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CIRCULATION.

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PROSPECTING IN NOVA SCOTIA.

That a radical change of methods is necessary to success in prospecting for gold in Nova Scotia is evident. The superficial extent of the province's gold-bearing rocks is estimated at between 3,000 and 6,000 square miles. The unit of land held under lease or prospecting license is an area—a space 250 feet by 150 feet. During the year 1910 work was confined to 95 areas.

Over a considerable period of years not more than 315 areas in all have been prospected or mined. At the close of the past year there were held either under license or lease 31,470 areas. Thus, placing the total gold-bearing territory at 3,000 square miles, we find that only about one-seventieth part, or 42 square miles, of the possible field has been taken up. An inconsiderable fraction of these holdings has been prospected, and a very much smaller portion mined.

These facts furnish food for thought, especially when considered in conjunction with the actual position of mining and prospecting. These conditions were illuminatingly touched upon by Mr. W. H. Prest in a paper read before the Mining Society of Nova Scotia. Mr. Prest points out the vital need of a practical knowledge of geology in prospecting a country like Nova Scotia. Familiarity with local conditions is, of course, a sine qua non. "Local experience is just as necessary," says Mr. Prest, "is just as necessary to the skilled mining engineer as it is to the prospector. The lack of practical knowledge on the part of our scientific men is only equalled by the lack of scientific knowledge on the part of our practical men." With this opinion we heartily agree. Nothing is more needed than an adjustment as between the empirical worker and the academic observer.

The day has passed when the man who "putters round the woods with a pick" can be considered a prospector. The complications of glacial and post-glacial geology must be studied and understood. The old method of uniformly tracking rich pieces of drift north is based upon insufficient knowledge. Nothing is more wasteful than indiscriminate trenching. Heavy work of this kind must be guided by close study of glacial and post-glacial action. This point is well illustrated by Mr. Prest from instances in his own experience.

Moreover, the haphazard manner in which preliminary work is undertaken is so costly that much discouragement has resulted therefrom. Mr. Prest suggests many possible and practical economies.

Two concluding paragraphs demand quotation: "I refuse emphatically to believe that there is any such thing as failure in prospecting in Nova Scotia, providing the money and practical knowledge are forthcoming."

ing. . . We want geology, but only its most practical side. We want labour, but only its intelligent use; and last, but not least, we want solid financial backing."

STATISTICS AND CONSERVATION.

No one mineral commodity is subject to more extraordinary waste in mining, storage, transportation, and consumption than coal. In Nova Scotia, for instance, it can be proved that a large percentage of coal that was once available in the mine is now of no commercial value to the owners. Also there has been large waste through deterioration in storage. The same applies to our western collieries.

Both in Canada and in the United States the wasteful bee-hive even yet obtains—and for this there is yet good reason. The remedy for this condition can be only applied in homeopathic doses. No sweeping change is possible. But it is certain that the bee-hive will gradually be superseded by the retort oven, as witness the fact that 6,254,644 tons of coke were made in by-product ovens in the United States during 1909, while ten years ago the production was 1,075,727 tons. Some significance also may be attached to the fact that whereas in 1880 an average of 3,140 pounds of coal was used in making one ton of coke, only 3,020 pounds being used per ton of coke in 1909. These figures, are taken from Dr. E. W. Parker's report to the U. S. Geological Survey. Dr. Parker attributes this improvement entirely to the increased use of retort ovens.

Many more facts could be adduced from the same report. Our point, however, is that the cause of conservatism is definitely strengthened by means of carefully compiled statistics. Coal is at once our most important and our most largely wasted natural resource. Every unmined ton is appreciating yearly in value. We have only a vague idea of where we stand, of how large our reserves are, and of how enormous our waste. There could well be established at Ottawa an off-shoot of the Mines Branch to guard our natural stores of fuel.

THE WESTERN COAL STRIKE.

The strike of coal miners in Alberta and eastern British Columbia was declared on April 1st. Not less than 7,000 men are directly concerned. About 5,500 of these are members of the U.M.W.A. The mines that are closed produce an annual aggregate tonnage of about 4,300,000 tons. The suspension of coal production naturally entails the cessation of operations at the mines and smelters of southeastern British Columbia. Thus the copper industry of the west, giving employment to probably 4,500 men, will be temporarily closed.

The smallest item in all the train of suffering that strikes bring is loss to the investors. The largest is the misery that is brought upon the families of the thousands of workers directly and indirectly affected. A protracted strike breeds crimes of violence. No one

can foresee the final outcome. To our mind the strike is a grotesque anachronism. That it should still be permitted in this country, despite our elaborate preventive machinery, is tragical.

Already many of the unemployed miners are moving to the coast in search of employment. Soon the careless good-nature that characterizes the inception of hostilities will be replaced by rancour and open hostility. The longer the life of the strike, the less will that mischievous organization, the U.M.W.A., be able to carry out its pledges of financial support. When the pinch of short rations is felt then also is felt the desire for blood. The miserable drama, whose closing scene is even now being enacted in Nova Scotia, is evidence a-plenty of the moral irresponsibility of the U.M.W.A.'s leaders. To them the imposition of easily avoidable hardships upon numbers of women and children is a negligible incident.

In the present crisis the attitude of the Department of Labour is not reassuring. With some regret we are led to believe that the Hon. Mr. King fears to give the Lemieux Act a thorough trying out. We hope that this belief is not well-founded. But it is quite apparent that the U.M.W.A. intends to have its own way and to flout openly any efforts of the Department that are not in accord with U.M.W.A. ambitions.

Whether there shall be or shall not be "open-shop" is nominally the main issue. In reality, the objective of the U.M.W.A. is supreme control of the coal-mining situation in the west. How catastrophic such an eventuality would be, we can judge by results in the east.

In any rational and continued movement towards better conditions of work and living the coal miners of Alberta and British Columbia will have the moral support of the Canadian public. In following the lead of vicious foreign demagogues the miners lose all claim upon the sympathy of their fellow citizens.

UNTECHNICAL WRITING.

In the course of our duties we are called upon to read a large number of professional reports and a considerable volume of correspondence. Naturally these documents vary through a tremendous range of merit, demerit, and awfulness. In the main it is safe to assert that hardly one report out of ten is properly written. Even the tenth, excellent as it may be in a technical sense, falls short of what it might be because of the careless use of the English language.

Undoubtedly many serious losses have been incurred through the use of loose and ambiguous phrases. A misplaced comma may alter the whole meaning of a sentence. Trivial typographical blunders may bring ruin in their train.

As a signal example of obscurity we append a copy of a letter received by a Canadian mining engineer. We can vouch for the authenticity of this letter. It has been reproduced as closely as possible in the image of the original. Here it is, and we defy our readers

to arrive at the intentions of the writer:

Dear Sir I am dropping you a line to see if
You care to Entertain a Copper &—Gold Prospect—

$\frac{3}{4}$ of a
mile from Electric Power line— $4\frac{3}{4}$ miles from Rail-
road Station over good Wagon road—

there Was 93,242 of ore shipped
from there about 5 years ago—& it avraged \$50.00 per
ton & there Was Nothing. allowed:

them for the Gold & Silver—
the Prospectors left it to the Smelter Co—& they told
them the Gold—only Ran from 50c. to \$4.50 per ton
& the silver Was only 60c. to 90c. per Ton & the
Prospectors—let it go for granted that it Was all true—
& they ware satisfied With there ore as they ware
geting \$50.00 per ton out of it:

Now Here in the 60th there Was a shaft sank—100 ft—
deap & no difting there is about 18 in of good ore in
this shaft— & there is another Hole about 60 ft sank
some 40 years ago & no—drifting—in it—there is a
good showing in this Hole also More than 18 inches—
the fellows that owned. it: sank a hole about 50 ft
deap I think it was—& took out the 93,242.00 of ore
& shipped it they Cleaned out the other 2 Holes—& Had
a fine showing there. at that time: & I took Mr. L.
Lindsay of Los Angles Cal—there to see it.

they ware asking \$50,000.00 for it then & Wanted
\$5,000.00 down before they would allow us to touch it
—Mr. Lindsay—told them he Would put 12 men to work
& Prospect for 100-dayes & at the End of the 100-dayes
he Would give them the full \$50,000.00 an he Would
give them. Whot ore he had taken out at his Expense
but one.

of the Prospectors was
head strong & Refused his offer—then We left it—
in about 2-Weeaks after that the owners fell out. quit
work: & shipped there ore & quit & Here about 9- monts
ago the fellow that Was—fair to deal With: traded:
His Partner out & I Can.

Now deliver it on a—2—years Working Bond—for
\$20,000.00
No—money at all untill you have Prospected for 12.
monts & if you are Not satisfied at the end of the 12-
months pull off your Emprovements & quit.—if you
Want to go a head pay-half- of the \$20,000.00 & go
ahead for 12 monts more then pay the bal—
Now there is but little to see untill the holes are
unwatered but it is No

Wile Cat & I feal—sure there is a good
Mine there & My offer—Sirtently is Fair—

Would like to Hear from You

Yours—

TRANSVAAL MINING CAPITAL.

From returns recently furnished by the Transvaal
Mines Department we learn much that will be instruc-
tive to those who seek to institute unwise comparisons

between South African mines and those of undevel-
oped regions in this country. Of the 241 gold mining
companies listed, 139 are on the Rand. Glancing at
these latter, we find that 43 are dividend paying; 21
are producing ore but no dividends; 20 are in the de-
velopment stage; and 55 are not working. Without
the limits of the Rand there are but four dividend pay-
ing mines.

The net issued capital of the Rand mines aggregates
roughly \$309,000,000. The paying mines account for
\$165,000,000; the producing non-dividend mines, \$50,-
000,000; developing prospects, \$61,000,000; and dead
mines, \$33,000,000.

EDITORIAL NOTES.

Our readers are not to conclude that the illustra-
tions representing Nova Scotian gold-mine scenes, pub-
lished elsewhere in this issue, represent all that is
to be seen. The province contains some admirably
equipped plants, and numerous small modern stamp-
mills.

Apart from scientific interest, the principal value in
the reported discovery of diamonds in British Colum-
bia lies in the excellent opening it gives for journal-
istic fireworks.

A custom that has survived too long is that of en-
couraging long-distance orators to torture us at offi-
cial dinners. The annual dinner of the Mining Society
of Nova Scotia, held recently in Halifax, was a note-
worthy exception. At this event all speech-making,
save only a short address accompanying the toast to
the King, was done away with. Musical numbers
took the place of the ordinary arid eloquence.

It seems highly probable that Canada will soon feel
the grip, paternal or otherwise, of an explosives trust.
The trust is an accomplished fact. The strangle-hold
may come sooner or later.

The Board of Conciliation, appointed by the Depart-
ment of Labour, decided in favour of the striking coal
miners at Port Morien, Cape Breton. This decision
will strengthen the hands of the miners. But it is
remarkable how slightly the Department has been able
to affect the grievous condition in Alberta and British
Columbia, where thousands of miners have ceased
work without even a colourable regard for the law.

The Porcupine boom has not gained the headway
that brokers had hoped it would. The stock market
is not over elastic. Not the prestige of the Bewick-
Moreing people (of whom more particulars are ob-
tainable in London than in Toronto), not the glamour
of Heinze, nor yet the diffusive joy of the vendor suf-
fices to create the wave. The press is, as a whole,
praiseworthy careful.

The Cobalt Daily Nugget argues, with a large degree of reason on its side, that the Ontario Government should remit the excessive royalties that it has heretofore imposed upon certain mining enterprises in Cobalt. In its salad days the Government caught the fever that infected the whole country. It wanted to make money and make it rapidly. Now, however, such conduct would not be compatible with its larger dignity. But that same dignity would be enhanced were the Nugget's suggestions followed.

Correspondence

The Editor, The CANADIAN MINING JOURNAL:—

Sir,—I am taking the liberty of writing this letter, to ask your opinion of a chemical reaction which probably might interest your readers, as it gives a simple, instantaneous method of restoring over-exposed blue prints at very little cost.

About two years ago, while making a number of blue prints, in a moment of curiosity I happened to pour some hydrogen peroxide over an over-exposed print. The print, which was burnt to such an extent as to be almost obliterated, at once assumed a rich blue colour, and the white lines came out with great intensity.

Since that time, in the southern office of the Republic Iron & Steel Company, I have continually used hydrogen peroxide to restore over-exposed prints, and have thereby saved many prints which would otherwise have been lost.

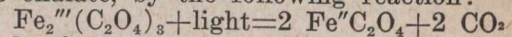
In fact, when it was desirable to make a very strong

print, I have intentionally over-exposed and treated with H_2O_2 , as the resultant was so far superior to the ordinary blue print.

For my own satisfaction I have tried to read up the reaction and to the best of my knowledge the following represents the reactions:

To begin with, it is well to remember that ferrous salts yield with potassium ferricyanide, a deep blue precipitate of ferrous ferricyanide, popularly known as "Turnbull's Blue." This is the composition of the blue of the print, and it has the chemical symbol $Fe_2(Fe(CN)_6)$.

Now, ferric oxalate, exposed to light, is reduced to ferrous oxalate, by the following reaction:



Then, the ferrous oxalate, thus formed, reacts with potassium ferricyanide ($K_3Fe_2(CN)_6$) to form the ferrous ferricyanide, cited above. The following reaction explains this change: $3 FeC_2O_4 + 2 K_3(Fe(CN)_6) = Fe_2(Fe(CN)_6) + 3 K_2C_2O_4$.

The H_2O_2 then reduces to ferrous form very rapidly the ferric molecules that had either not been reduced at all, or else had undergone subsequent oxidation. When forced to reassume the ferrous form by the action of H_2O_2 these molecules were immediately attacked by potassium ferricyanide to form additional "Turnbull's Blue," thereby intensifying the print.

In using the "peroxide" the print is first washed in cold water and then spread face upwards on a table where a few drops of 1:4 H_2O_2 solution are dropped on its surface. The hydrogen peroxide solution is spread over the surface of the print either with the hands or a small sponge, the print again washed in cold water and hung up to dry.

Yours sincerely,
GERALD DOBBS.

MINING IN NOVA SCOTIA DURING 1910

Notes compiled for the CANADIAN MINING JOURNAL from the Annual Report of the Department of Mines:

Nova Scotia Mineral Production.

YEAR ENDED SEPTEMBER 30TH, 1910.

Mineral.	Quantity.
Coal raised (gross tons)	5,477,146
*Iron ore (net tons)	52,640
Pig iron made (net tons)	341,674
Ingots steel made (net tons)	409,663
Limestone quarried (net tons)	483,100
Patent fuel (coke) made (net tons)	493,167
Gypsum quarried (gross tons)	322,974
Building stone, quarried (net tons) ..	8,503
Bricks, made	21,305,500
Drain-pipe, made (feet)	974,819
Grindstones quarried (net tons)	325
Gold bearing ore mined (net tons)	49,557
Gold produced (ounces)	10,675
Manganese ore (net tons)	25
Copper ore (net tons)	nil
Antimony concentrate (net tons)	203
Moulding sand (net tons)	180
Scheelite (net tons)	75
Sulphate of ammonia (net tons)	3,622
*Iron ore imported, 705,351 net tons.	

COAL.

During 1910, there were 4,896,896 tons of coal sold, an increase over 1909 of 281,183 tons. The total production was 5,477,146 tons, colliery consumption accounting for 515,720 tons.

In CUMBERLAND COUNTY the total output was 277,862 tons, as against 542,040 for 1909. The Maritime Coal, Railway & Power Company, with 161,843 to its credit, was the chief producer, the Cumberland Railway & Coal Company's output being largely reduced on account of the protracted strike.

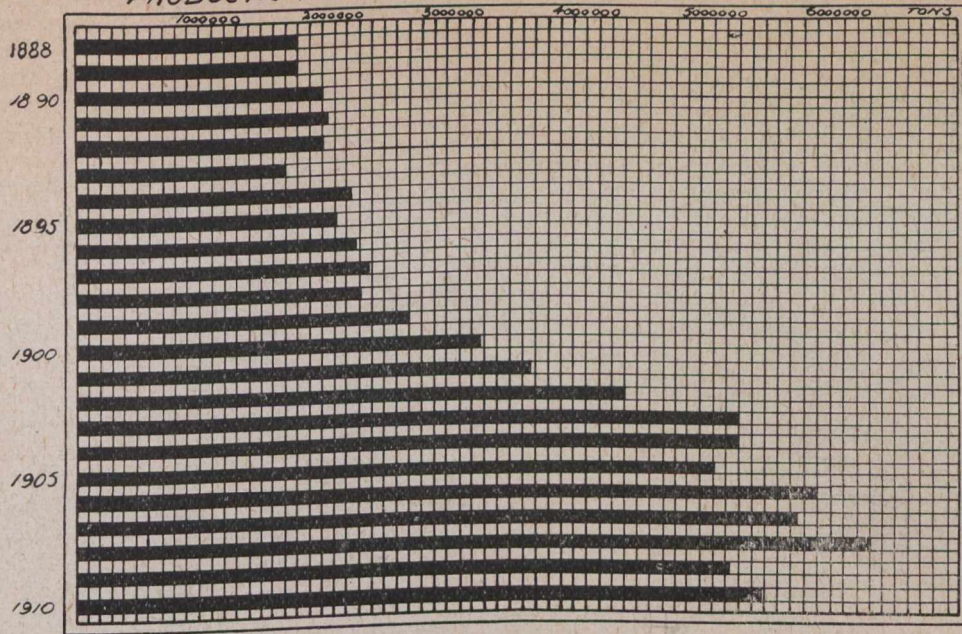
PICTOU COUNTY's production was 629,599 tons, a slight falling off as compared with 1909. The producers were the Acadia Coal Company and the Intercolonial Coal Company.

In INVERNESS COUNTY, 364,104 tons were raised, the Inverness Railway & Coal Company contributing 277,257 tons, and the Port Hood-Richmond Railway & Coal Company the balance.

CAPE BRETON COUNTY output was 4,205,131 tons, as compared with 3,634,392 tons during 1909. The Dominion Coal Company, with 3,244,754 tons, and the N. S. Steel & Coal Company, with 836,348 tons, accounted for the great bulk of the tonnage.

11,001 persons were employed during the year.

