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CIRCULATION.

During the year ending with March 1st, 1908, 91,750 copies of THE CANADIAN MINING JOURNAL were printed and distributed, or an average of 3,822 per issue.

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LAWSON AND THE YUKON.

Thomas W. Lawson has been sufficiently pilloried. Technical and financial journals on both sides of the Atlantic have taken pains to apprise their readers of the fact that Lawson is a false prophet.

Were investors in Lawson's stock of an enquiring turn of mind, they could easily find out that his promises are specious. Authorities agree that he is shifting onto the shoulders of the "gelatine-spined" public an investment that at best will pay an absurdly low rate of interest.

Some one has accused Mr. Lawson of being a clever advertiser. We would consider the person who could substantiate this accusation a genius of the first water.

An advertiser Mr. Lawson is—unscrupulous, unvarnished, impudent. But not one element of cleverness is to be detected in his frothings.

We are tempted to believe that those who are deluded into "blowing" themselves on Mr. Lawson's Yukon gold, deserve what they will get.

However, our space is too valuable to devote to Mr. Lawson and his lucubrations. We wish only to announce that civil proceedings are soon to be instituted against his promotion for failure to comply with the requirements of the Ontario Companies' Act. THE CANADIAN MINING JOURNAL is laying the information.

ETHICAL.

A contemporary has alluded to the apparent similarity existing between the 'Miami Company' scheme and sound English flotations. There are two important respects in which this similarity does not hold.

In Great Britain the requirements of a rigid companies' act apply to all flotations and, to a large degree, safeguard the public. No such federal enactment exists in the United States.

In Great Britain, as on this continent, it is unusual for the consulting mining engineer to play the part of promoter. In this case Mr. J. Parke Channing, vice-president of the company, is also the consulting engineer whose report is quoted in the prospectus, and upon his representations the public are asked to invest.

We may justly infer that Mr. Channing, as vice-president, is directly interested in the financial success of the Miami Copper Company. Is this in accordance with that unwritten code of ethics to which mining engineers here and elsewhere conform? Is it wholesome from a business point of view? Is not the report of an independent mining engineer indispensable?

THE HAMSTEAD MINE FIRE.

All coal-mine operators will welcome Mr. F. W. Gray's article on the use of breathing apparatus at the Hamstead mine fire.

We are not overstating the case when we say that Mr. Gray deserves the warmest praise for the efficient and practical manner in which he is taking up the subject of rescue work.

The press reports of this disaster have been incomplete and misleading. Mr. Gray's clear analysis of the circumstance is therefore timely and welcome.

It will be seen that there is no just cause for dissatisfaction with the rescue apparatus used. Also, Mr. Gray makes it evident that it is of the utmost importance that each colliery should possess its own complement of respirators and should keep a thoroughly trained corps of selected men. Both men and apparatus must be ready for instant service.

There is inspiration in the heroism of Thorne, one of the Tankersley Station men, who made repeated descents into the mine in the vain hope of saving the lives of others. His example is all the more profitable when it is known that he had trained unremittingly and had become thoroughly accustomed to the use of the Draeger helmet.

SPANISH.

Many of the graduates of Canadian mining colleges have had cause to regret their ignorance of Spanish.

A prominent and successful mining engineer residing in Mexico, has recently suggested to us that Spanish should be made a compulsory subject in the course mapped out for mining students. Since our correspondent is himself a Canadian and a graduate of a Canadian college where Spanish is not included in the mining course, he speaks with knowledge and feeling.

In our own experience we have known of numerous instances where young mining engineers were unable to accept positions in Mexico and other Spanish-American countries, simply because of their ignorance of the language. In all other respects they were amply qualified.

The mining engineer is the truest cosmopolite. To him neither the pink tea nor any other social futility should appeal. His country is that in which his work lies. It may be Siberia or the Yukon or Peru. But Canadian mining engineers, if they do not find work in Canada, are much more likely to look for it (and find it) in Mexico than anywhere else. Our correspondent's suggestion is therefore in accordance with the dictates of common horse-sense.

A VALUABLE REPORT.

Mr. A. A. Cole, mining engineer to the Temiskaming and Northern Ontario Railway Commission, has compiled and published a report on the Cobalt district for the year 1907.

In addition to conveniently tabulated figures of production, much useful information concerning the various smelters is included. Canadian, United States and European smelting rates and schedules are given in full. The flow-sheets of five concentrating plants are reproduced graphically.

Altogether Mr. Cole's report is interesting and valuable.

It will require the passage of but very few years to increase vastly the difficulty of finding out certain facts about the early history of Cobalt. A clear record of conditions published now is worth reams of dubious speculations some time hence. Both from a thoroughly practical and from a sentimental point of view, it is well to write history while events are yet warm in the memory.

The mining public should be grateful to the Temiskaming and Northern Ontario Commission and to Mr. Cole.

OFFICIAL BULLETINS.

The British Columbia Bureau of Mines has commenced issuing official bulletins. It is no longer necessary to await the publication of the annual report to get information concerning new districts or important work in old districts. Bulletin No. 1, by Mr. W. Fleet Robertson, Provincial Mineralogist, describes the mineral locations on Moresby Island. Here, incidentally, is situated the Ikeda mine, owned and operated by the Japanese firm of Awaya, Ikeda and Company of Vancouver.

We wish to commend to the attention of the mining departments of other provinces, this departure from established routine. As we have pointed out many times, timely bulletins are infinitely to be preferred to the bulky and belated annual reports.

Editorial Notes.

News notes, photographs and enquiries from our readers are always welcomed. Our news columns could be greatly enhanced in value if readers would advise us from time to time of happenings in mining circles. Canada is a large country.

Mr. Courtenay De Kalb, well known in Ontario, has accepted the position of associate editor of the *Mining and Scientific Press* of San Francisco. For some years, Mr. De Kalb occupied the chair of mining and metallurgy at the School of Mining, Kingston. He was also Inspector of Mines for the province of Ontario.

Mr. De Kalb is a mining engineer of wide experience. He has contributed many articles to technical papers. As a writer he is incisive and polished. We congratulate our western contemporary upon this important addition to its staff.

LE ROI No. 2, LIMITED, ROSSLAND, B.C.

GEO. A. OHREN.

A mining company that has demonstrated in a satisfactory manner that Rossland gold-copper ores can be mined at a good profit is the Le Roi No. 2, Limited, which up to the time of this writing has paid \$838,000 in dividends, on a capital of £600,000 divided into 120,000 shares of £5 each, since the present company took it over from the British American Corporation, who controlled its interests to 1898. This company has not mined on as large a scale as some of the other mines in Rossland camp but its affairs have been managed in an economical and business-like manner and the result has been substantial dividends for the shareholders, who have come to look upon it as a steady and confidence worthy mining enterprise.

The group comprises the Annie, Annie Fr., Josie, No. 1, No. 1 Fr., Thekla, You Know, Rockingham, Surprise,

The mine is at present producing about 2800 tons of "first-class" ore per month, which is treated at the Trail smelter. Approximately 1,100 tons of "second-class" ore is treated each month at the concentrator. Ore from this mine occurs in much narrower veins than in the Centre Star or Le Roi but is of a very much higher grade, as will be seen by the following figures:

The "first-class" ore mined during the year ended June 30th., 1907, amounted to 18,000 tons. This ore carried:

Gold,	.707 ounces at \$20.	....	\$14.140
Silver,	.751 ounces at \$0.6769c....		5.508
Copper,	1.512 per cent at \$0.2188c....		6.614

Gross value of ore per ton \$21.262



LE ROI No. 2 AND LE ROI MINES, ROSSLAND, B.C.

Poorman, Golden Dawn, and Copper Queen mining claims in Rossland camp. The principal mining operations are carried on through the Josie property on which the Josie shaft, 900 feet in depth, is situated. The product of the mine is hoisted through the Josie shaft with a 150 horse power electrical hoisting engine, a duplicate of which engine they have in the shaft house on the No. 1 claim. The shaft on the No. 1 is 650 feet in depth and some of the best copper ore in the camp has been taken from the No. 1 workings. Commodious ore bins, blacksmith and machine shops, framing shop, superintendent's residence and other mine buildings are located on the Josie claim. The concentrator is situated across a small gulch from the Josie workings. The air drills used are of the 2 1-2 inch, 3 1-2 inch and 3 5-8 inch sizes. Those with the 3 5-8 inch cylinders are used for the heavy work, such as sinking, etc., while the smaller machines are used for stoping.

The smelting charges were \$6.12 per ton.

Of "second-class" ore 11,840 tons were put through the mill, which carried per ton:

Gold . . . . .	.84 ounces
Silver . . . . .	.144 ounces
Copper . . . . .	.396 ounces

and 706 tons of concentrates were shipped which assayed as follows:

Gold . . . . .	.933 ounces
Silver . . . . .	.859 ounces
Copper	1.22 per cent

The output shown above, with 3,400 tons of ore left broken in the stopes, gives a total production for the year of 33,069 tons.

The cost of mining the ore is made up as follows:

Ore production	\$1.95
Ore sorting .....	.25
General expenses .....	.49
Power plant .....	.74
Mine general .....	.97
Diamond drilling .....	.48
	<hr/>
	\$4.88
Depreciation	1.92

Total cost per dry ton mined \$6.80

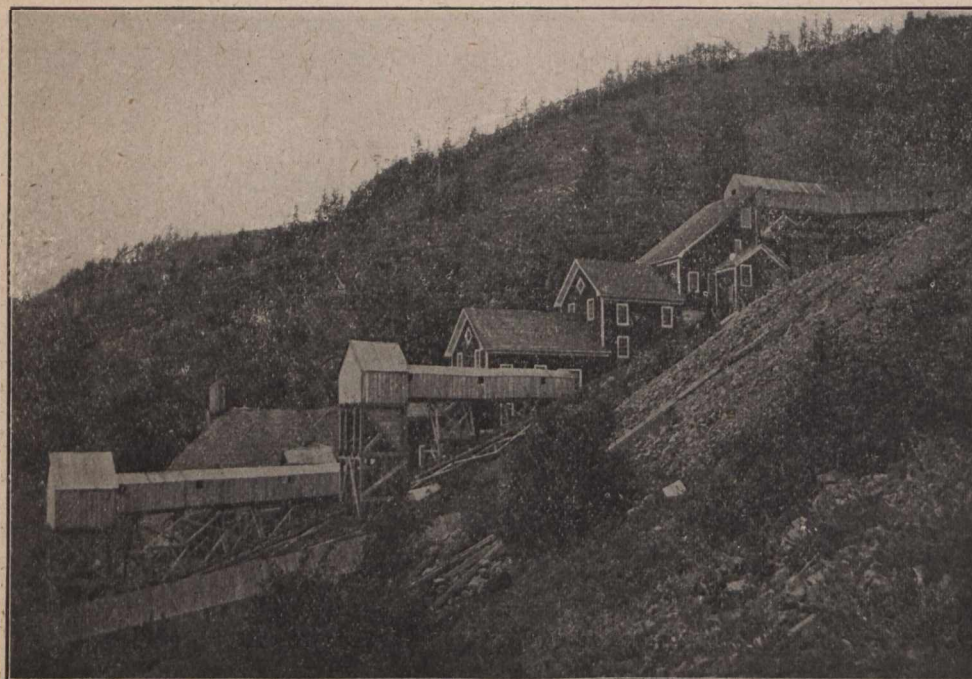
The shipping ore is carried by tramway from the Josie ore bins to bins at the railway siding where it is loaded for shipment to the smelter. The "second-class" ore is conveyed by tramway to the concentrator, where it is crushed in jaw crushers and then goes into Trent Chilian mills. From the mills it is run on to four Wilfley tables arranged in two sets, the headings running over the first two tables and the product from these tables being treat-

The company has an option on and is working the Vancouver Group (silver-lead) near Silverton, B. C. This group consists of the Vancouver, Vancouver Fr., Zilor, Silver Star, Kelley, Napia, Ricardo, Prior and Mountain Boomer, comprising 527 acres. They are now treating about 2,400 tons per month from this property. There is no trouble separating the zinc from the lead with this ore. The zinc concentrates are sent to Antwerp under contract. The cost of milling is about 40 cents per ton. The work here is being done by hand and costs:

Drifting and crosscutting per foot.....	\$13.24
Sinking	21.24
Raising	9.61
They shipped 21,079 tons of this ore, which assays:	
Silver	13.6 ounces
Lead	3.7 per cent
Zinc.....	4.7 per cent

and produced 1,100 tons of lead concentrates assaying:

Silver.....	117.2 ounces
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LE ROI No. 2 CONCENTRATOR ROSSLAND, B.C.

ed on the other two. The tailings from the second tables are not treated. During the year under review it is estimated that they carried the following values:

	Cents.
Gold.....	.030
Silver.....	.098
Copper .....	.344

Electric power for operating the concentrating and hoisting plants is secured from the lines of the West Kootenay Power & Light Company and costs approximately \$40 per horse power per annum. Compressed air for operating the mining machinery, smoke blowing, etc., is derived from the Consolidated Company's compressing plant and costs Le Roi about \$20,000 per annum. Nearly forty per cent of this cost of air power is for air that is used in smoke blowing and ventilation.

