., C.E., to the office of Chairman of the Transcontinental Railway Commission. This appointment is regarded by the Toronto Branch as emphatically the best choice that could have been made. I have received a reply as below from the Premier, the Hon. R. L. Borden, to whom I was instructed to forward a copy.

Prime Minister's Office, Canada.

Ottawa, Ont., Nov. 6, 1911.

My Dear Sir,—

Your letter of the 31st October reached me upon my return to Ottawa. Will you kindly convey to the Toronto Branch of the Canadian Mining Institute my thanks for their resolution relative to the appointment of Mr. R. W. Leonard as Chairman of the Transcontinental Railway Commission. I am glad to learn that this appointment is meeting with the general approval of the public of Canada.

Believe me,

Yours faithfully,

(Signed) R. L. BORDEN.

W. E. H. Carter, Esq.,

Secretary Canadian Mining Institute,
85 Front St. East, Toronto, Ont.

By the second motion a committee of five members was appointed to "investigate the subject of Workmen's Compensation, with particular reference to workers in mines and allied industries," and to prepare a memorandum of recommendations from this Branch to be forwarded to Chief Justice Sir William Meredith, for his consideration, at the time of his hearing of the whole subject. The committee will consider the important attitude of compensation directly in proportion to investment. Furthermore, I believe it was the feeling of the meeting that any expression of opinion should be entirely impersonal on the part of the Toronto Branch of the Canadian Mining Institute, and that the aim be to devise recommendations that will be mutually acceptable and profitable to both parties.

Sir Wm. Meredith was notified of the action of this Branch, and has replied to me as follows:

The High Court of Justice for Ontario.

Osgoode Hall, Toronto.

November 4th, 1911.

Dear Sir:—

I have yours of the 3rd inst.

I shall be glad to have the benefit of the report of your Association and shall keep the Commis-

sion open as long as possible to enable you to prepare it.

Yours truly,

(Signed) W. R. MEREDITH.

The Secretary,

Toronto Branch Canadian Mining Institute,
85 Front Street East.

Yours sincerely,

W. E. H. CARTER, Secretary.

Personal and General

Mr. G. H. Gillespie, managing director of G. H. Gillespie & Company, tale producers, Madoc, Ont., was in Toronto on Nov. 6th.

Mr. J. J. Harpell, formerly business manager of the CANADIAN MINING JOURNAL, visited Toronto Nov. 1st.

Mr. R. H. Stewart, managing director of the Consolidated Mining & Smelting Company, left Ottawa early in November for Trail, B.C.

Dr. Milton Hersey, who recently suffered serious injury to his eyes, is recovering rapidly.

Mr. T. H. Rae will make Toronto his headquarters during the winter.

Mr. H. P. Davis was in Toronto recently on his way to Cobalt, Swastika, and Porcupine.

Messrs. E. T. Corkill and J. C. Murray attended the National Safety Demonstration at Pittsburg on Oct. 30th and 31st. Other Canadians present were: the Hon. Mr. Tolmie, Deputy Minister of Mines for British Columbia; Inspector Strachan, British Columbia; Mr. J. Hudson, Mines Branch, Ottawa; and Mr. McMahon, Dominion Coal Co., Sydney.

Dr. A. E. Barlow attended the last meeting of the Toronto Branch of the Canadian Mining Institute.

Mr. W. F. Ferrier is the new chairman of the Toronto Branch of the Canadian Mining Institute, and Mr. W. E. H. Carter the secretary.

Mr. T. W. Gibson, Deputy Minister of Mines, Toronto, was present at the American Mining Congress, Chicago.

Mr. P. L. Nasmith, of Lethbridge, Alberta, general manager of the Alberta Railway and Irrigation Company, owning the Galt collieries, situated near Lethbridge, was recently in the Crow's Nest district of British Columbia.

Mr. Douglas Lay, superintendent of the Van-Roi Mining Company's silver-lead-zinc mine and concentrating mill in Four-mile camp, near Silverton, Slocan Lake, spent a holiday vacation at Spokane, Washington, last month.

Mr. James Ashworth, of Vancouver, B.C., has been engaged by the Head Syndicate, Limited, to examine and report on a coal mining property, situated on the south fork of Old Man River, in southwest Alberta, owned and being developed by the syndicate, with Mr. Leslie Hill, of Nelson, B.C., as engineer and manager.

Mr. Robert Irving, of Vancouver, B.C., secretary of the Slocan Star Mines, Limited, recently organized by Mr. R. S. Lennie, also of Vancouver, to acquire and operate the Slocan Star and Rabbit Paw groups of mineral claims, has returned to Vancouver from a visit to the property, which is in the vicinity of Sandon, Slocan.

Mr. W. C. Bayly, of Nelson, B.C., secretary of the Nugget Gold Mines, Ltd., of Sheep Creek, has left British Columbia on a trip to Europe and other countries, and will be away several months.

Mr. M. K. Rodgers, well known in British Columbia in connection with the earlier development of the Nickel Plate and Hidden Creek mines, is now associated with Mr. T. D. Pickard in prospecting the Apex group, in Hedley camp, Similkameen, which property has been secured, by them under option of purchase.

Mr. I. L. Merrill, president of the Hedley Gold Mining Company, is on one of his periodical visits to the company's Nickel Plate group of mines and stamp mill in the Similkameen district of British Columbia.

Mr. Thomas Kiddie, of Vancouver, B.C., is arrang-

ing to take a trip to Morenci, Arizona, where his elder son holds an important position with one of the larger companies operating in that state.

Mr. O. E. LeRoy, who has been supervising the field work of several Geological Survey parties in the Kootenay and Boundary districts of British Columbia, is about to return to Ottawa, the season's outdoor work having been completed. Mr. W. H. Boyd, who had been doing topographical work in the Blairmore-Frank district, Alberta, left for Ottawa about the middle of October.

Mr. Arthur Fisher announces his resignation as manager of the North Western Asbestos Mills Company, the Wyoming concern which has advertised its stock throughout Canada.

Concentration at Hudson Bay Mines, Ltd., Cobalt, Ont.

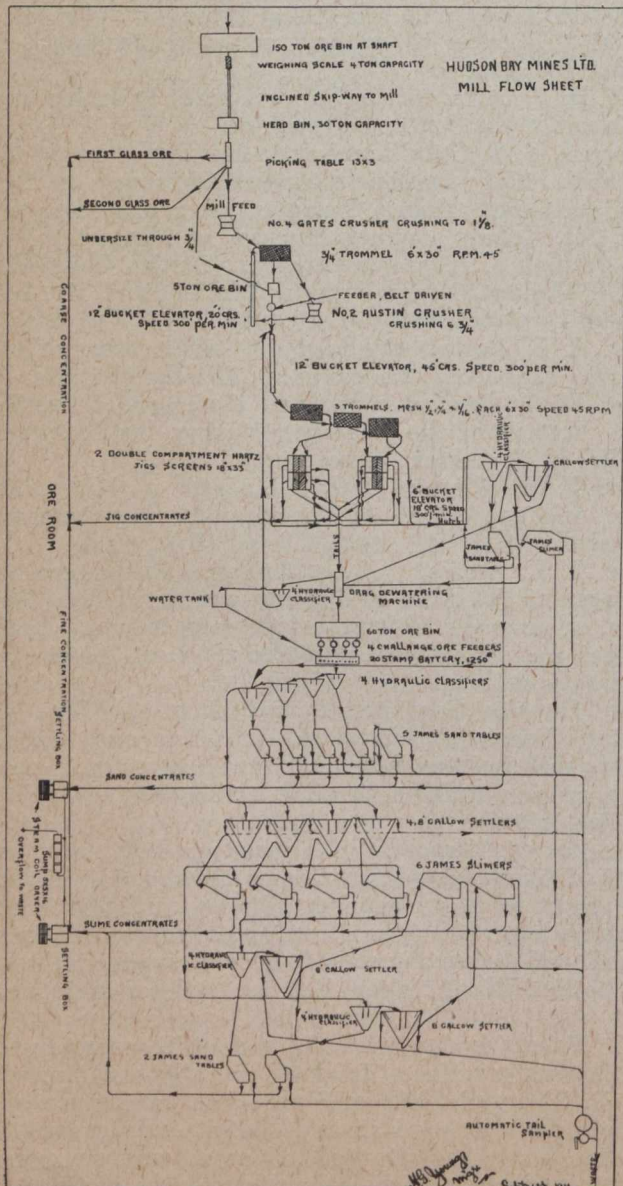
Written for the CANADIAN MINING JOURNAL by H. G. Young.

Nature of the Ore.

The silver values occur mostly in the vein associated with niccolite, smaltite, and calcite. The country rock near the vein, sometimes for 12 inches on each side of it, carries leaf silver. These veins occur in the conglomerate formation.

Flow Sheet.

In our shaft house there are two landing decks, one fifteen feet above the other, and between the two there is installed a storage bin for mill ore, of one hundred and fifty tons capacity. All ore is handled at the second deck and dumped from the cars into this bin, with the exception of the first-class ore, which is dumped on the floor and high grade picked out, the balance going to the storage bin. At the bottom and along the front of this bin there are arranged four gates from which the ore is drawn off into a skip which passes under them. Underneath the track there is installed a four-ton weighing scale, so adjusted that the weight reading is zero with the empty skip on. The weight recorded for each skip is thus net ore. By pressing a lever the scale records the weight on a card. These cards are delivered at the office at the end of each shift, and the tonnage reckoned. The skip is then drawn up an incline to the mill by a small friction hoist which is belted to a line shaft in the mill, where it dumps automatically into an ore bin and returns. The ore is fed from here onto a picking table three feet wide and thirteen feet long, which is hung from supports by four eight-foot rods, and has a slope of one foot. The table is given a reciprocating motion by a Park's pusher, which is operated by air. At the end of the back stroke it bumps against supports which cause the ore to travel forward. In the ore bin gate there is placed a roller three feet long by twelve inches diameter, with a two-inch shaft in the centre. Attached to this shaft on one side there is a ratchet wheel and a pawl with spring and arm two feet long fits into the ratchet. The arm is attached to the table. As the table reciprocates the arm travels forward and back, and causes the roller to turn and feed ore evenly onto the picking table. Any first or second-class ore is picked out on this table and



thrown into a bin. The balance drops off the end into a number four Gates crusher set to one and one-eighth inches, which is directly beneath. This ore is our mill feed. We find this picking table a very good arrangement for both hand sorting and for crusher feeding, as the feed is steady and well distributed and there is no handling of the ore necessary. The first and second-class ore is cobbled, sampled, bagged, weighed, and tagged for each shift. From the number four crusher the ore passes to a revolving screen of three-quarter inch mesh. The oversize goes to a number two Austin crusher, set to three-quarter inch, and the product returns to the screen. Thus, all mill feed passes three-quarter inch and drops into a small bin. The ore is delivered from this bin in a steady stream by a 12-inch bucket elevator, which raises it to the sizing screens over the jigs. These screens give us four products, over one-half inch, over one-quarter inch, over one-sixteenth inch, and under one-sixteenth inch mesh. The first three are delivered to four Hartz jigs, double compartment type, with 18 by 33-inch screen, over one-half inch being split in two equal parts. The concentrates are skimmed off and thrown in a box two feet by 4 feet by 6 inches. This box has a pipe leading into the bottom of it, which conveys the ore to a small hopper in the ore room. Before sending to the ore room the native silver is picked out and dropped in a small locked box through a hole in the top. The jig tails go to the dewatering machine. The hutch joins the undersize from the one-sixteenth inch mesh trommel and is raised to a four-foot hydraulic classifier, where the sands are removed and go to a number two James table. The concentrates from this table go direct by a pipe to the sand concentrate collecting tank in the ore room. A corner middling is returned and tails go to the dewatering machine. The overflow from the hydraulic classifier passes into an eight-foot callow settler and the slimes are treated on a James Simplex slimer. The concentrates go direct to a slime concentrate settling tank in the ore room. The tails go to classifier in front of the stamps. The dewatering machine simply drags the ore out of the water and delivers it to a belt distributor of reversible type, over the stamp bin. The water passes through a small settler and into the storage tank behind the battery and is re-used.

Our battery consists of 20 Fraser & Chalmers 1,250 pound stamps. The mortars are the narrow type with low discharge, and weigh 9,000 pounds each. They are arranged with water service behind each die. We use 16-mesh roll slot screen, manufactured by B. Greening Wire Co. Rate of drop is 100 per minute; distance, six inches. From the stamps the pulp passes into a chain of hydraulic classifiers. The sands are delivered to four number two James sand tables. Concentrates from these tables go direct to a tank in the ore room, and the tails to the waste launder. A corner middling is taken from each table and treated on a number two table. The tails go to the waste launder. The slimes are carried over and distributed into four eight-foot callow settlers, the overflow going to the waste launder and thickened slimes onto four Simplex James slimers. The concentrates are carried by pipe to the ore room. The corner middling is collected and passes through a four-foot hydraulic classifier. The coarse product is fed on a number two James sand table and the overflow passes into an eight-foot callow tank. The concentrates go direct to slime collecting tank and the tails to waste launder. The tails

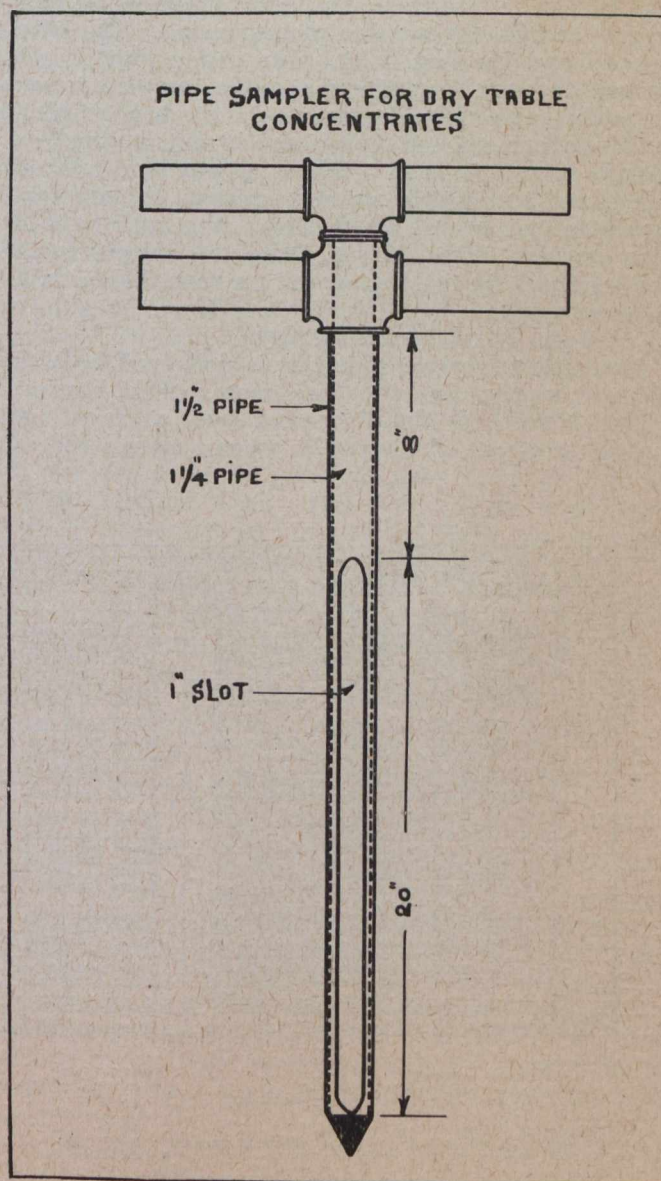
from the four slimers go through the same process as the corner middlings.

The concentrate collecting tanks in the ore room are two feet by three feet by eight feet, and there are two for sands and two for slimes. Each morning at seven o'clock the delivery pipes are switched over to an empty tank and the concentrates for the previous 24 hours are dried on a steam drier, 16 feet by 6 feet, made of one inch return pipe. The pipe rests on a quarter-inch mesh screen. As the concentrates dry, they drop through the screen into a hopper, from which they are drawn off by a gate, and bagged. They are sampled, weighed, and tagged and put away. In this way we get our concentrates almost perfectly dry, the moisture in eleven cars averaging as low as 0.6 per cent. The overflow water from the collecting tanks passes through a settling tank five feet by five feet by eighteen feet, arranged with three baffle boards. The overflow water from this goes to waste. This tank will catch on an average two hundred dollars per month, and we find it a splendid arrangement to prevent losses of ore already won.

Sampling.

(1) Dry Table Concentrates.

The above cut shows the sampler used for this purpose. It consists of a one and a quarter inch pipe in-



(3) **Hard Ore.**

The first and second-class ore is cobbled by an experienced hand and the sample taken as he is doing the work.

In our mill we make five classes of ore, namely:—first-class ore, second-class ore, jig concentrates, sand concentrates, and slime concentrates. For each class of ore we use a tag of certain colour, and when each bag is sewed up and put away it is tagged. On this tag we mark the date, number of the bag, and weight. When we desire to ship a car of ore we are thus able to pick out any day's ore in the mill, and we know its assay value. Thus we can grade our shipments in order to take advantage of smelters' tariffs. Also, if when we get our assay returns, we have any reason to believe that the sampling of any class might be in error, we can always pick out that day's ore again and resample.

(4) **Tail Sample.**

All reject from the mill, consisting of sands, slimes, overflow from the callows, and wash water from the floors, passes out the general tail launder and through the automatic sampler shown in the cut. The impact of this stream causes the 20-inch barrel to revolve and the tailings discharge through four 3-inch pipes in the side at the bottom. The 4-inch launder catches the whole stream from each pipe as it passes over it and delivers into the small barrel shown. The smaller barrel revolves by belt connection to the larger one. The pulp passes out through one-inch pipes and the sample is caught in a two-inch launder, which delivers it to the sample box. This box is cleaned out every 24 hours and sample assayed.

The following screen analysis of tails will be interesting:

October 24th, 1911.

Mesh.	Per cent. Assay.	
	oz.	oz.
On 16	2.51	5.5
On 40	15.66	1.2
On 60	18.66	0.8
On 100	4.29	0.5
On 150	10.54	1.5
On 200	5.11	1.6
Through 200	43.23	6.0
	100.00%	

Average assay, 3.32 ozs.

October 25th, 1911.

Mesh.	Per cent. Assay.	
	oz.	oz.
On 16	2.63	2.3
On 40	16.68	1.0
On 60	19.71	0.8
On 100	4.40	1.6
On 150	9.53	1.6
On 200	8.74	1.6
Through 200	38.41	6.1
	100.00%	

Average assay, 3.06 ozs.

The following table will illustrate our experience with hand sampling as compared with automatic sampling of tails. In hand sampling the tails we were very careful, using a wash tub of about twenty gallons capacity and taking a cut of the whole stream of sands and slimes every fifteen minutes, and allowing it to settle carefully before decanting.

Hand sampling.

	Assay heads.	Assay tails.
April 27th.....	26.1	6.5
April 28th.....	29.5	5.5
April 29th.....	26.8	6.4
May 1st.....	20.4	5.4

Automatic sampling.

	Assay heads.	Assay tails.
May 2nd.....	22.1	9.9
May 3rd.....	20.4	8.2
May 4th.....	19.1	9.3
May 5th.....	20.3	7.0

The automatic sampler was put in service on May the 2nd, and if you work out the percentage of extraction from heads and tails you will find that immediately, as the automatic sampler came in service, we discovered that the losses in our tails were easily 10 per cent. greater than we had anticipated.

Monthly Mill Sheet.

Our mill feed is figured on the product crushed from the picking table. All ore going to the mill is weighed. Thus in our data on this sheet the weight of second-class ore recovered must be deducted from the ore hoisted in order to give us the weight of mill heads. In the line marked "Totals," for assay values these figures represent average values for the month. All first class ore was picked out at the shaft and is shown here because we keep all ore data on one sheet for convenience. All other data should be perfectly clear.

The horse power required for the mill is 130, in which is included a 30 horse power pump at the lake, supplying the mill and plant. Our jig floor only operates one shift, of 11 hours, and we find this arrangement economical in labour and power.