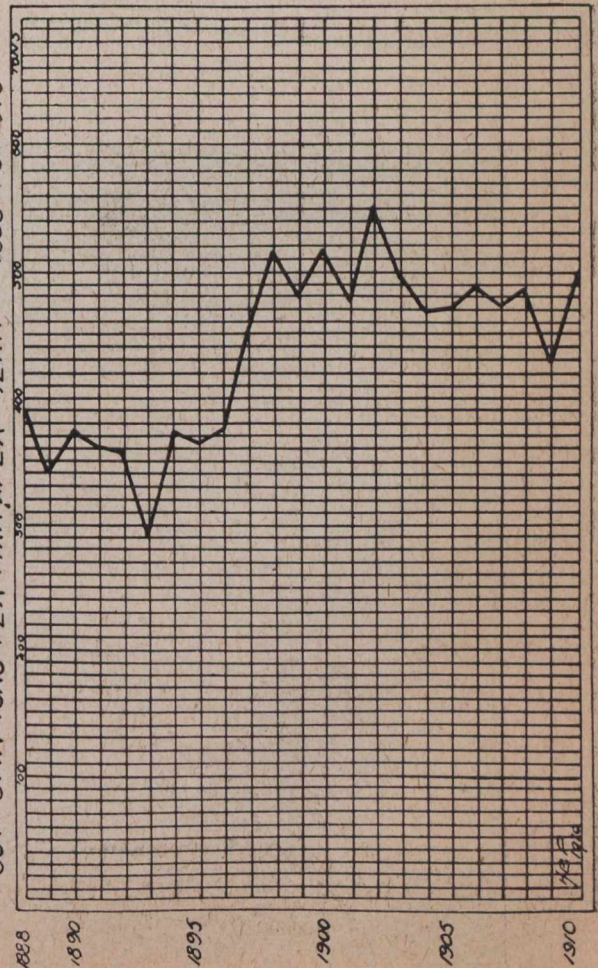
PRODUCTION OF COAL IN NOVA SCOTIA 1888 TO 1910



MEN EMPLOYED IN NOVA SCOTIA COAL MINES 1888 TO 1910

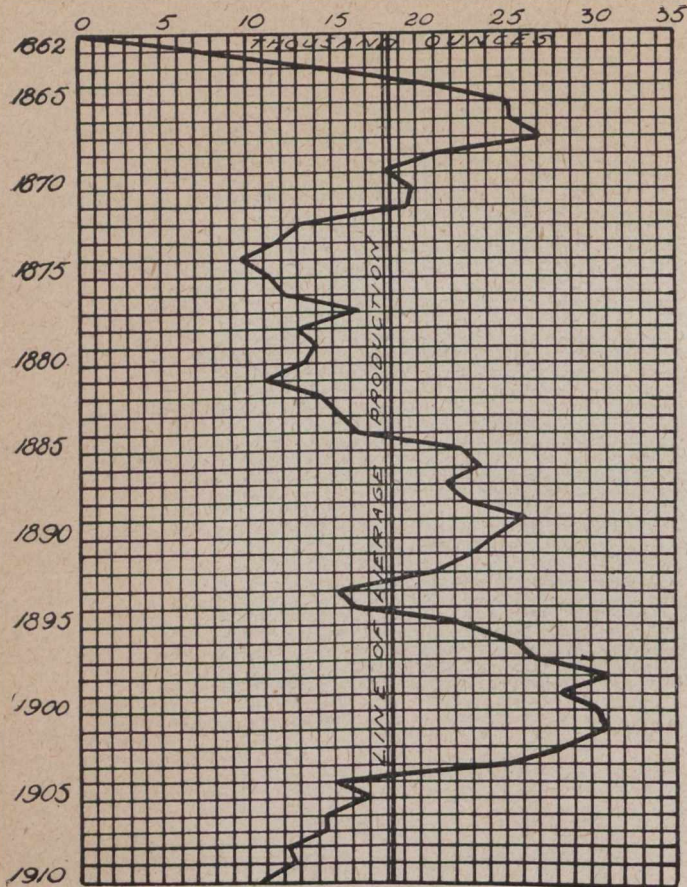


OUTPUT IN TONS PER MAN, PER YEAR 1888 TO 1910



YEARLY YIELD OF GOLD

1862 to 1910



1/2

GOLD.

The total yield of gold was 10,675 ounces recovered from 49,557 tons of gold, a figure slightly below that of the previous year. The average yield—an average that is arithmetical rather than physical—was \$4.09 per ton, higher by 4 cents per ton than that of 1909.

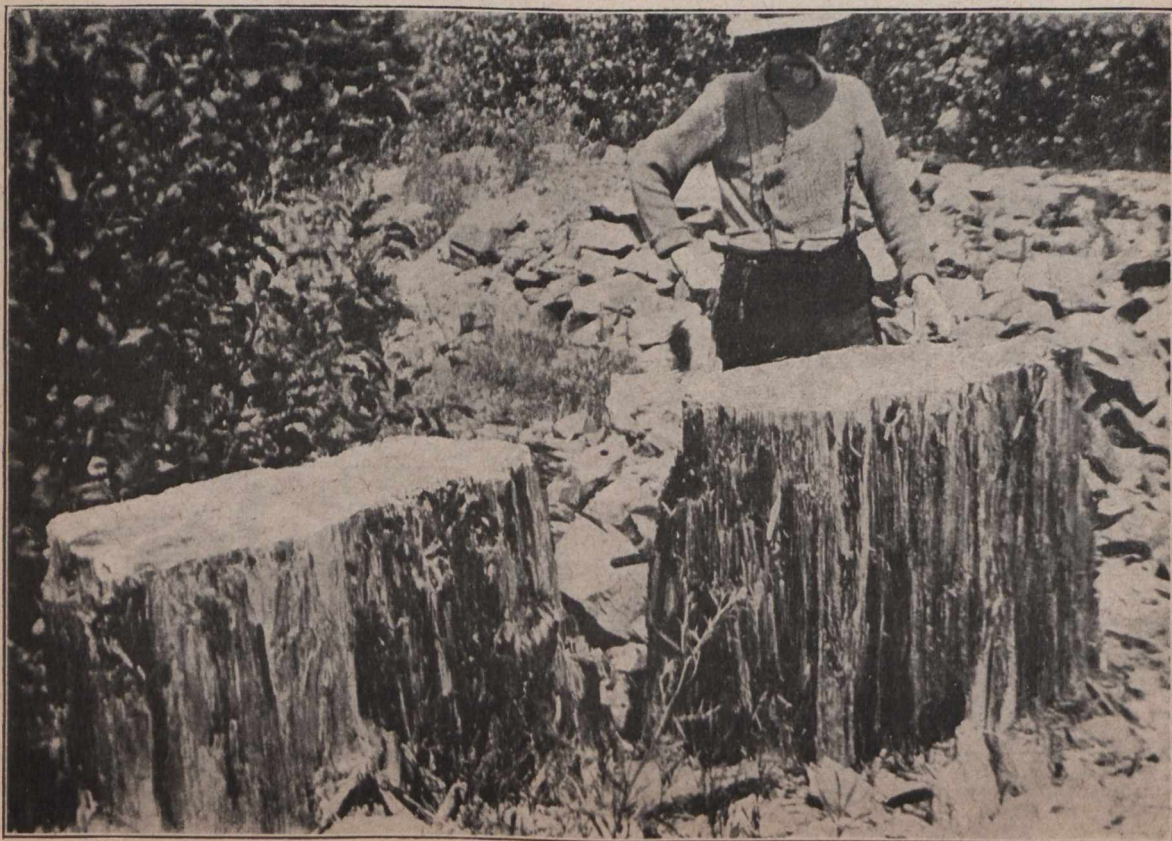
One serious blow to the industry was the temporary stoppage of work at the Richardson mine at Goldboro (Guysboro County) due to a cave-in of the old workings.

Twenty-five small concerns operated during the year. A considerable amount of prospecting was done that should affect favourably the results for the current year.

GUYSBORO COUNTY—The New England Mining Company, working the Richardson mine, recovered \$77,297 in gold from 36,940 tons of ore, an average of \$2.09



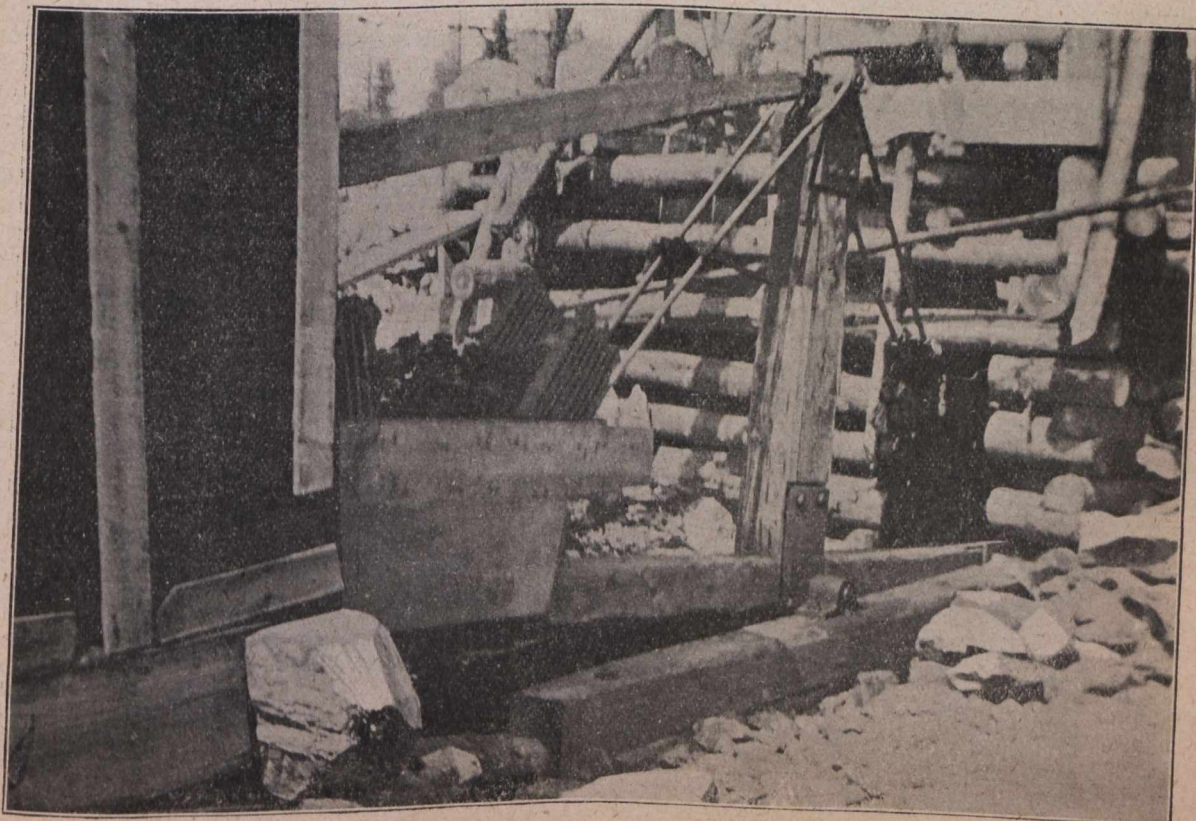
Montagu—Typical small gold working



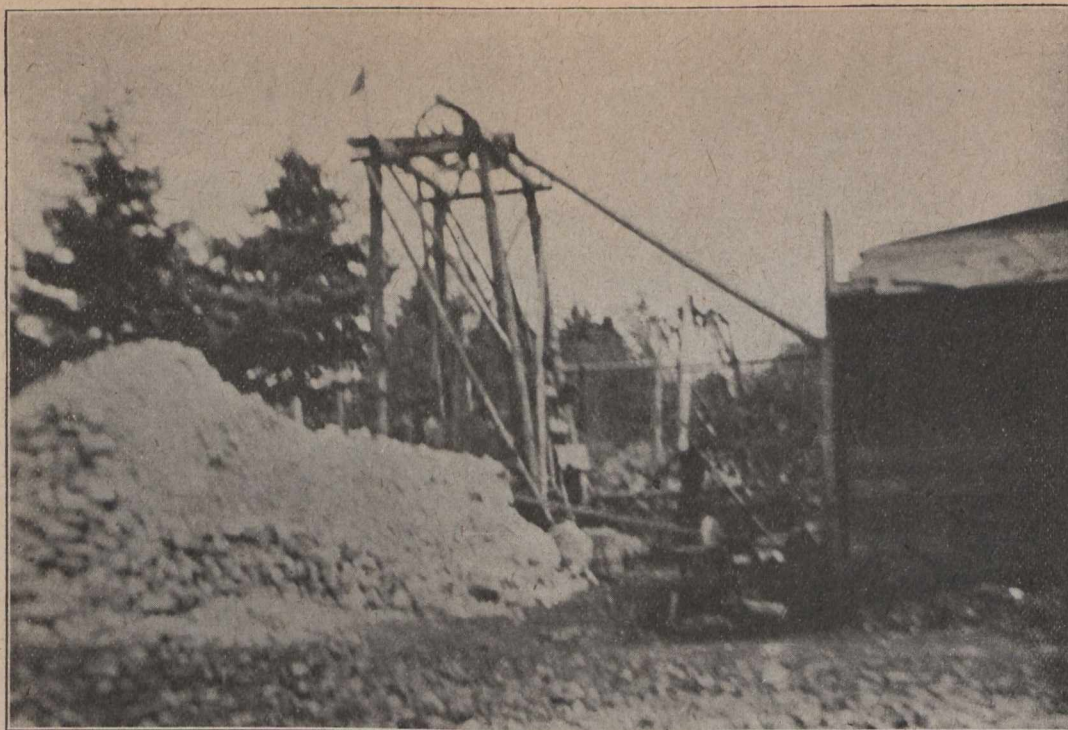
Montagu—Veteran Miner standing behind remains of stamp-battery foundations



Montagu—Old shaft 25 feet by 6 feet sunk about 120 feet



Cornish pump at Montagu



Headframe and dump

per ton. 715 ounces were extracted from 956 tons of concentrates by bromo-cyanide treatment. 529 tons of arsenical concentrates were made and shipped to Swansea. The Richardson has yielded about \$1,000,000 in its 18 years of life.

HALIFAX COUNTY—At Killag and Salmon River small prospects were worked. At Tangier, the Dominion Mining Company extracted 866 ounces of gold from 3,090 tons of ore. At this plant hydro-electric power is used.

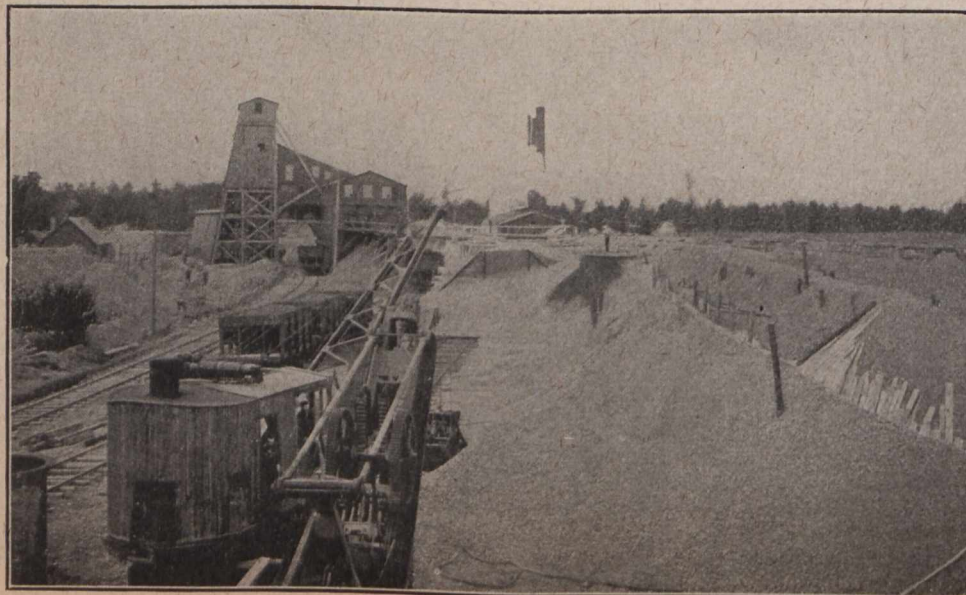
The Caribou Gold Mines, Limited, at Caribou, won 273 ounces from 409 tons of ore. Fraser and McLeod, working at Fifteen Mile Stream, extracted 148 ounces from 180 tons of ore. Other small enterprises reported unimportant returns. The Petpiswick Mining Company, under the management of Mr. G. J. Partington,

did much preparatory work at Lake Catcha. At Oldham, the Oldham Mining Company, E. H. Brennan, manager, won 2,481 ounces of gold from 1,260 tons of ore, the average per ton being \$37.41, taking gold at \$19 per ounce.

LUNENBURG COUNTY—The Gold River mine of the Chester Basin Gold Syndicate, managed by A. B. Stewart, was closed in February, 1910. The Uniac Mines & Power Company, Limited, won 58 ounces from 51 tons of ore.

QUEENS COUNTY—At Malaga Barrens, the Ponhook Mining Company, under the supervision of W. J. Prisk, mined and milled 776 tons of ore yielding 326 ounces. The mine was closed in June. More capital is required.

HANTS COUNTY—Representatives of Mr. M. J. O'Brien, operating the property formerly belonging to



Torbrook Iron Mine, west shaft

the Pictou Development Company, mined and milled 1,834 tons of ore yielding 624 ounces.

IRON.

During the year the amount of iron ore mined in the province increased from 10,000 tons to 52,640 tons. This quantity was produced at the Torbrook mines of the Canada Iron Corporation, Limited. Shipments totalling about 11,000 tons were made to Pennsylvania and to Glasgow.

705,351 tons were imported by the Dominion Iron & Steel Company and the Nova Scotia Steel & Coal Company.

ANTIMONY.

No antimony was mined at the West Gore mine of the West Gore Antimony Company. The dump ore was milled to the extent of 5,565 tons, yielding 203 tons of concentrates.

MANGANESE.

25 tons of high-grade manganese ore were shipped from New Ross by the Nova Scotia Manganese Company. Work is being pushed vigorously and further shipments are being made.

TUNGSTEN.

75 tons of high-grade tungsten ore were shipped from Scheelite, Moose River, Halifax County. The mine is now under the management of Mr. Victor Hills, an experienced Colorado mining engineer. Many new veins have been discovered and development has brought much ore in sight. Regular shipments will commence this summer.

GYPSUM.

The growing gypsum industry had a good year, 322,974 tons being produced. Only 10,500 tons were used in the manufacture of gypsum products in the Province, the balance being shipped to the United States. 640 men were employed. Eight concerns operated.

The Mining Society of Nova Scotia

Nineteenth annual meeting at Halifax, March 29th and 30th, 1911.

The meeting convened at 10 a.m. the morning of March 29th, Mr. T. J. Brown (Manager, Nova Scotia Steel & Coal Company's collieries at Sydney Mines) in the chair. The morning session was taken up with the following business:

- Reading of Minutes of last Annual Meeting.
- Election of new members.
- Report of Secretary.
- Report of Treasurer.
- Report of Librarian.
- Report of Council.
- Appointment of Scrutineers.
- Report of Special Committee regarding Legislative matters.

Wednesday Afternoon.

The President gave an address and also read a paper entitled "The Great Black Cities." In this paper he described the underground workings of a mine, drawing comparisons between it and the ordinary city life.

This was followed by two moving picture films—one illustrating the workings of an underground mine, explosions, care for the injured, etc. The other film showed the manufacture of steel from the open-hearth to the finished article.

Mr. C. H. Wright (Manager of the Halifax branch of the Canadian General Electric Company) then read a paper on "Electrical Apparatus for Mining." This paper was illustrated by a number of very fine lantern slides.

Mr. C. J. Coll (General Manager, Acadia Coal Company, Stellarton, N.S.) followed with a paper entitled "Use of Permitted Explosives in Coal Mining."

After both these papers there ensued lengthy discussions.

This completed the afternoon session.

WEDNESDAY AFTERNOON.

The Annual Banquet, which is always an event of prime importance, took place at the Halifax Hotel. Among the invited guests were:

Lieutenant-Governor MacGregor.

Hon. A. K. McLean, Attorney-General of Nova Scotia.

Hon. G. H. Murray, Premier of Nova Scotia.

Hon. William Templeman, Minister of Mines.

Hon. Christopher Chisholm, Commissioner of Public Works and Mines.

Members of the Geological Survey, Ottawa.

President of the Canadian Mining Institute.

President of the American Mining Institute.

President of the Nova Scotia Society of Civil Engineers, etc.

THURSDAY MORNING.

Prof. E. A. Holbrook (Mining Department, Nova Scotia Technical College, Halifax) read a paper entitled "Modern Gold Mining Practice and its Application in Nova Scotia."

Mr. John Preston (Manager, Colliery of Nova Scotia Steel & Coal Company, Sydney Mines) read a paper entitled "Description of Light Weight Motor Driven Reciprocating Pump."

Mr. W. F. Jennison, C.E. (of Truro, N.S.) read a paper on "Gypsum." This is the first paper on gypsum that was ever read before the Mining Society of Nova Scotia. It was listened to with keen appreciation and was interestingly discussed.

Mr. W. H. Prest (of Bedford, N.S.) read a paper on "Prospecting in Nova Scotia." Mr. Prest's thoughtful paper is referred to in the editorial columns of this issue.