Some of the costs of development work, etc., are:

Drifting and crosscutting per foot .. .	\$14.576
Stoping	4.88
Diamond drilling	2.61

Lead	60. per cent
Zinc	11.3 per cent

The 1,316 tons of zinc concentrates carried:

Silver	40.4
Lead	2.3
Zinc.....	45.2

A quantity of picked lead ore was also shipped and the output was worth in all \$119,030.

The Le Roi No. 2 holds, roughly, a one-third interest in the Conclurry Syndicate, on which they have recently received a dividend of \$21,506, which is a valuable asset.

The balance in favor of profit and loss for the year was \$61,897 and the balance of cash on hand at Rossland and London amounted to \$22,500.

In conclusion, the Le Roi No. 2, Limited, has certainly proved that with economy and careful management the ore bodies in this district can be worked at a profit and there is no doubt that the mine will go on paying dividends to the shareholders for many years to come.

THE USE OF OXYGEN BREATHING APPARATUS AT THE HAMSTEAD MINE FIRE.

BY F. W. GRAY.

The English newspapers of the 6th of March record a most gallant attempt at the rescue of 21 entombed miners by trained men equipped with oxygen breathing apparatus, which was unfortunately unsuccessful.

A fire broke out in the Hamstead Mine, which is situated at Perry Barr near the city of Birmingham, on Wednesday night the 4th of March. Thirty men went down on the night shift, but of these nine managed to make their way through the smoke and fumes and escaped by way of the upcast shaft. The other twenty-one had however gone into the far workings and were cut off by the fire, which originated near the bottom of the downcast shaft. Under the direction of H. M. Inspectors rescue operations were carried on throughout the night and Thursday morning, but without avail. Telegrams were sent for the Normanton and Tankersley Rescue Corps. The Normanton men have been trained at Mr. W. E. Garforth's station at Altofts Colliery in West Yorkshire. They wear the Weg apparatus, Mr. Garforth's invention. The Tankersley Station is situated near Barnsley, South Yorkshire, and the apparatus worn by the party despatched to Hamstead was the Draeger. Full descriptions of both these stations will be found in the Transactions of the Institute of Mining Engineers. A friendly rivalry has existed between the men of these two stations for some time past, and to the call now sent they responded with the utmost promptitude. Mr. Garforth himself led the Normanton party of five men, Hopwood, Haslop, Cranswick, Whittingham and Welsby. The Tankersley party were at work in their own mines when the summons came. They were Thorne, Taylor and Outram, accompanied by A. T. Winborn the Superintendent of the Tankersley Station.

The parties arrived early in the afternoon of Thursday and proceeded at once to make preparations for descending the mine by getting acquainted with the plans. Previous to their arrival attempts had been made to penetrate the workings by rescuers unprovided with the apparatus, but they could not descent the shaft. It was thought that the fire could not have reached the entombed men, who were in all probability in safety in the remoter workings, and strong hopes were entertained of the possibility of their rescue. At 3-22 p.m. three of the Normanton men made the first descent down the upcast shaft, and remained below over an hour. They returned however without having been able to find any sign of life, except a partly asphyxiated cat. The second attempt was made by two of the trained men and the manager of the mine at five o'clock. They came up at ten minutes after six, not having been able to find anyone. The third party went down at 7.30, having arranged to return not later than 9 o'clock. At 8.30 two of them came up, Thorne and Outram. Outram was overcome by the heat, but Thorne obtained fresh oxygen cylinders and again went below. He returned about nine o'clock with Whittingham, both men in a state of exhaustion. When they recovered they explained that Whittingham and Welsby had penetrated some 800 yards into the mine, when Welsby was overcome by the heat and the stooping. Whittingham dragged him as far as possible, but had to leave Welsby owing to the drain on his own resources. Mak-

ing his way to the shaft, he met Thorne, who had to assist him. Thorne showed most remarkable endurance, having made three distinct descents. Two other men from the Normanton party then descended to rescue Welsby, if possible, but returned without finding him. Further operations had to be postponed, as the rescuers were all exhausted, and their oxygen supply was running short. Next morning they attempted another descent, but after being twenty minutes in the shaft had to rap to be drawn up again. The shaft bottom was on fire and the heat was unendurable. Further particulars are not to hand, but we understand the twenty-one men entombed and Welsby were finally abandoned.

At the first reading it would appear as if the first use of oxygen breathing apparatus in actual rescue work in England had resulted in no practical good and had also caused the death of one man more than the number involved in the original disaster, and this being the first time these devices have been brought prominently before the public eye, it is particularly necessary that a too hasty judgment should be avoided as to the merits of oxygen breathing apparatus.

There are several points to be considered: In the first place the fire broke out on Wednesday night, and the first party of rescuers did not arrive until 3 o'clock in the following afternoon. These men were 120 miles from their main station, only a bare dozen in number, and quite strange to the Hamstead workings, which is a difficulty that all miners will appreciate. They made a magnificent effort and faced death as a matter of course. They proved once more the depths of heroism that lie latent in the miner's nature when he goes to the help of his fellows in danger. But the task set before a dozen men was too great: to penetrate an unknown and burning mine with roads only four feet high in an unbreathable smoke at a temperature over 120 degrees was an awful tax on human endurance. Had the rescuers arrived earlier they might have succeeded in their efforts. But the fact that under such circumstances men were able to penetrate 800 yards and return, to visit the stables and locate the seat of the fire, proves the capabilities of properly trained men equipped with these devices.

Several points appear to be clear from the meagre reports now at hand:

1. To be really effective and useful in time of need, oxygen apparatus should be kept on the spot, and should be available for use instantly. Had the Normanton and Tankersley corps arrived at Hamstead before the heat of the mine became so great there can be no doubt that the doomed men would have been rescued, for smoke and fumes are no hindrance to the trained men who wear these apparatus.

2. It is absolutely necessary that men be trained in the use of these apparatus in conditions that are as nearly as possible actual conditions; that is, in really unbreathable gases, and with heavy work to perform. So far as can be learned the collapse of Welsby was not due to any fault in his apparatus, but to his physical failure under the trying conditions. The unfit can only be discovered by such methods. Men who undertake this work need good lungs and a sound heart, and should be of spare

and wiry build, preferably of medium height. Thorne, the man who made three descents and showed extraordinary heroism and endurance, was a man who had trained most conscientiously, having made several weight lifting records in smoke at contests between apparatus teams. A little previously he had undergone a similar experience in extinguishing a fire at Wharncliffe, Silkstone colliery (see Journal, Vol. I., p. 523). Untrained men are worse than useless when the emergency comes. No man knows his hidden indiosyncrasy until he makes the test.

3. No party should consist of less than five men, and no man should be called upon to descend more than once in the day, otherwise his physical powers are liable to be too severely taxed. Relays of fresh men should be ready to take up the work.

4. An adequate supply of oxygen and cartridges should be at hand. Rescue parties need oxygen trunks to revive men whom they find unconscious and enable them to be carried through noxious gases to the open.

To be brief, the appropriation for rescue stations and their upkeep should be ample and sufficient. At a recent explosion in Germany eighty rescuers were present, all equipped with apparatus, etc. The number of sets of apparatus should be more than adequate, and the oxygen reserves never allowed to get below the safe point. Numerous and frequent drills are necessary, and it is foolish to exercise economy in renewals and supplies for practice. Further, the apparatus must be kept in constant use if it is to be in order when the call comes. Rescue corps differ in no wise from fire brigades in this particular. Constant practice is a prime necessity for both apparatus and men. As an example, the Tankersley station had four Draeger apparatus until lately, when forty would have been nearer its requirements. At least five apparatus for each mine served by a rescue station is the minimum that should be provided.

Up to very recently the English mines have been very poorly provided with breathing apparatus, the Norman-ton and Tankersley stations being the only ones. At present, however, large stations are in course of erection at Wath, South Yorkshire; in Lancashire and South Wales. Several are also to be found in Scotland, particularly that of the Fife Coal Company at Cowdenbeath.

The present experience, we think, while proving the capabilities of these apparatus, shows also the folly of half measures in the matter. If a job is worth doing at all it is worth doing well, and the provision of breathing apparatus, if contemplated at all by any mining company, should be contemplated in no niggardly way.

The fact that men were to be found willing to descend a strange mine, as they did at Hamstead, and trust their lives to their apparatus, shows the entire confidence they placed in its trustworthiness, and such men should not be called upon to suffer by reason of the lack of sufficient apparatus and trained rescuers. That under such conditions as prevailed in the Hamstead mine one of the volunteers succumbed is no reason for the non-provision of breathing apparatus. On the contrary, it is a reason for a more generous provision, and more extensive drill and practice work.

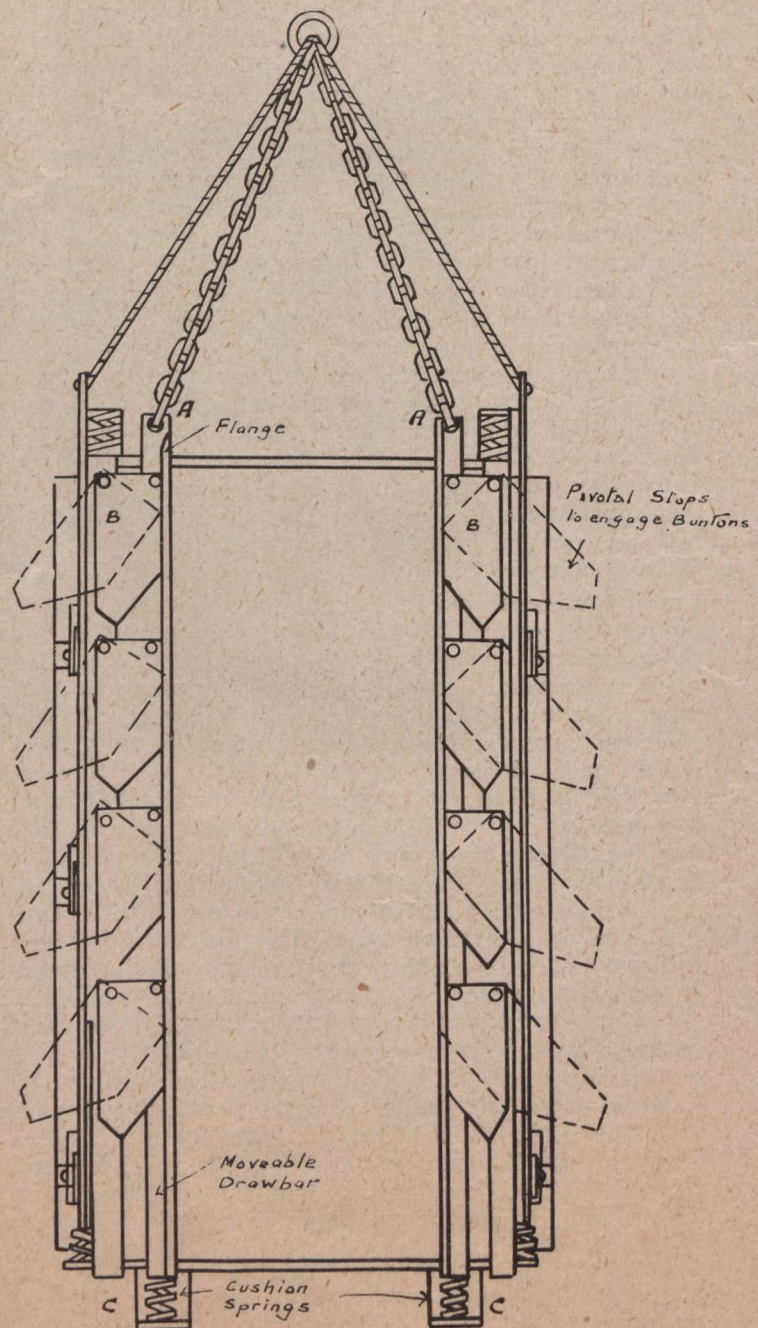
Another matter that strikes us very forcibly is that one mine or one company should not sponge upon another, or rest content in the knowledge that a neighboring company have men and apparatus if anything should happen in their own collieries that would make the use of breathing apparatus desirable. We know that willing volunteers will never be wanting when other men's lives are in danger, and it is hard to refuse aid under such

circumstances. But what right has anybody to expect volunteers from another district to risk their lives in the unknown workings of a strange colliery at long distances from their base of supplies. Such men are like the mariner in uncharted seas, and they could be accused neither of cowardice nor inhumanity if under such circumstances they refused to endanger their lives. But we know they would not refuse, and therefore the national character of the matter becomes at once apparent.