For each 24 hours we have an accurate and reliable sample of our loss in tails. We also have an accurate sample of dry concentrates recovered, together with the weight. We know also exactly the weight of ore put in to the mill. With this fundamental data accurate, we have every reason to believe that all data contained in our monthly mill sheet is absolutely reliable. There are days, as you will note, on which we have done excellent work. However, I wish to print only what is our average, and thus I have put in a whole month's work, which covers high and low marks.

In this paper I wish to heartily commend the work of Mr. E. Brewer, my mill foreman, who has looked after our work in a very capable manner.

A Neglected Field

By F. P. RONNAN.*

It has been estimated that the combined area of our several gold districts will equal about 5,000 square miles. To attempt to enumerate the actual number of gold bearing veins already opened would mean to use up the entire space of this issue of the Advocate, giving a line only to each gold bearing vein. It has been humorously remarked that every man in Nova Scotia owns a gold mine, and the statement, while

*Editor the Industrial Advocate, Halifax, N.S.

exaggerated, is not so far from the truth as one might think at first reading.

The average Nova Scotian believes in the gold mining future of his province — that is, in the abstract, but it is difficult work to get him down to the concrete principle of putting his capital in such ventures on a hard practical business basis, and yet, he has squandered a great deal of money in the past 43 years in mere surface work which has served only to prove the wide extent of mineralization without returning him a reward sufficient to pay him for his trouble. Now if there be one avenue of development more important than another, in which the future of this province is wrapped up it is the problem of how the full advantage may be taken of these magnificent mineral deposits. Many geological authorities have traversed its fields and have arrived at the conclusion that there are available profitable openings for exploitation. Mining engineers from various portions of the United States have arrived at practically the same conclusion. Naturally the question will propose itself, under such circumstances, why is it that an industry of such possibilities is in a backward condition? And the only answer that can be made to such a reasonable question is that Nova Scotia in her entire mining history is the one known gold mining camp in the world which has not yet enjoyed the benefits of a boom.

The word boom is used because, perhaps, it best describes the condition which appears to control the birth of world-famous camps. We all know that the so-called boom, more familiar perhaps to the west than the east, is not an unmixed blessing, yet without it the investing classes would never have been induced to furnish the capital for developing famous producers. It is not intended to advocate for Nova Scotia a boom, because there has scarcely been one movement of this character in connection with mining districts that has not resulted in a great deal of loss for many persons, yet with the redeeming feature that it has brought about the addition of many important producers of precious metal to the world's supply.

In no other part of Canada is gold found of such free milling character. In no other locality are labour conditions so favourable. Almost every known gold-bearing district is within 20 miles of the Atlantic, and the larger portions of them are directly on the coast line, thus rendering transportation of supplies a comparatively simple and inexpensive item. The size of the lodes will vary from the thickness of a jack-knife blade to belts of ore bearing material as wide as 50 feet. It would be impossible to go into the structural geology of the gold occurrences of this province, nor would the average reader appreciate the conclusions and data of these learned men who have studied the methods of deposition and the genesis of our ore bodies. The average investor wants to know where he can put his capital safely and with fair expectation of obtaining as great a reward as possible. And it would seem from a close study of the various districts of this province that there exists here numberless opportunities where these conditions may be obtained, if the same qualities which safeguard ordinary business undertakings are applied and sufficient capital be at the disposal of the operator. It has been a standing wonder to many why the same plan followed by English exploration companies should not find in Nova Scotia a favourable field for its application. So far in Nova Scotia the obstacle of labour unions, in so far as gold mining is concerned, is an unknown factor,

and this is no small feature to be considered in the successful opening of our deposits. There are many water powers available in various districts which would still further assist in large scale mining operations.

Twenty-five years ago the five stamp mill was the rule. Five years ago the 10-stamp mill was the prevailing size of reduction plants. Now the 40-stamp mill is generally considered to be the proper means of treating the deposits in an economical manner. It can be readily understood, therefore, that mining and milling practice in this country has not reached perfection, and on that account the forecast of what the future may have in store for this province in the way of increased developments is very greatly strengthened.

In the past, operators have confined their attention to rich streaks of pay ore, and nothing under an ounce to a ton was worth considering, and rightly too, if looked at from the standpoint of the individual miner who wants only to extract these values which are most profitable, because of the smaller expenditure for labour, etc. This is the direction in which whatever development done in the past has been extended, and, therefore, the persons who have studied mining facts in connection with Nova Scotia have more faith in the future outcome of the development of large bodies of ore which will be worked upon a large scale, and at a minimum of expense, and it is from this class of deposits that the future of the industry will be determined, leaving the richer but smaller ore bodies to be worked in conjunction, and thus add to the general tenor of the mill output.

Milling practice in this province has in a few instances been reduced to the highly creditable point of 20 cents per ton of tails, a result which is surpassed by only a few properties in the world. It is fair to ask that if a totally unorganized body of miners, shifting from one district to another as a matter of convenience or whim, following no constant objective point, hampered by the lack of capital and facing the obstacles which nature puts in the path of those who would wrest her wealth from her, can produce nearly \$17,000,000 worth of gold, what should follow the operations of say a dozen groups of thoroughly organized capitalists with the necessary technical skill directing their enterprises in such a country as Nova Scotia.

Perhaps the most important point that has been raised in recent years in connection with these gold deposits, is the probability of their richness with depth. By depth is understood, say, 3,000 feet. The deepest working in Nova Scotia at present does not exceed 1,000 feet vertical, and this occurs in but two districts. The average depth of shafts in Nova Scotia does not, perhaps, exceed 100 feet, though there are many which will run 300 to 500 feet, and it does not require extensive technical education to recognize the fact that a 250-foot shaft is little better than a prospect hole. It has been estimated that the thickness of our gold-bearing strata is in the neighbourhood of 7,500 feet, and the data available at present would seem to point to the maintenance of value to at least three times the present greatest depth. On this subject a considerable amount of literature has been issued, and the question has been a fruitful one for discussion among mining men. Mr. Faribault, of the Dominion Geological Survey, who has been studying the gold measures of the province for the past 30 years, gives it as his opinion that gold will be found at that depth, and he bases his

conclusions upon certain similarities between the formations of Bendigo and those of Nova Scotia.

The Government of Nova Scotia, to encourage those who would undertake the task, has placed upon its statute books, measures which commit it to furnish one-half of the cost of underground work, including shaft sinking and crosscutting, an advantage that is offered in no other country to our knowledge, in the world. Up to the time of writing such a measure of assistance has not been taken advantage of, although several mining companies have made incomplete applications therefor.

A word or two in reference to the conditions under which mining may be carried on. With particular reference to government requirements, it may be said the tax of 2 per cent. on the gold produced, of which it is possible to obtain a refund by way of rentals, is a comparatively moderate one. Mining claims in Nova Scotia measure 150 x 200 feet. The shorter measure-

ments being in the direction of the veins. Fissure veins occur in a number of districts and are considered as being of more promise than the usual bedded vein. Almost every district has been mapped by the Dominion geological authorities, and it is possible to obtain a great deal of detailed information regarding the size of veins, the depth of various shafts sunk in the past, and such information as would be of value to a serious investigator.

Had it pleased Providence to create Nova Scotia in the midst of an arid desert surrounded by nearly impassable mountains, peopling it with ferocious races, together with many drawbacks of climate, etc., the chances are that the adventurers of all nations could not be kept from exploring her riches by a cordon of gatling guns. This recalls the old story of the difficulty a man would have of selling newly minted gold dollars for fifty cents to the casual passers-by, who will not take time to determine whether they are genuine or not.

MEETING OF AMERICAN MINING CONGRESS

Written for the CANADIAN MINING JOURNAL by T. W. GIBSON.*

The 14th annual session of the American Mining Congress was held in Chicago from 24th to 28th October, President John B. Dern, the veteran gold mine operator, of Salt Lake City, in the chair. During its earlier years the Congress was not taken very seriously, but it has since developed into an important and influential body. The Chicago meeting was addressed by Dr. J. A. Holmes, Director of the Bureau of Mines, Washington, D.C.; George Otis Smith, Director of the Geological Survey, Washington; also by Hon. W. L. Fisher, Secretary of the Interior, and by President Taft himself. The body of the Congress was made up of representatives of the gold, silver, and copper interests of the western states; coal operators from Pennsylvania, West Virginia, Illinois, Ohio, etc., and a very considerable sprinkling of federal and state officials, such as geologists, mining inspectors, and others.

A number of the subjects discussed pertained to conditions peculiar to the United States, such as the Alaskan situation; the Sherman Anti-Trust law, etc., while others were of more general application. Representatives from Alaska were most vigorous in their denunciation of the United States Government's policy in dealing with the coal lands of that territory. The situation at present there is, that while there are large and valuable beds of coal in Alaska, the Government has withdrawn them from disposal, and all the coal locally used must be imported from British Columbia at a cost of \$16 or \$17 per ton. Secretary Fisher took the opportunity of announcing that the Government had decided upon a policy of leasing the coal lands instead of selling them outright, and intimated that railway facilities would be encouraged. It appears quite probable that the present importance of the Alaskan coal deposits has been over-rated. There are two known fields of good quality, the Behring River field and the Matanuska field, but in the former, which is the most accessible, there have been disturbances which have injured the physical condition of the coal and

increased the difficulties of winning it. The Pacific coast as a market for fuel has also been largely pre-empted by petroleum, of which the Californian wells continue to yield enormous quantities. It is, therefore, doubtful, whether if the Alaskan coal mines were opened to-morrow the product would find an extensive sale.

Meeting in the east, the coal-mining industry received a large share of attention. Complaints from coal mine operators were loud and doleful. Competition is exceedingly keen, and profits are low, or even non-existent. West Virginia has some easily worked seams of good quality, and the price at which the product is marketed leaves little margin for mines where the coal is poorer, or more expensive to get out. All the coal operators united in denouncing the Anti-Trust law, declaring that it must be modified to allow of reasonable combinations, otherwise the trade would end in bankruptcy.

A subject that is of present interest on both sides of the line was discussed, in the shape of a proposed measure of compensation for accidents to workmen. Uniformity of law is desirable on the point, but the matter being under the jurisdiction of the individual states, it was recognized that this would be difficult to obtain. A committee appointed at a previous session of the Congress submitted a draft measure, which was approved. It provided:

(1) Compensation on a fixed scale for all accidents, regardless of their cause, "contributory negligence," etc., being practically eliminated. The maximum compensation for death was placed at \$3,000.

(2) Compensation to be paid out of a fund raised by a tax of one cent per ton on all coal mined. Employees were not called upon for any contribution.

(3) The fund to be administered by a state-appointed advisory board of three members, one member to be a coal operator, and one a coal miner.

(4) Acceptance of compensation from the fund to be a bar against any suit against the employer for damages.

*Deputy Minister of Mines for Ontario.

As will be seen, the measure applied to the coal mining branch of the industry only, and did not attempt to cover the field of metalliferous mining. Some of the speakers thought the miners themselves should contribute to the fund, say on a basis of one per cent. of the monthly pay-roll. It was thought that a fixed rate per ton contributed by all mines, would give no advantage to well-equipped properties where every precaution against accident was taken, over those mines where recklessness prevailed, or which were insufficiently equipped, while if the miners paid into the fund they would have a strong incentive to guard it against depletion by fraudulent claims.

More generous appropriations to the Bureau of Mines were advocated. The opinion prevailed that while the Bureau was serving a useful purpose, its field had so far been limited largely to the problems presented by the coal mines of the east, the metal miners of the west being neglected.

Accidents, economics of the coal trade, conservation methods as applied to mining, and other subjects of interest were discussed. Not the least instructive was a paper by the veteran Canadian, Dr. James Douglas, of New York who described the Copper Queen Company's collieries and coke plants at Dawson, New Mexico, involving an investment of two millions of dollars.

The Canadian delegation this year was small, consisting of Mr. H. H. Lang, of Cobalt, and Mr. T. W. Gibson, Deputy Minister of Mines.

The Use of the Pulmotor in Metal Mining

Written for the CANADIAN MINING JOURNAL by E. T. Corkill.*

Since the organization of first aid to the injured societies in Germany about thirty years ago, great progress has been made in the development of oxygen resuscitating apparatus for rescuing the lives of workmen who have been overcome with poisonous gases in the mines. Apparatus of this nature is now being largely used in the great coal-producing countries of the world. Rescue stations have been or are now being established at suitable centres of every large coal field. These stations are equipped with oxygen helmets, pulmotors, bandages, splints, antiseptic dressings, and various first aid appliances, and are placed in charge of a corps of men trained in the use of this apparatus and first aid appliances. The oxygen helmet has been used with great success in rescuing men after explosions and fires in coal mines, and has been used to a lesser degree in the extinguishing of fires in metal mines and in saving men entrapped by fire. After these explosions and fires, many of the injured, when brought to the surface, are unconscious as a result of inhaling the poisonous gases. As a means of resuscitating these men the pulmotor was invented. The apparatus consists of a cylinder in which oxygen is stored under a pressure up to 125 atmospheres, a blowing and suction valve actuated by two accordion bellows; a face mask which encloses the mouth and nose, making an air-tight connection with the face, to which a mask is attached, two flexible tubes leading to the blowing and suction valves respectively.

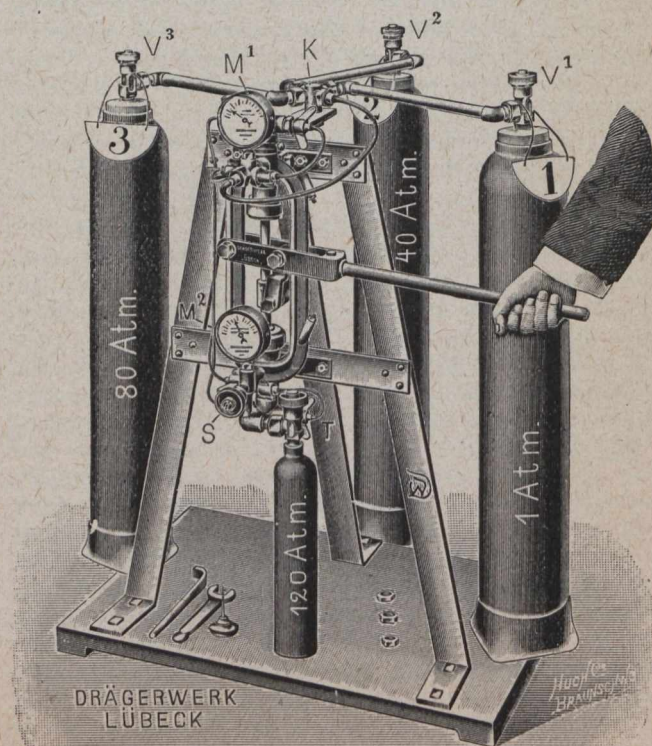
*Inspector of Mines for Ontario.

When the mask is made air-tight on the face and the oxygen turned on, the apparatus works automatically. Oxygen is forced into the lungs until a pressure of 4 inches of water gauge is reached, which pressure is in connection with one of the accordion bellows, and owing to the elongation of the bellows under this pressure, the valves are turned and the pressure in the lungs released. The suction valve immediately begins operation and continues to exhaust the oxygen from the lungs until a vacuum of 4 inches of water gauge is reached. The oxygen used for creating this partial vacuum elongates the second accordion bellows and changes the position of the valves, allowing the oxygen again to be forced into the lungs, etc. A lever enables the inflow and outflow of oxygen to be regulated by hand, independent of the automatic device.

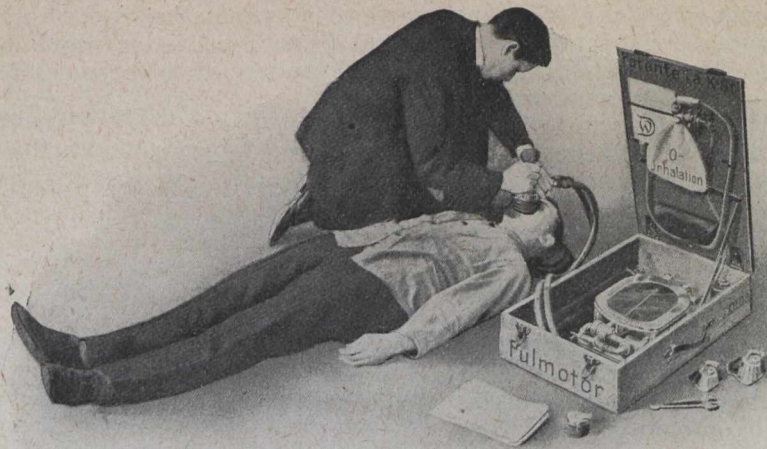
The application of this device necessitates placing the subject on his back, in which position the tongue may fall to the back part of the throat, allowing the soft palate to close the larynx. To overcome this condition, a flexible rubber tube is attached to the upper part of the face mask which will admit of grasping the tongue with a pair of forceps and withdrawing it sufficiently to raise the palate.

Another type of mask is one which fits over the nose and nostrils only, allowing the mouth to be free. With the use of this nose mask the tongue may be withdrawn and held between the teeth and lips with sufficient pressure to hold it in place and make the mouth air-tight. For the successful use of the apparatus it is necessary that an air-tight fit be made with the type of mask used.

Attached to the lid of the pulmotor is an inhalation device which may be substituted for the pulmotor as soon as the subject under treatment recovers the involuntary action of the lungs. This inhalation device is fitted with a rubber bag which holds two liters of oxygen when inflated, and a metallic mask which



The Oxygen Cylinders and Pump.



The Pulmotor in Service.

fits over the mouth and nose and which may be held in place with a rubber band passing around the head.

The apparatus has been used most successfully in the resuscitation of persons who have been overcome through breathing irrespirable gases, by drowning or electric shock.

In metal mines many men are every year rendered temporarily unconscious through the inhalation of the gases which result from the explosion of dynamite, etc. In a number of cases they are not rescued in time to save their lives by the ordinary methods employed. In Ontario, during the years 1901 to 1910, 13 men lost their lives from this cause. A number of these men were not rescued until all signs of life were extinct, but there were a few who were still alive when brought to the surface but subsequently succumbed as a result of the poisonous gases inhaled. In addition to the fatalities there were a number of men who were rendered temporarily unconscious from inhaling gases resulting from dynamite explosions. These men were revived by the ordinary means of artificial respiration. If the pulmotor had been available, these men would

not only have been revived sooner, but the gas would not have had as lasting effects. The best safeguard is to have the workings so well ventilated that poisonous gases cannot collect. Failing this, the next safeguard is to use artificial ventilation, such as fans, etc. If accidents then result, it is certainly advisable to have a pulmotor available for the speedy resuscitation of those workmen overcome by the irrespirable gases. The apparatus is automatic in action and any person can be trained in a very short time to its use.

The pulmotor has also proved very beneficial in resuscitating workmen who have received electrical shocks. The treatment is similar to that for poisonous gases, and if there is any heart action at all in the injured person resuscitation is very probable. Electricity is now in general use in the majority of metal mines, and accidents are therefore liable to happen from accidental contact with the wires no matter how carefully the wires, switches, etc., are insulated and guarded. It is, therefore, the duty of the operators to provide the best remedies obtainable for aid to the injured.

Stock Value and Mine Value

Written for the CANADIAN MINING JOURNAL by Dr. A. C. LANE.*

Continued from our Last Issue

I assume, then, that an unlisted copper mine figuring simply on its yield will, and should fairly, sell between well-posted business men at a price that would represent the payments to be received from it discounted at 10 per cent. compound interest.

Average Return from Listed Copper Mines 6 Per Cent. to 7 Per Cent.

I next take up the effect of increasing the marketability of copper mines in the raising of their price measured by the reduction in the yield. Taking the

mean price of leading Lake Superior mines and comparing them with the return in dividends we find the average annual return in dividends on the mean annual price of the Lake Superior copper mines for 14 years between 1891 and 1910 to be almost exactly 7 per cent., varying in different years from 5.3 per cent. to 11.4 per cent. The figures for value given by Stevens are the average of the highest and the lowest price for the year, a mean value which is not technically the average value. It is sufficiently near the average, however, for our purposes, and these average values have been checked somewhat by comparison with the state valuations.

*Professor of Geology, Tufts College.