The meeting then adjourned until 2.30.

THURSDAY AFTERNOON.

Mr. H. E. Coll (Manager, Acadia Coal Company, Stellarton, N.S.) read a paper entitled "Regulations Governing the Use of Explosives in Coal Mines." In reading this paper, Mr. Coll used paraphernalia to illustrate the safe handling of explosives, etc.

This paper was followed by the following:

Dr. Ora W. Knight (State Assayer for Maine, U.S.A.) "Research Work on Certain Nova Scotia Gold Ores."

Mr. G. J. MacKenzie (Mines Instructor, Westville, N.S.) "The Coal Dust Problem."

All these papers were discussed and votes of thanks passed those furnishing them.

The President then read the result of the ballot. A vote of thanks to the retiring President was moved by Mr. C. J. Coll, and seconded by Mr. G. J. Partington.

The meeting broke up singing "For He's a Jolly Good Fellow."

This meeting was probably one of the best in the history of the Society in point of papers read, but on account of the lateness in the month, which was un-

avoidable, a number of the members found it impossible to attend.

Mr. D. B. Dowling, of the Geological Survey Department, Ottawa, read a paper on the "Coal Mining Industry of Alberta and British Columbia.

Mr. J. C. Murray brought to the notice of the meeting the work being done by the Special Committee of the Canadian Mining Institute in codifying the mining laws of the Dominion.

The officers elected for the current year were:

President—G. J. Partington.

First Vice-President—Prof. Sexton.

Second Vice-President—Thos. Cantley.

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OUR EUROPEAN LETTER

British mining markets dull — Lowering cost of getting British coal — Some comparative expenses—Royal Commission on Mines and its opinion on ventilation — Salt Union and the Bowman-Hodgkinson process—A submersible electric motor for pumping out flooded mines—Shaft sinking against water by cement injection—Russia's backward gold industry.

(Exclusive correspondence of CANADIAN MINING JOURNAL.)

London, March 18th, 1911.

Mining descriptions on the British share markets continue to make only a very poor show, there being very little demand on the part of the public and nothing to stimulate the demand. The best that can be said of most of the big features such as South Africans is that the declines in quotations this year have been small. South Africans particularly have suffered in response to the persistent liquidation in Paris where several agents de change have risen. Tin mine shares preserve a certain buoyancy but the fluctuations in the price of the metal do not conduce to buying.

So far as British coal mining is concerned that interest which is always aroused in any new method which would have the effect of materially lowering the cost of getting British coal has been excited in connection with a paper recently read by A. E. Booth before the Midland engineers. The contents of the paper are all the more significant, taken in conjunction with evidence brought before the departmental committee appointed to inquire into the working of the special rules. For instance, one passage given in the evidence by D. M. Mowat, general manager of the Summerlee Iron Company, of Coatbridge, Scotland. This gentleman said: "There is no doubt that a coal-cutting motor was one of the machines which had improved tremendously in the last ten years. Ten years ago they had a breakdown once a month. In Scotland there are practically no compressed air machines being installed. Electricity has been in use for thirty years, and we have never had an ignition of gas arising therefrom." It was also noted that five more cutters driven by electricity were being put in, and a further installation was in contemplation. In other parts of his evidence, however, he explained that the Scotch coal mines he was referring to were not what is known as of a fiery character—that is to say, there were never any great outbursts of gas sufficient to cause big explosions; but, nevertheless, the fact that electric power has been employed with apparent success for so many years in Scottish coal mines is of great significance.

At the outset of Mr. Booth's paper he said that machine-cutters resulted in a higher output from a given length of "face." He then proceeded to describe at great length certain new types of conveyors, which are designed for use on thin seams of coal in conjunction

with machine-cutters. The features of some of these contrivances have hitherto been quite unknown in coal-mining practice. He furnished a great mass of technical details dealing with the mechanism of the various types of conveyors, which would be quite out of place in these columns. One of the points which he emphasized was that the trials of these devices had been the most successful where the apparatus had been especially designed for the local conditions.

In speaking of the advantages of these new methods, he fully admitted that the changes involved in the organization of a coal mine by the introduction of mechanical cutters and conveyors created many difficulties for the management, but he strenuously argued that if the problem was approached with determination and perseverance a satisfactory result could be obtained. Not the least among the difficulties surrounding the introduction of new machinery in coal mines was that connected with the labour question. The machine-cutting and conveying installation made it necessary to allow a group of men to work together, under the instructions of a foreman, in parts of the mine somewhat remote from other operations. The character of the whole arrangement and the kind of discipline necessary to carry on the work with success, giving the new machinery a fair chance of justifying itself, have to be carefully thought out, and the personal element duly allowed for. Under adequate and good management, however, it was shown that considerable economies could be effected in the winning of coal, and particularly so when the operations were on thin seams.

As showing the actual comparative cost of working a 2-foot, 8-inch seam as between three systems, the following figures were cited:

	Working Costs per English Ton.		
	By hand.	Machine cutting.	Coal cutting and conveyor.
Getting, timbering, etc..	\$0.48	\$0.30	\$0.22
Stonework.. . . . .	.16	.14	.06
By-work.. . . . .	.08	.10	.04
Sundry costs .. . . .	.10	.10	.04
Moving conveyor.. . . .	...	...	.06
Total per ton	\$0.82	\$0.64	\$0.42

All over the United Kingdom the great thick seams of coal are being steadily exhausted, and more and more attention has, perforce, to be given to the thinner seams. Without going into the technique of the matter, it may be noted that with the old-fashioned handwork the getting of coal from thin seams is full of difficulty, besides being essentially more costly, and

therefore, in the majority of cases, commercially impracticable. But, assuming that the mechanical methods described in this paper prove to be sound and practicable in actual working, the whole aspect of the coal situation in this country will be profoundly modified. The commercial difficulties connected with the thin seams will largely disappear, and the available supply of good coal will be immensely increased.

Also, according to Mr. Booth, the use of the apparatus he described would bring about a permanent increase in the percentage of "round" coal, which follows upon the use of face conveyors. This appears to solve one of the ever-present and pressing problems in the working of all thin seams—namely, a reduction in the amount of small coal.

The third report of the Royal Commission on Mines was issued on March 16th. In their second report the Commissioners expressed the opinion that it would be desirable to have such a standard of ventilation as to prevent the appearance in any open and readily accessible position of a fully-formed "cap" on the lowered flame of an ordinary safety-lamp, burning the oil in common use, and that the men should not be allowed to work or pass where this standard is exceeded. Since that time they have studied the subject more closely and now deal with the percentage of gas which should be allowed by this standard, and recommend that it should be made law that no men shall work or pass in the ordinary course of their employment in places where there is more than $2\frac{1}{2}$ per cent. of gas in the general body of the air. If a higher percentage is found, no one ought to go or work there, except under special supervision, for the purpose of removing the excess of firedamp or otherwise securing the safety of the mine. Such an enactment, the Commissioners think, ought specially to point out that this provision is not to be taken as a standard of ventilation, but is in addition to the existing duty of adequately ventilating the mine. For mines worked with naked lights, a similar rule is proposed, with the substitution of $1\frac{1}{4}$ per cent. for $2\frac{1}{2}$ per cent.

At the annual meeting of the Salt Union, held on March 17th at Liverpool, good results were recorded despite the over-production in the trade. Chairman G. H. Cox naturally referred to the Bowman-Hodgkinson patent, concerning which so much matter has appeared in the press lately, but he refused to commit himself to any expression of opinion regarding the value of this process as the trial tests have not commenced. However, he asked the shareholders not to listen to all the "tittle-tattle" that went on with respect to this patent. Exhaustive tests are to be made at the Northwich works of the Salt Union, and it may be held that as an option has been acquired over the United Kingdom rights, the process is regarded seriously.

As readers of the CANADIAN MINING JOURNAL will be well aware, the inventor claims to increase enormously the output of salt from a given quantity of brine, and at the same time, as might be expected, to reduce the operating charges correspondingly. One is inclined to wonder what is to become of all the salt which is threatened to be produced by so fundamental a change in the volume of output, but apparently the reply to this query is that lower selling prices will promote consumption—particularly in the East. Whatever may occur in this connection, however, it is clear that important developments are impending in the salt industry, and on the whole the tendency appears to be towards increased profits for the Union.

Experts of the British and other Governments inspected on March 8th a demonstration of the Macdonald submersible electric motor in London. It is claimed that this invention will revolutionize the methods of pumping out flooded mines or sunken ships, as the motor works equally well whether sunk in water or running on dry land, while it can be employed for working coal-cutting machines without the slightest danger of "sparking." The type of motor working on March 8th was of 10 h.p., and it is capable of discharging 30,000 gallons per hour to a height of 30 feet. It ran without a hitch during the hours of observation. Captain Young, of the Liverpool Salvage Association, which has done great feats in the raising of warships and other vessels, expressed enthusiasm about the invention. "There is, as you know," he said, "an agitation against the use of electric motors in coal mines, especially in working the cutting tools. This motor can be placed in a tank of water and attached to the machine and the switches, and, being thus submerged, does away entirely with the danger of 'sparking.' Again, ordinary electric pumps in a mine are rendered useless by a rush of water, as in South Wales recently, but this motor works in water, though it is unenclosed except for a light covering to keep floating debris from the working parts. From my own point of view, that of salvage, it will be of importance as a first-aid pump, as it requires no suction, no primings, and can be lowered in a chain sling and commence operations immediately."

The Poetsch freezing process for the sinking of shafts in water-bearing ground is a well-known one. There has been now developed in France, in the chalky formation of the Pas-de-Calais coalfield, the process of shaft sinking against water in fissured ground by injections of cement. This is suitable for any fissured water-bearing rocks, but is of no use for a soft-running ground such as quicksand.

The principle is that a number of boreholes of suitable dimensions are sunk at equal intervals in the form of a ring surrounding the proposed site of a shaft. Cement and water injected through these bore-holes by means of a force-pump find their way into all the cavities and crevices of the ground surrounding each hole, in which the cement sets. As the cement from one hole penetrates the rocks surrounding it, that coming from the adjoining hole is encountered and a cemented, water-tight wall is formed round the proposed site of the shaft. In this way it is possible to get rid of the water troubles that occur in the process of sinking. The equipment for the process is small and inexpensive as compared with that required for making an ice wall by the Poetsch process, besides which, when once the cement has set, the work of the plant is finished, whilst with the Poetsch method the machinery has to be kept at work until the shaft has been sunk and lined, a considerable extra expense being thus incurred. As a result of these savings, the cost of sinking by cement injection is only about one-third that of the Poetsch process. The practical advantage is that water is almost completely shut out, and a masonry lining, if necessary, is made more secure, though the solid wall of concrete makes the lining almost superfluous. The danger to shaft sinkers is greatly lessened, as they have not to cope with continual water troubles when sinking, and, in the event of repairs to shaft lining being necessary later, the existence of the permanent cement wall practically shuts out all water from the shaft, whereas with the Poetsch

freezing process the water is held back only by the tubing.

Although in the past twenty years Russia has increased her production of gold by 50 per cent., yet this is nothing in comparison with the increase in other parts of the world. The reasons are found for this backwardness of Russia in a production for which nature has particularly fitted her in the following: Russia lacks roads and railways, and cannot get at her gold with the facility necessary; she is hampered by legislative and administrative orders that put serious obstacles in the way of private ventures, and she has not the superabundant capital required to place the industry of gold-getting on a satisfactory footing to compete with other goldfields the world over.

The necessity of paying closer attention to the gold-wealth of Russia can be argued on the following lines: Gold alone of all the industries is capable of creating colonization in waste places of the kind found over a great part of the regions of the empire known to be auriferous; it is an industry that is not subject to the same uncertainties of markets and prices as other productions of all kinds are; on the contrary, it creates markets for all other goods, for it has been esti-

mated that for every unit of gold got out of the earth, from 2,000 to 2,500 units of other goods must be provided for consumption by the workers. Owing to redundant harvests, Russia is now exceptionally well situated in the matter of gold, which continues to come into the country in return for grain and other commodities; but this cannot be reckoned on to last forever, and Russia, with her gold value, must get more gold out of her own territory if she is to avoid difficulties in maintaining her gold value.

The measures proposed in this direction are various. New laws for Siberia, involving either some form of local self-government or the placing of administrative powers in the hands of the gold-getters, whose organizations, in fact, do administer for all practical purposes no small part of the wilder districts of Siberia and the regularizing of the practice of "gold-running," which at present is illegal, but so profitable as rarely to incur penalties at the great distances from the seat of authority at which it is practised. This "gold-running" is treated as highway robbery, and most severely punished. In all other countries it is called "prospecting."

LABOUR DIFFICULTIES IN WESTERN COAL DISTRICTS.

By E. JACOBS.

The CANADIAN MINING JOURNAL has already published a list of the various companies concerned in the labour difficulties affecting the collieries of the Crow's Nest Pass district of British Columbia, those situated near the Canadian Pacific transcontinental railway in Alberta, and most of those in Alberta about Lethbridge and westerly along the Crow's Nest Railway. A list of the twenty-five locals comprising District No. 18 of the United Mine Workers of America was also printed, and detailed information was given showing the preliminary proposals of the representatives of the miners, together with the reply thereto of the Western Coal Operators' Association consisting of sixteen coal mining companies operating on the several districts above-mentioned. Further, the chief obstacles to progress towards making a new agreement between the operators and the U.M.W.A., the latter representing the employees—namely, the question of open or closed shop, the check-off system, and the discrimination clause, were briefly stated. Since then negotiations, which on March 9 were postponed for eleven days, have been resumed, but unfortunately without any agreement having been come to, for on March 24 the conference was "declared off," and the representatives of the mine operators and miners dispersed. The situation was shortly indicated in a message from Calgary, where the conference had been held, to the "District Ledger," the union miners' newspaper, published at Fernie, B.C. This brief message was: "Negotiations at an end. Adjourned sine die."

There was no discussion of the rates of wages to be paid in future to the various workers, for notwithstanding that at different times, first the operators and then the miners suggested that consideration of the wages scale be proceeded with, this was not done. The main issue was the check-off system, and in relation to this both sides remained firm—the miners' representatives

insisting on an effective check-off system being provided for, and the operators refusing to concede this point to the extent asked on behalf of the miners.

WHAT HAPPENED IN 1909.

A review of matters connected with proceedings in 1909, when the agreement which has just expired was made (but not until after the mines then represented by the Operators' Association has been idle three months), will perhaps make the position to-day more clear. In March, 1909, the agreement made in 1907 being about to expire, a conference was held at Macleod, Alberta, between the operators and representatives of the employees, and all differences adjusted, so that the agreement reached was referred to the men employed at the various mines for their approval or rejection, with the result that a large majority in favour was reported. The then president of District 18, U.M.W.A., Mr. Frank H. Sherman, who had been too ill to take part in the conference at Macleod, however, did not approve of the agreement, which permitted "open shop" at the several collieries concerned, and contained a "Discrimination clause" which effectually weakened the union in its efforts to prevent non-union men working in the coal mines or at the coke ovens, so he and the secretary for District 18 called a strike and ordered the men to stop work at the expiration of the old agreement. The main object of this arbitrary action was to compel the other operators to yield to the union's demands, as had the Crow's Nest Pass Coal Company, which had withdrawn from the Operators' Association and made its own agreement with the miners, who were granted the check-off system, so vital to the success of the union locally, and, too, there was in that agreement no discrimination clause to restrain the union from interference with non-union men. The Corbin Coal & Coke Company had not joined the Operat-

ors' Association, so it, also, made its own agreement with the union. Likewise the Canadian American Coal & Coke Company (now the Canadian Coal Consolidated, Limited), of Frank, Alberta, made a separate agreement, and, too, the Tabor district, east of Lethbridge, met the requirements of the U.M.W.A. It will be here mentioned that the Crow's Nest Pass Coal, Corbin, and Canadian Coal Consolidated companies are now included in the Western Coal Operators' Association, so that all the companies producing coal and coke in southeastern British Columbia and all the larger producers in Alberta (the total production in Alberta in 1910 was 3,036,000 tons, of which 2,800,000 tons is stated to have been produced by companies in the Operators' Association) are acting together against what they regard as the unreasonable demands made by the United Mine Workers of America.

PRESIDENT LEWIS APPEALED TO.

Following the strike of April 1, 1909, at the mines represented by the Operators' Association, the operators appealed to Mr. T. L. Lewis, international president of the U.M.W.A., in Indianapolis, Indiana, U.S.A., to compel the members of the organization to carry out the Macleod agreement, which it was claimed had been practically accepted by the locals of the U.M.W.A. A representative of the president was dispatched to Canada, and negotiations looking to a settlement of the dispute and a resumption of operations, for which the miners were known to be anxious, were commenced, but the operators declining to give way, union representatives applied to the Labour Department, Ottawa, for a Board of Conciliation and Investigation under the Industrial Disputes Investigation Act, 1907, which was granted. In the application for the Board of Investigation it was asked that, among others, the following clause be included in a new agreement: "The company will require each person employed by them, or to be employed by them, as a miner, mine labourer, or otherwise, in or about the mines and coke ovens of the respective companies, to sign this agreement, as a condition precedent to continued employment of the person already employed or to be employed. The agreement to be placed in a book together with a legal check-off clause and signed by all employees."

STRIKE CALLED CONTRARY TO ACT.

In their reply the operators said, in part:

"2. The applicants have caused the said strike to be declared at each of the said collieries named, and the Board should enquire into the dispute existing at each and all of said collieries.

"3. That the discontinuance of operations at the said collieries is the result of a strike ordered by the President and Secretary of District 18 of the United Mine Workers of America contrary to the provisions of the Industrial Disputes Investigation Act, 1907."

In the agreement the operators, in their reply, submitted should be adopted by the Board it was provided that:

"(f) No check-off clause or deductions should be allowed other than as provided for by the laws of the Province of Alberta and British Columbia."

BOARD OF INVESTIGATION IN 1909.

The Board of Conciliation and Investigation was granted. The operators were represented by Mr. Colin McLeod, of Macleod, Alberta; the miners by Mr. Frank H. Sherman, president of District No. 18, U.M.W.A. These having failed to jointly recommend a chairman,

the Government appointed Rev. H. R. Grant, of Fernie, B.C., to that position. The Board was practically in continuous session from May 20 to June 16, during which period much evidence was taken. The chairman and Mr. Sherman eventually made a majority report. Mr. McLeod, in his minority report, said: "Having in mind the agreements which existed between the parties prior to April 1, 1909, and the Macleod agreement, which was approved of on a referendum vote, I have compiled an agreement based on these agreements, which I would recommend to the parties for acceptance," etc. Regarding a check-off clause, Mr. McLeod said: "The applicants are undoubtedly entitled to a check-off clause in their agreement, but the check-off clause submitted by them being inconsistent with the laws in force in British Columbia and Alberta, should not be accepted, and the check-off clause of the old agreements should be continued, the same being shown in the proposed agreement submitted herewith." The "Check-off" and "Discrimination" clauses proposed by Mr. McLeod were as under:

"Check-off—The company will give to the United Mine Workers of America full recognition and concede the check-off system, that is to say, upon the individual request in writing of any of the company's employees, the company shall deduct such moneys from their wages each month as is designated for dues, assessments, fines, and initiation fees, in other words, the company will retain from the wages due employees any sums they may have given orders upon the company for in writing payable to such officers of the United Mine Workers of America as may be designated in such orders.

"Discrimination—No person shall be refused employment or in any way discriminated against on account of membership in labour organizations, and there shall be no discrimination against any employee who is not a member of a labour organization by members of such an organization."

FINDINGS OF BOARD NOT ACCEPTED.