A NEW SAFETY DEVICE FOR HOISTING CAGES.

(Communicated by our Glace Bay Correspondent.)

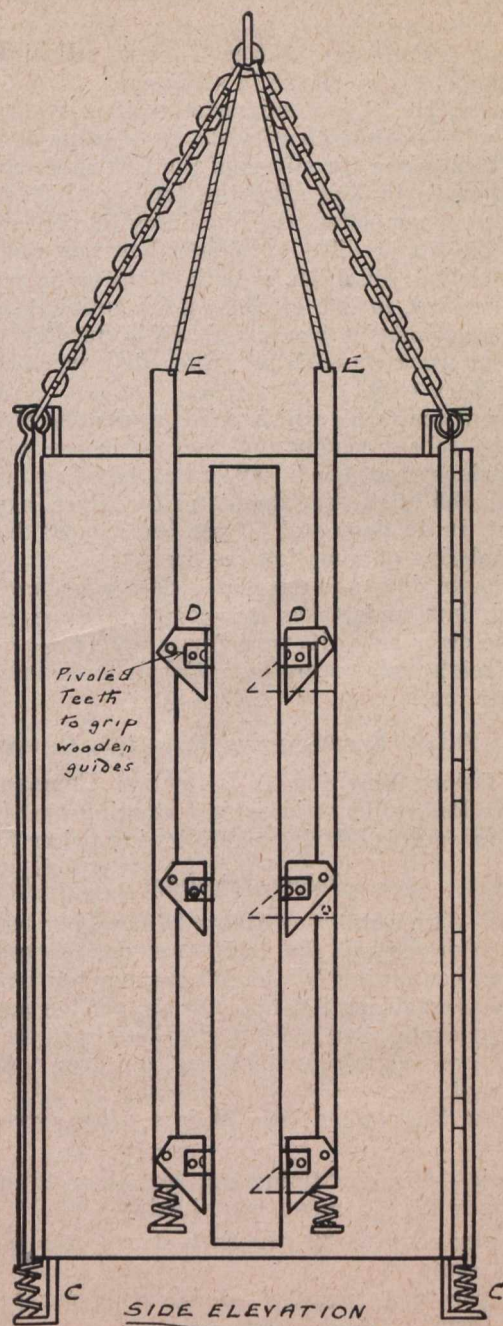
The recent deplorable accident at Sydney Mines No.1 Shaft caused by the failure of a safety catch, whereby two valued officials lost their lives, has drawn attention



FRONT ELEVATION

here to safety devices for the prevention of accidents due to the detachment of mine cages from their supports. A Royal Commission has just finished its work in South Africa in investigating various safety devices for use in hoisting shafts of great depths. There are many patented safety devices for arresting mine cages in case of accidental descent which are applicable to circular walled hoisting shafts fitted with wire rope guides, or the ordinary woden or iron conductors, but none of these patents would be of much use in the rectangular timbered shafts

rope is relaxed sufficiently the weight of the drawbar A, assisted by the springs C, causes it to fall, which projects the stops B outwards, so that they engage over the buntons of the shaft lining, thereby arresting the downward progress of the cage. The springs C serve also to absorb the shock of the suddenly arrested cage. At the same time the moveable drawbars E are drawn downwards causing the triangular teeth D to bite into the wooden guides. The action of the device appears very positive, and should be applicable to hoists of all kinds.



that are the rule on this continent. A device has however been recently patented by Mark Rideout, a young Glace Bay bricklayer, which is particularly adapted for local shafts. The following sketches will illustrate the working of the device.

The cage is suspended from the shackles by moveable flanged drawbars A at each corner, attached to which are a series of pivotal stops B held in vertical position retracted against the flange of the drawbar A, so long as the hoisting rope is taut. Whenever the tension of the

MOISTURE IN COAL.

The determination of moisture in a sample of coal is apparently simple and a result is easily obtained. The proper relation that this result bears to the original sample is, however, not so easily determined. Variations in this relation directly affect the application of all analytical work done upon the sample and the possibility of unaccounted-for moisture losses during the taking, shipping and preparing of the sample for chemical analysis too often receives little or no attention.

Care in Preparation and Shipment of Sample.—As a rule precautions to prevent moisture losses during the taking of the sample are not given sufficient attention and the too common practice of shipping the coarse sample by mail or express in canvas bags cannot be too strongly condemned where the moisture result is expected to represent the moisture in the coal as sampled. A sample of coal in a canvas or muslin sack may and usually does lose a large proportion of its loosely held moisture while in transit in warm mail or express cars, and the moisture results on such a sample can be only the moisture present in that particular sample in a more or less nearly air-dry condition. This is a point which has been too much overlooked in the past, and as a consequence many hundreds of published analyses of coal supposedly representative of the coal as mined really lack as much as several per cent. of the moisture actually present in the sample as mined or shipped.

Failure to guard against moisture losses is not necessarily of serious consequence on samples which have been selected more or less at random and sent to the chemical laboratory for analysis. On such samples the sender understands that the particular results obtained can represent the seam of coal only in a general way. The moisture result on these samples, while low and to that extent misleading, is a minor determination, as the ash and sulphur are usually the determinations particularly desired. When samples from actual steaming tests are handled in this way the unaccounted-for moisture losses will, of course, directly affect the accuracy of the test and the heat balance in such a case is necessarily misleading, as the coal usually analyzes better than the coal as actually fired under the boilers. This makes the unaccounted-for losses larger by perhaps several per cent. then they should be and some coals with an originally high moisture content and consequent high moisture loss may be made to appear superior to really better coals with an originally low moisture content and a consequent lower moisture loss in transit to the laboratory. If correct moisture results are desired, the only safe way is to have the sample shipped from the mine or testing plant in air-tight cans, as was recommended by the committee.—E. E. Comermeier, in *Mines and Minerals* for April.

REPORT ON COBALT DISTRICT FOR YEAR 1907.

By ARTHUR A. COLE.*

The first seven pages of Mr. Cole's report to the Commission is taken up with statistics of ore shipments, most of which have appeared in different forms in previous issues of THE CANADIAN MINING JOURNAL. In the report, however, Mr. Cole has arranged the output of each mine by months for 1907 and by year for 1904 and 1907, inclusive.

On page 8 begins a list of smelter purchase schedules, etc., which is well worth reprinting.

One preliminary note, however, must not be omitted. Mr. Cole, alluding to the much more rapid increase of the tonnage than of the total value, explains that this indicates not that less rich ore is being encountered, but rather that a larger proportion of low grade ore is being shipped.

DISTRIBUTION OF OUTPUT.

The output for 1907 was distributed for treatment as follows:—

	Tons, or per cent.	
Canada	2,585.05	17.40
England	167.34	1.13
United States	12,098.95	81.47
Totals	14,851.34	100.00

CANADA.

The Orford Copper Company.

The Orford Copper Company's smelter at Copper Cliff took almost all the ore that was shipped to Canadian smelters. At the end of the year the following was the purchase schedule and terms of settlement of the Orford Copper Company for silver and cobalt in arsenical silver-cobalt ores:—

Purchaser to make payment for—

- 94 per cent. of silver per ton of ore (2,000 lbs.) when same assays 4,000 ozs. and over.
- 93 per cent. of silver per ton of ore (2,000 lbs.) when same assays 1,200 ozs. and over.
- 92 per cent. of silver per ton of ore (2,000 lbs.) when same assays 800 ozs. and over.
- 90 per cent. of silver per ton of ore (2,000 lbs.) when same assays 500 ozs. and over.
- 85 per cent. of silver per ton of ore (2,000 lbs.) when same assays 300 ozs. and over.
- 80 per cent. of silver per ton of ore (2,000 lbs.) when same assays 150 ozs. and over.

Purchaser to make payment of—

- \$30 per ton of ore (2,000 lbs.) when same contains 12 per cent. cobalt and over.
- \$20 per ton of ore (2,000 lbs.) when same contains 8 per cent. cobalt and over.
- \$10 per ton of ore (2,000 lbs.) when same contains 6 per cent. cobalt and over.

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

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

*Mining Engineer, Temiskaming & Northern Ontario Railway Commission.

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

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

Payment for 50 per cent. of the silver returnable to the seller, as per the above scale, to be made at the New York official price for silver on the first settlement date, which shall be 45 days after the date on which sampling of the ore is completed, the remaining 50 per cent. to be paid 45 days later. The purchaser, however, reserves the right to deliver on either or both of the settlement dates above specified, in lieu of cash, at its option, such silver bullion (commercial bar silver) as is due the seller in settlement upon these dates. Such delivery to be made in New York City.

Payment for cobalt will be made as per the above scale when the cobalt content of the ore comes within the specifications mentioned, settlement to be made 50 per cent. on each of the two due dates for silver, namely, 50 per cent. in 45 days and 50 per cent. in 90 days after the completion of sampling the ore.

Purchaser does not guarantee date when ore will be sampled, but undertakes to complete same promptly after the ore reaches its turn for sampling.

The freight rate on ore from Cobalt to Copper Cliff is \$5.20 per ton.

The Deloro Smelting and Reduction Company.

The Deloro Smelting & Reduction Company, with works at Deloro, Ontario, is just starting operations on Cobalt ores and is offering the following prices for them:

Deloro Schedule.

Silver.—Ore containing 100 to 200 ozs. per ton pay 85 per cent.; ore contain 200 to 500 ozs. per ton pay 90 per cent.; ore containing 500 to 800 ozs. per ton pay 91 per cent.; ore containing 800 to 1,000 ozs. per ton pay 93 per cent.; ore containing 1,000 to 2,000 ozs. per ton pay 94 per cent.; ore containing 2,000 ozs. and over per ton pay 95 per cent.

At New York quotations 30 days after agreement of assays.

Arsenic.—Ore containing not less than 10 per cent. arsenic pay for all arsenic contained:—

- 10 per cent. to 30 per cent.—1 cent per pound arsenic.
- 30 per cent. and over—1 1-2 cents per pound arsenic.

Cobalt.—Ore containing not less than 6 per cent. cobalt—

- 6 per cent. to 10 per cent. cobalt pay \$10 per ton ore.
- 10 per cent. and over cobalt pay \$20 per ton ore.

Treatment charges in all cases \$10 per ton (2,000 lbs.) ore.

No charge for sampling.

No penalties for "insoluble matter."

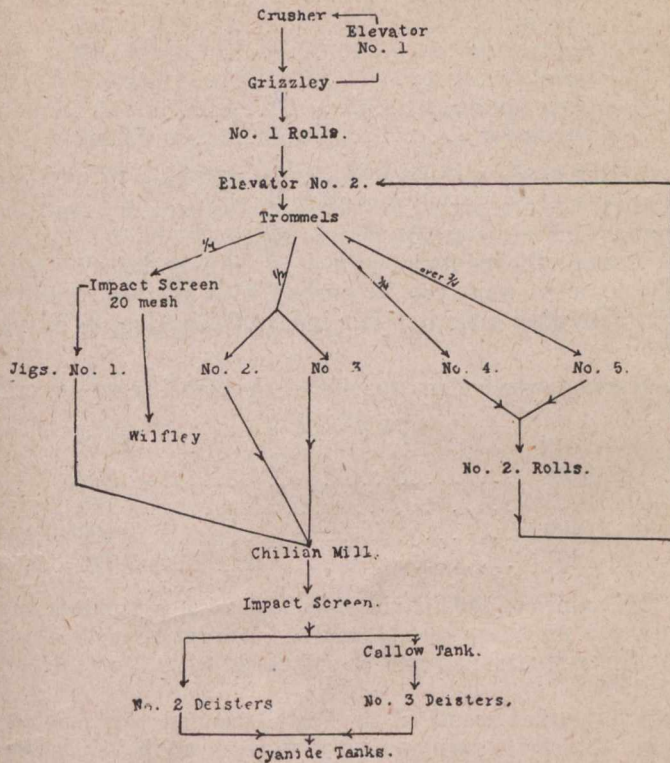
Ore to be delivered in carload lots, f.o.b. Marmora station, Central Ontario Railway.