The statement that the average yield of a Michigan copper mine is close to 7 per cent. on the money invested may also be checked thus. The total assessments (money paid in on the stock marked thereon according to Michigan law) were \$78,497,700 up to 1909 and the dividends \$183,073,816. A mine, however, never begins to pay its dividends until four or five years after its organization and initial assessments. The most prominent dividend payers like the Quincy and Calumet have been paying for a long time, respectively since 1862 and 1870. These two alone are responsible for two-thirds of the dividends. Thus, without undertaking the colossal work of estimating the worth at an even date of all the assessments and dividends, it is clear that the dividends have certainly not followed the assessments on the average as promptly as if they were evenly distributed over the 28 to 34 years following organization. This would imply in the former case a return on the mine assessments of 7 per cent., in the latter case of 6 per cent.

Yield of St. Mary's After Listing.

The St. Mary's Canal Mineral Land Company was followed and succeeded by the St. Mary's Mineral Land Company, and, though by its holdings of copper stock this has become no more a purely land speculative company, it will be interesting to see the effect of listing and making a market for it. The opening of the Baltic lode increased very much the value of the company's property. Since 1903 it has received a steady income from the Champion Company. Accordingly, in 1901, a new company was organized with 200,000 shares at \$20 a share, of which \$6 went to each old share with a right to subscribe to one more, which sold at a premium. Thus the new shares made the old worth from \$150 to \$250, and, while this was during an epoch of inflation in the stock market generally, St. Mary's stock has never sold for less. Thus it can not be said from the stock market point of view to have been inflated. If we take the statement of the assets and liabilities in the first report of the St. Mary's Mineral Land Company and correct the value assigned to the holdings of the Champion mine stock from \$19 to \$67 or \$80 a share to agree on a 7 per cent. basis with what it actually has yielded, we find the shares issued in 1901 were worth \$42 to \$55 a share on a 7 per cent. basis. A share bought that year at the time of issue of the new stock would probably have cost about that figure. Computing the dividends for the next few years up to 1906, when say 10,000 more shares were issued, and supposing the stock were sold in 1906 at the price of the new stock which sold at a small premium, it would have been worth in 1901 \$41.50, supposing that the intermediate dividends and the sale in 1906 had been discounted on the 7 per cent. compound interest basis; whereas if it sold for the high price that year it could have made much more. We see then that the yield after listing St. Mary's came down to a 7 per cent. basis something like other Michigan copper stocks.

Increment of Value Due to Marketability Similar for Stable and Unstable Securities (50 Per Cent.)

If the effect of listing and making a market for copper stocks is to reduce the yield from near 10 per cent. to 6 per cent. or 7 per cent., and, therefore, to increase the value by the same proportion, it is interesting to notice that the increase of value is in very nearly the same ratio as in the safer stocks already mentioned—guaranteed railroad stocks—as against mortgages. In the latter case the proportion is 42 to 63, or 67 to 100, instead of 69.8 to 100. It would seem fair to say that

organized speculation increases the value of stocks about 50 per cent., from which, of course, must be deducted the cost of the organization itself.

Fluctuation Factor.

Not closely dependent on volume of sales.—But while the average effect of listing is thus given, it is not the same for all classes of stocks. This will come out better as we study the next factor—the activity factor.

I at first attempted to analyse this by taking the volume of sales in 1899 (the first year given by Stevens) and arranging the stocks in the order of the volume of the sales. I arranged them also to show the amount of fluctuation. To show this fluctuation I divided the highest price of the year by the lowest, obtaining what we may term the fluctuation factor. I was disappointed to find little apparent correlation between the volume of sales, if measured by number of shares sold, and the amount of fluctuation. Some mines of which very few shares are sold have a wide range, others where there is much sale have no range at all.

More closely dependent on price of stock.—But it must be remembered that the order of absolute number of shares was no sign of the order as to money involved. Five shares of the Calumet and Hecla selling at \$500 or more is as great amount of activity, so far as actual money is concerned, as five hundred shares of a \$5 stock.

For instance, in 1903 one of the most active stocks was Allouez, of which there was 152,262 shares, at from \$3.13 to \$7.50 a share. This really involved no more money than the sale of 5,375 shares of Calumet and Hecla at prices ranging from \$550 to \$400. I also plotted the weekly prices and sales of Copper Range from 1903 to 1909, but no correlation was apparent.

If we rearrange the mines, however, multiplying the total sales by some figure that we shall take as a mean price (though it would be more strictly correct to take each transaction, multiply the number of shares by its price and thus obtain the total amount of money involved in the sales of the year) we find that the fluctuation factor depends much more strictly on the price of the share than the amount of sales, which, indeed, may be neglected. The greater the price of the share the less the fluctuation. Setting off in the table for 1903 the names of the mines more or less to the right according to their fluctuation factor, we find the more expensive shares least set off.

Michigan Copper Stocks.

Fluctuation Factors and Sales in 1903.

1,226,030	2.03 Copper Range.
301,086	2.65 Centennial.
181,253	2.46 Winona.
152,262	2.40 Allouez.
120,526	1.87 Mohawk.
98,842	8.16 Arcadian?
83,419	1.84 Osceola.
67,078	2.70 Elm River.
65,717	6.00 Mass.
54,552	3.84 Wyandot.
52,925	6.00 Victoria.
44,485	3.50 Isle Royale.
34,087	2.14 Atlantic.
29,087	2.53 Michigan.
28,794	1.43 Wolverine.
23,522	2.72 Phoenix.
23,377	2.08 Franklin.
15,239	2.53 Tamarack.
15,634	5.00 Mayflower.

15,815	5.00 Rhode Island.
7,505	4.50 Tecumseh.
6,438	1.58 Quincy.
5,371	1.37 Calumet and Hecla.
4,582	3.80 Arnold.
2,240	3.33 Washington.

Division of Copper Stocks Into Two Classes at \$10.00.

Class A.—Mines successful, dividend paying with average fluctuation factor 5/3. Rarely over 2.5.—In the table of sales for the year 1903 (where the mines are arranged in order of the number of shares sold, the fluctuation factor prefixed to each mine and the name indented in proportion to the range of the fluctuation factor) I underscored those mines which in 1899 at no time sold below \$10, and though I took this line arbitrarily I found I had with but one exception made a natural group (Class A). The mines which at no time sold below \$10 in 1899 were with this exception all mines that had been proved to be able to produce copper with profit, and they agree in several other striking features beside the fact that they did not sell below \$10. Only the exception (the Arcadian) did not sell above \$10 in 1901. This mine (the Arcadian) was an illustration of a mine that at a time of frenzied boom was held at an artificial price through a whole year. In no other year was its lowest price above \$10, and it has never paid any dividends or produced copper to speak of or otherwise come into the class of the properties concerned. It should be excluded from the class, but I have not done so as it makes no qualitative difference as to our conclusions. If one studies the mines of Class A one finds that the fluctuation factor averages 1.67 for 1899 (Bowen made it 1.631), and not only in that year, but in other years, it very rarely goes above 2.5.

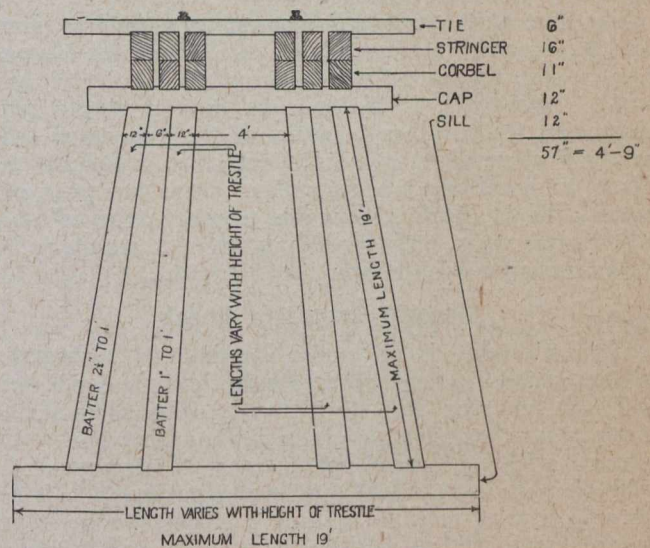
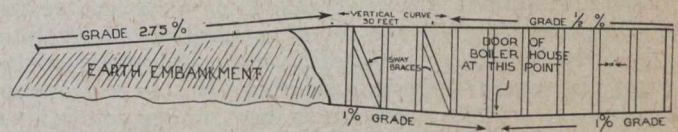
(To be Continued)

SIMPLE COAL TRESTLE OF UNSQUARED TIMBER

By P. B. McDonald, of Negaunee, Mich.

The accompanying sketches show a coal trestle for use at mine boiler houses, to be constructed principally of logs. The grades of the rails for railway cars and

the 1 per cent. grade of the floor to facilitate hand tramping the coal to the boiler house door, have been found to be convenient in actual installations. Sway braces, to prevent the bents toppling over like a row of dominoes, are shown in two of the spaces. Planks may be nailed diagonally across each bent if desired, and some engineers prefer to rest the sills at either end upon pieces of railway ties sawed into three lengths. To obviate using corbels under the stringers which are 12 feet long, the stringers are sometimes made 24 feet long, making joints upon alternate bents; two double rows of stringers are run, one row making joints upon even bents and one row upon odd bents; over each bent the two rows of stringers are bolted together for greater security.



SIMPLE COAL TRESTLE OF UNSQUARED TIMBER

ELECTRICAL ACCIDENTS IN MINES: THEIR CAUSES AND PREVENTIONS

By H. H. CLARK,*

Introduction.

One of the purposes of the work carried on by the Bureau of Mines is to make mining safer. For this reason the bureau is investigating the causes of mine accidents, the methods by which such accidents may be prevented, and the best ways of rendering aid to those who are injured or put in danger by accidents. This circular tells what are the chief causes of electrical accidents in mines, briefly points out the precautions that should be taken to avoid or prevent these accidents, and gives directions for treating persons suffering from electric shock or burns.

Definitions.

To make this circular clear to persons not familiar with electrical matters, the following terms are defined:

Electric conductor.—An electric conductor is something through which electric current may flow, just as a pipe is something through which water may flow.

Electric Circuit.—An electric circuit is a system of electric conductors joined together so that electric current may flow through them, as water flows through a system of pipes.

Complete Circuit.—A complete circuit is one in which the current may flow freely, with nothing to stop it.

*Miners' Circular No. 5, U. S. Bureau of Mines.

Current strength.—The strength of a current is its amount. A large current may be considered as stronger than a smaller one, because it has more effect upon a man's body.

Alive and live.—Alive and live are terms that mean 'charged with electricity,' and are used in speaking of conductors, circuits, and machines that are in a condition to give an electric shock.

Insulator.—An insulator is something that stops the flow of electric current, just as a dam stops the flow of water.

Voltage.—Voltage means electric pressure. Voltage causes electric current to flow, just as water pressure causes a current of water to flow.

Chances for Shock in Mines.

In handling live electrical machines or wires, or in working near them, care must be used to avoid getting a shock. This is especially true when the wires or machines are underground, because, as a general thing, there is little space, little light, and much dampness in a mine, and these are conditions which help to make electrical accidents possible.

The fact that the earth is used as a return circuit for the electric current places the miner in the position of standing upon one terminal of an electric generator; therefore, if he touches only a single point connected to the other terminal of the generator (such as the trolley wire, a metal part of a switch, a bare place on a mining-machine wire, or a live part of a motor) he is likely to receive a shock, the effect of which will vary with conditions from a severe jolt to a bad burn or even death.

General Causes of Shock.

A man's body is an electric conductor, although it is not as good a conductor as a trolley wire or a track rail, and current will flow through the body if it is made part of an electric circuit. The effect that such a current will produce depends upon its strength. The current may be so small that it can not be felt; it may be only strong enough to give a slight shock; it may be so strong that it will burn the body; or it may be strong enough to produce insensibility and death.

The amount of current which will flow through a man's body when it is made part of an electric circuit depends upon two things:

- (1) The voltage or pressure of the circuit.
- (2) The completeness of the contact between the man's body and the circuit.

Under the same conditions more current will flow from a large voltage than from a smaller one. A single-cell battery giving 1 to 2 volts can cause a current to flow through the body, but the current is too small to be felt. Much more current will flow through the body from contact with a 110-volt circuit. Such a current will give a slight shock. Contact with circuits of higher voltage allows even stronger currents to flow, and these give more severe shocks.

If a perfect insulator could be found, a man might stand upon it and place his hand upon a 500-volt trolley wire without receiving a shock, because the circuit through his body would not be complete and no current could flow. If a man should stand upon damp earth and handle a live trolley wire with gloves that were moist with sweat he would probably receive a severe shock, because a circuit would be completed through his body. If he wore no gloves the shock would be heavy enough to knock him down and might even kill him, because the circuit through

his body would be still more complete. There are some men, but not many, to whom this last statement does not seem to apply.

It is most important to realize the extreme difficulty of so insulating the body that a circuit can not be completed through it. There is no such thing as a perfect insulator, although for practical purposes a number of things may be so considered. The most that can be done is to so insulate the body that the current which passes through it will be so small that no shock will be felt. The difficulty of doing this becomes greater as the voltage that is handled increases.

The most common voltages used underground are 110, 250, and 500 to 600 volts. The first voltage, which is used very rarely, is not hard to guard against, and the conditions under which it will give a severe shock are seldom, if ever, met. It is much more difficult to protect the body from 250 volts, and in working about circuits of 500 to 600 volts great care must be used in order to escape shock, especially when the earth is used as one side of the circuit, as it very often is in mine work.

Some Direct Causes of Shock.

TROLLEY WIRES.

The reports of the mine inspectors of several States indicate that most of the shocks received in mines result from contact with trolley wires. These wires have to be bare of insulation, and they can not easily be shielded from passers-by throughout their entire length. A trolley wire must often be strung less than a man's height from the floor, with a track rail almost directly underneath it. Everything combines to make it dangerous to travel in the same entry with a trolley wire, especially if tools are being carried or things are happening that distract the attention. Great care is necessary to avoid shocks in crossing over trips of cars or entering or leaving them from the trolley-wire side. In such cases a man's head must pass close beside the wire at the time that his attention is given to watching his footing.

ACCIDENTALLY CHARGED EQUIPMENT.

Next to contact with trolley wires, the most likely cause of shock is contact with parts of machines or equipment that are not supposed nor intended to carry current, but are accidentally charged with electricity. This charging is caused by the failure of insulation or by a live wire coming in contact with equipment. The frame of a motor or cutting machine or the iron casing of an inclosed switch may become alive and may then give as bad a shock as a trolley wire. Such a condition is especially dangerous because it is unexpected.

The frame of a locomotive is usually so completely in contact with the track rail that a man can not get a shock by standing on the rail and touching the locomotive, but this may not always be the case. If for any reason there is a great deal of sand on the rails the locomotive frame may be almost completely insulated from them. In that case a shock may be received from the locomotive frame or the draw-bars of cars coupled to the locomotive.

Other shocks are caused by contact with those parts of equipment that are known to be alive but are touched by accident while handling apparatus or repairing it. This applies to connections made to the trolley wire while it is carrying current, to the ad-

justment of motor brushes, and to all repairs made to apparatus that is alive.

Precautions.

The best way to avoid electric shock is to show due respect for the electric current. Indifference to the dangers of electricity does not indicate courage or wisdom, but poor judgment and ignorance. The fact that a man does not get hurt when he is careless in handling electric wires does not prove that he is cleverer than other men, but rather that he is more fortunate. The worst feature of such acts is the bad effect that they have on those who see them or are told about them. Those who know about electrical apparatus and are employed to handle and repair it should try to teach others to be careful instead of encouraging them to be careless.

The only sure ways to escape shock are to keep away from the trolley wire, especially when carrying tools; to avoid touching electrical machines unnecessarily; and to provide and use some means of insulating the body when making repairs on electrical apparatus. If there is a way to cut off the current from apparatus the current should be cut off before the apparatus is handled. If it is necessary to work on apparatus that is carrying current, every precaution should be taken to insulate the body from the ground.

It is impossible to tell whether conditions are safe unless the workman has made them so himself. No one can tell by merely looking at a motor whether or not the parts that carry current have come in contact with the frame of the machine. A workman can not be certain whether the place where he must stand to repair live apparatus will sufficiently insulate his body from shock. The only way for him to be safe is to provide something suitable to stand on while making repairs. In doing this he should remember that dryness is the most desirable quality. Dry boards, free from nails, are good for the purpose.

Rubber gloves or leather gloves in good condition and without metallic fastenings will protect the body from shock. If the rubber covering of the gloves is worn thin the gloves give almost no protection. The same is true of leather gloves that are damp with water or sweat. Rubber boots without nails in the soles or heels are good protection when new, but if the soles are worn or cracked, their insulating value is doubtful.

The position of the body is an important matter in handling apparatus that is carrying current. If a man has merely to make some adjustment he should use but one hand, if possible. He should also try to place his body so that the involuntary recoil from a possible shock will remove his hands from the apparatus instead of causing them to grasp it.

The use of rubber tape on the handles of pliers, screw drivers, and wrenches can not be depended on unless the tape has been freshly and carefully applied. Rubber coverings for the handles of such tools are a protection if the coverings are new and in good condition, but even then the chances are great of touching the hand or the fingers to an uncovered part. Insulated tools should not be trusted to give entire protection.

There is one practice that can not be condemned too severely, and that is the wilful giving of electrical shocks to others. This may be done impulsively or may be deliberately planned, but it is always dangerous. The effect of such a trick can not be foreseen because there are so many things to consider. The

person who is given the shock may be so placed and so constituted that serious and even fatal results will

Explosives and Electricity.

Great care should be used in handling explosives near electric current. It requires only a very small electric spark to set off powder. An exceedingly small current passed through the powder itself will explode it.

In carrying explosives in mine cars care should be taken to keep the packages off the floor of the car and away from the iron fittings, as these frequently receive current from the draw-bars, especially when the motorman is using sand on a slippery rail. Packages of explosives should be kept closed, and should not be taken into cars that are near the locomotive, as sparks are often thrown down from the trolley wheel.

The safest thing to do is to keep explosives as far away as possible from all electric current. If explosives must be handled near the current, use every precaution to protect the packages.

Some Suggestions.

The following suggestions given below, will help to lessen the number of electrical accidents

(a) SUGGESTIONS FOR MINE FOREMEN.

Don't allow explosives to be carried in cars near
Don't allow inexperienced men to handle electric wires.

Don't fail to protect the trolley wires at crossovers and partings.

Don't allow wires to be installed in a slipshod manner.

Don't fail to have wires promptly repaired after roof falls.

Don't allow explosives to be carried in cars near the locomotive.

(b) SUGGESTIONS FOR ELECTRICIANS.

Don't fail to set a good example for less experienced men to follow.

Don't work on live apparatus if it is possible to cut off the current.

Don't stand directly on the ground and work upon live apparatus of any kind—get something dry to stand on.

Don't rely upon gloves for protection, unless they are perfectly dry, free from holes, and without metal parts.

Don't, under any circumstances, work on live apparatus that is charged with a voltage greater than 650 volts.

Don't handle wires carelessly just because they are insulated.

Don't send an inexperienced man to work on or about live apparatus.

Don't neglect to inspect your equipment regularly.

Don't ever cause anyone to receive an electric shock.

(c) SUGGESTIONS FOR MINERS.

Don't think that it is smart to get an electric shock. Every time a man gets a shock it shows that he has been lacking in care or knowledge.

Don't be ashamed to be careful. You owe this not only to yourself but to others who may follow your example.

Don't handle wires or electrical apparatus of any kind unless you are told to do so.

- Don't get off or on trips from the trolley-wire side.
- Don't carry tools on your shoulders when crossing under the trolley wire or when travelling in the same entry with it.
- Don't travel in the same entry with the trolley wire if you can avoid doing so.
- Don't get your explosives near electric wires.
- Don't allow packages of explosives to come in contact with the metal parts of cars.
- Don't carry explosives in cars near the locomotive.
- Don't ever cause anyone to receive an electric shock.
- Don't ride on electric locomotives.
- Don't fail to report when you find that electric wires are down.
- Don't install temporary lights — leave that work to the electrician.

Treatment for Electric Shock.

When a man has received an electric shock that leaves him senseless, two things should be done as soon as possible.

First, remove the victim from contact with the electric wire.

Second, rive him or "bring him to," by getting him to breathe.