The report of the Board was not accepted by the miners, so the mines represented by the members of the Operators' Association remained idle for three months, during which period neither side yielded. Eventually the officers of District No. 18, U.M.W.A., desisted for the time in their endeavours to secure "closed shop" and the concession of the check-off system as demanded by them earlier, so on June 30 an agreement was signed by the Operators' Association and District No. 18, U.M.W.A. The official Labour Gazette mentioned that this agreement "is practically the same as the findings of the Board of Conciliation and Investigation."

The position when operations were resumed in the summer of 1909, therefore, was, that the U.M.W.A. had by then succeeded in getting "closed shop" and the "check-off system" at the three collieries and the coke ovens of the Crow's Nest Pass Coal Company, the Corbin Company's mine, and the Canadian-American Company's mine at Frank, while the mines represented by the Western Coal Operators' Association, beside not having conceded either of these, had in their agreement a "discrimination clause" similar to that above quoted.

THE UNION'S "CHECK-OFF" CLAUSE.

In the agreement between the Crow's Nest Pass Coal Company, Limited, and its employees, as represented by District 18, United Mine Workers of America, the term of which agreement began April 1, 1909, and ex-

pired March 31, 1911, the following clauses were contained:

"The company will require each person employed by it, or to be employed by it, as a miner, mine labourer, or otherwise, in and about the mines and coke ovens of the said company, to sign this agreement, as a condition precedent to continued employment of the person already employed or to be employed."

"Check-off System—The company will give to the United Mine Workers of America full recognition and concede the check-off system; that is to say, upon the individual request in writing of any of the company's employees the company shall deduct such monies from their wages as is designated, for dues, assessments, fines, and initiation fees; in other words, the company shall retain from the wages due employees any sum they may have given orders upon the company for in writing, payable to such officers of the United Mine Workers of America, as may be designated in such orders, which shall be continuous orders, not revocable while the makers remain in the employ of the company; except that the employees embraced in the article headed 'Employees not under Jurisdiction,' may revoke orders as above given by them."

OPERATORS' ASSOCIATION NOW STRONGER.

The Crow's Nest Pass Coal Company, the Corbin Coal & Coke Company, and the Canadian Consolidated Coal Company (formerly the Canadian-American Coal & Coke Company) having joined the Operators' Association, and there not being any company in a position to make a large production of coal and operating between Lethbridge and the western boundary of the Crow's Nest district (the McGillivray Creek Company, with a new mine near Coleman, Alberta, is stated to have an output capacity of about 300 tons of coal a day; it has not joined the Operators' Association), the operators along the Crow's Nest Railway west of Lethbridge, and those on the main line of the C.P.R., are acting together, so the United Mine Workers of America have not the advantage this time of lack of practically complete organization among the operators as they had in 1909. On the other hand, the U.M.W.A. is also stronger now than two years ago, for it now has in its 25 local unions a membership of 5,827, nearly all in the affected districts.

MEN AFFECTED AND COAL TONNAGE.

The number of miners affected by the present difficulty has been variously stated in recently published press despatches at a minimum of 7,000 and a maximum of 15,000. The latter is certainly a grossly exaggerated estimate, although if the strike be continued over several months, so as to necessitate the cessation of work at copper mines and smelters and the taking off of freight trains, it is not unlikely the larger number of other men would be affected, directly and indirectly. In the summer of 1909 the number affected was stated at 2,100 directly and 10,000 indirectly; if the number of men employed at that time by companies not then included in the Operators' Association be added, the total of those directly affected would have been between 4,000 and 4,500. The average number of men employed in 1910 at British Columbia mines and coke ovens in the Crow's Nest district was approximately 3,100; the gross tonnage of coal produced was 1,529,000 short tons. No corresponding official figures are available for Alberta, but since it has been stated in press despatches that the mines in that province affected by the labour trouble produced 2,800,000 tons of coal last year, it may be regarded as quite probable

the number of men employed in and about those mines was in excess of 4,000. So it would appear that not less than 7,000 men will be directly concerned, and, too, it may be conceded that, since there are 5,800 members of the U.M.W.A. nearly all in the affected districts, fully three-fourths of the 7,000 are union men.

FAR-REACHING EFFECTS PROBABLE.

The possible far-reaching effects of a prolonged struggle between the operators and the miners have already been suggested by a brief reference to the copper mines and smelters and the railways, that haul their ore to the smelters, and fuel and other supplies for both mines and reduction works. A cessation of work at the mines and smelters of the Boundary and Trail Creek districts would be disastrous, not only to those directly engaged in connection with copper mining, but also to all classes of trade largely dependent upon the mining and smelting industries for their chief support.

CHIEF POINTS IN DISPUTE.

The prospects for an early agreement do not appear to be encouraging. The representatives of the miners offered to leave preamble, check-off, and discrimination clauses as at present, that is, to proceed with conditions as they have been—namely, closed shop and an effective check-off system with several companies, and open shop and discrimination clause as before with others, but the operators would not agree to any clause at all binding even a few of their number practically to the closed shop, or to a check-off which would tend in that direction, nor would they grant the general advance of 5.55 per cent. in wages asked for, only in some cases, but not in those cases—pillars and timbering—in which the union claims the pay is totally inadequate. So a deadlock was reached, and the conference ended.

The union knows that the Industrial Disputes Investigation Act has in the past been openly broken, and that with impunity, so the suggestion of the Minister of Labour that the law must be observed is not likely to be heeded for the reason that in the past it has not been enforced.

Two dredges with steel hulls, said to be the first of the kind built in the West, are being constructed in San Francisco for the Yukon Gold Dredging Company. The dimensions of each are: length, 93 feet; beam, 38, feet; depth, 8 feet. They will have a bucket capacity of about 15 cubic feet, and will be operated by electricity.

The Board of Trade of Nelson, B.C., which is the most important town in the Kootenay district, recently unanimously adopted the following resolution, a copy of which has been sent to the Provincial Secretary: "Resolved, that this Board of Trade bring to the attention of the Provincial Government the requirement in this district of a Mining School; either as branch of the Mining School to be connected with the Provincial University about to be erected at the coast, or in connection with the Nelson High School; and would further draw the attention of the Provincial Government to the Mining School in connection with the High School at Sudbury, Ontario, which is supported by the Ontario Government, and request that the British Columbia Government have inquiries made as to the operation of the same; and would further urge the erection and operation of a similar school in Nelson."

Plan and Purposes of Experimental Coal Mine of the U. S. Bureau of Mines, near Bruceton, Penna.

By George S. Rice, Chief Engineer, Bureau of Mines.

The explosibility of coal dust in air having been successfully demonstrated in the 100-foot gallery of the United States Bureau of Mines at Pittsburg, and in the longer galleries at Lievin, France, and Altofts, England, the next step in the investigation of coal dust explosions by each of the experiment stations was to determine the exact conditions under which such explosions took place. When these conditions were understood, tests of various preventative measures could be undertaken with some degree of precision. Prevention, or at least, limitation of explosions in mines was, of course, the real objective of the stations.

The gallery at Lievin, a short length of which was erected in 1908, was gradually lengthened to a distance of 820 feet, and an increase to 1,600 feet is under contemplation. The gallery at Altofts, also erected in 1908, was about 950 feet long as originally laid out. In both these galleries the limitation of strength prevents safe loading with pure coal dust for more than a distance of 400 to 500 feet; on loading beyond this distance the galleries are sometimes ruptured. The managements of these stations have expressed the desirability of making tests of coal dust in longer and stronger galleries, since it is impossible to solve all the problems surrounding an explosive wave in the short distances now available; moreover, methods of limiting an explosion which were successful with a loading of coal dust for a length of 300 or 400 feet, would probably not be so with a longer loading or a larger explosion.

The Director of the Bureau of Mines, Dr. J. A. Holmes, and his technical staff, at any early date appreciated these unavoidable limitations of a surface gallery, hence desired to obtain an underground gallery or mine opening, which would not only enable the tests to be made on a larger scale than is possible in external galleries, but in which experiments could be made under actual mining conditions. In such an underground gallery there would be no restriction as to the extent and violence resulting from explosion experiments, provided a suitable location was secured. Moreover, the methods of limiting and preventing explosions, the real objective of all such investigative work, could be tried out under real mining conditions.

It was foreseen that the greatest difficulties in experimenting in an underground gallery would be:

- (1) To obtain certain desired natural conditions.
- (2) Having obtained those, to carry out and control the experiments in a scientific way, and be able to get complete records in the face of violent explosions.

After a long search a location for the experimental gallery, or mine, has been selected near Bruceton, Pa.

From 2,500 to 3,000 feet of straight entry can be driven from the outcrop in the Pittsburg seam. In some of the mines operating in the seam, in the past, great explosions have occurred.

The entries will probably be either level or slightly rising, except for irregularities, so that there will be

no serious problem of drainage. The entries enter from a steep sidehill and a cover of from 60 to 160 feet is obtained. The openings are well located with reference to explosion effects, as there are no houses in the vicinity, except those in connection with the plant. The mine is fairly close to a railroad (one-third mile), so that the coal dug in advancing the entries can be loaded on railroad cars. By damming a ravine close at hand, water can be obtained for a boiler plant and fire protection. Natural gas for experimental purposes and for use in a gas incline engine and fan engine is obtained from a pipe line which passes a few hundred feet from the mouth of the mine. Finally, the situation is near enough to Pittsburg to allow convenient movement of the engineers and physicists between the testing station there and the mine. The location of the mine is twelve miles southwest of Pittsburg on the Wheeling Division of the B. & O. R. R. The coal and necessary surface surrounding the mouth of the mine, has been obtained at a nominal rental from the Pittsburg Coal Company.

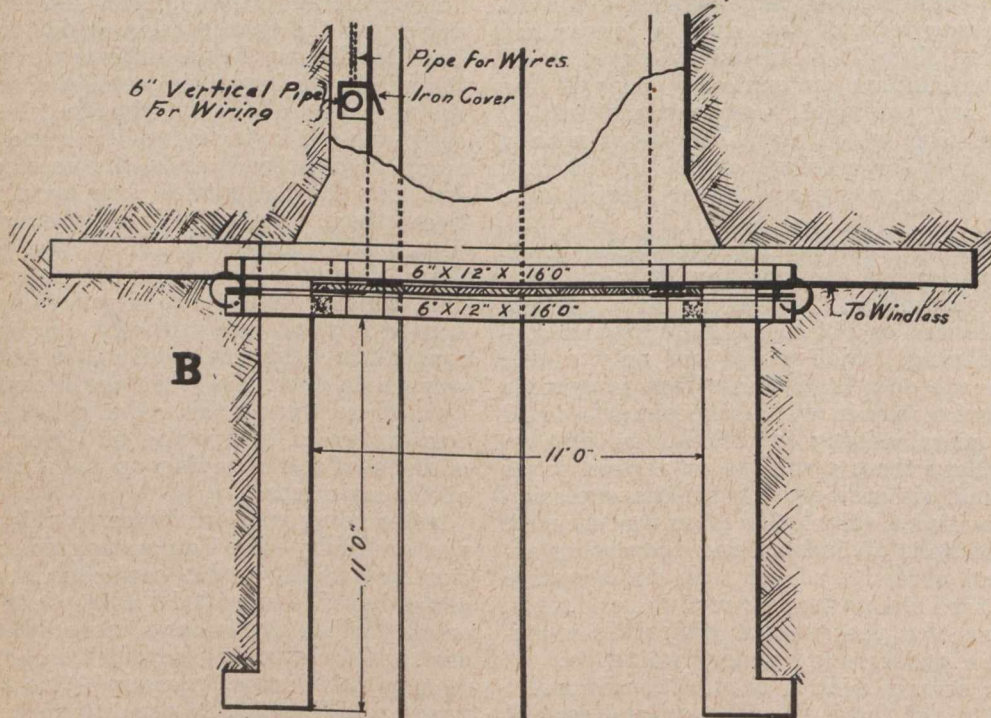
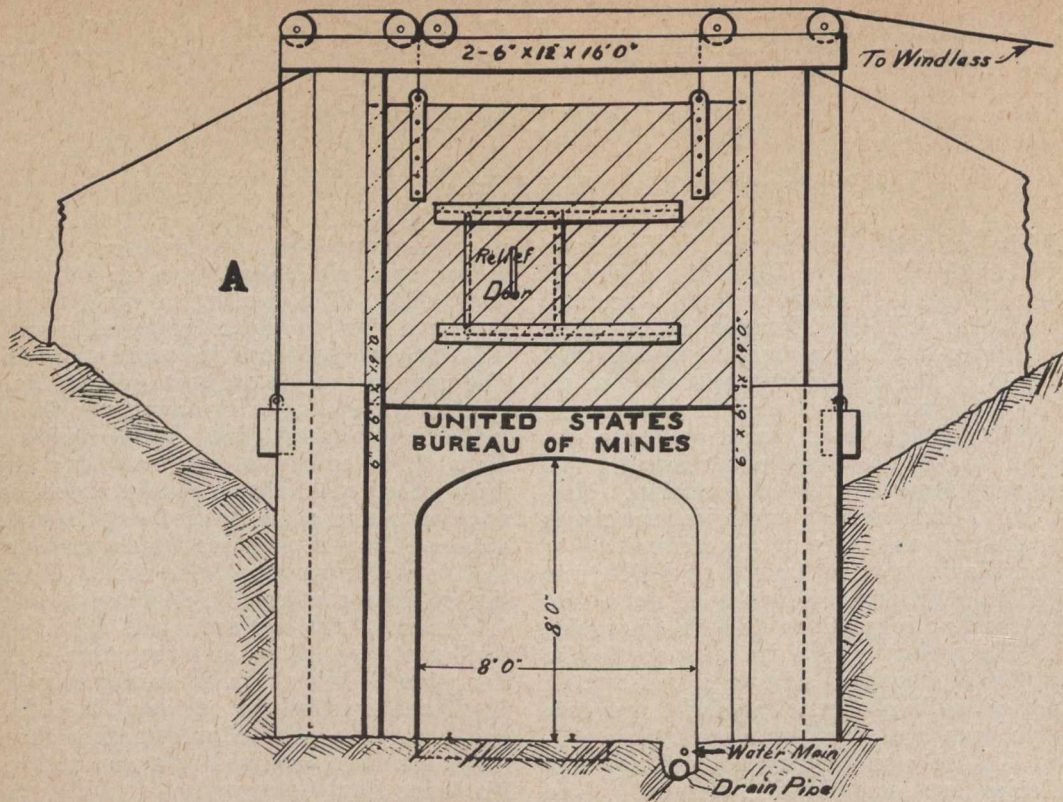
Progress and Development—After a long continued search for the best location, which would give the desired conditions, the present site was picked, and about the middle of December permission was obtained from the Secretary of the Interior and the Director to proceed with the laying out of the mine. The surveys already having been made, the outcrop was uncovered and two parallel entries with forty feet of pillar between them, were started. At the time of writing this description (March 16, 1911) these entries have been driven in under cover over 200 feet. The right hand one, which will be considered the main entry, was started in the lower part of the coal seam, taking the top of the limestone, which is 5 feet below the coal seam, as a floor. Between the limestone and the coal seam there was at this point a hard shale; the entry was excavated in this and in 3 feet of the lower part of the coal seam, leaving up for a roof about 2½ feet of the main seam.

After going in about 50 feet in this manner, the floor was gradually raised on an upgrade until the excavation was wholly in the coal seam and the draw slate above it. The so-called "draw slate" is a soft shale or clay which comes down immediately on mining the coal. Above it, as is generally the case in the Pittsburg seam in this district, there is 1½ to 2 feet of so-called "roof coal," which is generally of poor quality and interspersed with layers of shale.

The parallel entry, which will be called the air course, was driven wholly in the coal seam. It is not intended to use the mouth of this entry in explosion tests. For normal driving this air course will be the return, and ventilation will be obtained by a small fan driven by gas engine located at the top of a small upcast shaft near the mouth of the air course. This shaft will be offset from the air course about six feet.

There will be another entrance to this air course joining at about 150 feet from the mouth, and which will enter at an angle of about 55 degrees, on the opposite side from the main entry. At the mouth of this side approach there will be placed a short length of

*This paper prepared for Western Society of Engineers by permission of the Director of the Bureau of Mines.



EXPERIMENTAL MINE NEAR BRUCETON PA.

A - Exit of Main Entry

B Plan View of Exit

concrete gallery with explosion doors, and beyond that a round steel gallery 120 feet long, 20 feet of which will consist of removable sections that can be rolled out of the way when it is desired to isolate the 100-foot gallery. This part will then be identical with the 100-foot steel gallery at the Pittsburg station, with one exception, a branch off some a short distance from the inlet to which a large reversible fan will be connected. The object of having this steel gallery, which

is 6 feet 4 inches diameter, separable from the mine is so that experiments similar to those conducted at Pittsburg can be made. The gallery at Pittsburg is so continuously occupied with the testing of explosives that systematic testing of coal dust cannot be undertaken in it. When the removable sections before mentioned have been rolled to one side and a steel door lowered in place to cover the connection into the air course, experiments can be conducted in the isolated

gallery without interfering with operations in the mine.

Dust Tests in Mine—At the start it is intended that coal dust explosions will be originated in the steel gallery and the explosion will enter the air course through the branch, pass up same to the last open crosscut, through the latter into the main entry and out to the mouth of same. The crosscuts will be driven on a circle tangent to the entries. This will require one 45-degree turn and one semicircular turn of the explosion wave, a condition which seems to cause no obstacle in a real mine explosion, nor does it cause difficulty in the Altofts Gallery. The records of experiments in that gallery show that on the return side, that is, towards the exhaust fan, the dust, carried by the air current and the advance compression wave of the explosion, has been inflamed and the flame has passed around a number or all of the five right-angled turns in that gallery.

The purpose of this method of initiating explosions in the outside gallery of the experimental mine is to proceed from the known conditions in the gallery (as developed at the Pittsburg Gallery) to the unknown conditions prevailing in mine entries. There is also another object, that while entries are being driven it will give double the length of travel for the explosive wave and thus allow the trying out of the mathematical instruments, before the final explosion experiments which may be originated in the interior of the mine.

Fire Damp—Besides making investigations of the explosibility of coal dust in pure air, it is intended to make tests with small percentages of methane in the air. It is generally recognized that a very slight amount of methane, even as low as $\frac{1}{2}$ per cent., may increase the chance of ignition of coal dust and more widely extend an explosion that has once been started.

The location of the experimental mine is fortunate in having a natural gas pipe line near it. This line takes gas from some gas wells in the same ravine. It is intended to take a branch from this gas main for use in a gas engine hoist and in a gas engine for driving a small ventilating fan. It will also be used for the purpose above indicated, of introducing when desired small quantities of gas into the mine.

Natural gas has very nearly the same composition as the marsh gas of the coal seams, the difference being that in addition to the methane (CH_4) there is from 10 to 15 per cent. of ethane (C_2H_6). This slightly varies the properties of the mixture of air for its combustion, but the difference for practical purposes is negligible.

The gas will be piped to certain points and by a system of mixing with the ventilating current will be re-carried through in whatever proportions may be required, approximate percentages will be determined through meter measurements and precise determinations by sampling the air and gas mixture and analyzing. It is considered that this line of investigation of the effect of small percentages of methane is most important, and the need for it has been expressed by foreign critics of coal dust experimentation now carried on.

Concrete Lining—It is anticipated that great explosive force will be developed at the mouth of the main gallery; hence it is intended that the timbering which is now in place must be supported by reinforced concrete walls and arching. The latter will present a smooth surface to the explosive wave and thus prevent great falls at the mouth of the mine, the occurrence of which would lead to heavy expense and delay in clearing up after each experiment.

It is the plan to concrete the approach leading from the steel gallery to the air course, and it may become necessary to concrete between this connection to the mouth of the air course, although it is not intended to load that portion of the air course with coal dust. It is expected that the explosion wave entering from the gallery entrance will not have gained sufficient momentum at the junction with the air course to break down doors or stoppings erected between that point and the mouth of the air course, but will be deflected into the air course toward the face.