This tariff is subject to change without notice.
The freight rates on ore from Cobalt to Marmora station is \$7 per ton.

ENGLAND.

The Anglo-French Nickel Company of Swansea, Wales, was the only European company that bought ores from the Cobalt camp.

(1) BUFFALO CONCENTRATOR.



This company wished ores solely for their cobalt contents, and paid nothing for the silver.

The following is the schedule of average prices paid for Cobalt ores during 1907, by the Anglo-French Nickel Company, but before the end of the year these prices were cancelled:—

- 8 to 10 per cent. cobalt, 30 cents per pound for metallic cobalt.
- 10.1 to 12 per cent. cobalt, 35 cents per pound for metallic cobalt.
- 12.1 to 14 per cent. cobalt, 40 cents per pound for metallic cobalt.
- 14.1 to 16 per cent. cobalt, 45 cents per pound for metallic cobalt.
- 16 per cent. cobalt and over, 50 cents per pound for metallic cobalt.

The freight rate on ore from Cobalt to Swansea, Wales, is \$13.98 per ton.

UNITED STATES.

American Smelting and Refining Company.

Eighty per cent. of the camp's output went to the United States and most of this was taken by the American Smelting & Refining Company at their works at Perth Amboy, N.J.

The following is the schedule of prices offered by this company at the end of the year for silvercobalt ores:—

American Smelting & Refining Company's schedule for ores assaying under 1,500 ozs. per ton—

Silver.—Pay for ninety-three per cent. of the silver contents at the New York quotations as given by Messrs. Handy and Harman to Western Union Telegraph Company, on the thirtieth day after agreement of assays.

Working Charge.—Nine dollars per ton of two thousand pounds dry weight, plus one-half cent per ton of each ounce of silver contained.

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

Insoluble Matter.—An addition to the working charge will be made at the rate of seven cents per dry ton for each per cent. of insoluble matter contained in excess of iron.

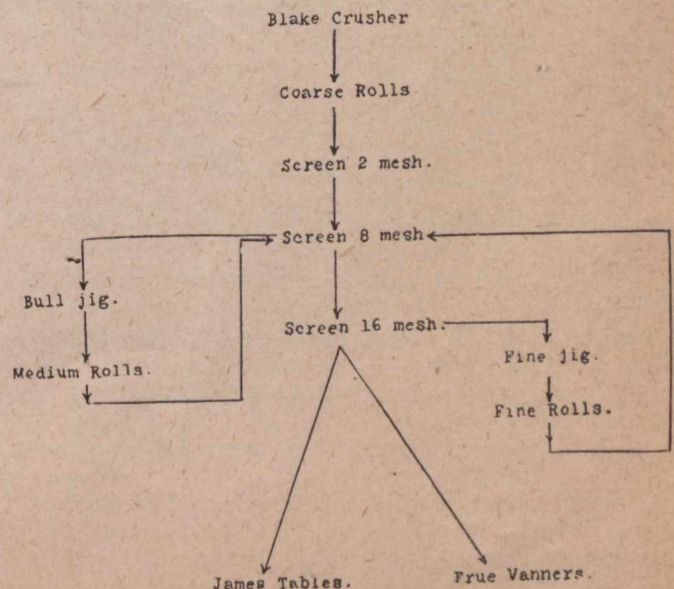
Payments of net proceeds of shipments will be made on the thirtieth day after date of agreement of assays.

Ores assaying 1,500 ounces per ton or over—

These ores will be treated at the Perth Amboy plant by the cupelling process, separately from any other ores, in the presence of the shipper's representative, making payment immediately on production, for all of the silver recovered in silver bars at the New York quotation prevailing on date of production of bars, as given by Messrs. Handy & Harman to Western Union Telegraph Company.

All by-products recovered during the process, such as slags, test bottoms, etc., will be sampled in the presence of the seller's representative, and ninety-eight per cent. of the silver contents of same will be paid for on the basis of assays arrived at by averaging the smelter's results with those of the seller's representative, providing the differences are not unusual; payment being made on the thirtieth day after date of agreement of assay and

(2) COBALT CENTRAL CONCENTRATOR.



at the quotation prevailing on that date; any unusual differences in assays to be adjusted by umpiring in the usual manner.

Working Charge.—\$125 per ton of 2,000 pounds of ore dry weight plus one per cent. per ounce of silver paid for.

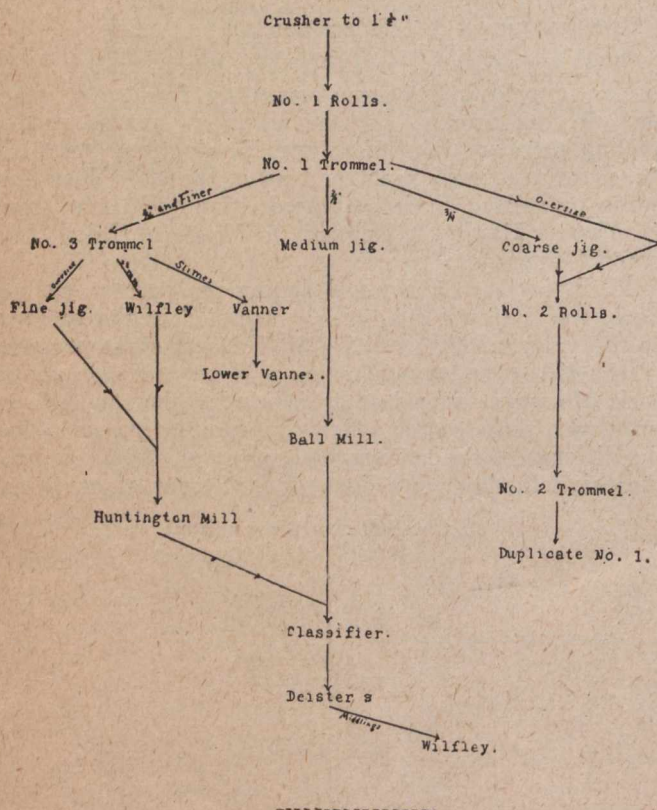
On ores running under 1,500 and above 400 ounces per ton the shipper is advised to consign through Messrs. Ledoux & Company's works at Bergen Junction, with privilege of sampling in transit. At any sampling or other operations at Perth Amboy plant the seller is entitled to have a representative present.

The freight rate on ore from Cobalt to Perth Amboy, N.J., is \$10.20 per ton.

Some of the comparatively low grade ores proved suitable for mixing with certain western ores, and for this reason towards the end of the year a considerable tonnage of these ores was shipped to the American Smelting & Refining Company's works at Denver, Colorado. A reduction was made in the smelting charge to offset the increase in freight rates.

The following companies were also occasional buyers of silver-cobalt ores during the year:—

(3) CONIAGAS CONCENTRATOR.



Balbach Smelting & Refining Company, works at Newark, N.J.

United States Smelting, Refining & Mining Company, Chrome, N.J.

Pennsylvania Smelting Company, Carnegie, Pa.

PROGRESS DURING THE YEAR 1907.

Not only have the old shippers increased their shipments during the year, but the number of shipping mines has been increased by ten, making a total of twenty-nine, and notwithstanding the fact that some of these only shipped small quantities, the increase is noteworthy. It is all the more satisfactory when it is remembered that the shipments for several months were curtailed on account of labor troubles and also that they increased towards the end of the year in the face of a falling price of silver.

The average monthly price of silver in refined ounces in New York is given in the following table, taken from the Engineering and Mining Journal:—

Month.	Average Price.
January	68.673
February	68.835
March	67.519
April	65.462
May	65.981
June	67.090
July	68.144
August	68.745
September	67.792
October	62.435
November	58.677
December	54.565

The average price for the year 1907 was 65.327, the highest price being 70.125 cents on January 3rd, and the lowest 52.5 cents on December 21st.

Most of the mines now have machinery installed and development work can be pushed with greater rapidity. The following table is a fair index of the advance in this line:—

Horse-power boiler capacity of the Cobalt camp at end of

Year.	H.P.
1904	Zero
1905	150
1906	3,406
1907	7,918

The mines of the district now have 74 steam plants and two gas producer plants, and in connection with these are 51 compressor plants, as compared with 20 at the end of 1906.

A favorable result of the installation of this machinery is that more development than formerly is being done per ton of ore shipped, and there is to-day more ore blocked out than there was a year ago.

Concentration.

From the very opening of the Cobalt district it was realized that the problem of treating the low grade ores would form a very important feature in its industrial future. Nearly every mining school and testing laboratory on the continent has run small mill tests on the ore, and from the information thus gathered mills have been designed. There are six mills in the camp, four mine mills being in active operation, and two custom mills nearing completion.

They belong to the following companies:—

Mine Concentrators—

- (1) The Buffalo Mines Company, Limited.
- (2) Standard Cobalt Mines, Limited (Cobalt Central).
- (3) Coniagas Mining Company.
- (4) McKinley-Daragh-Savage Mines of Cobalt, Limited.

Custom Concentrators—

- (5) Muggley Concentrators, Limited.
- (6) Cobalt Concentrators, Limited.

All use water concentration with the exception of the Cobalt Concentrators, Limited, which is installing a pneumatic process plant.

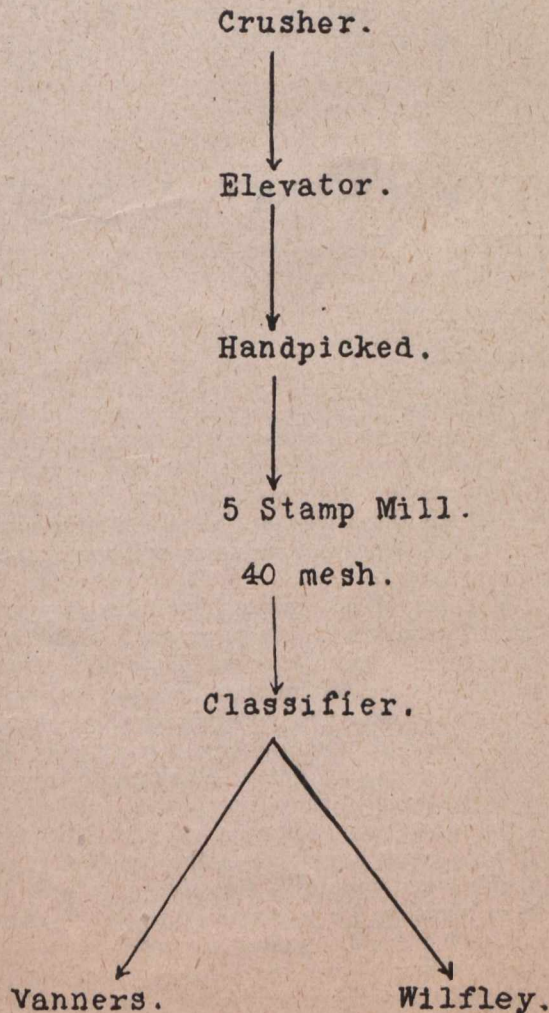
The following flow sheets illustrate in outline the general methods of concentration adopted.

(5) MUGGLEY CONCENTRATORS, LIMITED.

This company has a mill almost ready to start operations and is contracting for ore on a tariff of which the following is an outline:—

- On ore yielding 20 to 60 ounces silver per ton, crushed, pay 50 per cent. net silver value.
- On ore yielding 60 to 80 ounces silver, per ton, crushed, pay 55 per cent. net silver value.
- On ore yielding 80 to 100 ounces silver per ton, crushed, pay 60 per cent. net silver value.
- On ore yielding 100 to 125 ounces silver per ton, crushed, pay 65 per cent. net silver value.
- On ore yielding 125 to 150 ounces silver per ton, crushed, pay 70 per cent. net silver value.
- On ore yielding 150 to 175 ounces silver per ton, crushed, pay 75 per cent. net silver value.

(4) MCKINLEY-DARRAGH CONCENTRATOR.