While removing the victim from the electric circuit, be careful not to get a shock yourself. If there is a switch right at hand, cut off the current at once; but if there will be any delay in cutting off the current, remove the body from the circuit by means of a piece of dry wood, used either to roll or push the body aside or to lift from the body whatever is carrying current to it. Tools with dry wooden handles, such as picks or axes, may be safely used for this purpose.

The body of the victim can be safely grasped if your hands are protected by several thicknesses of dry cloth, or if you stand upon a piece of dry wood.

When you can do nothing else, you may be able to short-circuit the line with which the victim is in contact, and thus blow the circuit breaker or fuses which protect that part of the electric system.

A short circuit may be made by placing an auger or drill or a piece of pipe so that it will connect the two sides of the electric circuit. For example, in case the victim is in contact with a trolley wire, the auger, drill, or pipe should be thrown across the trolley wire and track rail, so as to be in contact with both. In doing this, be sure that the auger, drill, or pipe leaves your hand before it touches the current-carrying part of the circuit, as otherwise you will get a shock yourself.

When the victim has been removed from contact with the current, turn him on his back, loosen the clothing from around his neck, chest, and abdomen, and place a small log, a rolled-up coat, or something of similar size and shape under his shoulders in such a way as to throw his head back and his chest up.

The next thing to do is to draw out the victim's tongue, which can best be done by grasping it with a piece of dry cloth. This act clears the windpipe, and unless it is done, the victim can not be made to breathe. If the rescuer is alone, he will have to keep the tongue in this position by tying it with a handkerchief or a bandage passed over the tongue and under the jaw.

The tongue must be held in this position while giving artificial respiration.

There are several methods of giving artificial respiration, but the one most commonly used is the Sylvester method. Kneel behind the head of the victim,

grasp the forearms just below the elbows, and draw them slowly backward until they are extended as far as possible over his head, and hold them there for about one second.

Then slowly push the elbows forward and downward. Next press the chest and hold them there for about one second so as to drive out the air from the lungs.

Do not perform these movements hurriedly; pumping the arms up and down is a waste of time. To complete one series of movements should take about four seconds. A very good way to time yourself is to count, very slowly, "one, two, three, four," while making the movements. Count "one" as the victim's arms are being extended, count "two" while they are being returned to his side, and count "four" while exerting pressure on his chest.

Usually a victim of electric shock can be made to breathe within an hour, and the artificial respiration should be continued at least that long, even if the patient does not show any signs of being "brought to."

If other persons are at hand, have them assist by relieving you at short intervals, and have them keep the victim warm by covering him with coats or anything else that may be at hand. After the victim begins to breathe, the assistants should rub his limbs briskly and toward the heart, keeping their hands under the covering while doing so. This will help to restore the circulation of the blood, which has been for a time suspended.

While arrangements are being made for removing the injured man to his home or to a hospital, treat any injuries that the victim has received. Treat electric burns exactly as ordinary burns. Before the arrival of a doctor it is proper to cover the burnt place with several thicknesses of picric-acid gauze. This gauze is now being used in nearly all mines and hospital emergency rooms.

In case no picric-acid gauze is at hand, the burns may be covered with clean gauze, preferably taken from sterile packages, and covered with vaseline, carbolyzed vaseline, olive oil, linseed oil, or what is known as carron oil, which is a mixture of linseed oil and lime-water.

Cover these dressings with plenty of cotton and protect this in turn from the outside air with oiled paper or anything that will keep out the air while the victim is being taken home or to a hospital.

Bandage all dressings lightly, so as to cause as little pressure as possible upon the injuries.

Magnesia rarely occurs in brick clay in larger proportions than one per cent.

A convenient item in the prospector's equipment is the oiled silk tent. For the man who is travelling by himself, or with but one companion, the canvas tent is heavy and cumbersome. Light loads mean a great deal to the man who has to cover virgin territory.

The care of belting for power transmission is a most important factor in industrial establishments. The individual electric motor drive has not displaced the belt drive. The mathematics of the question have not been fully developed; but it is known that the tension is an extremely variable quantity, a quantity affected by atmospheric moisture, by the age of the belt, and by other uncontrolled factors.

High Grade Ore Deposits of the Portland Canal District.

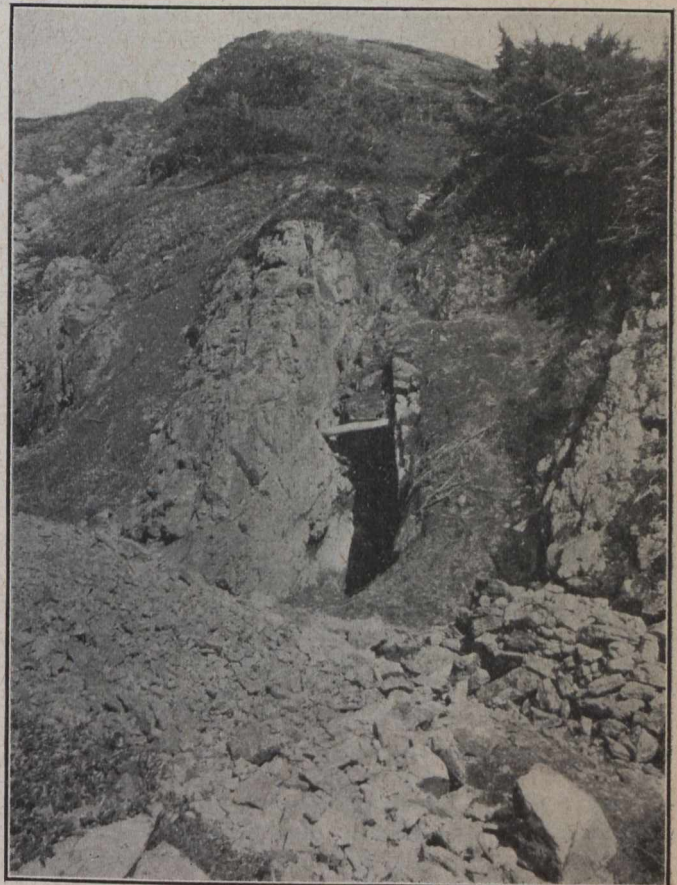
(By an Occasional Correspondent.)

There are fashions in mining as in millinery. The public favour turns from Cobalt stocks to California oil with as little apparent reason as is incident to a change in style of bonnets. A leaching process is in vogue, and every mine manager tries to apply it to his particular problem until some new 99.99 per cent. process supplants it. It is interesting to watch some technical term making the rounds of the trade and scientific publications. For some time in this district the low graders have not only held the centre of the stage, but have pretty well monopolized the whole show, more capital having been found for their exploitation — the usual undiscerning human deference to large expenditures of money. Disparaging references to "high assays" have been fashionable. Even the Provincial Mineralogist seems to have fallen in with the popular mood. In the last annual report of the Minister of Mines, he says: "The camp contains a large number of properties from the prospect workings of which exceptionally high assays have been obtained, giving rise to unwarranted hopes and statements which can not be borne out on a strict examination. . . . In the opinion of the writer this portion of the camp will be comparatively low grade concentrating propositions, from \$10 to \$20 ore, the high grade minerals being difficult to concentrate and not sufficient in quantity to dispense with this process." It would be singular if a large number of properties yielded exceptionally high assays without here and there a workable deposit of high grade ore. In view of the fact that the Provincial Mineralogist visited none of this class of properties, and that at the time of his visit none of the low grade properties had repaid a cent of their large capital expenditure, his statement is manifestly unfair and wholly unwarranted, and it is the purpose of this article to remind the investing public that the ores of Portland Canal are not all low grade; that the initial expense of operating high grade properties is negligible in comparison with the cost of necessary equipment for exploiting low grade ore; and that it is by no means proven which class of properties in this district will develop the best dividend payers.

In an inhospitable country where the economic pressure is greater than in the Coast district, no doubt considerable ore would have been produced from discoveries of equal promise. But living is easy on the Coast, the prospector has been pessimistic regarding his discoveries or inexperienced as to economical methods of exploiting them; transportation difficulties have been great, and so he has preferred to sit back and wait for the boom and the capitalist, rather than take the risk of mining and brave the winter's snows in the lonely canyons of the hills. Now that transportation facilities have been greatly improved and the stock market is no longer an Aladdin's Lamp, it is probable the succeeding years will see shipments of high grade ores of increasing commercial importance.

I include under the head of high grade ores, all ores that can be brought to market at a profit without preliminary treatment and by a primitive mode of transport — in short, "rawhide" ores. The minimum assay value of such ore under present transportation facilities would be in the neighbourhood of \$50 per ton. There are a considerable number of properties in the

district, silver-lead chiefly, that belong in the rawhide class. Among them may be mentioned, on Glacier Creek, the "Lakeview," the "Francis," and the Rush-Bagg-Nelson group; on American Creek, the "Bonanza." The Lydden and Eusch claims and the holdings of the Northern Terminus Company. The "Mountain Boy" carries lenses of splendid ore along with large bodies of concentrating material. At the Northern Terminus a trail has been built to the Red Cliff to connect with the railroad; ore is being sacked and a camp is being equipped for mining and rawhide



Tunnel and Ore Dump, Excelsior Mine.

ing ore during the winter. On Salmon River, Seattle parties have been doing quiet but effective development work on a grey copper property belonging to Linderbourg Bros. High grade ore is also reported from the Upper Salmon, Bitter Creek, and Upper Bear River. This list does not pretend to be complete.

Among the high grade properties of the district the Rush-Bagg group of claims, situated between the north and south forks of Glacier Creek, occupies a place of leading importance by reason of their extent, values, and advantageous position. With this section the writer has considerable familiarity, and a discussion of its characteristics may be of interest. Rush and Bagg's main camp is reached by horse trail $3\frac{1}{2}$ miles from the Portland Canal mill. The "Ben Bolt" mine, Sir Donald Mann's property, uses the same trail for $2\frac{1}{2}$ miles. The camp is situated at an altitude of 2,000 feet in a heavily timbered cleft in the hills, on the

banks of the Middle Fork. R. G. McConnell describes this section as a region of basic intrusives. For a cursory examination this is as accurate as could be expected. It will be found, however, that the main structural differences between this section and adjacent country are: (1) the entire absence of granite; (2) smaller areas of argillites and larger areas of intrusives; (3) the presence of a bluish to greenish siliceous limestone that blends into the intrusive and may be mistaken for it. The intrusive will usually be found to be a diabase. A basic porphyrite occurs, probably formed from the same magma. Successive bands of slate (argillite) show the formation to be regular, striking and dipping as in the adjacent country. Faults are unusual. Quartz veins frequently accompany the slate bands, carrying ore similar to that found in the Ben Bolt and Portland Canal mines. Veins of this class are found on the "Sentinel" and "Jupiter" claims. The whole region is criss-crossed with barren or sparsely mineralized quartz veins, without any regularity of strike or dip. Ankerite occurs but is not important as a gangue. Rusty "blowouts" are common, especially on the Excelsior and Eagle claims.



Upper Tunnel, Evening Sun Mining Co.

But it is the high grade veins in which we are particularly interested. These veins invariably cross the formation and dip at a steep angle. They divide themselves into two classes: (1) Siderite veins (striking N.E.). A vein of this class is found outcropping on both sides of the creek at Rush & Bagg's camp. It has been traced down one hillside and up another, through the "Columbia," "Evening Sun," and "Silver King" claims. The vein is very regular, free on both walls, and up to 10 feet in width. The gangue consists of siderite, quartz, and sheared country, softened and transformed by mineral solutions. The sulphides, pyrite, arsenopyrite, galena, zinc blende, stibnite, and grey copper are disseminated throughout the vein, and are frequently found concentrated in lenses and shoots of solid sulphides, varying from clean ore to combinations of every degree of complexity. The chief value of the ore is its silver content, which is found associated with galena, zinc blende, and what is locally called "grey copper," probably freibergite. The last-named mineral has been found, when pure, to assay up to 3,950 ounces silver per ton. Two 75-foot drifts have been driven on the Evening Sun, and a 35-foot drift on the Columbia — far too little work to prove

the ground when the capricious nature of high grade silver deposits is considered. One tunnel shows better ore than the surface, and the other two vice versa. On the Silver King the same vein has been opened up by three tunnels, two of which have developed shipping ore. A spur vein on the Evening Sun is 5 feet wide and shows a strong shoot of the usual character of ore.

The Excelsior, situated one mile east of the Ben Bolt camp has two similar veins or vein systems about 1,000 feet apart. The south vein has about the same width as the Columbia vein, and has been traced upwards of 1,000 feet, outcropping for about half that distance. It is not so regular as the Columbia vein but its ore and gangue are almost identical. There are several tributary veins, two of which at least carry high grade ore in some quantity. The development



Open Cut, Columbia Mining Co.

consists of a number of open cuts and trenches and two short drifts, one on the trunk vein and one on a spur. The north vein is rather a wide vein zone with successive parallel lenses of ore and spurs into the adjoining country. It has been traced 400 feet by a line of outcrops connected by float. Beside the usual ore and gangue there is considerable chalcopyrite. Development is limited to a series of open cuts.

(2) Quartz veins (striking N.W.). On the Katherine claim of the Rush-Portland Mining Company, a vein of this class has been traced some 500 feet, varying in width from 1 to 5 feet. The mineral contents of the vein are similar to those of the siderite veins with the exception that there is less lead and antimony and more arsenic. A tunnel has been driven on the vein for 110 feet, developing throughout its length ore similar to that found on the surface. A small trial

shipment has been sacked that samples \$160 per ton in gold, silver, and lead. The same company has a similar vein on the Elsie claim on the opposite side of the ridge. This vein appears to carry some native silver in a finely divided state, in addition to the usual sulphides. The lowest opening shows 3 feet of quartz with heavily mineralized paystreaks, along both walls. A drift has been started. The convergence of this vein, with a tributary just after the vein leaves the bluffs and disappears under the talus, makes it appear probable that the best of the vein is covered. Two strong veins outcrop on the Ne Plus Ultra claim, but they have not been prospected even superficially.

Lack of funds has hitherto prevented the companies operating in this section from doing any considerable amount of exploratory work, but enough has been accomplished to demonstrate the existence of rawhide ores—"Slocan" ores in some quantity. Any person who is well informed regarding the Portland Canal district, knows that such ores are of rather frequent occurrence throughout the camp. When a fraction of the money that has been spent here on low grade ores has been used in developing these high grade deposits, it will be early enough to pass judgment upon their value.

NOTES ON MINERALS FOUND IN THE SLOCAN DISTRICT, B.C.

The following paper was prepared by Mr. Wm. Thomlinson, of New Denver, B.C., and read at a meeting of the Western Branch of the Canadian Mining Institute, held in the Slocan Lake District last September. Mr. Thomlinson stated, in his introductory remarks, that he intended to deal more with some things not generally known concerning the mineral occurrences of the Slocan, than with the ordinary commercial ores of the district. He then proceeded, as under:

High-Grade Silver Ores.

As the high-grade character of the silver-lead ores of the Slocan is now so well known, I shall refer but briefly to these, for my chief aim now is to give information relative to other minerals also found in the district.

First, though, I would mention that I think the high silver content of both the silver-lead and the "dry" ores of the district is due mainly to their containing freibergite, or grey copper, a variable and complex variety of tetrahedrite, which is, in this district, usually rich in silver. Other high-grade silver minerals, such as argentite and pyrargyrite, also occur in the ores, but, I think, are not generally so important as the freibergite. As examples of ores rich in silver I give herewith analyses of two samples of freibergite from the Slocan Star mine, situated near Sandon:*

	Sample A.	Sample B.
Silver, per cent.	19.57**	15.14***
Copper, per cent. ..	14.57	11.27
Zinc, per cent.	10.53	8.15
Iron, per cent.	7.51	5.81
Antimony, per cent..	22.91	17.72
Sulphur, per cent....	24.91	20.13

*From the "Report of the Commission Appointed to Investigate the Zinc Resources of British Columbia, Mines Branch, of the Department of the Interior, Canada, 1906."

**A—19.57 per cent. silver equals about 5,706 oz. per ton of freibergite.

***B—15.14 per cent. silver equals about 4,415 oz. per ton freibergite.

Zinc Ores.

As to the zinc ores of the district — sphalerite, or blende (sulphide of zinc) is practically the only zinc mineral found. It occurs in considerable quantities associated with all classes of silver and silver-lead ores, and is seldom of shipping grade as crude ore, or without having first been concentrated. Much of the ore of the Lucky Jim mine is a notable exception, a comparatively large quantity of this ore averaging more than 50 per cent. zinc, having been shipped in its crude state.

Other Minerals.

Regarding other minerals found in the Slocan, I shall, for the sake of brevity and clearness, place them under subheads, as follows:

Gold.—A majority of mining men and the general public outside of the district think there is no gold in "the Silvery Slocan." To some extent this is a mistake. Fine specimens of free gold have been found on claims situate on Lemon Creek, and samples of dry ore from Springer Creek, Eight-mile Creek, Four-mile Creek, and the north fork of Carpenter Creek, have been found to run high in gold. Two cars of ore from the Kile group, on Lemon Creek, gave smeltery returns of nearly \$80 per ton in gold. About 15 years ago two prospectors shipped from a prospect on Eight-mile Creek five tons of gold-bearing quartz, which shipment was made in my name, so that I can vouch for the accuracy of the statement that the returns received from the smeltery showed a gold content of a value of \$125 per ton.

In the Slocan gold occurs chiefly in the dry ores, but there has been one prominent exception within the silver-lead producing area of the district, for at the Monitor mine, near Three Forks, carload lots of silver-lead ore were found to contain as high as \$15 per ton in gold, and even the zinc concentrate of ore from this mine assayed from \$2 to \$12 per ton in gold.

Silver.—The principal silver minerals of the camp are: (1) freibergite, (2) pyrargyrite, and (3) argentite; their importance being, I think, in the order here given. These minerals are often found in a decomposed condition, as dark stains, or powdery masses in the vein gangue or selvage. In such cases the term "black sulphurets," or simply "sulphides of silver," is used. Alteration of freibergite or grey copper usually gives green and blue stains through the ores and, in most cases, these indicate the presence of much silver, especially in the so-called dry ores.

Chlorides and bromides of silver are said to occur here, but I have never seen these minerals in the district, so, like the Scotsman, I "hae ma doots"

Native silver occurs at many places, especially in the dry-ore belt, from Four-mile Creek southward to Lemon Creek.

Fine specimens of arsenical ruby-silver ore (proustite) have been found on prospects on the north side of Ten-mile Creek, and from the same claims specimens showing cobalt bloom (erythrite) can be obtained.

Lead Minerals.—Of course, galena, the sulphide of lead, comes first, as it is the main lead mineral of the district.

The secondary lead minerals, carbonate of lead (cerussite) and sulphate of lead (anglesite) are not plentiful, although the carbonate ore does occur in shipping quantities.

The hard, clear, crystalline variety of carbonate is rarely found here, the commoner form being as granular or powdery masses intermixed with oxides of iron, limey vein matter, etc.

Zinc Minerals.—As already stated, blende, the sulphide of zinc, is the only zinc mineral of importance found here. In the Slocan, as elsewhere in the north-west corner of North America, the secondary zinc minerals appear to be almost entirely absent. Whether the ore deposits in this part of America are of comparatively recent origin or the climatic conditions have been unfavourable for the alteration of the sulphide ore to carbonates and silicates of zinc, I shall leave to abler men to determine.

Copper Minerals.—Copper minerals occur here, but, to date, no ores of copper have been produced. However, there are great possibilities, even in this direction, especially on Eight-mile Creek, south of Silverton.

Yellow copper (chalcopyrite) occurs all over the district, and associated with all classes of lead, silver, zinc, and gold ores. In the dry ores, yellow copper is closely associated with the grey copper, and at the Arlington mine, on Springer Creek, yellow copper served as an indication of the presence of high-grade silver ore. I have noted a similar connection in ore from the Standard mine, on Four-mile Creek, near Silverton. Some specimens show chalcopyrite enclosed in freibergite, these associated metals occurring as eye-like inclusions in the galena.

Secondary copper minerals are not plentiful in the district, although green and blue stains — carbonate of copper — are often seen in the local ores, resulting, I think, from the alteration of the copper-bearing freibergite. On Eight-mile the secondary copper minerals, malachite, azurite, and cuprite, are conspicuous along the outcrop of a large mineralized zone of eruptive rock. In this zone, chalcopyrite, iron pyrite, and, I believe, nickel-bearing pyrrhotite, are also found. Some good specimens of carbonates and red oxide of copper can be obtained here, and they give clear proof of their secondary origin, as they occur on or near the surface of the mineralized rocks, and are found containing inclusions of twigs, roots, pebbles, etc.