Method of Driving Entries—The method of driving entries is the usual one employed in the Pittsburg coal seam. The coal is undercut and shot down with explosives, which in this case are of the "permissible" type, electrically fired. The coal is loaded on pit-cars, which are hauled by mules, to the mouth of the mine, thence over an outside tramway with slight descending grade, to the head of a rope incline. Trips of cars are lowered, by the hoist under brake, to a trestle and tippie located on a siding of the B. & O. R. R.

Buildings and Apparatus—It is necessary to have a considerable number of buildings; these are now under construction. There will be a boiler house with boiler to furnish steam for the several engines, including the fan engine. A crusher and grinder house will be necessary to grind up the dust for the experiments; as much as four tons will be necessary when the mine is fully developed. There will be a blacksmith shop containing small equipment for the necessary repairs and an engine house for the incline engine. There will be a combined office and observation room for observations and the starting of explosions, in connection with which there will be a small laboratory for field analyses of gas and mine air samples. Several small buildings, including a barn for the mules, have already been constructed.

Ventilating Fan—The ventilating fan for the experiments must be of such size as to create all the conditions which may surround an explosion in a mine. It is desirable to obtain high velocity in restricted areas, say, 1,500 feet per minute over a considerable distance. A capacity of 80,000 cubic feet per minute at a pressure of 2 inches water gauge and 15,000 cubic feet per minute at a pressure of 6 inches water gauge, is specified and has been guaranteed by the builders. The fan is made reversible, so that experiments may be conducted with dust explosions going against the air current as well as dust explosions going with the air current. The Altofts gallery fan is not reversible and the explosion portion of the gallery is at the intake end.

Pressure and Recording Instruments—The important objectives of the experiments are to obtain the speed of the explosion as indicated both by pressure and by flame; the variation in pressures at different points along the course of the explosion; the temperatures; and the samples of the gases immediately preceding the inflammation of the dust or gas and immediately following the inflammation at a given point. Such experiments will require apparatus of an extremely sensitive nature.

A similar set to those used in the Altofts gallery has been purchased from the Cambridge Scientific Instrument Company, of England. These were designed primarily for external galleries, but it is believed there will be no serious difficulty in arranging them in steel plate boxes sunk into the coal rib. It may be found necessary to design new and additional apparatus.

An important point in the use of the recording instruments is their driving, also the making and breaking of electric circuits. To connect these instruments with the outside will require the wiring to be done in such a way that it will not be torn out by the explosions. It is proposed to place the wiring in pipes placed in a groove in the coal rib and at the mouth of the mine; these pipes will be set in concrete but arranged with suitable boxes at short distances apart so that the wires may be gotten at.

It is evident to make the wires safe under the enormous pressures which are expected, which may run up several hundred pounds or more per square inch, will need great care. To obtain the currents for the instruments will require a very steady running generator engine set. It is expected to obtain a set which will be sufficiently large to allow some lighting with incandescent lamps in and around the mine.

Limiting or Preventing Explosions—The real importance of the experiments is not the mere study of explosion waves, although of great scientific interest, but to study methods for preventing or limiting explosions. It is, therefore, proposed to experiment with all the important methods that have been suggested up to date as described in U. S. G. S. Bulletin 425 and Bureau of Mines Circular No. 2, among which may be briefly recited, watering by water sprays, by exhaust steam sprays and by deliquescent salts (calcium chloride) and by rock and shale dust in various ways. It is believed these experiments tried out in a mine on a sufficiently large scale can effectually demonstrate the relative efficiency of the various methods.

Explosives—A secondary purpose of the experimental mine, and by no means an unimportant one, is the study of explosives which have been placed on the permissible list for use in gaseous and dusty coal mines—testing them under actual working conditions in coal.

Dust Production—Another purpose to which the experimental mine can be put is in studying the relative production of inflammable dust by different types of machines which undercut or shear the coal.

Gasoline Locomotives—Still another purpose is the testing out under mine conditions of gasoline motors to determine the safety of the apparatus in actual use and the degree to which the air may be vitiated by the exhaust gases.

Electrical Devices—It is probable that many electrical mining devices can be tried out under actual service, together with tests of insulation of wiring.

Concrete, also Steel Timbers and Props—The growing scarcity of mine timbers, as well as the danger of fire from their use, suggests the importance of testing reinforced concrete timbers and ties; also steel props and ties in the experimental mine.

The relative advantages of brick arching and reinforced concrete for lining the main entries can also be studied, and under severe conditions.

It is probable that the equipment will be sufficiently installed by the first of May to try some preliminary experiments. In the meantime the entries are being driven as fast as possible.

The next general meeting of the Western Branch of the Canadian Mining Institute is to be held at Trail, B.C., on or about May 18. As the headquarters in British Columbia of the Consolidated Mining & Smelting Company of Canada, Limited, owning the large smelting works and refinery in operation there, are at Trail, it is expected there will be a good attendance of members and an interesting meeting.

Pit Bottom Arrangements for Large Outputs.

(Written for the CANADIAN MINING JOURNAL by W. A. Clifford.)

The sketch plan of mine herewith was prepared for the discussion of a paper contributed by Mr. E. H. Fohl, consulting engineer of Pittsburg, to the Coal Mining Institute of America, at its December, 1910, meeting in the Carnegie Technical School. The title of the paper was "Shaft Bottoms." Particular reference was made to the manner of distributing the air from that point, and especially to protecting the men working at the pit's eye in severely cold weather.

Mr. Fohl advocated the use of undercasts for air crossing, but the writer is not clear whether he proposed to drive them in natural strata underlying the coal.

The subject is one of great practical importance to coal operators and mining engineers, in view of the fact that at no very remote date deep mining will involve costly installations, and therefore the winning of extensive areas from a single plant, with large output to insure financial success.

In his endeavours to obtain sketch plans of shaft bottoms where large outputs are obtained, the writer was not successful; therefore, as a forlorn hope and an endeavour to atone for his failure, he hurriedly prepared a sketch plan to illustrate what he had to say at the meeting, and at the request of the Editor of the Institute, now put his remarks in a less desultory form than when uttered verbally.

In these days of fierce blasts, where the roadways of a mine have to bear strains akin to those pressing the walls of a great gun barrel during firing, the overcast has been found to be the weak point. Carbonic oxide poisoning, rather than burning, has now consequently become the chief contributor to the greatly increased death roll in colliery explosions. Overhead air crossings of the most substantial construction have been destroyed, like a house of cards, thick walls of reinforced concrete proving altogether inadequate to resist the force of such explosions as have occurred, where coal dust played the most active part.

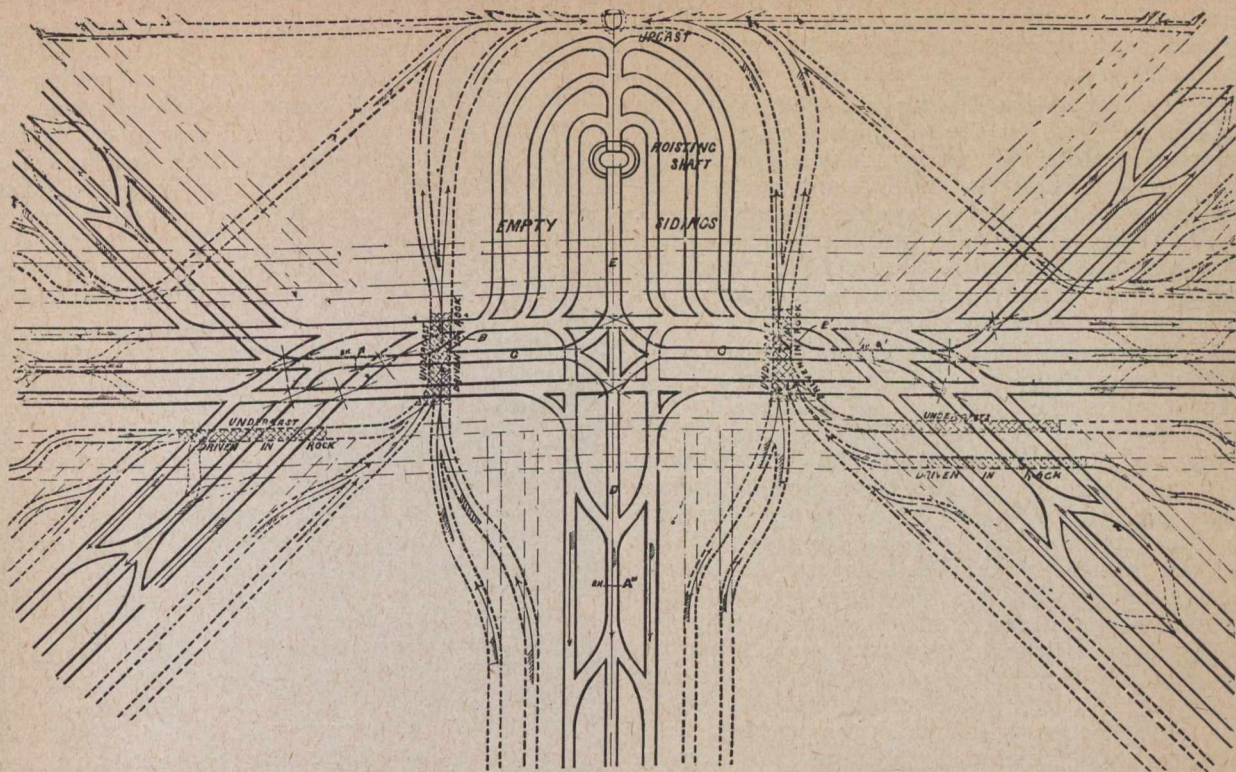
The writer agrees entirely with Mr. Fohl, that the best and safest form of crossing for a fiery mine is the undercast, and he would hardly limit this to where floor conditions and drainage admit its use, but would rather add that it is worth while to provide against adverse conditions to gain the advantages offered by air crossings driven in the solid under the floor.

Two systems of that form are known, and have their advocates among the leading mining authorities in Europe.

The first consists of driving the channel conveying one air current across another, through the solid strata overlying the coal, beginning at the floor level and gradually rising to a cowl or summit directly over the road to be crossed, then by descending a similar grade to the one it rose by, until the coal floor is reached or "footed" on the other side.

The other system proceeds by passing down grade to a point directly below the road to be crossed, then rising on the other side until another point or airway is reached, level with the roof and floor of the coal.

The first system has been used in a few mines, during the last half century.



The second system has been applied in a very limited number of cases, where the conditions of floor, pitch, and drainage, appear naturally to invite its adoption, and perhaps it might be added where mining practice was specially resourceful and intelligent.

The British Government in the Mines Regulation Act of 1862, fixed 10 feet as the thickness of natural strata between the upcast and downcast shaft. This was calculated to resist any blast that could obtain with the average ventilation of that day, but the writer would be inclined to fix the distance between the floor of an air crossing drift and the roof of the road it crosses, at something greater than 10 feet, depending much upon the strength of the interlying rock.

Both the overcast, and the road it crosses should be lined with masonry at, and a little distance beyond, each side of the crossing. With an air crossing below the coal, the undercast road only need be lined with the coal, the overcast road acts as a natural relieving arch to the crown and haunches of the lower one, carrying most of the pressure of the superincumbent strata. This allows a thinner division between the two roads, and consequently a smaller bending of the air current, a matter of some consequence where the initial volume, or a primary split is involved.

In the outline plan shown, a large output is contemplated, and the coal is hauled from the working places to a number of bank-heads or summits, formed by raising the roads at the summits, and by grading each way, or by lowering the hoisting shafts bottom and cutting away the floor to the several bank-heads. The grade from the bank-heads to the shaft should be even and about 2½ per cent.

The choice of methods of forming these bank-heads, or summits, must be carefully considered. In the former case mentioned, raising the road by material shot down from the roof, the bank-heads will be approached from the workings by a gradient, necessarily either steep or long, or against the load. In the latter case,

lowering the landing at the shaft and cutting away the floor to grade, the lift at the pit bottom, hereafter described, must be higher, which is undesirable—15 to 20 feet should be the limit. Good judgment would look at the problem as presented in the particular case, and probably strike a compromise by blowing down some top, and blowing up some floor, the disposal of the dirt being taken into account; but the efficiency of the job, will be the paramount consideration. Taking up some floor in the empty sidings and adjacent engine roads, should be carefully considered. The greatest efficiency, the smallest prospect of repairs, and the smallest first cost, will always be kept in sight. The kick-back switch shown in Mr. Fohl's sketch and followed by the writer, in the one presented to the Institute along with his talk, has been changed to that now shown to meet the contemplated larger output, which further thought suggested.

The kick-back arrangement involves the risk of stopping the whole pit, which is too serious a matter, especially with a large output. Empty roads curving towards the main haulage roads as shown in sketch, are not new. They were employed by one of our past presidents, Mr. F. A. Schellenberg, at the Westmoreland shaft 40 years ago, and the writer knew modifications of them in the north of England and Midlands as long ago as 1867.

The operation of the plan described herein, and shown graphically in the sketch, is very simple. The coal is hauled from the workings by locomotives over the bankheads, or delivery points, each of which points is identified with a particular producing section of the mine. In operation the locomotive having hauled its train over the summit, drops down a steep shunt, B or BI, to the back road and thence to the empty siding.

Thus released from the control of the locomotive in front of them, the waggons commence their unaided journey down the incline towards the shaft, as fast as those in front of them move on, impelled by the same power of gravitation, until they ultimately reach

their goal, and are in their turn hoisted to the surface, making way for those behind them, which are subsequently hauled over the same bankhead.

The empty locomotive having dropped down the shunt and made its way to the empty sidings, has taken and delivered another empty train inbye, in exchange for a full one, and is now pulsating its way to its bankhead to deliver it. The process goes on repeating itself. From every district of the mine trains are being hauled over the bank-heads with the most perfect regularity and alacrity that efficient equipment and close supervision can induce during working hours.

Several district roads feed into central arterial ones, CC, which in plan shown range in straight lines, longitudinally towards the boundary of the coal to be worked. These two, and perhaps another one, D, at right angles to them, deliver their coal into the wide arched pit porch, E, of considerable length, with four tracks laid in a line with those on the cages. There are opposite each cage controlling devices to automatically or otherwise release, as the cage strikes the bottom, just as many waggons as the plant is designed to pull at one time, and no more. The full waggons by gravitation assisted by power, or by power alone, push the empties from the cage to the platform of an elevator at the back of the shaft, and the same movement automatically raises stops, which hold the waggons in a fixed position upon the elevator platform. During the time a hoist is being made to the surface, the elevator platform, which slopes in the direction the empties must travel when released, is raised to the landing. The stops which secure the waggons on the platform are automatically dropped, as soon as the landing is reached, by mechanism which cannot operate sooner. The waggons run out on the rails of the empty roads and gravitate to the proper point where the locomotive can reach them and haul them into the workings to be refilled.

Over the entrance to the empty porch or mouthing, a man or boy sits to operate the lift, and by means of switch levers at his side to distribute the waggons as they are lifted. To enable him effectually to perform these duties, he occupies an elevated seat or platform, from which he can see all that goes on in the shaft bottom on the one hand, and the landing and travelling of the empty waggons on the other hand.

It will be apparent that the purpose of providing the somewhat extensive empty sidings on each side of the pit, is to keep up the supply of empties in the case of any temporary hitch in winding, or stoppage at the top, where the large standage of full waggons between the bank-heads and shaft provide for continuing hoisting when the supply of coal from the hauling roads is from any temporary cause curtailed or stopped. For a mine hoisting 1,200 an hour, the writer conceives that a standage of 350 to 400 empty cars is not too much.

The operator at the lift can divert cars to either side whenever the demand calls for it. And that he may know just how many cars are standing, simple electrical devices, with illuminated dials, at the entrance to each switch road, may be contrived without any serious stretch of ingenuity as nothing requiring any mental application should be allowed to distract the attention of a man engaged in such a strenuous occupation.

To prevent the smashing of waggons turned down grade at the switches, when they come in contact with those already standing in the empty road, artificial retardation must be resorted to, the simplest form of

which is undulations of grade in the empty roads designed for the purpose.

The details of this paper and the drawing are not claimed to be new. Some portions of them will be found in the arrangement in nearly every modern colliery. The writer has brought these scattered elements of good practice together, and incorporated them in a fairly complete scheme, by what may be termed a process of mechanical synthesis.

It is for practical men who peruse this description to assimilate what they consider good, and reject that which they may deem not good.

The writer, however, feels the utmost confidence that, as an engineer, he could carry the scheme into practice without serious modifications, and also without any abridgement of capacity.

The sketch as drawn is too much crowded—the pillars thin—and hence it does not represent what would be good practice in actual construction. This condensation has been done to get the sketch into small size, and in no way affects the principle of operation of the scheme.

Safely and effectually to work such a mine as projected above, one mainshaft of good size or two smaller main shafts, would be required. The structure of these shafts or shaft should be such that an explosion could not render them useless.

As will be seen, the plan contemplates the entire separation of the intakes from the returns, except in those parts of the mine where coal is being worked. And as fast as a working is finished, a substantial airtight stopping should be put in at each end of the pillar pierced with tamped stowing between them, in order to restore the wall separating the intakes from the returns, to as near as possible the original strength of the coal pillar.

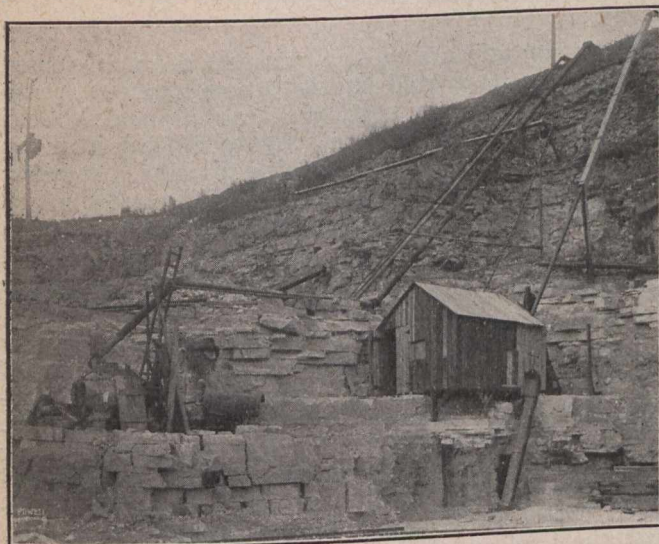
Fresh air laid on to pass principally along the two outside roads, in each set, the middle road being coal hauling road, up to points not shown, just behind the several bank-heads, the two outside roads being in consequence of this arrangement, ordinarily free from coal dust. The air in the middle road to be sealed to only something more than the sanitary requirements of the men working in it, so that in case of an ignition of the dust, the flame will have a chance to die out for want of oxygen, instead of vigorously travelling outbye, and wrecking the shaft, as now usually happens.

In case of longwall working the pit pillar would require to be of very ample size.

Hon. Wm. Templeman, M.P., Dominion Minister of Mines, is stated to have promised the Board of Trade at Chilliwack, B.C., that Mr. Charles Camsell, of the Geological Survey, who spent the field-work seasons of the last four years in the Similkameen and Tulameen districts of British Columbia, will make a reconnaissance survey of the Steamboat Mountain prospective mining field, which has come into prominence in the coast cities of British Columbia during the year last past. The new field is in Yale district, and has thus far been reached chiefly by way of Hope, on the Fraser River. Provincial Government parties will, it is expected, make trails in from Chilliwack, on the west, and Princeton, Similkameen, on the east of the Hope Mountains, which, if done, will open a second and third route to Steamboat Mountain region. As yet not much development work has been done, but many mineral claims have been staked, and assay returns from mineral specimens from some of them encourage the hope that much gold-bearing ore will be found there.