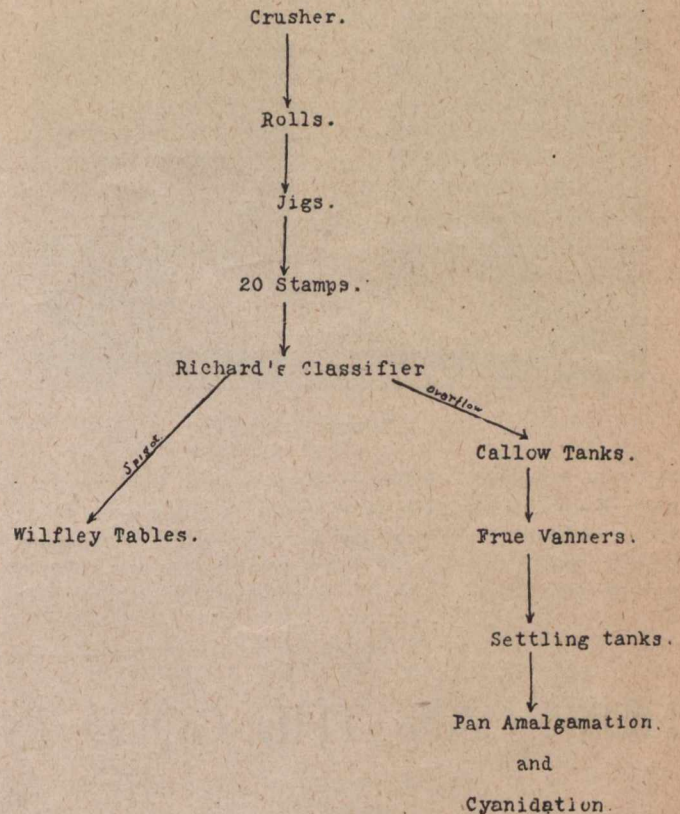
On ore yielding 175 ounces silver and up per ton, crushed, pay 80 per cent. net silver value.

By net silver value is meant the gross silver value less smelting charges.

LEASES.

During 1907 the following mining companies operated on a royalty basis on mineral lands owned and leased by

(5) MUGGLEY CONCENTRATOR.



the Temiskaming & Northern Ontario Railway Commission:—

- (1) City of Cobalt Mining Company.
- (2) Cobalt Townsite Mining Company.
- (3) Nancy Helen Mines, Limited.
- (4) Railway Reserve Mines, Limited.
- (5) Right of Way Mining Company.
- (6) Wright Mining Company.
- (7) Jack Pot Silver Mining Company, Limited.

The report is concluded with detailed statements of the equipments and mining operations of the seven companies mentioned above.

In his introductory paragraphs Mr. Cole makes allusion to the rapid and regular growth of mining in Cobalt. The silver production of the camp for 1907 was nearly 5 per cent. of the world's total.

The report should be widely distributed. It is the work of a capable, conservative and painstaking mining engineer.

A NOVEL COUPLING FOR MINE CARS.

(Copied from "Gluckauf," 14th March, 1908.)

The coupling arrangement shown in the following cut has been successfully used for some time past in the Minister Achenbach Colliery at Brambauer, near Dortmund, Westphalia. No further details than those shown in the illustrations are necessary to explain the design,

the chief advantage of which is that both coupling members—the shackle and the hook—are together on each side of the car. To couple, the shackle of one car is placed horizontally and the hook is thrown over the circular end of the shackle of the other car. To uncouple

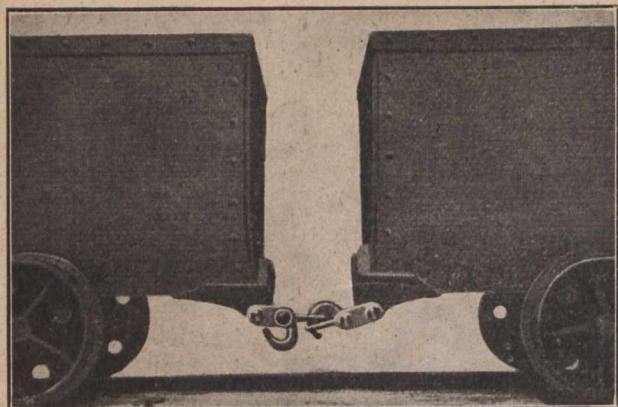


FIG. 1.—COUPLING ATTACHMENT.

the cars it is only necessary to press the hook upwards when both shackles will be released by their own weight. Any accidental uncoupling is impossible because the weight of the shackles in every position presses them together and holds the hook in place. The stronger the

pull of the rope also the tighter the connection between the hook and the shackles. It is therefore impossible for uncoupling to occur through sudden bumpings or jolts of the cars, and the numerous breakdowns that occur from this cause are entirely obviated by the use of the

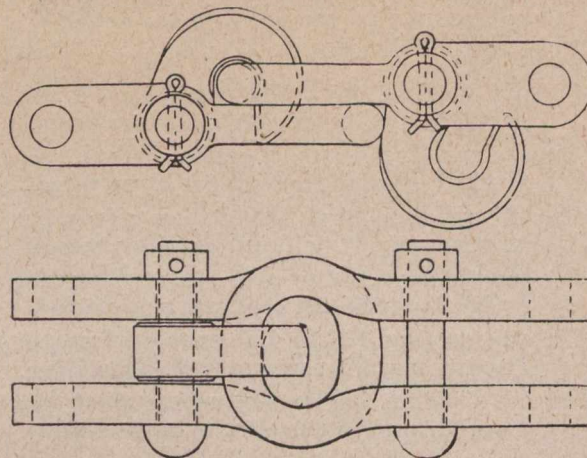


FIG. 2.—SIDE VIEW AND PLAN.

arrangement under consideration, and by reason of the tight connection jerking is almost eliminated.

The coupling is made by the firm of Hugo Klever of Dortmund, and is easily attached to any form of mine car.
F. W. G.

HOW CAN THE GOLD INDUSTRY OF NOVA SCOTIA BE ASSISTED.

By E. PERCY BROWN, GOLDBORO, N. S.

(Paper read at Meeting of 25th March, 1908.)

Many of us believe that gold mining in Nova Scotia is about to experience a period of fresh activity on a surer basis than heretofore. We realize that many mistakes have been made in the past, and that the industry has received some bad blows from which it must take some time to fully recover.

I have endeavoured in a few short papers, written during the past year, one for this society and one or two others for THE CANADIAN MINING JOURNAL of Toronto, to set forth what I believe to be the basis of future success in gold mining in this province, namely, the location of "pay shoots" and the following of the same. We have had several instances of the well-defined zones of pay ores extending to considerable depths, examples of which are probably familiar to all, and I contend that in most cases, when rich outcrops have been opened on the surface, that the same continue in depth and their continuations could be followed if proper knowledge were employed.

As to the difficulties in the way of opening up such properties, the chief one consists of the fact that the areas are held by men who will not, or cannot work them, and who do not have to sell them. I believe that right here lies the secret of what is hindering our gold-mining industry more than all other things put together—the high price of coal not included. I claim that so long without working them, by the payment of the nominal sum of fifty cents an area per year, so long will the

mining industry of Nova Scotia be more dead than alive. The measures necessary to correct this may seem harsh. No doubt we would all suffer to a certain extent if a radical change were made in this direction; but I believe that all those who are vitally interested in the welfare of this important industry will see that such a change is necessary.

Why is it, may I ask, that gold mining, struggling as it is, has still to pay a tax on its output? Other kindred industries receive bounties, why not gold? Our coal-mining brethren will claim that they pay a royalty on their product. I ask: who pays this royalty? It appears to me that the gold miners not only pay the 2 per cent. royalty on their output, but a full share of the 50 cents per ton on all the coal they use.

If a manufacturing company of any kind proposes to establish a plant anywhere in the province it receives certain privileges, such as a free site, free light, exemption from taxation for a certain number of years, etc. When a gold mining company proposes to start operations, it must first acquire the areas by paying for them probably ten times their actual value, as they lie undeveloped or condemned. The surface rights must be purchased, or the company runs the risk of having to pay excessive damages. When operations are underway they must bear the burden of taxation for the district and hand over to the government the two per cent. tax on their gross output, even if they run themselves into debt to do it.

Can there be any question as to the good that a gold-mining concern, properly conducted, does to a community? We have simply to compare the conditions as they were at any of our well-known mining camps, when in full operations, with what they are to-day when idle. What is more prosperous than the community surrounding an active gold mine? Take for example the settlement that has grown up in the vicinity of the Richardson mine at and near Goldboro, Guysboro county. This mine has been in operation for the past fifteen years, expending from \$3,000 to \$5,000 per month in the immediate neighborhood. Directly and indirectly the people within 20 miles on each side of this mine have derived great benefit from it, and there are not many manufacturing plants in the province that have benefited the people more than has this mine.

What encouragement has this mine received from the government or from the municipality? The Boston Richardson Company pays a very large proportion of the total school rates for the district; but when it asked that a school house be built close to the mine, so that the miners' children could avoid a walk of over two miles, its request was peremptorily refused. The company then built its own school house and furnished it at a cost of \$700, accomodating fifty children that otherwise could not have attended school regularly during the winter months. They got no thanks and instead of a rebate in their school rates got an increase. The Richardson mine has produced, during its existence, almost one million dollars worth of gold, netting a royalty of nearly twenty thousand dollars. The county taxes for the past year amounted to about six hundred dollars.

As another instance of the help afforded a gold mine by the community, may be mentioned the case of a company that expended between one and two hundred thousand dollars in developing a water-power and erecting a plant. Had its operations been successful it would have continued to distribute three or four thousand dollars per month among the community. So grateful were the people near at hand for this expenditure of capital, that they brought suit against the company, claiming that it would ruin the trout fishing on their river.

It seems to be the general impression that gold mining machinery is admitted free of duty; but I have carefully studied the tariff and can find no material or machinery admitted free, except copper plates and automatic feeders, that is likely to be of any great use to the gold mining industry. Automatic ore samplers are on the free list; but I very much doubt if we will ever need to import one. Bullion furnaces are not likely to be imported, and when we have arrived at a stage when we need to import mercury pumps, amalgam cleaners and amalgam safes, we will probably be quite willing and able to pay duty. Why this discrimination?

I know of one case where a gentleman was importing a set of assay balances valued at \$150.00. He asked that they be admitted free of duty as they were for a cyanide plant. His application was refused by the department as it was stated that balances might be used for other purposes than those mentioned,—for use in a grocery store, for instance.

The government of this province has passed an act to encourage gold mining in Nova Scotia by assisting in the sinking of vertical shafts. I do not know of a single district where such a shaft will develop to best advantage the zones of pay-ore. Where this method has been tried it has resulted in a failure. The reason for this is that where zones of pay-ore are found they usually pitch at low angles, ten to thirty-five degrees in the strike of

the vein, and a vertical shaft rapidly leaves them, making proper development impossible, or, at the best, very expensive. A system of cross-cutting has been suggested, but while I can see how this would prospect the ore-bodies, I cannot see how it would develop them.

I hold that the only proper way to develop the shoots of rich ore, which we know to exist in this province, is by getting in touch with the pay-ore and keeping in touch with it, probably by means of an inclined shaft.

The above points have been merely stated as they occur to me, and I am open to correction on any one or all of them; but what I do ask is that a committee of active gold mining men of this society be formed to consider these points which may be summarized as follows:

1. To collect data relative to the existence of well-defined pay-shoots in Nova Scotia.
2. To confer with the government regarding the holding of areas by people who will not work them.
3. To confer with the government regarding the abolition of the 2 per cent. royalty.
4. To consider the tariff in so far as it relates to gold mining machinery and supplies, and to determine if a revision be possible.
5. To confer with the government regarding an amendment to the present act concerning the assistance to be given to the sinking of vertical shafts, so that it may apply to the sinking of any shaft, vertical or otherwise.
6. To determine what other steps can be taken to encourage the gold mining industry of the province.

The success which has attended the efforts of this society to establish a system of technical education in Nova Scotia shows what can be accomplished when the proper steps are taken, and I believe that the above committee could be as fully successful in its undertaking.

In closing, I beg to suggest that Mr. E. R. Fairbault be a member of this committee.

ROCK DRILLS USED IN COBALT.

The tabulated list of power and drill equipments of Cobalt district, recently published in THE CANADIAN MINING JOURNAL, was as correct as could then be obtained. We are indebted to Mr. A. A. Cole, mining engineer of the T. & N. O. Railway, for the following corrected statement of the number and makes of drills:

Percussion—	
Ingersoll	56
Mac	73
McKernon	9
Rand	203
Sullivan	4
Total	345
Air Hammer—	
Hardsoeg	2
Murphy	13
Shaw	1
Sullivan	2
Waugh	3
Total	21

As will be noticed by comparing this with the former list, there are a few changes. Any person who has attempted to gather exact information of this nature will realize how difficult it is to obtain. It may be added that such information is of positive value.

THE MECHANICAL EQUIPMENT OF THE OTTAWA MINT.

(A paper read before the Mechanical Section of the Canadian Society of Civil Engineers.)