Iron Minerals.—No ores of iron are found here, but pyrite, pyrrhotite, and oxides of iron are all closely connected with the local ore deposits.

Vein Fillings.—In the silver-lead producing area the vein material is usually quartz, calcite, and siderite, with graphitic rock and talcose-clayey selvage. Veins in the granite or grano-diorite area have a filling of quartz, feldspathic rock, calcite, and siderite, also with a clayey-talcose selvage.

Antimony.—Stibnite, the sulphide of antimony, occurs at several places in the district, the largest deposit yet found being on the north fork of Carpenter Creek. A car lot of high-grade antimony ore was shipped from there a few years ago, when antimony was selling at 25 cents per pound. The property from which it was taken is not at present being worked.

Molybdenum.—Molybdenite (sulphide of molybdenum) is found in small quantities at half a dozen or more places in this district, but the deposits have not yet been developed, or even examined closely.

Tungsten.—Scheelite (calcium tungstate) has been found at the Meteor mine, on Springer Creek. The occurrence is small, but this mineral may have been frequently overlooked in properties near the Meteor, in the same granite formation, owing to the resemblance of the pinkish-coloured scheelite to the inclusions of reddish feldspathic rock in the veins there.

Other Minerals.—I believe that some nickel and cobalt minerals occur on Eight-mile Creek, but cannot yet speak with certainty as to this.

Native arsenic and arsenopyrite are found on the L. H. group of claims, situated on Red Mountain, south of Silverton, and here, as elsewhere, gold is associated with the arsenical iron.

Heavy spar, barytes, sulphate of barium) occurs at two places on Four-mile Creek, in one instance closely associated with lead ores, on the Robin claim, near the Standard mine.

Both fluorite and kaolinite are found near The Mountain Chief mine, about two miles from New Denver.

As an illustration of the fact that the mineral possibilities of this old mining camp are not even yet fully known, I may add that during a quite recent prospecting trip in the granite area, I looked over two unworked mineral claims, and on one I found huelandite, a member of the zeolite family of minerals, while on the other I found tourmaline, a well-known associate of tin ores.

A brief discussion followed the reading of this paper, and Mr. Thomlinson was complimented upon the instructive and interesting nature of the information he had presented before the meeting.

Cuban Iron Ore Deposits

Written by DWIGHT E. WOODBRIDGE.*

On the north coast of Cuba there are iron ore deposits in the nature of laterites, amounting to something more than 200,000,000 tons. Six years ago the existence of these ore bodies was not known. They lie in the Province of Oriente, near the east end of the island, and adjacent to the sea. They are owned by various steel-making interests in the United States,

*Mining Engineer, Duluth.

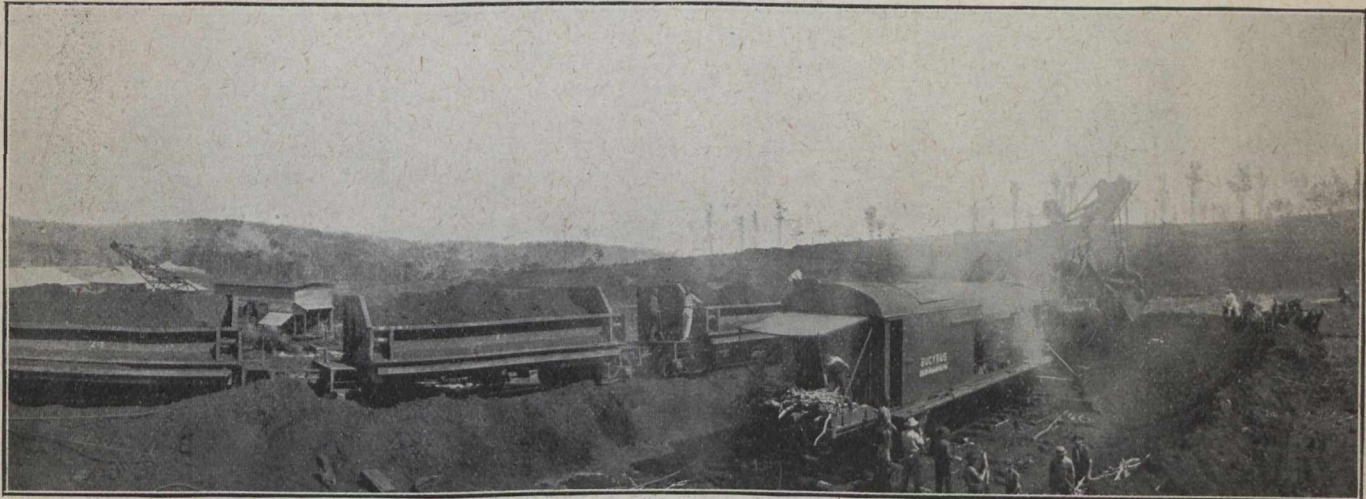
and one of these steel-making concerns is using about 1,000,000 tons of this ore a year in the manufacture of high-grade, low phosphorus nickel steels.

This north coast Cuba iron ore is peculiar in several respects. It is a brown ore, high in moisture and alumina, very low in silica, with practically no phosphorus, and carries about .7 per cent. in nickel. These ores are upon the top of the ground; that is, they form the soil, and the average thickness of the ore beds is

not far from 20 feet. They are nowhere distant more than ten miles from the sea. All of these considerations make them of exceptional value.

Let me emphasize the fact that no surface of soil exists over these ores; that, indeed, the ore itself is the soil, upon which grow either pine forests or a characteristic tropical jungle. On the lower elevations and in the better drained of the upland interior, pine predominates; inland, where the rainfall may be heavier, and wherever it remains more persistently after falling, the verdant jungle enters. It closely resembles the jungles of northern South America, with its

posed entirely of this material, it is usually carried in a matrix of soft ore, and it was the original design, at the time of discovery, to wash this hard ore from the surrounding red soil and ship a product of indurated iron ore. This scheme was impracticable. During the course of experiments having in view the washing of this material, it was found that the soft matrix was as good as the hard ore, and when this fact was fully realized the great size and vast importance of these deposits were appreciated and their possibilities were realized.



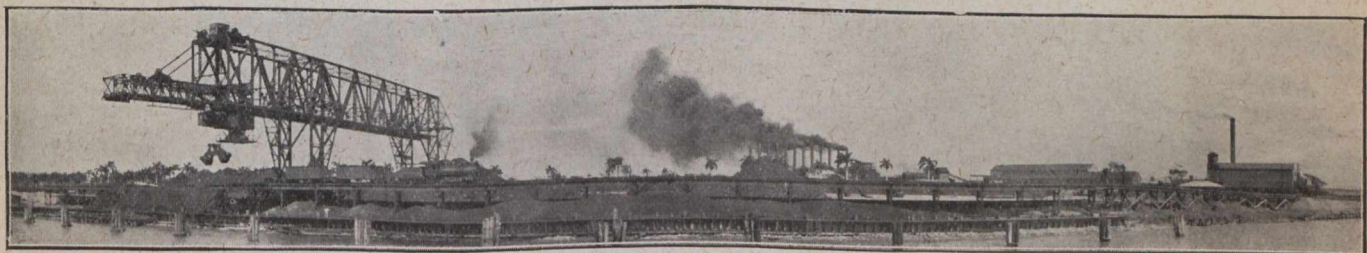
Mining Iron Ore by Steam Shovel, Mayari Fields, Cuba.

tough, cord-like creepers, its strange arboreal growths, and its dense poisonous and prickly shrubbery. It is hard to penetrate unless one has in his hands that omnipresent weapon, the machete. In the belief that a thin capping of surface-soil and humus might lie above the ore in these jungles, I took many samples in these woods at varying depths, which showed on analysis that, when found at all, the ore extended to the surface, whether it was timbered or not. No stripping of these ore bodies is necessary to fit them for mining, and during the dry seasons a lighted match may be applied to the forest-floor and the fire will clean off all organic matter above the ore, leaving it free and fit for immediate mining by the steam shovel or other means of excavation.

A typical analysis of these ores dried at 212 degrees, is about as follows:

	Per cent.
Silica	3.37
Fe	43.67
Al ₂ O ₃	13.07
Cr	1.745
Ni	
Co}	0.8025
P	0.008
S	0.107
Combined H ₂ O	11.59

Hygroscopic moisture varies with the seasons, but may average about 15 to 20 per cent.



Loading and Nodulizing Plant, Mayari

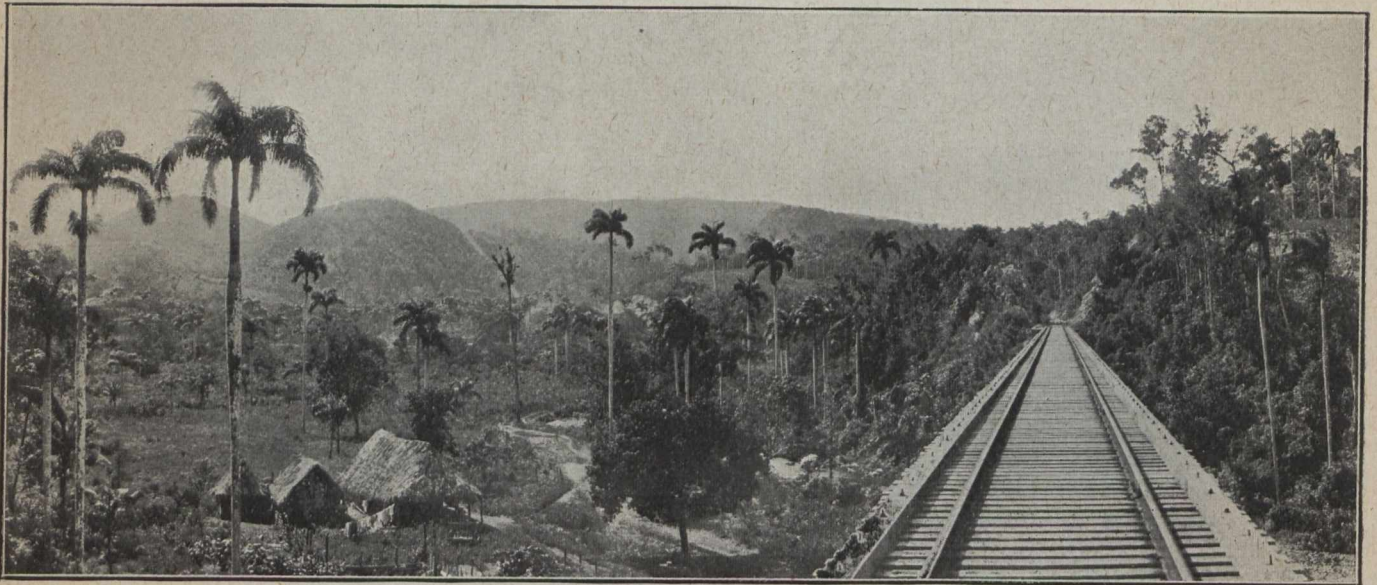
Scattered about the surface of these deposits are boulders, flat sheets, pellets, and nodules of hard iron ore, somewhat dehydrated, and varying from masses of many tons to pieces the size of minute bird-shot. Natives call the pellets "shot-soil," a name warranted by their appearance and by the use to which they sometimes have been put, both in peace and in war. While the upper inch or two is occasionally com-

About two years ago the Pennsylvania Steel Company began smelting these ores, after an investment of several million dollars in railway, beneficiating plant, piers on Nipe Bay, etc. It found the ore admirably adapted to all uses which an ordinary low phosphorus ore might be put to, and, furthermore, found that the nickel alloy gave the steel greatly added strength and elasticity. Up to the present time the major portion

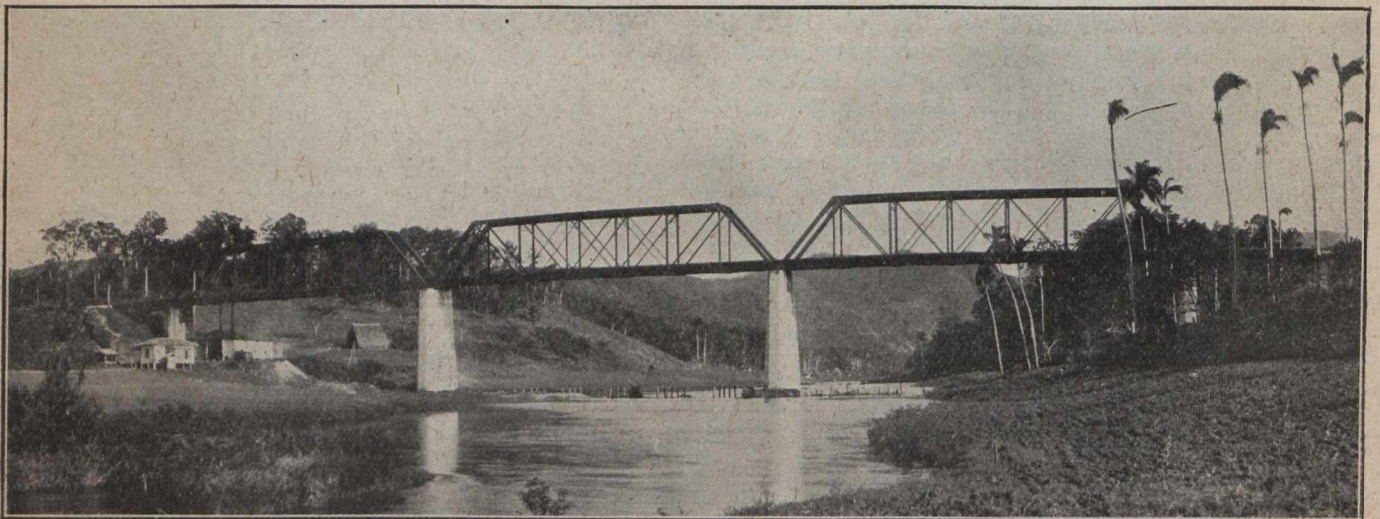
of shipments have been nodulized ores, but the company is now shipping ore in its natural state more heavily than before, and is operating a large blast furnace exclusively on the raw ores. This company is the chief owner of these north coast Cuban ores, having a tonnage variously estimated at from one thousand million tons upwards.

During the last four or five years very extensive explorations have been carried on in these ore bodies I was in charge of an exploration that measured and tested grades on some 750,000,000 tons, no slight ad-

each end of each rod, except where the bit is shaped, is a backing-nut screwed down hard, in order to prevent the rods from working too tightly into the sleeve-nuts when turned into the resisting ground. In most cases ore can be bored by this simple tool with comparative ease, and when hard blocks and boulders are encountered underground, they are sometimes cut by the substitution of a cutting chisel-bit for the auger-point; in other cases the men will move a few feet away and drive another hole, experience having shown that a very short distance will usually be sufficient to



On line of Railway from Mine to Harbor



A Railway Bridge

dition to the world's reserves. By reason of the character of this ore the process of exploration is unusually rapid, simple, and cheap. As has been said above, the ores are claylike, and the walls stand remarkably well. Pits dug several seasons ago still show on their vertical sides the marks of the pick. In exploration the ore is bored by an ordinary two-inch auger-bit, that is driven down by hand. These bits are forged on the end of a sectional rod some four feet long. As a hole is driven down additional threaded sections are screwed on the rod, making it any desired length. On

avoid a boulder. The hole is started through the drier top soft ore or nodules on the surface, a little water is poured in, the bit lifted and driven down by the combined strength of two men, and then turned in the ore. The work is a combination of churning and boring. Every few feet the tool is lifted, the ore adhering to the bit is cleaned off by pressing a stick into the point of the bit and revolving the tool, and saved for analysis, and all sludge that has collected above the bit is scraped off. If the hole is sampled in sections, all ore taken out of each section by the bit is saved to make

a full sample; but if the hole is sampled as a whole, the ore is all piled upon a cloth and afterwards mixed and quartered down with the ever-ready machete to make a suitable sample. The drilling is hard work in deep or difficult holes, or where nodules are frequent—as hard as any labour that a man can comfortably endure. It is done almost entirely by Spaniards, mostly from the Province of Galicia, who become very expert and earn good pay.

The presence of nickel and chromium has been shown in the analysis noted. The former is found in quantities increasing towards the floor of the deposits. In my own analyses of several hundred samples for this element, the highest percentage found was 1.28 per cent., and the lowest 0.44 per cent., with an average not far from 0.80 per cent. I need not emphasize the economic importance of an iron-ore averaging 43 per cent. of iron, and carrying 0.80 per cent. of nickel. Several hundred tests from chromium showed an average of 1.75 per cent., a serious matter if it were not that a simple metallurgical process will eliminate this element at one stage of the reducing-operation. These ores are of Bessemer grade, lower in silica than the average Mesabi, and not higher in kaolin than some Mesabi ores. Phosphorus exists in very slight proportion. Sulphur is negligible. The high alumina adds to fluidity in the blast furnace and assists reduction. At Felton, on Nipe Bay, the Spanish-American Iron Company, operates a large works for the beneficiation of this ore by drying it in cylindrical, rotating, horizontal kilns heated to a high degree, which reduces, by 33 per cent., the weight of raw ore charged. Against this cost of nodulizing, which may be given at about \$1.25 per ton of product of the kilns, are to be placed the saving in freights and duty, and the advantage to the furnace-man of receiving for treatment a partly-prepared material.

With no over-burden to be removed, the deposit situated close to the sea, with stream-valleys cutting through the ore-beds and running directly to deep water, and with an average thickness suitable for about one shovel-cut, these ores should be mined at low cost by ordinary steam-shovel, or drag-line excavator. One block of 75,000,000 tons, assaying several percentages better than the average of the district and of a thickness of about 70 feet, can be connected with deep water by a railway 4,000 meters long, without excessive gradients. Ore so situated can be delivered on board ship at an actual operating cost not to exceed 20 cents per ton. The average cost of mining and rail-transport to the sea for the entire tonnage in sight should be but little more than this amount, if operations are conducted on a scale of magnitude commensurate with the importance of the undertaking.

It is interesting to make comparisons with this ore and that of the great Mesabi district of Minnesota. Cuba has the advantage in known tonnage, 2,000,000,000 tons, against, say, 1,500,000,000 known on the Mesabi. But the latter is not yet completely explored, and half a billion tons more may be found. With water extracted the ores are of nearly the same percentage of iron, with a slight advantage in favour of the Mesabi. The latter is both bessemer and non-bessemer, with its average phosphorus 8 to 10 times as high as this Cuban ore. Mesabi ores lie from 20 to 150 feet below the surface, while those of Oriente are 80 cents a ton to Lake Superior, 60 cents from lake ports to Lake Erie, and \$2.60 more if the ore is taken to Atlantic ports. These Cuban ores can be gotten to the sea at a transportation charge of 10 cents, and

an ocean freight of 70 cents will take them to Atlantic American furnaces, or \$2 to British ports. The Mesabi range will have shipped to the close of 1911 a total of about 250,000,000 tons at a profit of, say, about \$350,000,000, including royalties. The north Cuban mines are beginning what is doubtless a most important career.

While these are not the only irons in Cuba, they are, naturally, by far the most important. Mining has been under way on the Caribbean Sea, near Santiago de Cuba, for many years, by the Pennsylvania and Bethlehem Steel Companies, and until the discoveries on the north side these Santiago mines were the chief source of supply for those companies. These are hard, high-grade ores, and are in comparatively limited quantities, though probably many million tons remain to be mined.

Estimates of the total iron ore reserves of the world are, for a tonnage, reduced to metallic iron, amounting to 10,000 million tons. Of this these new north Cuban reserves constitute about 8 per cent.

PROPOSED BASIS OF SETTLEMENT OF COAL MINE STRIKE IN ALBERTA AND EASTERN B.C.