Electric Pump Replaces Steam Pump in Stone Quarry.

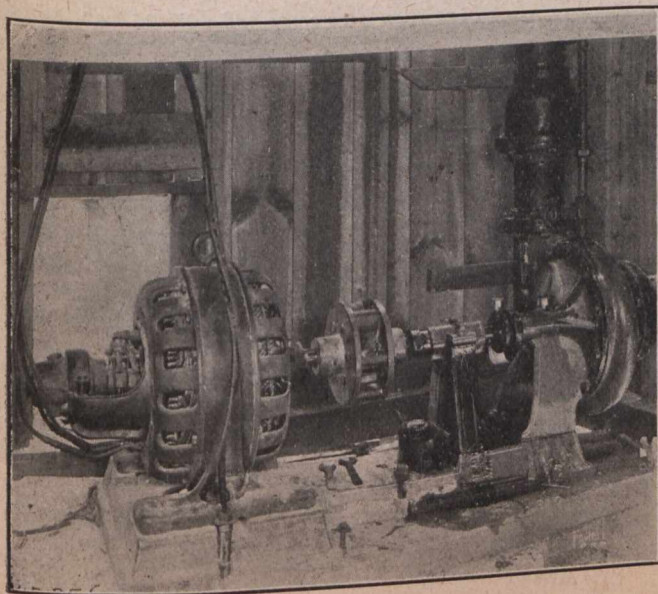
The view of the quarry shows the steam engine partially dismantled and left to rust out its days in the weather, also the shanty in which the new pump is installed and the suction and delivery pipes. The view inside the shanty shows the motor and the pump, installed across the end of the shanty close to the suction



and delivery pipes. As the motor is about 2½ feet high an idea may be had of the relative sizes.

This outfit, consisting of a No. 6 high duty American centrifugal pump driven by a 30 h.p. Westinghouse alternating current motor running at 690 r.p.m., was installed over a year ago by the Kankakee Electric Light Company, in the stone quarry of McLaughlin & Mateer, Kankakee, Ill., to keep the quarry dry, and has been giving excellent service ever since.

The pump delivers 1,100 gallons per minute against a discharge head of 55 feet and a maximum suction of 25 feet pumping the water from the quarry sump. The water is started and stopped by a ball float and master switch in the pump house and a magnetic starter on the bank above the quarry. The pump works automatically, running eight hours out of the twenty-



four; that is, the sump fills in one hour, and the pump empties it in a half-hour.

The owners of the quarry were somewhat skeptical of the powers of the pump when it first appeared on the scene and called it a "toy," and it did look diminutive beside the steam pump. When the pump was connected and ready to work they came around confidently expecting that this new device would be totally inadequate and that the firm was going to "get in wrong." But when the equipment dug right into the load and pumped water in a large stream and never once hesitated until the sump was emptied, their surprise and speedily their pleasure was great. So pleased were they that in 24 hours after the pump began work orders were given for the complete abandonment of the steam equipment.

The motor application is a particularly good one. The first point of excellence is the use of a flexible coupling between the pump and the motor, which permits slight inaccuracies in the alignment of the two shafts. Some form of flexible coupling should preferably be used on all installations where the motor is direct connected to any two-bearing machine. The second point is the excellent concrete foundation provided even though the pump and motor are mounted on the same cast iron bed plate.

SHEEP CREEK GOLD MINING CAMP, B.C.

Mr. W. M. Brewer, of Victoria, B.C., recently stated, for publication, that he considered Sheep Creek, in Nelson mining division of the West Kootenay district, the best camp he had seen in British Columbia.

"I consider it the best camp," he said, "for the reason that the Nugget ground is 6,000 feet above the sea and the Queen 2,000 feet below, with the Mother Lode workings 500 feet deeper than the Nugget—that all are in the same geology, though there is no relation between the veins of the various properties.

"On the Nugget there are oxidized gold-bearing ores on the surface and in the workings, 400 feet below they are still getting the same kind of ore. From it fully 80 per cent. of the value can be saved by amalgamating. In the Mother Lode, while a large proportion of the ore is free-milling it becomes more of a sulphide. The Queen is 200 feet below the level of Sheep Creek and here the ore is thoroughly sulphide, but they claim that there is in it sufficient free-milling quartz to save about 60 per cent. of the value on the plates.

"All of the development on the Nugget and the Queen has been paid for out of the bullion received from the mills on the properties—a 4-stamp mill on the Nugget and one of 20 stamps on the Queen. The Nugget is owned by a company, the stock of which is largely held in Vancouver. The Mother Lode has been developed by outside capital and is now arranging to put in a mill.

"In addition to these properties there are the Kootenay Belle group, the Clyde, and Fawn groups, all located in the same geological formation made up of alternating belts of schist and quartzite with some dikes of igneous rocks as intrusives. The general trend of the veins is easterly, while that of the country rock is northeasterly. In all these the fact that the veins are true fissures, cutting through the quartzite diagonally, is very noticeable. In value saved, they vary from \$12 to \$25 per ton on the mill runs. What is the extent of the area of the camp? That is problematical. Whether there will be any mines of value found outside the quartzite and schist zone remains to be proved."

Outlook for Placer Gold Mining in British Columbia.

By E. JACOBS.

The preliminary estimate of the mineral production of British Columbia in 1910, published by the Provincial Bureau of Mines in the first week of this year, shows a small increase in the value of placer gold as compared with 1909. The production in the latter year was the smallest during a fifteen-year period—1895-1909—both years inclusive. The officially recorded value of production in these years, respectively, was \$477,000 in 1909, and \$481,683 in 1895. There were, however, several earlier years in which production was still smaller, as follows: In 1891, \$429,811; 1892, \$399,526; 1893, \$356,131; and 1894, \$405,516. That for 1893 was the lowest on official record, the statistics commencing with 1858, which year was credited with an output valued at \$705,000. Thereafter, for twenty-three years—1859-1881—the yearly production was always in excess of \$1,000,000, with that of 1863 (\$913,563) as a maximum, and of 1880 (\$1,013,827) as a minimum. Since the discovery, in 1898, of the Atlin placer gold field, there have been five years in which the output was in excess of \$1,000,000, with that for 1899 (\$1,344,900) as the highest. The average yearly production for twenty-five years, 1858-1882, was \$2,259,986, with an aggregate for that period of \$50,649,656; that for the next twenty-five year period, 1883-1907, was only \$755,978, and the aggregate \$18,899,447. The addition of \$1,606,000 for the last three years, 1908-1910, will show the aggregate value of the production of placer gold during all years to 1911, namely, \$71,155,103.

It will be seen, then, as compared with the past, the production of placer gold in quite recent years has been small in this province. There is, though, good reason to look for an increase this year, and, given a fairly large water supply, also during a number of years to follow. A heavy snowfall in Cariboo district during the winter now closing warrants expectation that there will be plenty of water for the ensuing season's gravel-washing. In addition, larger and more productive hydraulicking operations are expected in the Quesnel mining division of Cariboo than for several recent years, for it is probable the water-supply system of the Quesnelle Hydraulic Gold Mining Company will be sufficiently advanced towards completion to admit of hydraulicking being commenced about the middle of next summer, and being continued during fully three months thereafter. If this expectation be realized, there is likely to be at least \$100,000 recovered by that company before the season shall close, for it expects to operate under conditions that will be more than usually favourable, owing to physical advantages connected with its water-supply system and the lay of its gold-bearing gravel beds. In the Cariboo mining division, too, the outlook is regarded as being decidedly promising, for Mr. John Hopp's several placer mines about Barkerville have been provided with facilities for a larger water supply and equipped with additional hydraulicking appliances, with the object of moving a larger quantity of gravel, and recovering more gold than in past years. In this division there are, as well, several hydraulic enterprises equipped for working on a smaller scale, the combined production of which will contribute an appreciably large amount to the total recovery of gold in this district.

Conditions in the Atlin field are also promising for an increased yield of gold, although the North Columbia Gold Mining Company, now the largest producer in this district, was able to operate to a large capacity last season, with a correspondingly enlarged production as compared with that for 1909. Several other operators may be expected to add considerably to the total for this field, though not to a similar extent as the North Columbia Company, which possesses an abundant supply of water, and has large areas of gold-bearing gravel favourably situated for being quickly moved.

There also appears to be a prospect of an increased recovery of placer gold in East Kootenay next season than for some years past, preparations having been made last season to operate a hydraulicking plant on Perry Creek, in Fort Steele mining division. To allow of the gravel being moved more quickly, a steam shovel has been put in, and other arrangements have been made to carry out the undertaking on a scale that will facilitate the recovery of sufficient gold to make the enterprise a profitable one.

With much attention being given to the country now being rendered more accessible by the construction of the Grand Trunk Pacific Railway through central British Columbia, it is not too much to expect that there will be done more prospecting for placer gold along some of the many streams considered likely to be found auriferous, but these are uncertain prospects as compared with those previously mentioned in connection with the Cariboo, Atlin, and East Kootenay districts. The last are of themselves sufficiently promising to justify the opinion that the production of placer gold will, at any rate for several years, show a steady increase and will attain to larger proportions than the average of the last three years.

Missouri Zinc

Canadian readers of the JOURNAL, especially those connected with the zinc and lead industry, will be interested in the following tables reproduced from the annual mining edition of the Joplin Daily Globe:

All the zinc blende in the Joplin district is purchased on a base price per ton of concentrates running 60 per cent. zinc contents. A penalty of \$1 per ton is imposed for every per cent. that the concentrates fall below this base in zinc tenor, and a corresponding bounty is allowed for each per cent. above 60. A similar penalty is added for iron contents and all settlements are made on dry weights.

The prices of zinc blende for 1910 fluctuated from \$46 base in January to \$40 in March, \$36 in April, and in August, ore sold as low as \$35, with a steady advance to \$48 in November, and the year closed with a gradual decline. The lead market suffered in the same manner. In 1907 lead concentrates sold as high as \$88 and \$90 per ton, whereas the average for 1910 was in the neighbourhood of \$52.

The imports of zinc ore for 1910, according to the United States Bureau of Statistics, amounted, all told, to 72,854 short tons, with a metal content of 25,832 tons, equivalent to a 36 per cent. average metal content.

With the exception of 1907 this metal content is the largest ever imported and the ore tonnage is the largest ever imported with the exception of 1909 and 1907.

The importation of spelter shows a decrease of 65

per cent., notwithstanding a reduction in duty from 1 1/2 to 1 3/8 cents per pound.

The following table, compiled by the United States Geological Survey, gives the imports of zinc ores from Canada and Mexico since the year 1904, in tons of 2,000 pounds:

	Calamine. (free).	All other (dutiable).	Total
1904			
Canada .....	.....	.....	.....
Mexico .....	.....	2,264	2,264
Total .....	.....	2,264	2,264
1905.			
Canada	913	3,150	4,063
Mexico	6,180	11,894	18,074
Total	7,093	15,044	22,074
1906.			
Canada	423	.....	423
Mexico	47,778	7,213	54,991
Total	48,201	7,213	55,414
1907.			
Canada .....	.....	1,112	1,112
Mexico	84,984	17,021	102,005
Total	84,984	18,133	103,117

1908.			
Canada	634	6,772	7,406
Mexico	22,900	23,451	46,351
Total	23,534	30,223	53,757
1909.			
Canada	4,330	5,694	10,024
Mexico	61,054	45,191	106,245
Total	65,384	50,885	116,269
1910.			
Canada .....	.....	4,927	4,927
Mexico .....	.....	67,927	67,927
Total .....	.....	72,854	72,854

Chili exported to the United States in 1910 over 13,000 tons of zinc ore containing a little over 13 per cent. zinc, but the zinc content was lost in the process of smelting for lead.

These figures show that Canada's proportion of the zinc imports is very small. On the other hand, the Canadian ores were of a much higher grade than those imported from Mexico.

The following table shows the production and value of the zinc and lead ores from the various camps in the Joplin district:

DISTRICT'S RECORD ORE PRODUCTION.

The Output in Pounds and Amount Paid for Lead and Zinc Ore by Camps.

Camps.	—BLENDE—		—CALAMINE—		—LEAD—		Total Values
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	
Webb City-Carterville, Mo.	215,713,555	\$4,515,466	.....	.....	47,716,005	\$1,258,799	\$5,824,265
Joplin, Mo.	98,758,190	2,075,844	3,573,690	\$ 42,744	14,426,465	379,608	2,498,196
Duenweg, Mo.	37,999,160	780,960	6,413,180	85,543	5,761,160	149,293	1,015,796
Galena, Kan.	38,589,230	801,557	287,220	3,364	4,136,710	108,729	913,650
Alba-Neck City, Mo.	37,168,990	805,190	87,040	1,076	403,150	10,439	816,705
Miami, Okla.	20,311,390	332,250	.....	.....	6,775,025	176,489	508,739
Granby, M.	10,692,790	194,424	19,217,190	250,474	826,000	19,739	464,637
Oronogo, Mo.	16,828,545	347,059	.....	.....	2,576,050	70,828	417,887
Spring City, Mo.	4,900,480	99,436	8,375,000	106,068	3,818,980	98,617	304,121
Badger, Kan.	12,982,930	273,589	.....	.....	925,630	25,675	299,362
Aurora, Mo.	8,368,820	171,379	6,615,475	79,642	454,475	11,550	262,551
Carthage, Mo.	11,111,170	238,611	349,450	4,288	36,620	866	243,765
Quapaw, Okla.	7,937,720	167,068	.....	.....	443,420	11,109	178,177
Carl Junction, Mo.	6,680,480	143,210	.....	.....	48,370	1,151	144,361
Zincite, Mo.	6,314,860	133,829	.....	.....	242,880	6,212	140,041
Sarcoxie, Mo.	4,721,820	97,256	2,500,065	32,370	29,770	817	130,443
Cave Springs, Mo.	3,511,500	73,124	.....	.....	18,370	408	73,532
Stotts City, Mo.	1,678,855	35,444	.....	.....	30,320	780	36,224
Reeds, Mo.	681,490	13,781	173,670	2,146	.....	.....	15,927
Wentworth, Mo.	166,540	3,577	226,080	2,720	.....	.....	6,927
Seneca, Mo. ....	.....	.....	108,250	1,331	124,650	3,383	4,714
Greenfield, Mo. ....	.....	.....	273,710	3,325	37,000	962	4,287
Peoria, Okla. ....	.....	.....	111,320	1,228	.....	.....	1,228
Springfield, Mo.	10,510	210	.....	.....	.....	.....	210
Total shipments	545,129,025	\$11,303,264	48,211,340	\$616,319	88,831,050	\$2,335,432	\$14,255,015
Surplus in bins	9,000,000	180,000	2,400,000	27,600	2,100,000	58,800	266,400
Total production	554,129,025	\$11,483,264	50,611,340	\$643,919	90,931,050	\$2,394,232	\$14,521,415
Shipments by States:—							
Missouri	465,307,755	\$9,728,800	47,812,800	\$611,727	76,550,265	\$2,013,430	\$12,353,957
Kansas	51,572,160	1,075,146	287,220	3,364	5,062,340	134,404	1,212,914
Oklahoma	28,249,110	499,318	111,320	1,228	7,218,445	187,598	688,144

British Columbia is the largest producer of zinc ores in Canada, and the bush fires in the vicinity of the zinc mines account for the large decrease in the zinc ore exports to the United States. The railway used for transporting the major portion of the tonnage was entirely destroyed for a distance of several miles.

"Comparing the Canadian imports of 1910 with 1909 and 1908, it will be noted that they fell off over 50 per cent., when in reality the mines have increased their productiveness and may be expected as heavy importers as soon as the transportation can be replaced. More attention has been given zinc production in British Columbia the past year than any year since 1907, and the whole province has entered into the work of making the mines producing zinc, profitable, and to that end have been securing the aid of the Dominion Government in the experiments on electric smelting, so that the ores of that country can be smelted at home and thus escape the loss occasioned by the high freight rates and tariff to American zinc smelters."

This statement by the mining editor of the Joplin Globe, who is an accepted authority on the Joplin district, shows that the zinc smelters of the United States are thoroughly conversant with conditions in Canada. If the smelters of the Oklahoma and Kansas districts can make a profit importing our high grade ores, in the face of the high duty and almost prohibitive freight rates, surely there is an excellent opportunity for a centrally located smelter, where the Canadian ores could be reduced to spelter, and then exported to the United States if the Canadian product could not compete successfully in the open markets of the world.

Portland Canal Mining Company

The directors of the Portland Canal Mining Company, Limited, have received from Mr. W. J. Elmdorf, manager of the company, the following communication, under date March 21.

"The proposed addition to the concentrating plant of the Portland Canal Mining Company is for the sole purpose of handling more ore at a decreased cost per ton and thereby assuring larger profits, not only in the aggregate, but per ton of ore treated. Furthermore, it is exactly along the lines contemplated by the management from the beginning of the mill construction. No new devices are to be employed, and none of those now in the mill, and used in the very satisfactory run of last fall, are to be discarded.

"The plants of concentrating machines, as installed, consists of four jigs, handling 5, 3, 2 and 1 mm. feeds; one Wilfley table and one Overstrom table, for the finer sands; and two vanners for the slimes. Experience showed that while all the machines used were satisfactory, the Wilfley table was pre-eminently so. Not only did it most successfully handle its own size of feed but, on this particular ore, it was equally efficient on sizes up to 2 mm. This was determined by diverting No. 3 and No. 4 jig feeds on to it. Moreover, it showed a capacity almost equal to a jig of these sizes. At the coarser sizes, 5 and 3 mm., the capacity of jigs greatly increases and it is for this and other reasons advisable in any concentrating mill to treat as much ore in a coarse condition as is feasible.

"The proposed plan of changing the 2 and 1 mm. jigs to 5 and 3 mm., thus giving two No. 5 and two No. 3 jigs, at least doubles the jig capacity. In order to handle the increased 2 and 1 mm. feeds to keep pace

with this increase, six more Wilfley tables should be provided. The Wilfley and Overstrom tables now in the mill, and the vanners, will be used on the finer ores. In order to be sure to meet the increase in concentrating facilities with crushing capacity, it is also proposed to provide a larger crusher. Our present one will be used later, when a further increase in the mill is warranted, as the orebodies in the mine are developed.

"The purchase of these machines and their necessary connections, and a simple piece of construction involving no foundation work, but merely the extension or enlargement of our concentrating floor, and other minor changes, cover the proposed additions. These will cost about \$15,000, and will give more than 75 tons daily capacity.

"Unless some most unreasonable delay occurs, this plant should be complete and running within 90 days from date, if the machinery is ordered at once."

The additional machinery recommended by Mr. Elmdorf has been ordered, so that the larger output from the mill, as indicated in the foregoing communication, may be expected to be made after about the middle of next summer.

Slow Progress on Zinc Problem.

The Liberal Association, Nelson, B.C., has received the following letter from Hon. William Templeman, Dominion Minister of Mines:

"I have your letter of Feb. 8, inquiring for information concerning experiments that are being conducted by the Government in connection with the reduction of zinc ores.

"I may say with regard to this matter that the department has secured the co-operation of Dr. Ingalls, the well known mining engineer of New York, who is now devoting his attention to this problem.

"Dr. Ingalls has investigated various proposals that have been made in technical literature and experimental practice for the treatment of zinciferous ores, but he does not think that any of the proposals so far submitted would afford any solution to the problem. He is also in touch with people in America and abroad who are working on problems of a similar character.

"While none of this work seems to be directly applicable to the conditions of British Columbia, some of it contains the germs of what may be useful ideas. The experimental work done by the Canada Zinc Co. at Vancouver and Nelson has been thoroughly reviewed. The manager of that company courteously placed the plant at Nelson at the department's disposal, but Dr. Ingalls did not deem it advisable to undertake experiments upon a large scale anywhere until certain fundamental conditions had been determined upon a small scale.