(Continued from April 1 Issue.)

Rolling.—When designing these mills arrangements were made to provide for extremely accurate and very fine adjustments for the rolls, for all the driving mechanism to be kept above the floor level (the ground being rock, and very hard to excavate) and for economy of floor space.

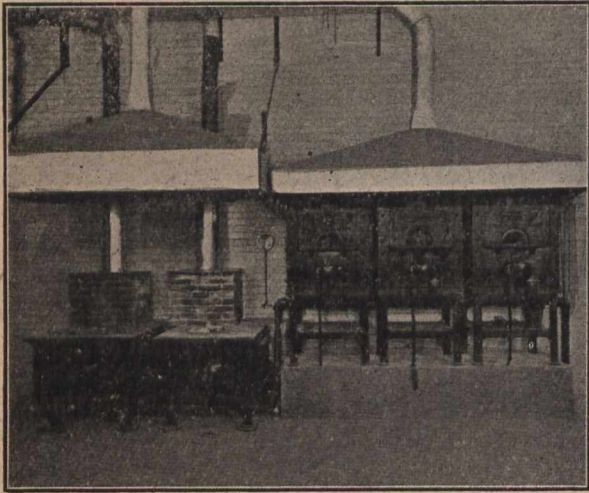


Fig. 6.—Cupel and melting furnaces in Assay Department.

Each mill is driven by its own motor, through gearing; the general arrangement being as follows:—

The motor, gearing and roll housings are all on one bedplate, thus ensuring rigidity and perfect alignment. The first motion shaft carrying the driving pinion runs

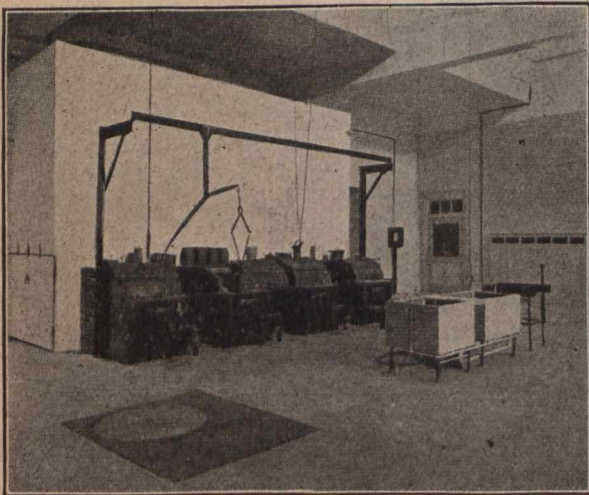


Fig. 7.—Melting furnaces, condensing chamber, acid and water tanks in Melting House. The granulating tank is situated under the iron plating shown at the left of the foreground, and is fitted with water supply, over-flow and waste pipes, and settling tank.

in its own bearings and, at one end, is connected with the motor through a flange coupling outside one of the bearings, so that the motor is entirely free from any thrust. At the other end of this shaft, outside the other bearing, a small fly wheel is keyed. The second motion shaft gears with the shaft driving the bottom

roll, and this latter shaft gear through double helical gearing with the shaft which drives the top roll.

The rolls are connected with the gearing by means of breaking spindles and muff couplings. The couplings are held up to their work by adjustable wood distance pieces.

The motors run at 600 revolutions per minute, and the rolls at from 40 revolutions per minute, for the breaking down mill, to 60 revolutions per minute for the finishing mill.

The form of drive described above is found to be very convenient, and to absorb very little power.

The breaking down mill is driven by a 30 H. P. motor, fitted with an overload release, which is set to cut out at 50 per cent. overload. The distance between the rolls is regulated by means of worms and worm wheels actuating large, single, square thread screws of 1-2 inch pitch. There are 50 teeth in each worm wheel. The worm shaft is divided in the centre, the halves being connected by means of a friction coupling, so that when it is neces-



Fig. 8.—Shearing machine, rotary files, and assay cutter in Melting House.

sary to "parallel" the rolls, one end only of the top roll may be moved at a time. This worm shaft is actuated by hand wheels at either end, one complete revolution of which closes or opens the rolls .01 inch. The hand and worm wheels are fitted with indicators and divided circles, so that adjustment of the rolls can be made as fine as .0005 inch. For ordinary rolling it is usual to work to .001 inch at this mill.

It has been found difficult, with the form of adjustment detailed above, to prevent the top roll from jumping, when the bar which is being reduced first enters between the rolls. This jump may arise from the three following causes:—

- (1) There may be slackness between the roll journals and bearings.
- (2) There may be looseness in the attachments between the bottoms of the big screws and the caps of the roll bearings.
- (3) There may be wear between the big screws and the threads of the nuts in the roll housings.

When it is remembered that the weight of the top roll with its brasses and adjusting gear amounts to about two tons, it can be readily imagined that signs of wear will soon become apparent between these nuts and screws.

Various devices have been tried with a view to prevent this jumping of the top roll; a common one being that of heavy weights, situated in a tunnel below the floor level, which act through levers and rods to counter-balance the weight of the top roll and gearing. This method, however, does not entirely overcome the difficulty.

In order to avoid excavating for a tunnel, the following arrangement has in this case been adopted, and there is every reason to hope that it will be entirely successful in preventing the jump of the roll.

The top of each roll housing has been extended on one side so as to form a hollow casing in which a powerful buffer spring is situated. Each spring is of sufficient strength to take, when half compressed, the entire weight of the top roll with its brasses and adjusting gear.

When the top roll is depressed to within one inch of the bottom one, these springs come into full play, and thus keep the big screws, which actuate the top roll in close contact with the upper side of the threads in the nuts. There is thus no weight on the bar that is being

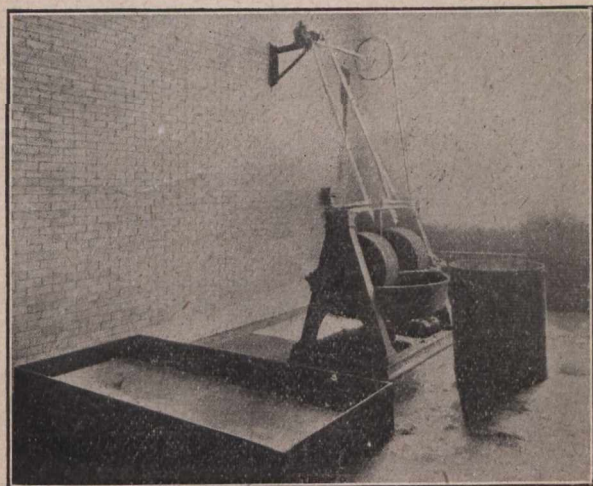


Fig. 9.—Mortar mill for reducing worn-out crucibles, etc., for the recovery of precious metal.

rolled other than the intentional pinch given to it through the gearing.

This arrangement has been thoroughly tested and, up to the present, the top roll has shown no sign of jumping. The bars so rolled into "fillets" have been carefully gauged and found to be remarkably uniform throughout their entire length.

The rolls in this mill are 14 inches in diameter and 16 inches in length, and are driven at 49 revolutions per minute.

The thinning mill is driven by a 20 H. P. motor in the same manner as the breaking down mill. The adjustment of the rolls is also the same, but the gearing, etc., is, of course, of somewhat lighter construction.

The rolls in this mill are 12 inches in diameter and 14 inches in length, and are driven at 50 revolutions per minute.

The finishing mill is driven by a 10 H. P. motor in the same manner as the others; but the adjustment of the rolls is different. This distance between the rolls is varied by raising or lowering the bottom roll by means

of long steel wedges, which are actuated by a hand wheel through gear wheels and fine screws. The hand and gear wheels are fitted with indicators and divided circles, so that adjustment of the rolls can be made as fine as .0002 inch.

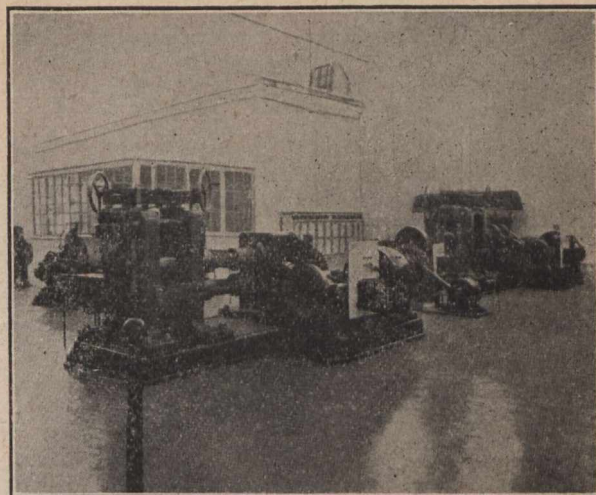


Fig. 10.—Rolling mills. Fillet-annealing furnace on right.

The rolls in this mill are 10 inches in diameter and 12 inches in length, and are driven at 60 revolutions per minute.

The bars from the Melting Department are first passed 10 or 12 times through the breaking down mill, after which they are annealed in the fillet annealing furnace. They are then passed 8 or 10 times through the thinning mill and 5 or 6 times through the finishing mill, when they should be the correct thickness for the coin that is to be made. For silver and bronze coins, rolling is sufficiently accurate; but for gold, further treatment is necessary. This latter metal is very dense, having a specific gravity of about 19, as against about 10 for silver and about 9 for bronze. The variation allowed by law from a standard weight is also, in the case of gold coins,

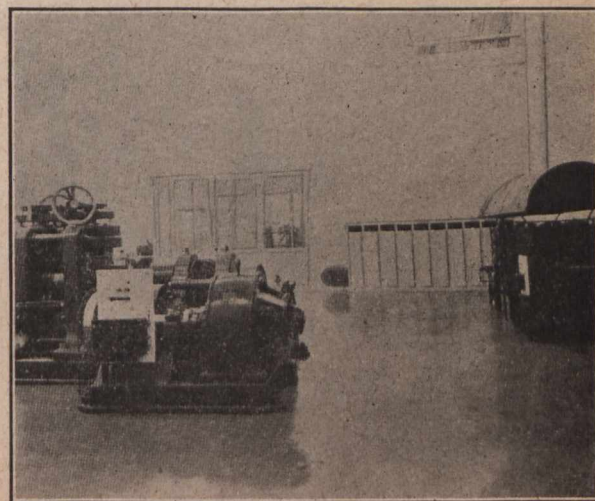


Fig. 11.—Breaking-down mill and fillet-annealing furnace.

very small. For instance, the standard weight of a British sovereign is 123.274 grains, but the remedy allowance is only .2 grain. If the coin exceed this limit, by even so little as .01 grain, it is rejected, and re-melted. The remedy allowance on silver coins is much more gen-

erous, weight for weight; being between two and three times as great as for gold.

The fillet annealing furnace is heated by oil fuel mixed with steam at 60 pounds pressure per square inch. The floor of the heating chamber is composed of three endless chains, travelling side by side, and driven by sprocket

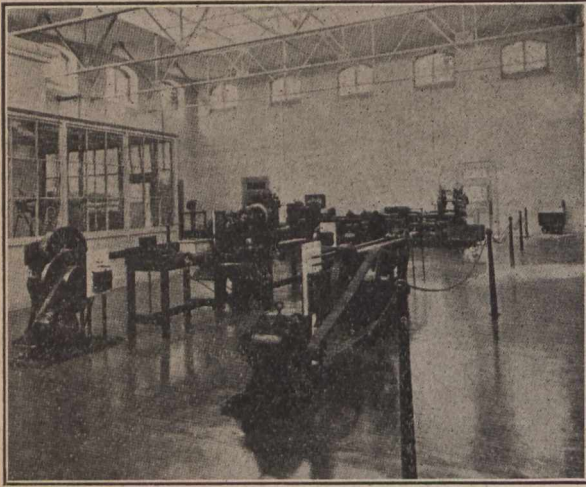


Fig. 12.—General view of Rolling and Adjusting Room, showing draw-bench, automatic trying cutter, and scale room.

wheels situated at either end of the chamber. The speed at which the chains travel can be varied by means of a speed box attached to the driving motor; so that the time occupied by a fillet in passing through the furnace may be from 4 to 12 minutes. The fillets are laid flat on the travelling chain, 5 or 6 side by side, and as they emerge, pass through a sheet of water; so that they are cooled before they come into contact with the air. This arrangement prevents oxidation, and very little, if any, discoloration is noticeable.