The District Ledger, which is the official organ of District No. 18, United Mine Workers of America, and is published at Fernie, Crow's Nest Pass, British Columbia, on October 28th printed the following statement, which it said is "a copy of the understanding of the situation upon which negotiations would be resumed" between the Western Coal Operators' Association and the official representatives of District No. 18, U. M. W. of A. This statement was "given in the letter signed by Hon. Robert Rogers, Minister of the Interior for Canada," and acknowledged as correct by five officials representing the U. M. W. of A. and Messrs. Lewis Stockett and O. E. S. Whiteside, representing the Western Coal Operators' Association. The statement follows:

"In reference to the various interviews I have had with your committee regarding the settlement of the dispute existing in the coalfields of Eastern British Columbia and Alberta, my understanding of the basis of agreement arrived at is as follows:

"That an agreement is to be drawn up, taking the Gordon award of the Board of Conciliation as a basis.

"In this it is understood that an open-shop is conceded to the operators and a non-discrimination clause inserted in the same similar to the one now on file with the Department of Labour at Ottawa.

"That a uniform day wage scale of wages shall apply, applicable to all mines in the Association; said scale to be the scale of the Western Coal Operators' Association of the last agreement with the increased percentage by Dr. Gordon added.

"Contract rates to be the same as provided in the last agreement with the following exceptions:

"1. An increase of three per cent. in contract rates at Lethbridge.

"2. A differential of five cents to seven cents per ton on all pillars presently without a preferential, the application to be made by mutual consent.

"3. An adjustment of the contract rates at Lille mines so as to make the rate proportionate to the thickness of the seams.

"The operators agree to make deductions from union members' wages for union dues for such amounts

as they have given definite orders from the individuals, with specified sum as limit of deduction.

"The management of the mines is to be fully vested in the various companies.

"All employees connected with the management of the mines are not to be under the jurisdiction of the union or members thereof.

"The term of the agreement to be for three and a half years, expiring March 31, 1915."

In the matter of the settling of the prices on new work, which were not determined at the expiration of the last agreement, and of the differential on pillars which was to be determined by mutual consent, it is understood that the committee for each side appointed to complete this agreement determine these prices at once. If they fail to agree, an independent chairman shall be called in to do so. If the committee fail to agree on a chairman, the Minister of the Interior shall

be asked to appoint one immediately

The District Ledger added the following comment:

"Messrs. W. B. Powell, president; C. Stubbs, vice-president; and A. J. Carter, secretary-treasurer, all members of the executive of the Mine Workers, met the Operators to-day for the purpose of discussing details of the proposed agreement.

"As there are many matters of detail to be considered, these will occupy the attention of the parties interested so that they may be drafted out clearly for presentation to the members of the organization to whom they must be submitted so that a referendum vote may be taken.

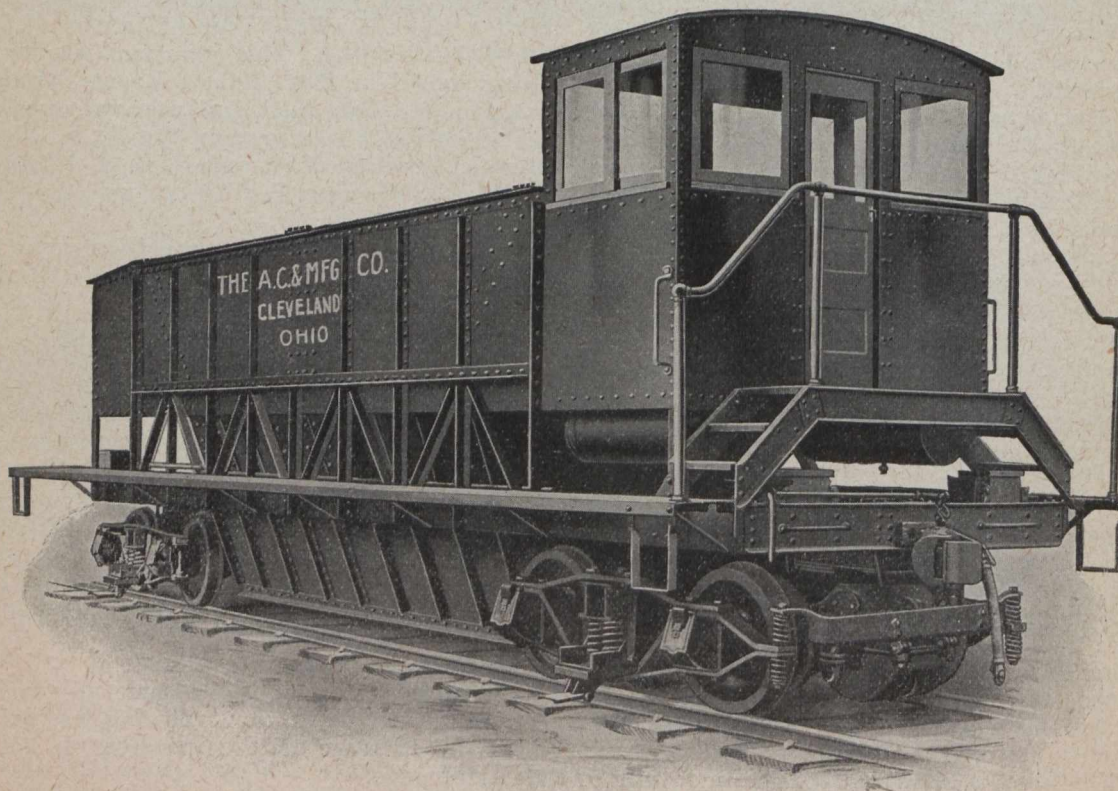
"We may add that it is understood that the men will be given the same working places as they had prior to April 1, provided, of course, that application is made within a time to be specified later."

Industrial Section

A NEW TYPE OF ORE TRANSFER CAR.

A number of new features in construction and electrical equipment have been brought out in an ore transfer car being built by the Atlas Car & Mfg. Co., Cleveland, Ohio. This car was originally designed for handling zinc ore; it is, however, adapted to any other ores.

and easily discharge the load. As the weight of the contents has a tendency to force the doors open after the toggle keeping them closed is released, only a small amount of air is required for this purpose. The tight joint which eliminates the loss of fine ores is made possible by the design of the doors, and when closed they are positively locked. A stationary apron,



The car is rigidly constructed. Box girders support the body, and the sides of the car act as trusses to transfer the weight of the contents to the body bolster. The trucks are of the arch-bar type and are of a very heavy design. Four doors in the bottom of the car are operated in sets of two each by compressed air

running under the car on either side, prevents the scattering of the load, so that the contents are dumped between the rails, eliminating loss.

A cab is placed on each end of the car. The operator's cab is at the forward end, and here are located in convenient positions the air valves, master con-

troller, and minor operating equipment. The auxiliary cab at the rear end contains a contactor controller, resistances, series relay, main line switches, etc.

The power for propelling the car is taken from third rail shoes attached to the trucks. Two 220-volt series relay type motors, which are spring-suspended, propel the car. The motors are rated at 53 h.p., based on a 75 degree centigrade temperature rise in one hour over the normal temperature of 25 degrees.

The controlling device is an important feature of the car. It consists of the various switches and relays, which are mounted on slate panels and assembled on a switchboard having an angle iron frame and sheet iron covers, which entirely enclose the apparatus. This equipment enables both motors to be operated, either in series or in multiple, in either direction, all the changes being secured magnetically. The control equipment includes a double pole main line service switch, two double pole magnetic switches for reversing the motors from series to parallel operation, individual auxiliary switches, cast grid resistance, a drum type master controller, and an overhead coil or current limiting relay. This coil protects the motors and is so constructed that when it operates the motors are disconnected from the line. It is reset automatically by bringing the master controller to the opposite position. The equipment provides seven speeds in either direction. Four of those are with the motors arranged in series and three with the motors in multiple. All of these speed variations are controlled by the operator, but if he so desires the master controller can be thrown to the full series position and the motors will be automatically accelerated by a series relay which limits the current employed to a safe amount. This arrangement can either be used for changing from full series to full parallel operation.

Principal dimensions and specifications of the car are as follows: length over all, 36 feet; width over all, 11 feet six inches; height from rail to top of cab, 13

feet; height from rail to top of body, 10 feet; capacity, 100,000 lbs.; capacity, 800 cubic feet; diameter of wheels, 33 inches; gauge of track, 56½ inches; weight of car, 63,000 lbs.

The equipment of the car includes an air compressor, an air brake and a pneumatic sanding device. Rolled steel wheels are used and a running board is provided on either side of car.

The Michigan copper ores as mined in the year 1910 average 1.025 per cent. copper.

The average lead and zinc tenor of Missouri ores in 1910 was 2.3 per cent.

Silicon bronze, in which silicon replaces phosphorus, is stronger and more ductile than phosphor bronze and does not rust.

The output of the Nova Scotia Steel and Coal Company for October was higher than ever before. 52,675 tons of iron ore were mined; 75,521 tons of coal; 7,253 tons of pig iron made; 6,456 tons of steel billets; and 4,718 tons of bars and plates. The October shipments of finished steel and forgings were 5,500 tons, as compared with 4,909 tons during September.

To ensure the complete combustion of petroleum, it is necessary that it be either sprayed or gasified. Most oils used for fuel are heavy and viscous. At higher temperatures the viscosity disappears. This makes it good practice to pre-heat the oil, using exhaust steam for the purpose.

Lithophone is a very white pigment precipitated by the double decomposition of zinc sulphate and barium sulphide. An intimate admixture of the two decomposition products is formed. Barium sulphate and zinc sulphide are the mixed products. 70 and 25 per cent. are the relative proportions of the two.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

Purchase of Timber Limits by the Dominion Steel Corporation.

It is announced that the Dominion Steel Corporation has purchased the Montgomery timber areas near Dalhousie, N.B. These areas, together with extensive holdings in Newfoundland, and the very valuable lumber properties taken over by the Steel Corporation from the Cumberland Coal and Railway Company, will make the Corporation a considerable factor in the maritime lumber industry. The quantity of lumber needed in the operation of the steel works and particularly the collieries, is nothing less than immense, and the management of the Corporation has done a wise thing in tackling what bids fair to become one of the most pressing problems of the allied industries. The cost of pit-timber is an annually increasing charge, and as the demand enlarges there will be an actual scarcity with present methods of lumbering. There is no necessity for this condition to arise, however, as the vast uncleared lands of Cape Breton and Nova Scotia would yield an indefinite supply of suitable pit timber if proper methods of forestry are in the future adopted.

Eight Hours' Act in England.

When the question of an eight hour day in the mines of Nova Scotia was being pressed, your correspondent ventured to affirm

that it would be just as well to see how the eight hour day worked out in practice in the English mines before enacting similar legislation in Nova Scotia, and the course of events has proved that the position then taken was a proper one. Nothing in recent legislation connected with coal mining has caused so much trouble as the Eight Hour Act in Great Britain. In the Midlands Coalfield of England, the triple shift and eight hour day has been in operation for many years, and almost all the mines there are designed to be worked in this way. In this district naturally the Act has not made any appreciable difference. In the north country, however, it has caused infinite trouble, and there is more to come. In many respects the conditions under which coal has been mined for generations in Durham and Northumberland resemble those attending coal mining in Nova Scotia. This is partly due to the fact that coal mining in Nova Scotia under the General Mining Association was largely directed by men who came from the north country, and it is interesting to-day to notice the great similarity between the mining terms used in Northumberland and in Nova Scotia. Again, the market of the north country is for sea-borne coal, and it is affected by the season of open navigation in the Baltic, as the Nova Scotian market is affected by the state of navigation in the St. Law-

rence River. In the north country they have worked for generations on the two-shift system, and they take very unkindly to the domestic upset which the triple-shift system necessitates. For many years the north country miners remained obdurate and would not agree in the efforts made by the Miners' Federation to bring about a general compulsory eight hour day in mines. Recently, however, the opinions of the miners of the Midlands have gained the ascendancy over those of the Durham and Northumberland men, and they reluctantly acquiesced in the eight hour legislation. The Miners' Federation, it is understood, intends to stand behind the demand of the Northumberland men for a return to the two-shift system, while, on the other hand, Sir Christopher Furness has stated at a shareholders' meeting that his company will close their collieries rather than revert to the two-shift system under a compulsory eight hour day. The conditions which have made the eight hour day such a failure in the north country in England are even more acute in Nova Scotia, and coming events in England will prove with even greater certainty than at present that the Magill Commission was perfectly correct when it reported that the adoption of a compulsory Eight Hour Act in Nova Scotia would be disastrous to the coal industry of the province.

One of the chief factors in the present unrest amongst English miners is the reduction in their earnings which has been directly caused by the Eight Hours Act; and the threatened strike, if it comes about, will be an endeavour to get the same wages for eight hours that were formerly earned in nine or ten hours.

Renewal of the P. W. A. Agreement.

The P. W. A. has accepted the Dominion Coal Company's offer of a renewal of the Two Years' Agreement on the same terms and conditions as formerly, and the term of the agreement has been extended until the end of 1913. The first long-term wage agreement between the Coal Company and the P. W. A. was made in 1904 for a term of three years. At the end of this period a Conciliation Board was asked for by the P. W. A., and sittings were held under the benign chairmanship of Professor Shortt, a gentleman whose able and conciliatory guidance is still remembered in Glace Bay. On the result of the Shortt Board's award a two years' agreement was entered into between the company and the P. W. A., which expired at the end of 1909. This was renewed at the end of 1909 for a further period of two years, and, as just mentioned, has once more been renewed. The various agreements, therefore, cover a space of nine years.

The local leaders of the U. M. W. have announced their intention to protest against the renewal of the agreement, and are once more endeavouring to create dissatisfaction. The net result of the recent U. M. W. strikes was the utter impoverishment of the strikers, strangely accompanied by a noticeable increase in the worldly goods of the salaried leaders, and it is suspected that the present activity of these same gentlemen is actuated more by the desire to make their own calling and election sure, than by solicitude for the welfare of those they aspire to lead.

Dominion Coal Outputs.

The individual outputs of the Glace Bay collieries during October were as follows:

No. 1	50,120
No. 2	63,110
No. 3	12,650
No. 4	35,590
No. 5	25,550
No. 6	22,460
No. 7	17,600
No. 8	14,610
No. 9	35,680

No. 10	16,270
No. 12	26,970
No. 14	20,220
No. 15	5,580
No. 16	1,990
No. 21	1,600

Tons 350,000

This tonnage has been exceeded only once in the month of October, namely, in 1906. The total output for the year to the end of October amounts to 3,323,791 tons, compared with 2,938,085 tons at the same date last year.

The shipments were fairly high, amounting to 365,000 tons. The St. Lawrence season is almost over, and it is expected to reach 1½ million tons, the largest shipment yet attained by the Coal Company during the season of open navigation. The coal banks are all lifted in good time, and generally the season has been a good one. Both in outputs and shipments a new series of records has been established.

The Springhill output for October was 36,060 tons. The output steadily increases, and will continue to do so during the winter. An air-compressor is being installed, and it is intended to operate a number of shearing machines. Up to the present time no machine-cut coal has been mined at Springhill. By shearing or "nicking" the coal in certain places, larger and stronger coal will be produced. No explosive is used in getting down the coal at Springhill. So far as its analysis and calorific value is concerned, the Springhill coal leaves little to be desired, but it is a friable coal which produces a great deal of slack in the mining. This slack with a suitable binder would make an ideal briquette, and it would not be surprising to know that a plant of this kind was in contemplation.

ONTARIO.

Cobalt and Elk Lake.

While the shipments from the camp in the box car are gradually decreasing, the consignments of bullion by express creep up and up. Next year there will be very little low grade ore, indeed, sent out at all from the camp, it being the intention to treat it on the spot. The Nipissing has found the reduction of its high grade ore to bullion so profitable that Mr. Chas Butters is now working to discover a process that will recover the values in the low grade ore with economy.

The Drummond has experienced a second birth. During the year Mr. E. V. Neelands, who is now in charge, in addition to the low grade ore that he has been shipping from the old workings, has sent out \$40,000 in high grade ore. He has also discovered on the surface by prospecting, several excellent new veins, which will be crosscut for this winter. There is a very considerable amount of life in the Drummond yet.

The Temiskaming and Hudson Bay Mining Company has declared the 35th dividend of 300 per cent. The company has now paid 19,000 per cent., or a total of \$1,474,590. Mr. Horace T. Young has resigned the management of the property and Mr. A. H. Brown, who has directed the development of the Pike Lake claims at Swastika for the past six months, takes his place.

The City of Cobalt Mining Company has taken a lease of the King Edward mill, which has been shut down now for about a year. The capacity of the mill is 50 tons per day. From the City of Cobalt to the King Edward, at Cross Lake, there is a haul of a mile to a mile and a half. Since the contract with the Northern Customs mill expired the City has been obliged to leave the low grade ore on the dumps, where a considerable tonnage has already accumulated.

The mill report of the Buffalo Mines for the month of September showed that over 100,000 ounces had been recovered from 32.95 ounce ore. The report reads: mill ran 561 hours; ore milled, 3,732 tons; average assay, 32.95 ounces; ounces re-

covered, 102,336; mill expenses, \$11,466; ounces paid for, 105,988.

A good discovery of silver is reported from the Donaldson claims at Elk Lake. A shaft was sunk on a two-inch vein of calcite which is reported to have widened considerably and to have more than maintained its surface values.

After many rumours, found to be groundless, the Hitchcock, at Elk Lake, is at last reported to have despatched ten tons of ore to the smelter. Some of the ore will run high in silver, but the shipment, taken as a whole, is low grade.

R. B. Stewart, for the Ontario Bureau of Mines, has made a report to the Government on the Shining Tree gold discoveries. The report is non-committal, the geologist being of the opinion that not enough work had been done to warrant any definite statement.

The Casey Cobalt mine, in Casey Township, north of New Liskeard, has made a shipment of 20 tons of high grade ore and 23 tons of low grade.

The Green Meehan has also shipped some concentrates.

After a long and animated sitting, the La Rose decided not to declare an extra disbursement in addition to the usual 3 per cent. A number of the directors wished to reward shareholders with some of the big cash surplus, but the majority were in favour of maintaining the present large reserve until it is seen what is the outcome of the extensive exploration scheme in search of new bodies on the Lawson and the La Rose proper. At the La Rose proper the winze is being put down to the 400-foot level, from which point very extensive exploration work will be undertaken.

The position of the La Rose on October 20th was: cash in bank and ore at smelter, \$1,401,668; ore ready for shipment, \$91,182; total surplus, \$1,492,849.

The financial standing of the Nipissing on October 20th was: cash in bank, \$999,894.59; ore in transit and at smelter, \$131,782.94; ore ready for shipment, \$197,653; total, \$1,329,330.53.

The Beaver has now reached the 460-foot level, and a station in the main shaft has been cut at that level. The foundations for the new mill are completed and every attempt will be made to rush forward the work.

The McKinley-Darragh is now producing at the rate of 250,000 ounces per month, and will at the end of the year have shipped or despatched to the smelters 2,500,000 ounces. The output would have been considerably larger if the lack of power at the beginning of the year had not handicapped work.

Porcupine and Swastika.

The first fall of snow has come in Porcupine, and frost has stiffened the ground so that all surface work and prospecting will soon have to be abandoned. The last two months of surface exploration has yielded generously in new finds. From this time forward till next spring the main activity will be in the erection of buildings and underground development. The mines losing their camps in the big fire are completing their permanent buildings and getting out of the tents in which they have been obliged to work all summer. Thanks mainly to the spur it ran into its property, the construction work on the Dome plant has progressed very favourably, and the forty stamps should be dropping soon after the new year comes in. At the Hollinger there has been no attempt to get any mine machinery into the camp, but the construction of new buildings has made great headway. The office, the assay house, and the bunk house are completed, while the manager's house, the mine captain's house, and the club house are well under construction. The foundations of the mill have been laid and the walls are now going up. The slide of 400 feet of grade into Pearl Lake from the T. & N. O. will not permit the completion of the line into the Timmins Townsite at the earliest before January, but the railroad company is going to provide a siding near the McIntyre, from which point the Timmins and

other adjoining companies can team their supplies over the winter roads.

The Northern Ontario Light & Power Company has taken over the assets of the old telephone company, and will instal a new system as quickly as possible. There is a keen competition developing all over the camp between the British Canadian Power Company and the Northern Ontario Light & Power Company, and rates should be light. The Northern Ontario Light & Power Company is now connected with the Porcupine Power at Sandy Falls, on the Mattagami River, and they are lighting both towns, but have not an exclusive franchise. The British Canadian is rushing in machinery as fast as the roads will permit, to Waiwaitan Falls, where they are developing power. It will be ready to give service some time next year.