"Certain plans of experimentalization have been formulated, which include electric smelting. The metallurgical laboratory at McGill University is being used for these experiments, Dr. Alfred Stansfield, of the university, an experienced electro-metallurgical experimenter, having immediate supervision over the work.

"Experiments with the British Columbia ores began during November, and are now in progress. It is too early yet to forecast what the result will be, but Dr. Ingalls states that the tests have afforded valuable information respecting conditions affecting the design of electrical furnaces for zinc smelting.

"Experimental work in new fields, involving the designing and construction of apparatus, is necessarily slow, and particularly so in the case of a metal possessing the peculiar properties of zinc.

"It is proposed to carry on the experimental work on a large scale in British Columbia, as soon as the preliminary work has indicated some advisable way."

Personal

Managers of hydraulic placer gold mines in British Columbia who have spent the winter away from the districts in which their respective mines are situated, are returning to prepare for the expected early opening of the hydraulicking season. Among them are Mr.

John Hopp, of Seattle, Washington, whose mines are in the Barkerville district, Cariboo; Mr. John B. Hobson, of Victoria, B.C., who is opening a new mine near Quesnel Forks; Mr. Howard W. DuBois, of Philadelphia, Pa., who is in charge of the construction of a 17½-mile ditch in Quesnel mining division for the Quesnelle Hydraulic Gold Mining Company; Mr. J. M. Ruffner, of Cincinnati, Ohio, president of the North Columbia Gold Mining Company, which last season recovered about \$150,000 worth of gold from its placer mines in Atlin district, B.C., and others. There was a heavy fall of snow last winter in the chief placer mining districts of British Columbia—Cariboo and Atlin—and a long and profitable season is expected to result from the consequent large supply of water for mining operations.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

Safety Lamps.

Apud the fact that the Government of Nova Scotia is about to make safety lamps compulsory in all the coal mines of the Province, it is interesting to note that the centre of controversy in England has shifted from the question of the merits of safety lamps as compared with naked lights for mines, to the question of whether some so-called "safety" lamps are really what their name implies. The necessity of lamps are really what their name implies. The necessity of having nothing but closed lights is not now the subject of argument, and is taken for granted. It is, however, pointed out that there is a great and unnecessary variety of safety lamps, some of them containing more or less objectionable features which have been brought into prominence by recent disastrous explosions. It is now proposed that safety lamps shall be submitted to a series of rigid tests in explosive mixtures under varying pressures and velocities of air, and that only those lamps which prove themselves safe under such conditions shall be permissible for use in coal mines. A piece of land has already been secured by the British Home Office in the centre of the South Yorkshire coalfield where experiments along the lines mentioned are to be carried out. The idea has met with very general approval from mining men in Britain, and there can be little doubt that before long we shall have "permitted" safety lamps as well as "permitted" explosives in coal mines. In doing this the British authorities are only following in the steps of Continental Governments who long since adopted similar regulations. The circumstances surrounding the behaviour of safety lamps under varying conditions of pressure and amid certain explosive mixtures are more complex than might be thought at first, and definite data will be welcomed by all concerned, and particularly by the mine manager.

The Springhill Situation.

As forecasted in last fortnight's issue of the "Journal," the town of Springhill has been placed under the jurisdiction of a police commissioner, who arrived in the town with thirty picked constables on the 3rd of April. That it was high time the authorities took cognizance of the topsy-turvy condition of things in Springhill is evident from the fact that on the previous Saturday two of the town constables were arrested on a charge of interfering with the constables of the Cumberland Coal & Railway Company in the discharge of their duty, and were taken to jail. The appointment of a police commissioner in some respects a strong measure, but it was necessary, and there should be no excuse for a state of affairs which allows men who are willing to work to be deterred from exercising

their desire because of bodily fear and intimidation practised openly and in secret. Six strikers returned to work on the first day of April, making twelve during the same week. Most of these men were small property holders and types of the best class of miner in Springhill. There can be but little doubt that they, and many others, have been forced to remain out on strike because of the intimidation which has been allowed. That this is the case will speedily be shown when the new commissioner has taken charge.

In spite of the injunction against picketing made by the courts some time ago, this has been continued all along. A long list of defendants were arrested and tried for contempt of court. They were convicted, but an appeal was taken to the full bench in Halifax. The conviction has now been confirmed by the higher court, and an application to stay proceedings pending appeal to the Privy Council was refused. The defendants will therefore have to appear before the court for sentence.

A letter from the president and secretary of District 20 of the United Mine Workers of America has been sent to all the coal companies in Nova Scotia asking them to attend a joint meeting in Halifax on the 17th of April to draw up a wage schedule and agreement for the Province of Nova Scotia. This interesting communication, which is similar in contents to one sent out before the strike of 1909, concludes by stating that failure to attend the meeting will be taken as a refusal to consider a wage schedule and that the U.M.W.A. will take the steps best calculated to achieve their object. When it is remembered that in Cape Breton the U.M.W.A. have three unsuccessful strikes to their credit; that in Pictou County they have no following of any kind, and that in Cumberland County their influence is waning, it will be seen how farcical is the pose of this beaten and discredited organization as the representative of the miners of Nova Scotia. Some of the demands of the U.M.W.A. are understood to be the eight hours day, a minimum wage for labourers of \$1.75 per day, and \$2 per day for shift men.

The archaic platform of this organization is well set forth in a circular which has been widely distributed around the mining districts by the District Executive of the U.M.W.A. The opening paragraph of this leaflet postulates as follows:

"Hitherto the experience of the wage-earners of all countries and times, has been that every amalgamation of capital, every introduction of new machinery, has been made for the specific purpose of cheapening production by the elimination of numbers of wage-earners from the payrolls of their employers, and consequently resulting in an ever-increasing number of partially or wholly unemployed, and a gradual lowering of the

purchasing power of the earnings of those who do hold a job.''

This is nothing more nor less than the ancient exploded doctrine which led to rick-burnings in our great-grandfathers' time, and is on a par with the remainder of the written and spoken eloquence of the organizers of the U.M.W.A. The miners of Cape Breton have had a hardly-earned lesson in the folly of listening to these strike-creators, and in the shameless self-aggrandizement and dishonest use of union funds practised by the leaders and organizers of the U.M.W.A. Many earnest and honest men who were beguiled into striking two years ago lost all they possessed, and suffered the degradation of license and idleness, and at the same time gradually opened their eyes to the fact that their so-called leaders were waxing fat and prosperous. It will be a long time before these men are again induced to strike for a shadowy grievance. The U.M.W.A. have shot their bolt in Nova Scotia, and missed the mark.

Dominion Coal Output.

The Coal Company's output for March was 323,869 tons, comparing with previous years as follows:

1908	346,529	1909	253,622
	1910		243,747

The individual collieries contributed as under:

No. 1	50,330	No. 9.....	31,607
No. 2	66,963	No. 10.....	14,706
No. 3	16,152	No. 12.....	21,574
No. 4	30,414	No. 14.....	8,432
No. 5	27,848	No. 15.....	1,834
No. 6	18,641	No. 16.....	754
No. 8	17,191	No.	323,869
No. 7	17,423		

This is a comparatively large output for March, particularly when it is considered that No. 6 and No. 3 mines were both idle for about a week to make extensive spring repairs. It will be noticed that the Lingan mines are steadily increasing in outputs, and that almost 33,000 tons of the total output comes from that district.

The prospects for open navigation during April are not of the best. The main body of Gulf ice has not as yet come down, and it looks as though navigation would be more interfered with by drift ice this spring than has been the case for several years past. Be that as it may, the April outputs will almost certainly be above the corresponding month of previous years, as the Coal Company has sufficient rail business to enable it to maintain shipments.

All indications are pointing towards a record year of coal shipments from Cape Breton. Both the Dominion Coal Company and the Nova Scotia Steel Company are anticipating larger outputs this summer than ever obtained previously, and these together with the unusually ample storage banks which have been accumulated during the winter, will, if no labour troubles arise, make the coming summer a very busy one in the coal business.

ONTARIO.

Cobalt.

Cobalt, April 8.—The Cobalt camp is still in the main tied up through the lack of customs power. This is the latest spring the North has known for some time, and not until the ice goes off the river will there be any relief. The trouble at the Cobalt Hydraulic plant at Ragged Chutes on the Montreal River commenced when the heads of the intake pipes blew out last fall, then followed low water and the consequent insufficient pressure to consumers in Cobalt. The Hydraulic now has storage dams on Temagami, and these will make the present condition of affairs impossible next year. At the present time the hydraulic pressure varies between 60 and 90 pounds, not sufficient to run the drills with any efficiency. Their customers who have large enough compressors, like the Coniagas and the Temiskaming, are using their own power entirely at the present time. Others, like the Nipissing and the La Rose,

are supplementing what power they can get from the Hydraulic, with the power from their own compressors. But in this latter case operations have had to be restricted, and the output of the mine seriously curtailed. The operators worst hit by the lack of power are those who in view of the imminence of the customs power did not put any plant in at all. They have had to shut down entirely. The other customs plant serving the camp, the British Canadian, had an adequate service later than the Hydraulic, but the water has fallen so low now at their plant, at the Matabitchouan River, that there is absolutely no pressure at all. They neglected to make arrangements for the passage of logs over their storage dam, and the Government compelled them to open the dams and so let out the water. Next year there will be no trouble of this kind.

The ice is not likely to go off the rivers permanently until the end of this month, and until then the output from the camp, as reflected in the shipments will be small.

The mines working in the immediate vicinity of Cobalt Lake have felt the effects of the failure of the air least. Proceeding from the Hudson Bay along the west ridge, the Coniagas, owing to the large compressor, was only affected for a few hours. Operations at the Buffalo have been so extended since the customs air was installed that the compressor is now insufficient and here mining has been curtailed to a considerable extent. The City of Cobalt has adequate power for its needs, and is now producing at a higher rate than at any previous period of its existence. The Townsite is also crippled to a considerable extent. On the other side of Cobalt Lake the La Rose with its subsidiary mines, the Lawson and the Princess, has felt the effect of the air trouble probably as much as any mine in camp. At the present time no development at either the Princess or the Lawson is possible, and the main La Rose has to furnish all the ore for dividend requirements. The Nipissing, with its half-dozen mines scattered over an area of two miles, has also found it impossible to carry on much development work. They, however, have such great ore reserves that it has only entailed the pulling down of stopes made some years ago. In the Kerr Lake area the Crown Reserve with its 22-drill compressor is also independent of the power companies. The Kerr Lake is considerably handicapped, however, and the Lawson and the Hargrave have had to shut down. In South Coleman the Beaver has only been able to run two drills. But this company is now installing the second half of its Rand compressor, so that in the future it will be quite independent of any air trouble. The Temiskaming has adequate power of its own. Owing to the air failure a number of promising prospects in this section of the camp, for instance the Ophir, the Lumsden, and the Fisher Eplett, have had to discontinue operations. Both companies have maintained the electric power for the mills, so that this very important department of the silver industry has not been in the least disturbed.

The production of the Coniagas for the months of February and March will make a record for this company. In the last two months in 1910 the Coniagas produced nearly 1,000,000 ounces. In the second and third months of this year this record will be considerably exceeded. For the past two years nearly all the ore from the Coniagas has come from development, now the ore previously put into sight is being taken down. The mill, the second largest in the camp, is treating on an average 75 tons a day, and making an excellent extraction.

From the Gowganda camp during the last ten days of March, several shipments have been made. The Calcite Lake Mining Company, situated about seven miles from Gowganda, shipped between nine and ten tons. This is their first appearance on the list of producers. The Miller Lake O'Brien sent out about 20 tons of their high grade ore, while the Millerett despatched 22 tons. It is understood also that a few tons of ore went over the winter roads from the Hudson Bay claims, at Hangingstone Lake. All this ore came from below the 100-foot level. The Millerett would have made much larger consignments this

year if they had not been more concerned with the building of the mill than the mining of ore.

In the diabase section of the Millerett at Gowganda, excellent high grade ore has recently been struck at the 150-foot level. At the 70-foot level of this same shaft, the silver values in the smaltite vein were very low. The discovery that this vein in the diabase has become richer as it was sunk upon is considered a very important development in the camp.

The Beaver has now definitely joined the list of Cobalt dividend payers. There had been some debate as to whether the surplus on hand should be used in the erection of a concentrator or in the payment of a dividend. It was felt, however, that the erection of a mill was somewhat premature, and the mine has now gone on a 2½ per cent. basis.

Porcupine.

Excellent results have accrued from the development work on the 200-foot level of the Hollinger mine. The quartz vein here is, if anything, wider than that on the upper level, and the ore is now fully as rich. In all computations of ore in sight no estimate has been made of low grade ore in the mine, although it is known that the schist carries values. At least one parallel vein promises to add very considerably to the reserve.

On the Vipond property, adjoining the Hollinger, there is now a drift of 150 feet at the 100-foot level, all in ore. The pay streak in the vein is about 3 feet wide, and the ore from it in the little Nissen mill is running about \$40 to the ton. Outside this 3 feet there is a considerable amount of \$10 to \$12 ore. A cross-cut has been started to intersect the other parallel vein of the property. Operations on the Rea mine have added much in value to the Porcupine gold claims adjoining.

There has been a considerable influx of prospectors into what is known as the Keekeek country. Here something like 60,000 acres have been staked under the Quebec laws. The pioneer in this district is Samuel LeRoy, with a good free gold find at Keekeek Lake. While the assays from the veins are not very high they are very consistent, and the veins are both larger and better defined than in Porcupine, or in any portion of the gold district so far prospected in Northern Ontario. Little work has been done so far on the claims. The field is easy of access in the summer time, and it is probable that the better terms the Quebec Government is offering prospectors will lead several thousand men who have been operating Ontario for the past two or three years to cross the provincial boundary.

ALBERTA.

Blairmore, Alta., April 4.—On March 31 the agreement between the miners in District 18 of the U.M.W.A. and the Western Coal Operators' Association expired by time limitation, and as the parties were unable to settle upon any basis for the signing of a new agreement nearly 6,000 miners ceased work on April 1. Sixteen mines with a daily output of 12,000 tons are closed by this action.

On March 2 the operators and district officials of the miners met in Calgary in joint conference for the purpose of negotiating the renewal of the agreement. On March 23 the operators presented the following resolution:

"That, whereas we have already spent upwards of a fortnight negotiating and have as yet arrived at no definite conclusions, and in view of the fact that the present agreements expire on the 31st of the present month;

"It is resolved that in order to prevent the possibility of a suspension of work on that date the following procedure shall govern each party to the negotiations which may take place between now and that date:

"1. That we proceed with the discussion of the agreement, and such clauses with any amendments or rates as we may agree upon to be embodied in and become part of the new agreement.

"2. Such clauses or rates as we may not be able to agree on to be set at one side and on the completion of our negotiations

to be submitted to a Board of Arbitration for final adjustment.

"3. The finding of such Board of Arbitration to be binding and final and to be accepted by both parties.

"4. Said Board to be composed of two members appointed by the Western Coal Operators' Association, and two members to be appointed by District 18, U.M.W.A. and presided over by the Chief Justice of the Province of Alberta, or any justice of the Supreme Court of Alberta appointed by him.

"Meantime, should an award not be arrived at by the Board of Arbitration by the 31st inst., the miners will continue to work and the operators to operate their mines under the present agreements, and any award made shall apply as from April 1, 1911.

The miners did not agree to this, and then the operators presented the following offer for settlement:

"The general provisions of the Western Coal Operators Association agreement with the date of expiration fixed at March 31, 1913, and with the Discrimination Clause as at present and made a matter of record in the same way.

"An increase of 5.55 per cent. on all day wages of the Western Coal Operators' Association scale and on contract prices except on pillars and timbering."

The next day, March 24, the miners submitted the following reply:

"In reply to the proposals of the operators we desire to say:

"1. We will sign no agreement that is conditional upon the relinquishing by ourselves of the closed shop as it exists at this time at the Crow's Nest Pass Company's mines, unless such a check-off clause as that presented by ourselves be made one of the terms of the agreement.

"2. That we will not agree to the general application of such a discrimination as now applies to part of our membership.

"3. That the advance offered is not general and only applies to part of the employees.

"4. That the advance quoted is not sufficient to bring men employed on the day wage scale up to the rates paid in adjoining districts.

"5. That no provision is made for the eliminating of inequalities at the mines already specified.

"6. That no provision is made for the fixing of contract rates on mines where no contract rates exist, prior to the signing of the agreement.

"7. We desire to state that our proposition is definitely as stated in our first proposals with the following modification in Clause 4 to be changed: 'An advance of 12½ per cent. on the present day wage scale, after existing inequalities in the district are adjusted.' Clause 7 to be changed. The date of expiration of the agreement to be March 31, 1913.'"

As this was not satisfactory to the operators, the miners then moved to adjourn sine die, and up to the present no efforts have been made looking to a renewal of negotiations.

BRITISH COLUMBIA.

The construction of railways now in progress in districts of the Province in which economic minerals are known to occur gives promise of facilitating the further development of the large mineral resources of British Columbia. The extension by the Great Northern Railway Company of what is known locally as the V. V. & E. line from Keremeos, through Hedley, and thence to Princeton, is resulting in the opening of several coal mines near or beyond Princeton, notably those of the Princeton Coal & Land Company, which last year commenced production on a commercial scale, with an output of nearly 12,000 short tons of coal; and of the Columbia Coal & Coke Company, which is developing a valuable coal property situated between Granite Creek and Tulameen (Otter Flat). The Princeton Collieries, Osoyoos Coal Company, and two or three others have also been encouraged by the construction of this railway to proceed with prospecting work and development of their respective properties. A cement manufacturing enterprise has been started in this district, while the opening of a number of copper claims is also looked forward to.

In Nicola district, the construction of the Kettle Valley Railway is in progress; this is intended to connect this district, in which are productive coal mines, with the Boundary district, regarded as sure to prove a profitable market for coal and coke from Nicola collieries. There is expectation, too, that copper mines will be opened in parts of the country this railway will traverse. Toward the eastern end of the Kettle Valley Railway there is the West Fork of Kettle River district, in which, as well as in the Nicola country, much prospecting has disclosed the occurrence of metal-bearing ores, though the West Fork claims that have as yet had most attention contain value in gold or silver rather than copper.

In East Kootenay, the construction of what has heretofore been known as the Kootenay Central Railway, southwards from the Canadian Pacific transcontinental at Golden, B.C., up Columbia River to the lakes at its source and thence down the valley of Kootenay River to a junction with the same company's Crow's Nest railway, is being proceeded with. Work on the most southerly section of this line has been in progress for some time; recently a contract was let for about 40 miles of the northern end, work on which in past years consisted of grading about 10 miles south out from Golden. In Windermere mining division, approximately half way between Golden and the Crow's Nest line, there are a number of mining properties, chiefly silver and lead, several of which were worked years ago, and from which ore was shipped but at too high cost to admit of production being continued under such unfavourable conditions. Here, too, the provision of railway transportation, though intended primarily for the development of an agricultural industry in a comparatively large area of fertile country, will serve to promote the utilization of mineral resources believed to be extensive and capable of being worked to advantage.

It is yet early to estimate the effect on mining the construction of the Canadian Northern Pacific Railway, from Alberta through the Yellowhead Pass and thence down the North Thompson River to Kamloops, on its coastwards route, will have, but at least two beneficial results to this industry are expected, namely, the making more accessible the mica claims in the country about Tete Jaune Cache, and giving transportation to the North Thompson district, in which coal is stated to occur. As the country between Kamloops and the Coast has long had the benefit of the C.P.R. passing through it, no particular additional advantage is likely to accrue to the mining interests by the construction of a second railway.