Adjusting.—In the case of silver and bronze, the fillets pass from the finishing mill to the blank cutting machines; but, in the case of gold, as before stated, it

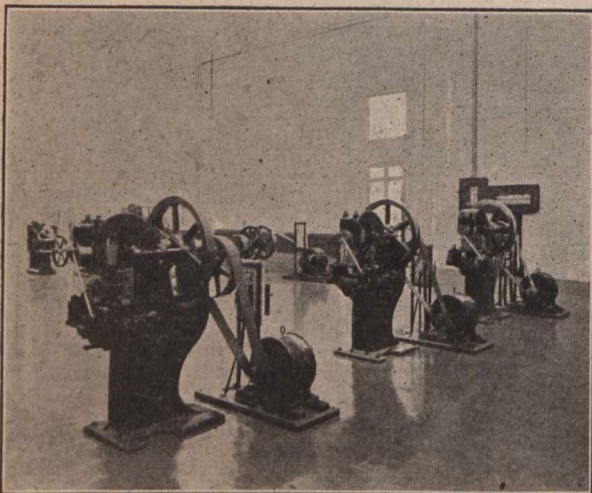


Fig. 13.—Cutting-out machines.

is found that further adjustment is necessary. The gold fillets are accordingly taken to the drawbench, where they are drawn between two fixed steel cylinders by means of a dog-clutch, which engages with an endless chain. These cylinders are about 4 1-2 inches long and 3-4 inch in diameter; they are highly polished, and ex-

tremely hard, and the distance between them can be adjusted to .0001 inch. By this means the small inequalities in the thickness of the fillets are regulated, and their variation from standard is reduced to a minimum. The fillets then pass to the blank cutting machines.

Cutting.—There are three of these machines, each one driven by a separate motor, and capable of cutting blanks for all sizes of coins, at the rate of 300 per minute. The punches and beds for all the different denominations are interchangeable, so that little time is occupied in changing from one to another. Each machine is fitted with an automatic variable feed, which can be increased or decreased by multiples of .05 inch.

After the blanks have been cut from the fillets, the skeletons that are left (technically known as "scissel") are cut up into convenient lengths, and made up into bundles for re-melting.

Marking.—The blanks are next taken to the marking machine, where raised edges are formed round their circumferences. These raised edges protect the impressions, which will be given to them later in the coining presses, and thus prevent their being rapidly worn

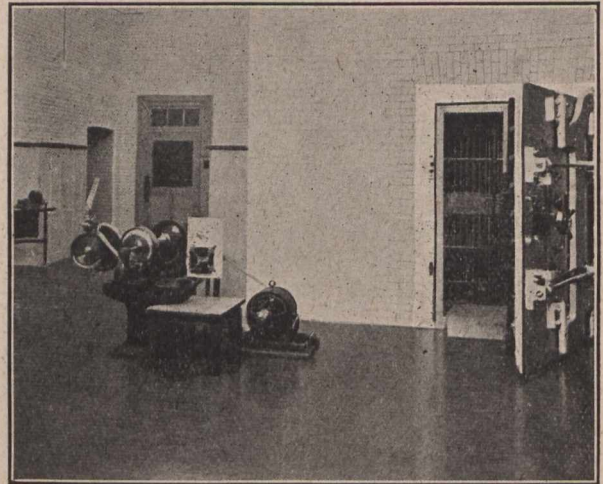


Fig. 14.—Marking machine and stronghold door.

away. This machine is capable of making 600 blanks per minute. The blanks pass between a circumferential groove, in a rapidly revolving hard steel disc, and another groove, struck from the same radius, in a fixed hard steel block. The distance between the disc and the block can be varied, so that any size of blank may pass between them. The blanks are then annealed, and thoroughly cleaned.

(To be continued.)

ALLOYS.

This is the age of alloys. Special research is constantly revealing unsuspected valuable qualities in new combinations of metals. Nickel steel, chrome steel and other high grade steel alloys have revolutionized the manufacture and use of structural material. The speed and durability of the modern motor car would have been unattainable had not special steel alloys been introduced. Foundry practice and machinery construction have been profoundly modified and improved by the intelligent use of alloys.

These considerations lend interest to a booklet issued by Geo. G. Blackwell Son s& Company, Limited, of Liverpool, Eng. This firm holds contracts with the British and many foreign governments. It specializes in alloys and metals. Under its control is the largest electric furnace works in the world, where a maximum of 42,000 horse-power is utilized. The firm also owns and operates its own mines. From the booklet a few facts may be quoted.

Chromium.—Ferro-chromium is used for armour plates, projectiles, wire, high speed steel, stamp shoes, and dies, tires and axles, etc. Its high percentage of chromium and its uniformity determine the value of an alloy. One brand made by the Blackwell Company shows the following analysis:

	Per cent.
Chromium	66.448
Iron	21.90
Carbon	8.800
Silicon	1.353
Manganese	Trace.
Phosphorus	0.053
Sulphur	0.045
Loss and undetermined	1.311
	100.000

As a contrast to this, and constituting in itself a metallurgical triumph, another variety of the same brand

shows 69.30 per cent. chromium and only 1.47 per cent. carbon; and another 63.586 chromium and 0.65 carbon.

For making high class steels containing fixed percentages of chromium and nickel, a chrome nickel iron alloy is supplied. Its analyses is as follows: C, 52; Ni, 18; Fe, 28.96; C, 0.50; Si, 0.50; S, 0.03; P, 0.01. The low carbon is a most important feature of this and similar alloys.

Tungsten alloys, which are replacing tungsten metal powder, range from 85.79 to 65.70 per cent. tungsten, and from 0.60 per cent. carbon to 2.92 per cent.

Molybdenum is fast becoming recognized as one of the most valuable constituents of a steel alloy. It increases the elongation and elastic limit of steel. In this respect it is much more valuable than nickel. An addition of 0.25 per cent. of molybdenum increases elongation from 4 per cent. up to 45 per cent. This gives it great value in the manufacture of large crank and propeller shafts. Its introduction into boiler plates for high pressure boilers has made possible the use of lighter plates that are actually stronger than much heavier plates made without the alloy. For motor car forgings and castings molybdenum steel is specially adapted. In high speed tools it gives all the desirable qualities with carbon kept below 1 per cent.

Ferro-molybdenum ranges in composition from 85 per cent. to 50 per cent. molybdenum and from 3.07 to 0.35 per cent. carbon.

NOTES ON FUEL ECONOMY AND ITS APPLICATION TO NOVA SCOTIA.

By A. A. HAYWARD, Halifax.

(Read before the Mining Society of Nova Scotia, 25th March, 1908.)

Of late there has been abroad a spirit of dissatisfaction and unrest, one that has developed into a strong desire for something commercially better, an increasing desire for a larger share of continental prosperity, a hope that fate might drift the golden barge of prosperity near our shore, so that we might secure more of its precious cargo. There are those whose personal desires and patriotic dispositions have lifted them above political and party degeneracy, and by such this manifestation has been termed the "forward movement." For these and such others as are desirous of dipping deeper into industrial questions, I have prepared the following remarks:

Do we deserve to become commercially strong? If so, it is absolutely necessary that we select for our foundation naturally existing materials or conditions, and not those created by party force or individual craft. Natural conditions are created, not made. They constitute our natural resources, such as raw material, water power, fuel deposits, etc. If we are wise, and above all sincere, in our industrial and commercial aspirations, we will seriously investigate these conditions if we desire to build wisely.

It is sometimes said we are an extravagant and wasteful generation, and that through our mechanical and commercial recklessness we are securing but a sup from the horn of plenty and throwing aside the remainder of its contents. Behind us we leave a trail of neglected opportunities and wasted natural resources. As we run

over the facts before us, the mass of accumulated evidence seems interspersed with instances of our supreme ignorance of natural conditions, as well as our neglect in applying the knowledge already in our possession. The only defence we offer for our course is that it is the result of the exigencies of competition and increased dividends on the production and distribution of the products of our raw materials. We are regardless of the moral and natural rights of the consumer, from whose birthright we are securing but a fractional part of the values contained therein. It does not require a close observation of events to see that we are selecting from our industrial tree only such fruit as is within easy reach, and from which we can, for the moment, secure the largest margin of profit.

Such in part are some of the regrettable facts conspicuously evident in a survey of this subject, conditions which justify the consumer in demanding an equitable share in the distribution of his inherited rights. Such an equitable distribution does not contemplate the securing a smaller percentage of the fruit of the industrial tree with the loss of the remainder, but the harvesting and marketing of a larger percentage, to the better advantage of both producer and consumer. If we are to enjoy the fullness of commercial prosperity, the ox should not be sacrificed for the hide and tallow alone.

During our mad rush for dividends and commercial supremacy, we have overlooked one of the most important of all fundamental facts, that is, that to mankind

in general belongs the natural raw material, and that while we have, by civil enactment, vested it in the hands of individuals, as custodians, it is incumbent upon the producer to secure and distribute the finished product to the consumer by the most direct means, and at the lowest possible cost. It is also incumbent upon the producer to recover, as far as possible, all the marketable commodities contained in the raw material, in order that he may cheapen the cost of the whole. It should also be his duty to protect the finished product from the commercial parasites that infest the highway from the point of production to that of consumption, by adopting as his trade-mark, "One common inheritance, one profit."

Does not the mal-practice with which we continue to manipulate the energy stored up in our great coal deposits furnish abundant evidence of the slowness with which we grasp the importance of more practical and economical applications of later-day mechanical devices and commercial methods. That we may more intelligently present our case, a single subject will serve to illustrate, and a specialization of the evidence will greatly assist in arranging our final conclusions. For convenience let us select as a representative subject, one familiar to all, namely, coal.

Nature has stored up in its coal deposits enormous energy, which we are rapidly consuming. In spite of the vastness of these fuel deposits there are those who recognize that materials containing such vital energy must be economized. We are not so rich that we can disregard the necessity for economy, and continue wasting what nature has so generously donated. Authorities all confirm the opinion that in the burning of coal by our present mechanical devices, we are wasting nine-tenths of the heat energy stored up in these fuel deposits. There are some who venture to predict the discovery of new sources of energy when these have been exhausted. The future is an unknown quantity and should not concern us at this time.

The question of economical generation of power and heat from fuel is the most serious and important one of this mechanical age; while its centralization and distribution require careful mechanical and commercial consideration.

Anyone sufficiently interested to follow the history of a ton of coal will see it mined at one profit, transported at another, handled and re-handled at an additional cost, and to this must be added the profit of the middleman, and he is forced to admit that all these various charges have been paid on at least 12 per cent. of ashes and stone contained in the coal. This picture of unnatural conditions must be sufficient to convince any student of economy that radical changes are absolutely necessary in our methods of production, transportation and distribution of our fuel product. It is estimated that forty per cent. of the fuel product mined is used for domestic purposes, and yet by the most improved methods of heat generation we have not succeeded in securing and turning into use 5 per cent. of its thermal efficiency. While from the balance, 60 p.c., if converted into power and light through the external combustion and steam engine, we have obtained remarkable results if we have secured 14 per cent.

A good average steam plant succeeds in securing and delivering at the engine shaft in useful energy from 6 to 8 per cent., while a modern compound condensing engine, working under favorable conditions and in large units of from 1,000 to 2,000 horse-power, may deliver

in useful power from 12 to 14 per cent., thus sustaining an actual loss of from 86 to 94 per cent. of thermal energy contained in the fuel. Owing to the intensity in temperature of the superheated steam used in the modern high-power engine, the limit of its economic development seems to be nearly reached.

A series of tests made with steam engines in 1906 showed that the very lowest consumption of coal with the most improved steam plant was 1.03 per 1 horse-power hour, while five express locomotives consumed 3.16 pounds. The average consumption was placed at 5 pounds, although there were some that showed a consumption of 36 pounds per 1 horse-power hour.

Tests made of steam plants by the Automatic Gas Producing Company of New York gave the following results, and show the yearly cost to maintain 1 horse-power by the use of steam engine and boiler:—

Coal at \$3 per ton, using 3 pounds per hour, \$1,570 per horse-power year.

Coal at \$3.50 per ton, using 8 pounds per hour, \$4,200 per horse-power year.

Coal at \$5 per ton, using 3 pounds per hour, \$2,250 per horse-power year.

Coal at \$5 per ton, using 8 pounds per hour, \$6,000 per horse-power year.

Coal at \$4 per ton, using 3 pounds per hour, \$3,000 per horse-power year.

Coal at \$4 per ton, using 8 pounds per hour, \$4,800 per horse-power year.

It is not the purpose of this paper to describe in detail the gas producer and engine nor its mechanical operations, but rather by its well-recorded economical achievements to illustrate by contrast the opportunities that apparently await more energetic recognition.