The sensation of the month followed the announcement of Col. Weatherley, an Alaskan operator, that he had made a wonderful find on the Brydge claim next to the Preston East Dome, and now known as the Little Pet mine. On the surface the discovery consisted of a number of stringers of quartz, rich in coarse gold, running through a big porphyry dike. Two shafts have been put down on them. The No. 1 shows that the quartz stringers have widened out into two seams of quartz from 6 to 17 inches wide, very spectacular. In the other shaft the vein has widened very materially also, and is now about five feet of quartz and schist, the quartz carrying much coarse gold. The owners took a sample of the quartz porphyry and obtained an assay of \$11 per ton from it. The visible gold appears to be contained exclusively in the quartz stringers and in the seams of the porphyry.

Mr. Chas. D. Taylor is reported to have bought the controlling interest in the Porcupine Imperial Mining Company in Deloro. The Dome Mining Company was at one time in negotiation for the property, but the deal did not go through.

Mr. Burr Cartwright and his associates have thrown up the option on the Brydge McAuley claims in Bristol township after doing a considerable amount of work and making several small payments. The price under the option was for \$500,000, but payments were spread over two years and were for the first two or three months very small. The Dome Mining Company will also abandon its lease on the Josey Woods claims in the Cripple Creek district in a few days. The full price here was \$250,000, but initial instalments were quite small. The shaft was sunk to 50 feet, where the vein split. These two failures to proceed with work on the two most important properties west of Pearl Lake will delay development of this part of the country.

The Dome officials paid a hurried visit to the property at the end of last month. They wished to see over the property before the snow hid the surface discoveries. Mr. Ambrose Monell, general manager of the Dome Mining Company, stated that the results of the diamond drill work had been most satisfactory as proving that there was good ore over a wide area and for a considerable depth. Values in the cores varied so greatly that it was as yet impossible to strike an average, but it was much better than they expected. So far underground operations had shown that the ore ran on an average higher than the assays from the cores would lead to believe. The mill is rising fast, nearly all the brick finished buildings are completed, and by the first of the month the Dome will completely have recovered from the fire and will be in a position to turn out good bricks.

Mr. Frank Armstrong and a party of friends have been inspecting the camp during the first week in November. Mr. Armstrong is directly interested in the Dobie and the Plenaurum, and more time was spent at these properties than anywhere else. Some remarkably spectacular ore has been taken off the Deloro claims of the Dobie Mining Company, and during the winter months very active operations will be carried

on there. Two shafts will be sunk a thousand feet apart to prove up the length and depth of the ore body.

J. T. R. Laurendeau, a director of the Crown Reserve, has purchased the controlling interest in the Hughes Porcupine gold mine. Mr. Mowery Bates has been appointed manager and he has already commenced to sink a shaft on the vein and put up camp buildings for a big force of men. The Hughes has one of the most remarkable surface showings in the Township of Whitney, but so far little beyond assessment work has been done on it.

At a meeting of the Foley-O'Brian Mining Company, the treasurer reported that there was cash in hand, \$144,930 available for development purposes. It was stated that at 140 feet a number of small veins in the schist ran \$12 to the ton over a width of 18 feet.

It is extremely likely that C. H. Poirier, manager of the Vipond property, will be offered and will accept the position of consulting engineer to the Rea Consolidated mines. He will still retain his position at the Vipond if he does obtain the Rea.

In the first week of November the main vein of the Rea was cut at the 300-foot level, 35 feet from the shaft. At this point it was 30 feet wide, of almost solid quartz. While the vein pans gold it does not show any free gold. No representative assay had been taken at the time of writing. It is very probable that the Rea will shortly commence the erection of a ten or twenty-stamp mill.

SOUTHERN ALBERTA.

The following notes were obtained about the middle of October. As it was reported late in that month that a basis of agreement had been reached between the Western Coal Operators' Association and the officers of District 18, United Mine Workers of America, representing the employees, it is possible that before these notes shall be published work will have been resumed at the various coal mines and coke ovens at which it was suspended at the close of last March.

Galt Collieries.—Work at the Alberta Railway and Irrigation Company's Galt coal mines is still restricted to keeping the pumps going at both Nos. 3 and 6 mines, and making additions and other improvements to the surface plant at the latter. A third 500 h.p. unit of Babcock & Wilcox water-tube boilers is being put in. Other additions to plant being prepared for are a third compressor, 200 k.w. generator, and another Webster 1,000 h.p. vacuum feed water heater.

Diamond Coal Company.—While miners are on strike, plant and machinery is being thoroughly overhauled and put in condition for active operations immediately after settlement of labour troubles.

Chinook Coal Company.—Much progress has been made with work of putting in surface plant and equipment. The tippie is completed; it is a steel structure with modern coal-handling machinery, and screening and picking appliances. Erection of masonry boiler and power-houses is finished, and machinery is being placed in position. Underground development is also being energetically proceeded with.

Lethbridge Collieries, Limited.—This company's colliery is situated about 7 miles from Lethbridge. During the last 12 months two shafts have been put down 600 feet to the coal, and openings made therefrom preparatory to mining the coal. A steel tippie building, with rotary tippie, has been erected by the Wisconsin Bridge and Iron Company; the tippie has been equipped with screening and other machinery by the Link Belt Company. Large boiler, power, and other brick buildings have been erected, and much plant and machinery put in. The boiler equipment consists of two 500 h.p. batteries of Babcock & Wilcox water tube boilers with chain grate stokers, induced draft fans, etc. In the power and hoist-houses are large compressor, generator, powerful hoisting engine, and much other machinery. The whole constitutes a complete and thoroughly modern bankhead equipment, designed by Mr. Charles Fergie,

of Montreal, and erected under the supervision of Mr. N. C. Pitcher, resident construction engineer. About 300 men are employed, some in doing underground development work and others on surface improvements. Mr. Wm. Maxwell is superintendent.

Leitch Collieries, Ltd.—This company's south mine, at Passburg, is still being worked, but with fewer men than in the past. Operations at its north mine, near Police Flats, are now having most attention. Owing to the labour troubles, affecting the whole district, only about 100 men are employed, which is but one-third of the number that will be required to operate mine and coke ovens at full capacity. Erection of 101 rectangular coke ovens, Mitchell type, has been completed; also of a 1,500-ton per day Roberts & Schaefer Company tippie and a Lührig jig washery.

Davenport Coal Company.—This company's mine is at Burmis, on the Crow's Nest Railway. Its output capacity under ordinary conditions varies up to 450 tons per day, with 90 men employed, but this production is not being maintained at present, for the mine is being operated with less than a full working force of men. Six seams occur on the property, but coal is be-

screens and picking table, is planned.

Breckenridge & Lund Company.—This company's mine is at Lundbreck; its normal output ranges up to 400 tons of coal per day with 80 men employed. Coal is being mined from two of the six seams prospected on the property; the average thickness of the coal is 10 feet.

Canadian Coal Consolidated.—This company (formerly the Canadian-American Coal & Coke Company, Ltd.) owns coal lands at Frank. The old company was the first to mine coal in this district. Pending settlement of the coal miners' strike, coal is being mined for market, but production will be resumed as soon as shall be practicable after existing difficulties with the employees shall have been adjusted.

West Canadian Collieries, Ltd.—Large holdings of coal lands in Blairmore-Frank district are possessed by this company, the chief share interest in which is held in France. Ordinarily the company operates three collieries, namely, those known as Lille, Bellevue, and Blairmore, respectively, but only the last-mentioned is now producing, with non-union men employed.

International Coal and Coke Company.—The mines and coke ovens of this company are near Coleman. At present only necessary upkeep work is being done, but production will be resumed as soon as this shall be possible.

McGillivray Creek Coal and Coke Co.—Ordinarily output from this company's mine, situated at Carbondale, one mile west of Coleman, is 400 to 500 tons of coal per day, but work is suspended at present. When the driving of a rock tunnel shall be completed, output capacity will be substantially increased. Surface plant includes a modern steel tippie with a capacity of 2,500 tons per day; it is equipped with a F. C. Greene dump, and produces slack, run-of-mine, and lump coal. At Ottumwa box car loader has just been put in.

Other District Mines.—Other coal mines in what is officially known as the Crow's Nest district are those of the Hillcrest, Maple Leaf, and Galbraith companies, respectively. About Lethbridge, the Pioneer (Ashcroft), and New Barnes, two small mines, are together supplying about 100 tons of domestic coal per day to Lethbridge consumers, while the Royal Collieries, Ltd., also near Lethbridge, has its mine idle through the miners' strike.

In South Fork District.—Several development companies have been prospecting coal lands situated in the vicinity of the south fork of Old Man River. Of these, the operations of the Head Syndicate, Limited, an outline of whose property and work was published in the Canadian Mining Journal of September 1, are the most important. Two adits

Have been driven on the coal from near the company's camp on Lynx Creek. A crosscut adit, designed to cut the several seams, was commenced last July; after passing through 280 feet of mostly hard rock a large seam of coal was entered on October 21. When visited on the following day 12 feet of coal had been cut without the farther wall having been reached. It was expected this seam would be proved to be 15 feet in thickness, all good coal.

BRITISH COLUMBIA.

Slocan.—A new company, known as the Slocan Star Mines, Limited, has been organized to acquire two groups of mineral claims—the Rabbit Paw and Slocan Star groups, respectively—situated near Sandon, Slocan mining division, together with the Slocan Star concentrating mill, water rights, etc. Briefly, the Slocan Star, Silversmith, and Heber fraction claims have been developed to a depth of 600 feet. The present workings consist of six levels, with various intermediates. Generally speaking, the high grade ore has been nearly all extracted down to the fifth level, so far as the Slocan Star vein is concerned. There are, however, numbers of places where ore mixed with gangue has been left standing, and this should yield a profit if dealt with in conjunction with ore of higher grade from other orebodies, if such shall be developed. The company's consulting engineer has recommended that an adit of 430 feet vertically and 600 feet on the incline, below the present fifth level. The most of this development work is estimated at about \$40,000. It is understood that the engineer's recommendation has been adopted and that the work will be commenced shortly.

Sheep Creek.—The Mother Lode Sheep Creek Mining Company, a State of Maine incorporation, the principal stockholder in which is Mr. John McMartin, of Cornwall, Ontario, is making progress with the erection and equipment of its 10-stamp mill, in Sheep Creek camp, Nelson mining division. In designing and equipping this mill, the aim of the management has been to make it one of the best gold mills in the world, and it is confidently expected by those chiefly interested that this object will be attained, for the best talent available has been employed in connection with both design and equipment, and this after adequate experimentation with ore from the Mother Lode mine, to determine the most effective method of treatment so as to secure the highest results practicable. Erection of the mill building was commenced last June; it is now being roofed, and machinery and plant is being put in place. The expectation is that a commencement to crush ore will be made by the end of the current year. It is thought a crushing capacity of 70 tons per day, with ten stamps dropping, will be developed after the machinery shall be in good running order. In designing the building and plant, provision has been made to allow of doubling the treatment capacity of the mill at comparatively small expense, whenever conditions shall make this advisable. The Mother Lode mine has been developed to a depth of 500 feet below the outcrop of its main vein, and it is estimated that there is sufficient gold ore blocked out to keep the mill supplied continuously for three years.

Rossland.—From the recently published sixth annual report of the directors of the Consolidated Mining & Smelting Company of Canada, Limited, it is ascertained that during its last fiscal year the production of the company's Centre Star group of mines, in Rossland camp, was 193,223 tons of ore, which contained 81,348 ounces of gold, 60,200 ounces of silver, and 2,318,456 pounds of copper, together having a gross value of \$1,980,112. The general average metal contents of the whole of the ore produced during that year, as above, were as follows: Gold, 0.421 ounces, and silver, 0.312 ounces per ton, and copper 0.6 per cent. The average gross value per ton was a fraction under \$10.25. The footage of narrow work done during the period under review in those mines was as follows:

Drifting and crosscutting, 11,298.5 feet; raising, 1,803 feet; sinking, 290 feet; total, 13,383.5 feet. There was also 25,622.3 feet of diamond drilling done. The managing director's comment was: "In our Rossland mines ore developed and shipments have about balanced. Although the tonnage developed is numerically less than for the previous year—194,000 tons as against 245,000 tons for the year 1910—the average value of the ore developed this year on the lower level is considerably higher. In the Centre Star and Idaho mines no ore has been developed in the lower levels and but little work done, most of the development having been confined to levels above the 10th. In these a number of small orebodies have been opened, and one or two larger ones of lower grade. The same is true of the Iron Mask. The greater part of the new ore that has been found has been in the lower levels of the War Eagle. A winze sunk from the 12th level opened ore to a depth of 150 feet and of a length at the bottom of 200 feet. The value of this ore is very good. The 10th and 11th levels are also producing a large tonnage of good ore." Other comment of the managing director concerning property in this camp was the following: "Since the close of our fiscal year, arrangements have been completed with the liquidator of the Le Roi Mining Company for the purchase of all the property of that company at Rossland. This property still has a large amount of low grade ore, and some prospects of finding ore of a better grade, and we believe that the purchase will be a profitable one."

Trail.—The Consolidated Mining & Smelting Company's annual report shows that during the last fiscal year 388,735 tons of ore were smelted at the Trail smeltery. The valuable metal contents of this ore were: Gold, 119,067 ounces; Silver, 1,458,758 ounces; lead, 24,026,015 pounds; copper, 4,421,988 pounds. The gross value of these metals was \$4,437,901.

During the month of September of the current year the Consolidated Company received 24,713 tons of ore, and smelted 24,713 tons. The total gross output for the month was valued at about \$593,000; of this total value, 67 per cent. was in gold. The total gross output for the quarter ended September 30th, was \$1,460,000, and the proportion of gold in this total value was about 63 per cent.

The aggregate tonnage of ore treated at Trail during all years to June 30th last is 2,847,469 tons, and the aggregate gross value of the metals recovered \$47,083,926. The total quantities of the several metals were: Gold, 1,017,123 ounces; silver, 13,458,631 ounces; lead, 224,898,570 pounds; copper, 47,875,802 pounds.

Boundary.—The British Columbia Copper Company has continued operating its mines and smeltery without intermission, notwithstanding the long continuance of the strike of the coal miners and coke oven workers in the Crow's Nest district, whence it had long obtained its supply of coke for metallurgical purposes. The largest proportion of the ore required to keep its three blast furnaces supplied has been obtained from the company's Mother Lode mine, while a much smaller quantity, of oxidized ore, came from its Wellington group mine. The Rawhide and Athelstan, both owned by the New Dominion Copper Company, controlled by the B. C. Copper Company, supplied the greater part of the remainder of the ore smelted, the former in large and the latter in small degree. Pennsylvania coke has been used at the company's smeltery at Greenwood, ever since the supply from the Crow's Nest district was cut off.

The B. C. Copper Company has relinquished its bond on the McKinley mine, in Franklin camp, north fork of Kettle River, and ceased work thereat. Two neighbouring mineral claims were afterwards taken under option of purchase, and these have since been under development, but work was lately suspended for the winter, under arrangement to resume operations next

With the promise of an early settlement of the coal miners' strike has come assurance that the Granby Company will re-

sume mining and smelting ore as soon as sufficient coke shall have been received to admit of the furnaces being kept in blast. During the summer preparations have been made for a new system of disposal of slag, by water granulation and conveyance thereafter by means of a system of belts to a sufficient elevation to allow of a new dump being thereby secured. Only two of the eight furnaces have as yet been connected by flumes with the new system, and if it shall be found

that this works well the remaining six will be similarly provided with facilities for slag granulation and the present method of hauling molten slag in large pots by steam locomotives be done away with altogether. All arrangements for crushing ore at No. 3 tunnel outlet from the mines at Phoenix and loading direct into railway cars have been completed. These take the place of crushing and shipping facilities destroyed or rendered useless by fire last year.

GENERAL MINING NEWS.

NOVA SCOTIA.

Halifax.—The Nietaux, Annapolis Co., iron ore concentrating mill, in course of erection for the Canada Iron Corporation, will soon be ready to be placed in working order. The low grade magnetites and the higher grade red hematites will be jigged and brought up to about 57 per cent. iron content. The product will be commercially free from sulphur.

ONTARIO.

Cobalt.—After building up a surplus of over \$1,300,000, La Rose is now proceeding to spend considerable money in exploration work for new ore bodies. La Rose found its main vein at 200 feet, but it did not contain values. In his recent work in Cobalt camp, Prof. Miller figured there was one main fissure vein down the centre of Cobalt.

From this vein McKinley-Darragh is still producing. Right of Way paid all its dividends, and La Rose mined millions. Government geologists figure there has been a throw of 400 feet, and La Rose to-day is sinking to the 400-ft. level to endeavour to pick up values again. In the meantime, good ore is being produced from subsidiary veins on La Rose property. Lawson is producing about 50,000 ounces a month, and Princess 40,000.

Cobalt, Ont.—The mill report from the Buffalo Mines for the month of September shows a record treatment for the year of ore milled.

During the month in the 561½ hours that the mill was running, a total of 3,732 tons were treated in the concentrator and cyanide plant of the property. The general average monthly treatment of the property is around 3,200 tons, so that the September treatment is a record in its line.

The average grade of ore is slightly lower than last month, being 32.95 ounces to the ton, as compared with 34.49 ounces for the preceding month. A total of 102,336 ounces were recovered by the process of concentration, the largest amount in three months.

The report for the month, as compared to the August report, is as follows:

September—Mill ran 561½ hours; ore milled, 3,732 tons; average assay, 32.95 ounces; ounces recovered, 102,336; mill expenses, \$11,466.11; ounces paid for, 105,988.68.

August—Mill ran 592½ hours; ore milled, 3,093½ tons; average assay, 34.49 ounces; mill expenses, \$9,439.76; ounces paid for, \$144,446.06.

The last dividend paid by the Buffalo was October 2nd, and was for 5 per cent.

Cobalt.—The Casey-Cobalt Mines, whose property lies in the centre of one of the best agricultural belts in the Dominion of Canada, just north of New Liskeard, has just made two shipments of ore, the third during the present year.

The recent shipment included 40,415 pounds of high grade ore and 46,224 pounds of low grade material.

The high grade ore was sent to the Delore smelter at Marmora and when the final assays are received the mine expects that the car will run better than 3,500 ounces to the ton, or

nearly 70,000 in the car. The low grade was screenings sent to Denver. It will run in the neighbourhood of 400 to 500 ounces.

Cobalt, Nov. 5.—Within the past week there has been a general improvement in the position of La Rose Consolidated. At Lawson crosscut, half way up the stope from the 180-foot level on vein 8, what appears to be another ore shoot has been encountered to the west. It will average some thousands of ounces, six inches wide, and, after being drifted on for 15 feet, is as good as ever in the head of the drift. The Lawson has never this year produced less than \$40,000 per month, and is likely to produce much more now.

At the Princess a new vein two inches wide, of 6,000 ounces of ore, has been crosscut 30 feet up in the slope from the 135-foot level, and has also been encountered on the level itself, so that it holds for some distance.

At Fisher Eplet, where previously nothing had been found, a foot-wide vein of quartz and calcite has been uncovered for 50 feet. In it occurs two patches of high grade silver, a foot long by a couple of inches wide. The vein will be sunk on at once.

Cobalt, Nov. 2.—Mr. R. B. Watson has made another unexpected strike on vein No. 8 on the Lawson property. The strike promises to pan out uncommonly well and gives every indication of producing a great deal of high value ore.

A strike almost equally good has been made on the Princess property.

Toronto, Nov. 2.—The City of Cobalt Mining Company has taken a lease of the King Edward concentrator on Cross Lake, and will treat its low grade ore at this point in future, teaming it from property to mill. King Edward mill was built three years ago by the mining company, but last winter it was decided to close operations at the time for an indefinite period and the mill has been lying idle ever since.

Matheson, Nov. 7.—Two gold bricks of 50 ounces left Matheson yesterday from the American Eagle mine, in Munro Township. These bricks represent \$2,000. Within the past two months the Gold Pyramid has sent out seventy ounces, so that this season the properties in Munro and Beattie, to the east of here, have produced 170 ounces, or approximately \$3,400 in gold. Both properties have been working some years.

MANITOBA.