On Vancouver Island, both the C.P.R. and Canadian Northern Pacific Companies are busily engaged in railway building. The work of the former is well advanced; that of the latter has lately been commenced. In both cases, country in which mineral occurs will be opened to prospectors to an extent that will encourage much more exploration work being done than in the past. Much of the country is mountainous and heavily forested, but this notwithstanding, prospecting will be rendered less difficult and costly after construction of the new railways, and the eventual opening of valuable deposits of mineral may be expected. Fortunately, the more important of the known coal fields of the Island are within easy reach of tidewater, so that with only the construction of short lines necessary, they have already been provided with transportation from the mines to shipping ports. It is in connection with the discovery and development of metalliferous minerals more particularly that the mining industry of the Island is likely to be benefitted.

The great extent of country in northern Cariboo, Omineca, and Skeena mining divisions that will be opened for mining development by the construction of the Grand Trunk Pacific Railway, now well on towards completion, contains immense and varied mineral resources from which in the course of a few years there will probably be a considerable addition to the value of the annual mineral production of the province. Placer gold, lode metals, and coal, are all to be found in that central part of British Columbia, and the provision of transportation

facilities will doubtless be followed by much mining on a commercial basis.

In smaller measure, the McKenzie & Mann Railway from Stewart, at the head of Portland Canal, inland, will assist in the development of mining further northwards. A beginning has been made by giving the mining properties near Stewart railway connection with the sea, and if the suggested extension of the line into the Nass River country, and thence eastwards to the Peace River district be carried out, another large area of practically virgin territory will be opened to prospectors and miners, with reasonable ground for expectation of substantial results in the direction of mineral production.

There are other railway construction projects that, if undertaken, may be expected to add to the volume and value of the mineral production of British Columbia (among them one that has been commenced and intended to connect the Lillooet district with Howe Sound, thereby opening another mining district.) Those mentioned above will, however, of themselves be sufficient to indicate that considerable expansion may be looked for in connection with mining in British Columbia, as well as with its other large and valuable natural resources.

Ore Production to March 31.

In a general way, the ore production of the Kootenay and Boundary districts is shown by the figures that follow. As these notes are being written before the returns for the last week of the quarter have been received, the figures are not exact, but, though approximate, exhibit fairly closely the quantities of ore produced in the several parts mentioned.

As the Boundary district is, in regard to ore tonnage, by far the most productive in the province, its proportion of the whole having of late years been nearly three-quarters, it necessarily is a long way in the lead for the short period under review. Roughly, the output for the three expired months of the year has been 450,000 tons of ore, of which quantity the Granby Company's mines have produced 293,000 tons, those of the British Columbia Copper Company 127,000 tons, and of the Consolidated Mining & Smelting Company 30,000 tons. Several small shipments were made by other mines, but in comparison with the foregoing they are unimportant. The Granby Company's production has been all from its group of big mines at Phoenix; the British Columbia Copper Company mined about 82,000 tons at its Mother Lode mine, 9,000 tons came from its Wellington camp property, and 36,000 tons from the Rawhide mine of the Dominion Copper Company's group, now controlled by the B. C. Copper Company. The quantity from the Oro Denoro mine was small, while that from the Napoleon is not taken into account, this mine being situated in the adjoining State of Washington. The Consolidated Mining & Smelting Company sent to its smeltery at Trail about 27,000 tons from its Snowshoe mine, 2,400 tons from the Phoenix Amalgamated group, and 700 tons from the No. 7 mine. The Phoenix Amalgamated had not previously shipped ore; the group is situated immediately south of the southern claims of the Granby Company's group. Late in March the Fife mine, in the extreme eastern part of Grand Forks mining division, made its first shipment in bulk, of copper gold ore, but it was only a small beginning.

Rossland mines made a total production of approximately 58,000 tons during the quarter. Of this quantity, 44,000 tons of gold-copper ore was from the Consolidated Company's Centre Star group, about 10,200 tons from the Le Roi No. 2 (including 3,600 tons of second class ore concentrated at the mine), and 3,600 from the Le Roi. From four or five small mines there was a total of about 220 tons, of which quantity 174 tons was from the Nickle Plate mine now worked in a small way by leasers, but years ago one of the important mines of Rossland camp. The expected production from two or three silver-lead properties in this camp has not yet been realized, except in very small measure.

East Kootenay mines have a total shipped of between 10,000 and 11,000 tons sent to the smeltery, and perhaps a rather larger quantity concentrated at the St. Eugene mill. The former total includes 1,600 tons of silver-lead concentrate from that mine. The quantity appearing in provincial newspapers as having been milled at the St. Eugene is far in excess of that actually put through the concentrator. The output of the Sullivan mine, which together with the St. Eugene is operated by the Consolidated Company, was about 9,000 tons. The Society Girl sent between 200 and 300 tons to Trail before the melting snow made the waggon road too soft for hauling ore to the railway. This mine commenced shipping on a small scale late last year; some years ago ore was taken from its surface workings, but recent production has been from underground.

The tonnage for Nelson mining division includes so much ore treated at local stamp mills that figures published are not reliable as a rule. The actual quantity shipped to the smeltery, including concentrates from the stamp mills, was between 3,700

and 4,000 tons. Mines near Nelson city contributed more than 400 tons, those at Ymir (chiefly from the Yanke Girl group), 1,300 tons, the Emerald at Salmo about 900 tons of lead ore, Erie mines, 200 to 300 tons (figures not available), and Sheep Creek 850 to 900 tons. The last-mentioned in no way represents the quantity of ore milled at the Queen and Nugget stamp mills; only the product sent to the smeltery from the several shipping mines of the camp.

Ainsworth and Slocan together have a total of nearly 4,500 tons, which does not at all fairly represent the producing capabilities of these districts, for there were no concentrating mills at work, consequently the figures show only the first-class ore shipped. Several small mines in Ainsworth camp made a combined output of nearly 200 tons. Slocan mines inland from the lake sent out 1,700 tons, chiefly from the Rambler-Cariboo and Richmond-Eureka properties. Slocan Lake mines shipped 700 tons, mostly from the Standard, with about 180 tons from Slocan City division. The Lardeau district shipped 190 tons in all.

GENERAL MINING NEWS.

NOVA SCOTIA.

Halifax, March 31st.—With the election of officers the 19th annual meeting of the Mining Society of Nova Scotia was brought to a close yesterday afternoon. The new president is G. J. Partington, who is identified with the gold mining industry.

At the morning session Professor E. A. Holbrook read a paper on "Modern Gold Mining Practice and its Application in Nova Scotia." Another paper was read by W. F. Jennison, whose subject was "Gypsum." This is the first paper relating to gypsum read before the Mining Society.

The only other paper read was one on "Coal Mining," by Mr. Dowling, of the Dominion Geological Survey.

During the afternoon a number of interesting papers were read. Dr. Ora W. Knight spoke on research work on certain Nova Scotia gold mines. C. J. McKenzie told how to handle the coal dust problem. W. H. Prest read a paper on "Prospecting in Nova Scotia," and John Preston described a "Light Weight Motor Driven Reciprocating Pump."

The officers elected were:

President, G. J. Partington.

First Vice-President—Prof. Sexton.

Second Vice-President—Thos. Cantley.

Council—C. E. Starr, Hiram Donkin, R. H. Brown, H. E. Coll, A. L. McCallum, A. A. Hayward, Hon. R. Drummond, G. W. Stuart, John Johnston.

Halifax, April 4—Major Thompson, Provincial Police Commissioner, left yesterday for Springhill, with his force of 33 Provincial police. The Commissioner and his men will replace the R. C. R. detachment, which will return the first of this week. They will be housed in "barracks" and will do, in the capacity of civil police, what the military force has been doing for the past year. The party left on the C.P.R. express.

Springhill Mines, April 2.—It now looks as if the strike in Springhill was drawing to a close. Five of the leading miners resumed work yesterday. Thomas Piggott and Duncan Blue were among the number. These men have been for many years residents of Springhill and have always stood with their fellow workmen. It is stated that a large number of others have applied for work, and have accepted the terms of the company.

During the coming week a big break in the ranks of the strikers is predicted. The town was exceptionally quiet on Saturday, there was no picketing nor any disturbance of any kind. The officials of the company are confident that the beginning of the end is rapidly approaching.

As a result of the judgment of the Full Bench of the Supreme Court on Saturday, the Springhill miners who were found guilty of violating an injunction against picketing, will now have to come before the court for sentence. Seven or eight men are involved.

The case was that of the Cumberland Coal & Railway Company vs. McDougall, an appeal from the decision of one of the judges. The court dismissed the appeal with costs.

W. B. A. Ritchie moved for an order not to enforce the judgment pending an appeal to the Privy Council. The motion was refused.

New Glasgow, April 4—New record outputs in nearly every department were made by the Nova Scotia Steel & Coal Company for the first quarter of 1911.

At all the Scotia plants the outputs since the New Year have been excellent, and increases of from 20 to 40 per cent. over the production for the same period of 1910 have been shown, due to the extensive improvements recently installed.

The most marked increases have been made at New Glasgow. The Cogging mill rolled 19,540 tons of billets during this period, an increase of 25 per cent., while the finishing mills produced 15,232 tons of bars and plates, nearly four thousand tons more than in the corresponding quarter of 1910, while the production of pig iron was 20,546 tons, six thousand tons better than last year.

A number of new records were made during March. The Cogging mills which made a record of 6,600 tons in February, exceeded this by six hundred tons, while the finishing mills, which in February established a record of 5,000 tons, exceeded this by 500 tons. Further improvements are now in progress at the various plants which should increase the outputs even more proportionately, and if the present record is maintained the outputs for 1911 will far exceed the records made in 1910.

ONTARIO.

Cobalt—The Beaver mine is now a dividend-payer. The first dividend of 2½ per cent. is payable May 15.

Copper Cliff.—Captain John Lawson has quite recovered from his illness and is back at his post of duty with the Canadian Copper Company.

BRITISH COLUMBIA.

Trail.—At the Trail smelter during March, 6,000 tons of lead ore were smelted, yielding 1,500 tons of lead. For the Kootenay district bounty will be paid upon 17,000 tons for the fiscal year ending March 31st.

STATISTICS AND RETURNS

COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending March 25, and those from Jan. 1, 1911, to date:

	Mar. 25.	Since Jan.1.
	Ore in lbs.	Ore in lbs.
Beaver	43,730	595,243
Buffalo	129,170	623,670
City of Cobalt	44,000	296,280
Coniagas	120,910	1,055,090
Crown Reserve	40,060	548,730
Hudson Bay	63,600	185,950
La Rose	59,780	1,165,500
Kerr Lake	120,106	841,698
McKinley-Darragh-Savage ..	100,110	1,420,150
Nipissing	132,720	1,738,960

The shipments for the week were 863,186 pounds, or 431 tons.

Following are the shipments from the Cobalt camp for the week ending Mar. 31, and those from Jan. 1, 1911, to date:

	Mar. 31.	Since Jan.1.
	Ore in lbs.	Ore in lbs.
Barber		6,000
Beaver		595,243
Buffalo	61,190	684,860
Chambers-Ferland	64,000	320,900
City of Cobalt		296,280
Cobalt Lake	58,900	1,205,800
Cobalt Townsite		289,740
Coniagas	111,300	1,166,390
Crown Reserve		548,730
Hargraves		41,100
Hudson Bay		185,950
La Rose		1,165,500
Kerr Lake		841,698
King Edward		40,000
McKinley-Darragh-Savage ..		1,420,150
Millerett	44,000	44,000
Nipissing	81,800	1,820,760
O'Brien	64,120	335,440
Peterson Lake (Little Nip.) ..		58,430
Right-of-Way		318,260
Silver Cliff		98,180
Standard Cobalt		44,813

Temiskaming	140,193	503,612
Trethewey	45,500	275,200
Wetlaufer		60,022

The shipments for the week were 671,003 pounds, or 335 tons. The shipments from Jan. 1 to March 31, were 12,469,043 pounds, or 6,234 tons.

BRITISH COLUMBIA ORE SHIPMENTS.

The following are the returns of the ore production and movement for the past week, ended March 25, and for the year to date:

BOUNDARY SHIPMENTS.

Granby	27,817	265,685
Mother Lode	7,056	74,655
Snowshoe	2,424	24,762
Rawhide	1,443	34,495
Jack Pot	805	7,631
Number Seven	27	639
Phoenix Amalgamated	102	2,239
Fife	32	32
Other mines		240
Total	39,706	410,378

ROSSLAND SHIPMENTS.

Centre Star	3,346	40,293
Le Roi No. 2	726	5,832
Le Roi No. 2, milled	300	3,600
Le Roi	241	3,119
Other mines		217
Total	4,613	53,061

SLOCAN-KOOTENAY SHIPMENTS.

Sullivan	806	8,149
St. Eugene, milled	2,775	33,300
Richmond-Eureka	30	644
Rambler-Cariboo	39	685
Hewitt	21	175
Queen, milled	420	4,830
Granite Poorman, milled	250	3,000

Nugget, milled	110	1,320
Wilcox, milled	75	900
Emerald	35	876
Eastmont	32	90
Summit	15	50
Yankee Girl	96	1,200
Knob Hill	133	312
Highland	22	22
Other mines		2,127
Total	4,859	57,680

The total receipts for the week, at the smelters, including concentrates, were 45,369 tons, and for the year to date, 476,473 tons.

SHARE MARKET.

(Courtesy of Warren, Gzowski & Co.)

MISCELLANEOUS.

The total shipments for the week, including the estimated milling, were 49,178 tons, and for the year to date, 521,119 tons.

April 7th, 1911.

B. C. COPPER CO.'S RECEIPTS.
Greenwood, B. C.

Mother Lode	7,056	74,655
Rawhide	1,443	34,495
Jack Pot	805	7,631
Other mines		240
Total	9,304	117,021

	Bid.	Ask.
Amalgamated Asbestos .....	....	....
Black Lake .....	....	14
Dominion Coal .....	....	....
Dominion Steel .....	....	....
Dominion Steel Corp.	58	60
Granby	30½	30¾
Consolidated Mining	40	50
Nova Scotia Steel .....	....	....
Crow's Nest	74

GRANBY SMELTER RECEIPTS.
Grand Forks, B.C.

Granby	27,817	265,685
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COBALT STOCKS.

CONSOLIDATED COMPANY'S RECEIPTS.
Trail, B.C.

Centre Star	3,346	40,293
Snowshoe	2,424	24,762
Sullivan	806	8,149
Le Roi No. 2	726	5,832
Le Roi	241	3,119
Number Seven	27	639
Richmond-Eureka	30	644
St. Eugene	62	1,585
Rambler-Cariboo	39	685
Hewitt	21	175
Emerald	35	876
Eastmont	32	90
Summit	15	50
Granite-Poorman	25	96
Nugget	34	95
Yankee Girl	96	1,200
Knob Hill	133	312
Phoenix Amalgamated	102	2,239
Fife	32	32
Highland	22	22
Other mines		2,872
Total	8,248	93,767

Amalgamated .....	....	....
Bailey .....	.04	.04¼
Beaver Consolidated .....	.38	.38½
Buffalo	2.10	2.40
Chambers-Ferland .....	.11¼	.12
City of Cobalt .....	.15	.18
Cobalt Central .....	.05	.07
Cobalt Lake .....	.17	.18½
Coniagas	6.95	7.10
Crown Reserve	3.06	3.15
Foster .....	.04	.07
Gifford .....	.02	.03
Great Northern .....	.19½	.20
Green Meehan .....	.03	.04
Hargraves .....	.17	.18½
Hudson Bay	96.00	106.00
John Black .....	....	....
Kerr Lake	6.20	6.30
La Rose	4.40	4.55
Little Nipissing .....	.03¾	.04½
McKinley	1.67	1.69
Nancy Helen .....	.02	.03
Nipissing	10.60	10.75
Nova Scotia .....	.11	.12
Ophir .....	.12	.18
Otisse .....	.01½	.02
Peterson Lake .....	.09¼	.09¾

Right of Way .....	.09½	.10
Rochester .....	.03	.03¾
Silver Leaf .....	.03¾	.04¼
Silver Queen .....	.02	.05
Temiskaming .....	.68¼	.69
Trethewey .....	.87	.89
Watts .....	...	...
Wettlaufer .....	.99	1.00

PORCUPINE STOCKS.

Apex .....	.15	.20
Pore. Can.	1.05	1.10
Pore. Central ..	.58	.62
Dobie	3.20	3.45
Dome Extension ..	.50	.54
Hollinger	8.25	8.34
Monitor .....	.21	.22
Preston .....	.35	.36
Pearl Lake .....	.50	.56
Pore. Tisdale ..	.07	.10
Swastika .....	.50	.51
United Pore. ....	.06	.11
Pore. Gold .....	.56	.57
Standard .....	.28	.35
West Dome	2.65	2.75
Coronation .....	.33	.35
Crown Chartered ..	.58	.59

NEW YORK CUBB.

	Bid.	Ask.
Brit. Col. Copper .....	.05½	.05¾
Butte Coalition .....	.11	.11½
Chino Copper .....	.21⅝	.21⅞
Davis-Daly Copper .....	.04½	.04⅝
Ely Consolidated .....	.....	.....
Giroux Mining .....	.06	.06⅞
Goldfield Consolidated .....	.06⅞	.06⅞
Greene-Canadian .....	.06⅞	.06½
Harcuvar Copper .....	...	...
Inspiration Copper .....	.07⅞	.07¼
Miami Copper .....	.18⅞	.18⅞
New Baltic Copper .....	.02½	.03
Nevada Con. Copper .....	.18	.18¼
Ohio Copper .....	.01⅞	.01⅞
Rawhide Coalition .....	.....	.....
Ray Central .....	.01½	.01⅞
Ray Consolidated .....	.15¾	.16¼
Union Mines .....	.....	.....
Yukon Gold .....	.03⅞	.04

TORONTO MARKETS.

April 10.—Pig Iron (Quotations from Drummond, McCall Co., Toronto):
 Summerlee No. 1, \$23.00 (f.o.b. Toronto).
 Summerlee No. 2, \$22.50 (f.o.b. Toronto).
 Midland No. 1, \$19.50 (f.o.b. Toronto).
 Midland No. 2, \$19.00, (f.o.b. Toronto).
 Hamilton No. 1, \$18.00 (f.o.b. Hamilton).
 Hamilton No. 2, \$17.50 (f.o.b. Hamilton).
 Clarence, \$19.00 (f.o.b. Toronto).
 Cleveland, \$19.00 (f.o.b. Toronto).

GENERAL MARKETS.

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

COKE.

April 6—Connellsville coke (f.o.b. ovens):
 Foundry Coke, prompt, \$2.00 to \$2.15 per ton.
 Furnace Coke, prompt, \$1.60 to \$1.65 per ton.

April 6—Tin, Straits, 41.50 cents.
 Copper, Prime Lake, 12.50 cents.
 Electrolytic copper, 12.25 cents.
 Copper wire, 13.50 cents.
 Lead, 4.47½ cents.
 Spelter, 5.50 cents.
 Sheet zinc (f.o.b. smelter), 7.50 cents.
 Antimony, Cookson's, 9.50 cents.
 Aluminium, 21.00 to 21.50 cents.
 Nickel, 40.00 to 45.00 cents.
 Platinum, ordinary, 41.50 per ounce.
 Platinum, hard, \$43.50 per ounce.
 Bismuth, \$2.00 to \$2.10 per lb.
 Quicksilver, \$52 per 75-lb. flask.

SILVER PRICES.

	New York.	London.
	cents.	pence.
March 22	52⅝	24¼
" 23	52⅝	24⅞
" 24	52⅝	24⅞
" 25	52½	24¼
" 27	52¾	24⅞
" 28	52¾	24⅞
" 29	52¾	24⅞
" 30	52⅝	24⅞
" 31	52½	24¼
April 1	52⅝	24⅞
" 3	52⅝	24⅞
" 4	53⅞	24½
" 5	52⅞	24⅞
" 6	53	24⅞