Winnipeg.—General satisfaction prevailed throughout the west when the news of the settlement of the coal strike was published. An indefinite coal famine would have ensued if the settlement had not been so timely. Now that the mines are again in operation the danger of a fuel famine is averted, this affecting both producer and consumer to a very great extent. It will also have the effect of keeping the price of coal down to normal.

Fernie, Oct. 31.—Chief Justice Gordon Hunter is here today to preside at the fall assizes of the Assize Court. But one case is upon the docket for trial, that of A. J. Carter against

W. G. Barclay, in which the latter is charged with making damaging statements regarding Mr. Carter's action in the matter of securing relief supplies for the miners. S. S. Taylor is appearing for Mr. Barclay, and L. P. Evkstein for Mr. Carter.

The scales committee of the operators and miners are meeting at Frank to-day, to take up the arrangement of a new scale of wages in accordance with the outline laid down at Lethbridge last week, when Hon. Robert Rogers succeeded in bringing the two sides to the controversy together again after a long wait following the Macleod conference with the boards of trade convention.

The task of arranging a new scale should not be a lengthy one, since all details have been gone over so many times, and the basis arrived at being clear and well defined. If this work is accomplished within a few days, the vote upon the proposition can be taken in one day all over the district and the mines can be opened within the next week.

A few men have already gone to work at Coal Creek, cleaning up, preparatory to active operations.

Fernie, Nov. 3.—The Riot Act was read in Fernie last night by Mayor Bleasdel after a violent outbreak on the part of the miners, when a train arrived from Coal Creek with men on board who had gone to work in the mines without waiting until the agreement now under consideration at Frank has been signed and ratified.

Large numbers of miners were on hand when the train reached here, and the men who had worked were greeted with hisses and derisive language. One man was hit upon the side of the face by a stone thrown by some one in the crowd.

Trail, Nov. 1.—During September the Consolidated Company received 24,717 tons of ore, and smelted 24,713 tons. The total gross output for the month was valued at about \$593,000, of which 67 per cent. of the values were gold. The total gross output for the quarter ending September 30th, was \$1,460,000, about 63 per cent. of the values being gold.

Nelson.—Supported by a group of Spokane capitalists, W. E. Zwickey, manager of the Rambler-Cariboo mine, is preparing to open up the famous Payne mine in the Slocan, a property which at one time ranked among the greatest producers in the province. Already Mr. Zwickey has a force of men at work cleaning out the tunnels and carrying on other work preparatory to operating the mine.

The Payne mine was located on September 9th, 1891, by Eli Carpenter, and Jack Seaton. They sold it to Steve Bailey for \$20,000, who disposed of it after some development had been carried on, to A. W. McCune for \$125,000. Mr. McCune, it is said, took a million dollars' worth of ore out of the mine, and then sold it to an eastern company, from whom Mr. Zwickey has taken a bond, for \$1,000,000.

The development of the mine under Mr. Zwickey's management will probably include the driving of a lower tunnel.

Rossland, B.C., Nov. 1.—The following report has been received at the London office of the Van Roi Company from the manager in Rossland:

Mill Report for September.—Total amount crushed, 3,700 tons; average assay: 12.6 ounces silver, 3.6 per cent. lead, 8.9 per cent. zinc, yielding 200 tons of lead concentrates, assaying 96.8 ounces silver, 65.4 per cent. lead, and 10.1 per cent.

ore, assaying 110 ounces silver, 14.7 per cent. lead, 22 per cent. zinc. Total, approximate value, \$20,940. Mill ran 565 hours.

Estimated expenditure for corresponding period — Development, \$2,393; ore production, \$9,524; milling, \$4,336; total, zinc; and 330 tons zinc concentrates, assaying 33.8 ounces silver, .9 per cent. lead, and 46.0 per cent. zinc; 6 tons picked \$16,253.

Mine report for September — Shipped 260 tons of lead concentrates and 456 tons zinc concentrates. The net receipts for 280 tons lead concentrates shipped are 90 per cent. of full payment, \$14,855; the net receipts for 369 tons of zinc concentrates shipped are 80 per cent. of full payment, \$4,065; total, \$18,920. Main vein level 5 advanced 45 feet, poor—Main level 3 advanced eastward 58 feet, of which 58 feet average 36 ounces silver, 3% per cent. lead, 12½ per cent. zinc, over an average width of 2 feet 3 inches. Breast still in ore.

Nelson.—The Slocan Star Mines, Ltd., is the new company under which are consolidated the mineral properties at Sandoon previously owned by the Byron N. White and John M. Harris interests, the most noted of which is the Slocan Star. The consolidation was recently affected through the efforts of Mr. Lennie, and it has permitted the operation of the important mines long locked up by litigation.

Work has now been started on No. 6, or lower tunnel, on the consolidated properties. This tunnel will tap the downward continuation of the chief ore bodies, including the one formerly in dispute, at a depth of 600 feet below the present No. 5 tunnel of the Slocan Star mine, on the dip of the vein. The work will take some time to complete, as it involves a tunnel 2,300 feet in length, but as the tunnel will pass through virgin territory it is expected that valuable veins will be uncovered. In addition to the work on this tunnel, operations will be pushed on the upper levels, and it is expected that shipments of ore from these will commence within 90 days.

UNITED STATES.

Cripple Creek, Colo., Nov. 1.—October closes as the greatest financial period in the history of the Cripple Creek district, as for the first time since the inception of the camp the dividends of the month are in excess of the gold production.

These dividends, with close corporations placed at the lowest figure and with profits of lessees not included in the total, amount to \$1,322,500 paid out by mining companies during October, and not only break all records in Cripple Creek, but establish a new record in the state.

The output of gold ore during the month was 77,728 tons, carrying a bullion value of \$1,318,199. This production is 1,000 tons in advance of that of September, with an excess valuation of \$21,500. Quite an increase in tonnage over the previous month is shown by the United States Reduction & Refining Company, and gains appear all the way down the line of the local plants.

Salt Lake City, Utah.—Dividends from the Utah mines thus far this year amount to \$5,169,687. This is from the mines alone, and does not take into consideration the profits from the International, American, and United States smelters and allied interests, which derive their profits from the local mines and from properties owned by these companies.

COMPANY NOTES

DOMINION STEEL.

Mr. J. H. Plummer presided at a meeting of Steel directors on Nov. 1st. Those present were: Sir William C. Van Horne, Hon. Robert Mackay, George Caverhill, Hon. R. Dandurand, Sir H. Montagu Allan, F. L. Wanklyn, William McMaster, W. G. Ross, and Jas. Reid Wilson.

The president gave the Steel Corporation returns for the month of October: Pig iron, 24,356 tons; steel ingots, 29,675 tons; rails, 15,587 tons; rods, 6,817 tons.

Mr. Plummer also stated that matters were progressing very satisfactorily at Springhill, the output of coal being larger than before the strike began. One day last week the output reached 1,600 tons.

STATISTICS AND RETURNS

WEST AFRICAN GOLD YIELD.

The West African Chamber of Mines announces that the gold yield of the colony during September was 26,717 ozs., valued at £109,039, an increase of 1,332 ozs., or £5,286, compared with the preceding month. Last month's return is a record as regards value, being £2,796 above the previous highest, which was £106,243 in March, 1908.

COBALT ORE SHIPMENTS.

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

	Nov. 3. Ore in lbs.	Since Jan. 1. Ore in lbs.
Badger	55,200	
Bailey	40,000	
Beaver	1,520,217	
Buffalo	2,212,863	
Chambers-Ferland	64,000	1,150,900
City of Cobalt	64,000	727,980
Cobalt Lake	114,430	3,760,920
Cobalt Townsite	53,004	1,142,514
Colonial		183,410
Coniagas	188,334	3,630,487
Crown Reserve	51,080	2,003,080
Drummond	60,000	1,080,000
Green-Meehan		145,800
Hargraves		161,100
Hudson Bay		1,255,824
Kerr Lake	60,000	2,233,670
King Edward		40,000
La Rose	144,800	6,233,480
McKinley-Darragh	212,704	5,598,040
Nipissing	58,908	5,010,868
O'Brien		1,257,958
Peterson Lake, Little Nip.		58,430
Provincial		151,950
Right of Way		1,190,805
Silver Cliff		106,680
Standard		102,813
Temiskaming	138,830	1,587,282
Trethewey	41,613	1,159,663
Wettlaufer		117,232

The shipments for the week were 1,251,793 pounds, or 625 tons, against 281 tons the previous week.

The shipments from Jan. 1 to Nov. 3 were 43,810,434 pounds, or 21,905 tons.

B. C. ORE SHIPMENTS.

The ore shipments for the week ended Oct. 21st totalled 18,954 tons, and the smelter receipts 16,310 tons. For the year to date the shipments total 1,293,206 tons, and the receipts total 1,192,437 tons. Following are the figures:

Boundary Shipments.

Mother Lode	6,900	250,483
Rawhide	2,893	36,330
Jack Pot	282	21,698
Athelstan	181	6,795
Unnamed	1,507	7,320
Other mines		637,617

Rossland Shipments.

Centre Star	3,244	161,053
Le Roi No. 2	442	22,856
Le Roi No. 2, milled	300	12,600

Le Roi	457	13,383
Other mines		457
Total	4,443	210,349

Slocan-Kootenay Shipments.

Sullivan	98	15,579
St. Eugene, milled	420	22,296
Richmond-Eureka	32	1,911
Queen, milled	420	17,430
Granite-Poorman, milled	250	10,510
Nugget, milled	110	4,620
Emerald	35	1,637
Knob Hill	84	4,029
Athabasca	14	51
Molly Gibson	85	945
Van Roi, milled	800	31,449
Molly Gibson, milled	300	4,200
Other mines		7,957
Total	2,648	122,614

B. C. Copper Co.'s Receipts.

Greenwood, B.C.

Mother Lode	6,900	250,483
Rawhide	2,893	36,330
Jack Pot	282	21,698
Oro Denoro	181	6,795
Unnamed	1,507	7,320
Other mines		10,652
Total	11,763	333,278

Consolidated Co.'s Receipts.

Trail, B.C.

Centre Star	3,244	161,053
Le Roi	457	13,383
Le Roi No. 2	442	22,856
Sullivan	98	15,579
Molly Gibson	85	945
Knob Hill	84	4,029
Granite-Poorman	35	338
Emerald	35	1,637
Richmond-Eureka	32	1,911
St. Eugene	21	5,992
Athabasca	14	51
Other mines		39,972
Total	4,547	268,746

MINERAL MARKETS.

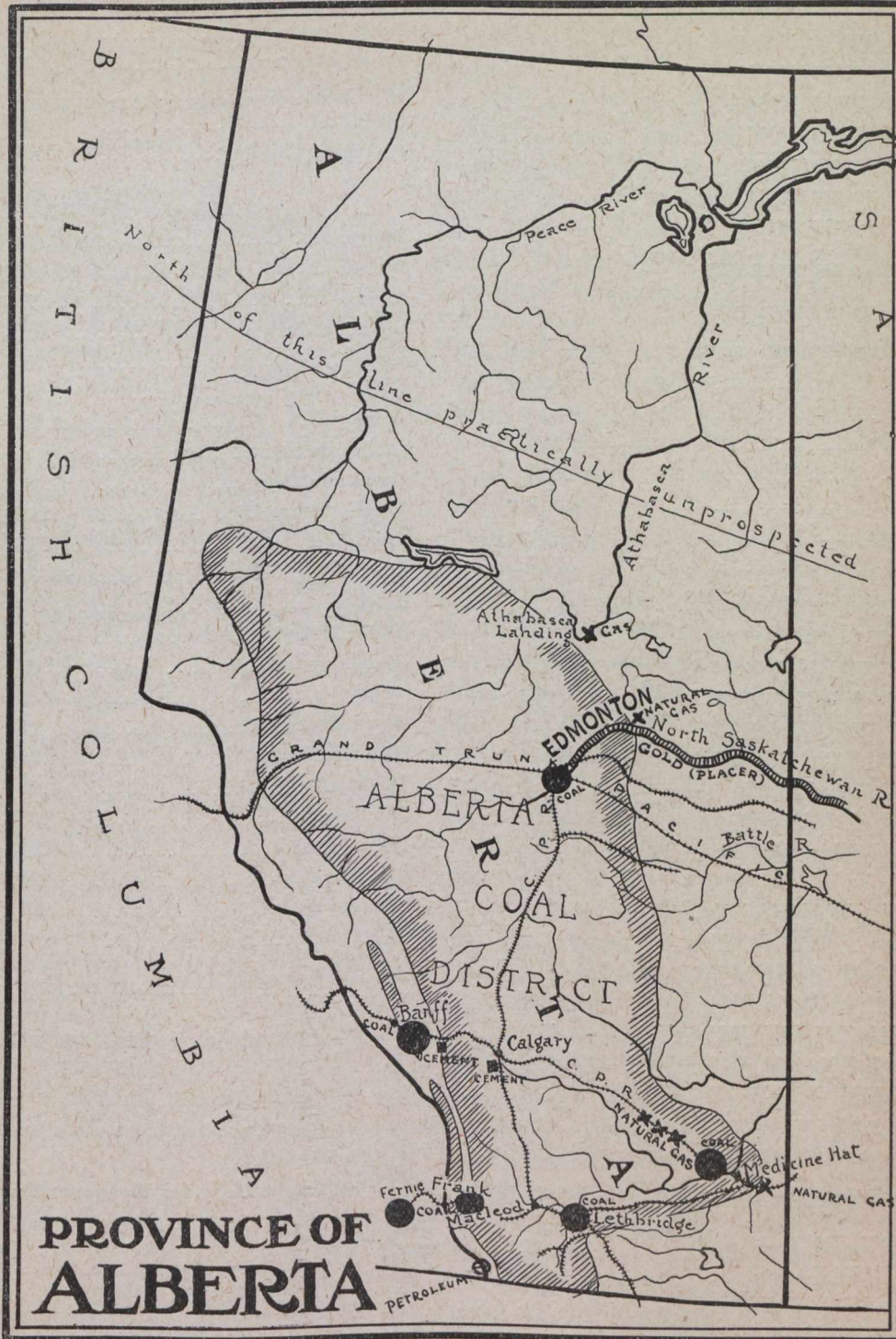
Acids—

- Muriatic, tank cars, \$1.15 to \$1.55 per 100 pounds.
- Nitric, \$0.04 to \$0.05 per pound.
- Sulphuric, \$0.01 per pound.
- Chrome Ore, 50 per cent., ton of 2,240 lbs., \$15.
- Fire Clay, \$2.50 to \$5 per short ton.
- Fluorspar, lump, \$9 per long ton.
- Fluorspar, ground, \$12 to \$15 per long ton.
- Graphite, lump, 4 cents to 10 cents per pound.
- Gypsum, short ton, ground, \$4 to \$7.50 per ton.
- Gagesite, crude, 95 per cent., \$7 to \$8.50 per long ton.
- Molybdenite, commercially pure, 25 to 30 cents per lb.
- Pyrite, lump, arsenic free, 10 to 12½ cents per unit.
- Pyrite, fines, arsenic free, 8 to 11 cents per unit.
- Tungsten ore, 50 per cent., \$7.70 per unit.

TORONTO MARKETS.

Nov. 9.—(Quotations from Canada Metal Co., Toronto):
 Spelter, 6.50 cents per pound.
 Lead, 4.25 cents per pound.
 Antimony, 7 to 9 cents per pound.
 Tin, 43 cents per pound.

Nov. 6.—Tin, Straits, 41.75 cents.
 Copper, Prime Lake, 12.50 cents.
 Electrolytic copper, 12.40 to 12.45 cents.
 Copper wire, 13.50 cents.
 Lead, 4.25 to 4.30 cents.
 Spelter, 6.40 cents.



Copper, casting, 12.85 cents per pound.
 Electrolytic, 12.85 cents per pound.
 Ingot brass, 7 to 12 cents per pound.

GENERAL MARKETS.

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

Sheet zinc (f.o.b. smelter), 8.00 cents.
 Antimony, Cookson's, 8.00 cents.
 Aluminium, 19.00 to 19.50 cents.
 Nickel, 40.00 to 45.00 cents.
 Platinum, ordinary, \$46.00 per ounce.
 Platinum, hard, \$48.50 per ounce.
 Bismuth, \$1.80 to \$2 per lb.
 Quicksilver, \$46 per 75-pound flask.

SILVER PRICES.

	New York.	London.
	cents.	pence.
Oct. 25	54½	25¼
" 26	54⅝	25⅛
" 27	54¼	25
" 28	54⅝	25⅛
" 30	54⅝	25⅛
" 31	54⅝	25⅛
Nov. 1	54⅝	25⅛
" 2	54⅝	25⅛
" 3	54⅝	25⅛
" 4	54¼	25
" 6	54¼	25

Northern .....	.82	.83
Tisdale .....	.06¼	.07
Preston East Dome .....	.22¼	.22½
Standard .....	.12½	.13¼
Swastika .....	.31	.31½
United .....	.03⅝	.04
Porcupine Gold .....	.47	.47¼
West Dome .....	.95	.98
Crown Chartered .....	.45½	.45¾
Eldorado .....	.11	.13
Gold Reef .....	.14	.20
Porcupine Canada .....	.85	1.00

SHARE MARKET.

(Courtesy of Warren, Gzowski & Co.)

NEW YORK CURB.

Braden	4⅞	5⅞
B. C. Copper	3⅞	4
Butte Coal	17¼	18
Ely Central .....	.01	.02
Ely Cons.	¼	⅜
First National Cop.	1	1⅞
Giroux	4⅞	4½
Green-Can.	7⅞	7¼
Inspiration	8⅞	8¼
Nevada Hills	2⅞	2¾
Ohio Copper	1⅞	1¼
Ray Central	2⅞	2¼
Union Mines	⅞	¼
Yukon Gold	3½	3⅞
Goldfields Cons.	4½	4⅞
Nevada Cons.	16⅞	16¾
Miami	19⅞	19⅞
Granby	off	60
Cons. Mining and Smelting .....	..	..
Davis-Daly	⅞	1
Cons. Arizona	⅞	⅝
Rawhide Coal .....	..	..
Ray Cons.	14¼	14⅞
Chino	20½	20¾
New Baltic .....	..	..
United Copper	1¼	1⅝

PORCUPINE STOCKS.

Apex .....	.12½	.13
Coronation .....	.02½	.03¼
Nor. Exploration	2.75	3.15
Dobie	1.10	1.25
Dome Ex. ....	.74	.75
Foley-O'Brien .....	.68	.74
Rea	2.93	2.95
Hollinger	10.65	10.75
Monita .....	.12	.14
Pearl Lake .....	.45	.45½
Central	3.60	3.62
Imperial .....	.10¾	.11

COBALT STOCKS.

Bailey .....	.02	.02¼
Beaver .....	.45	.45½
Buffalo	1.55	1.90
Chambers-Ferland .....	.12½	.12⅝
City of Cobalt .....	.08	.10
Cobalt Lake .....	.29	.30
Coniagas	6.00	6.50
Crown Reserve	2.82	2.85
Great Northern .....	.14	.14½
Green-Meehan .....	.01⅞	.01⅞
Hargraves .....	.05	.07
Kerr Lake	3.00	3.15
La Rose	3.85	3.90
Little Nipissing .....	.01¾	.02
McKinley-Darragh	1.85	1.86
Nipissing	7.50	7.55
Nova Scotia	off	.10
Peterson Lake .....	.06¾	.07
Right of Way .....	.06	.07¼
Rochester .....	.01¾	.02
Silver Leaf .....	.02½	.03
Temiskaming .....	.38	.38½
Trethewey .....	.57	bid
Wettlaufer .....	.83	.84

CANADIAN STEEL PRODUCTION.

1st Half 1911.

Steel rail production fell off about 8 per cent. during the six months, as compared with the corresponding period in 1910, being 161,635 tons.

The following table gives the production of pig iron, steel ingots and steel rails during the first half of 1911 and 1910, respectively:

	First 6 mos., 1911.	First 6 mos., 1910.
Pig iron (tons)	400,170	344,783
Steel Ingots (tons)	374,793	338,966
Steel rails (tons)	161,635	174,592
Grand total	936,598	860,341

The one unsatisfactory feature of the iron and steel situation in Canada is the demoralized condition of prices on account of the competition in the United States.