European engineers have for some years recognized the pressing necessity for economy, and no scientific introduction is meeting with more approval from the engineering fraternity than the gasification of fuel and its application for heat, power and light through the internal combustion engine. German engineers long since recognized the economic and mechanical advantage of using gasified fuel as a motive force. England is partially awake, while American engineers, although somewhat behind, have begun to appreciate the merits of higher thermal heat as a means of developing power and light. European engineers and the public regard this principle with the same degree of confidence. Both large and small plants are in evidence everywhere. Large central stations, aggregating several thousand horse-power, are numerous, especially where economy is essential.

The use of gas for engineering purposes has greatly increased during the past few years, and to-day it is considered one of the most important means of generating power. Notwithstanding that other systems have been devised for power and light, fifteen million tons of coal are annually converted into gas.

It is well known that the efficiency of the internal combustion engine far exceeds that of the external. This economic efficiency is largely due to the constant improvements that have been and are still being made in both the producer and engine. Tramways and power stations are now being equipped with gas plants of large units, and builders are prepared to guarantee the performance of both producers and engines.

In Germany there are already installed 203 gas plants which have a total effective power of 184,000 horse-

power, while there are under construction and erection 146 engines which will develop 201,000 horse-power, making altogether 349 engines having a total power of 385,000 horse-power. Between the months of March and July there were ordered 31 engines, combining 36,150 horse-power. Of this total, 18,950 horse-power is to be used for generating electricity. Altogether in Germany there are 199 engines, combining 206 horse-power, that are being used for electrical purposes, the largest horse-power in any one plant being 35,000 effective horse-power. In 16 collieries there are in operation 35 gas engines, having 30,300 effective horse-power and most of these engines are used for generating electricity.

Large gas engines are gradually coming into use in England. The following figures will serve to illustrate the confidence English engineers have in the economic and satisfactory mechanical performance of producer gas plants. There were during the year 1906, 91 plants in operation, having 70,685 effective horse-power. None of these plants developed less than 500 horse-power. Six plants developing 3,660 horse-power received their supply of gas from blast furnaces. Four engines developing 2,300 horse-power were supplied from coke ovens. The balance, 62,019 horse-power, received their supply direct from gas producers. Coupled to many of the larger units are by-product recovery plants, for the saving of ammonium sulphate.

At Philadelphia, near Sunderland, there is a plant for supplying gas to an electric generating station, which in turn supplies current for the Sunderland tramway system. This plant is located at the pit mouth. At Park Head, Glasgow, Messrs. Beardmore & Company are operating a 20,000 horse-power plant. At Dalmire there is a plant generating 10,000 horse-power, 4,800 horse-power of which is used for generating electricity. At South Staffordshire, England, the Mond Gas Company has secured Parliamentary powers to supply Mond gas over an area of 120 square miles, distributing the same through pipe lines for heating and power, at a cost to large consumers of 4 cents per 1,000 cubic feet, and has installed a plant of 25,000 horse-power, consuming 250 tons slack per day. Messrs. Beardmore & Company have built and are building producers of 100,000 horse-power capacity, all of which clean the gas, and recover, as a by-product, sulphate of ammonia in sufficient quantities to pay the entire original cost of the coal. The Cargo Fleet Iron Company, Middleborough, have installed 24,000 horse-power with an ammonia recovery plant attached. Messrs. J. Brown & Company, Clydebank, have an 8,000 horse-power also with an ammonia recovery plant. A plan has been proposed for supplying the city of London with Mond gas from a plant to be located in the South Yorkshire coal fields. This will require a pipe line 25 inches in diameter and 175 miles in length. To assist transmission, the gas will be compressed to 500 pounds in compressors of 46,000 horse-power. It is estimated the cost of the gas delivered in the holders will be 15 cents per thousand cubic feet.

While electricity in Europe has replaced gas as an illuminant, the demand for coal has continued to increase. In addition to that necessary in generating electricity, the demand for gas for power purposes has increased faster than illuminating gas has been replaced by electricity.

In illumination fifty per cent. more illuminating power can be secured by converting gas into electrical energy than by burning the same in an ordinary gas burner. The ordinary gas burner only gives about 3 candles per cubic

foot of 16 candle power standard quality gas per hour, while the modern gas engine coupled to a dynamo supplies one electrical horse-power on 19.8 cubic feet of illuminating gas at the rate of 26.5 cubic feet of gas consumed per kilowatt hour, giving off in electrical illumination 266 candlepower hours, equalling nearly four times the illuminating effect of the same gas burned in the ordinary flat gas burner, or equal to 10 candle power hours per cubic foot of gas burned.

(To be continued)

LOVE AND PETROGRAPHY.

Lines suggested by a conversation with the Petrographer of the Geological Survey, who was examining rock slides.

Visitor: "Come, throw those wretched slides away
and give ourselves to other thoughts,
Let's seize upon this summer's day
To drink the cup of joy in

Petrographer: Quartz.

Visitor: "Has life no other aim but this?
Discard your work—there's time enough!
Let's seek for love—and, seeking, kiss
The maiden when we find her

Petrographer: Tuff.

Visitor: "Holds love no joy for such as you?
Your rocks of stone! your heart of ice!
What if a loyal heart and true
Should prove some day that love is

Petrographer: Gneiss.

Visitor: "Let others prate of wealth, and might
Of conquering heroes, power and place—
Than die a nobleman to-night
I'd sooner live to

Petrographer: Diabase.

—F. J. N.

Economic Geology, March-April, 1908.—In a paper entitled "A Practical Classification for Low Grade Coals," Marius R. Campbell brings out these points:—

(1) The recognition of two classes of coal below the grade of bituminous.

(2) The restriction of the name "lignite" to the lower grade, and the application of the name "sub-bituminous" to the higher grade, in conformity with the usage of the United States Geological Survey.

(3) The recognition of weathering as the criterion for separating the sub-bituminous from the bituminous grade of coal.

(4) Manner of weathering divided into two classes: (a) Irregular breaking in sub-bituminous coal as opposed to cleaving into prisms in bituminous coal, and (b) separation along bedding planes into plates in sub-bituminous coal.

(5) Separation of lignites from sub-bituminous coal on the basis of color, the former being brown and the latter black.

INDUSTRIAL PAGE.

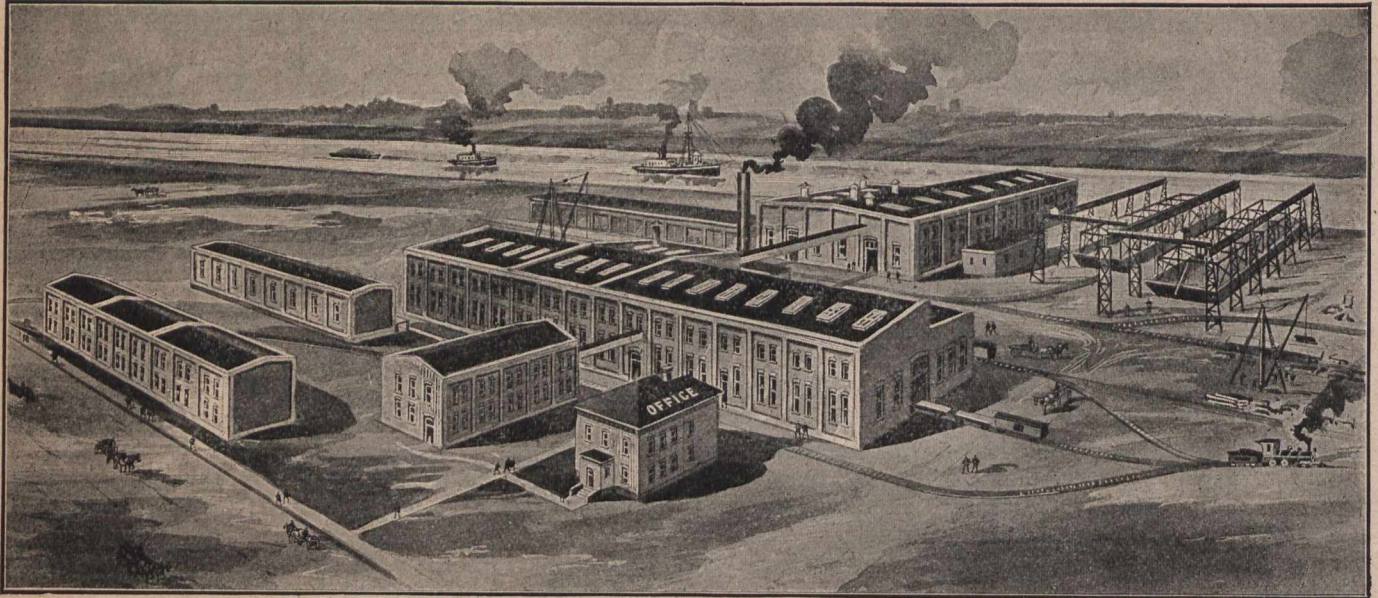
A LARGE CANADIAN PLANT.

Almost exactly a year has elapsed since M. Beatty & Sons moved into their new factories and offices on Muir street, Welland, Ont.

Founded in what was then the village of Welland, in the year 1862, by the late Matthew Beatty, of Londonderry, Ireland, the concern is now one of the most pro-

contractors' supplies, the firm's reputation is unique. Their products include dredges, derricks, steam shovels and hoists. These are adapted to the needs and requirements of Canadian conditions. The firm's long experience has enabled them to turn out machinery that is unsurpassed in strength and fitness.

Main Building.—This structure is 80 x 324 feet, is built of concrete and steel and contains the machine shop,

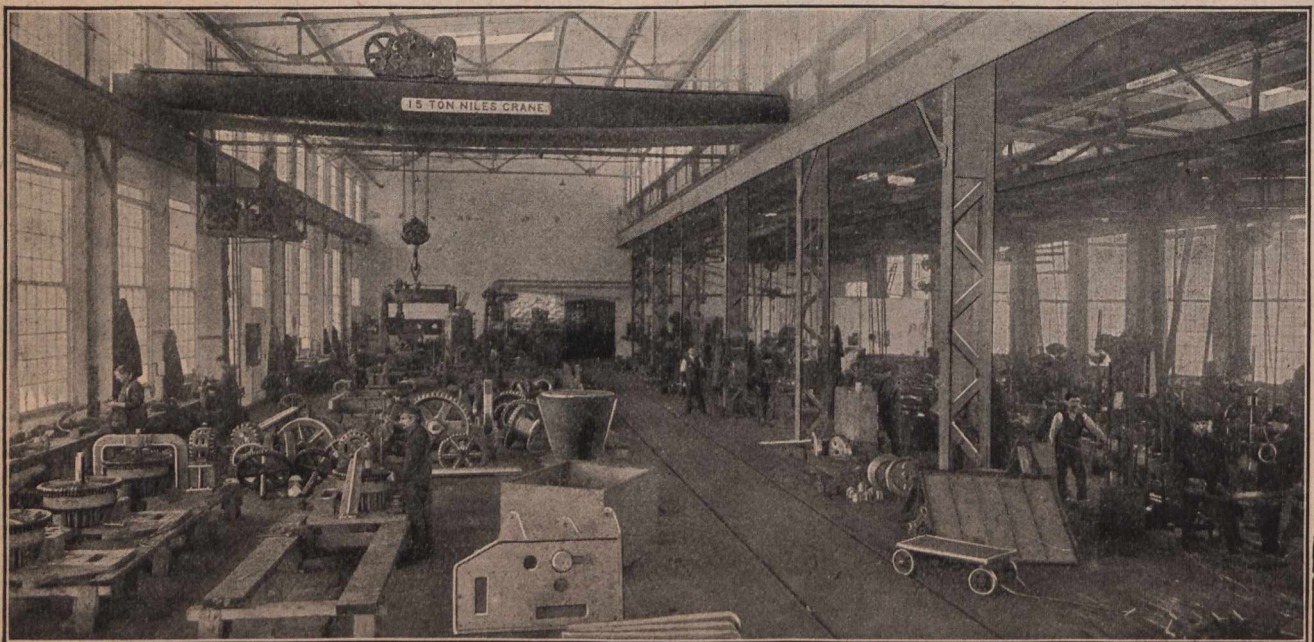


PLANT OF M. BEATTY & SONS, WELLAND, ONT.

gressive in Canada. Its superbly equipped plant occupies a frontage of 1,100 feet on the canal. The various buildings are of the most modern type of steel and concrete construction. The plant and yards cover fifteen acres.

The first complete dredge ever constructed in Ontario was built by M. Beatty & Sons. As manufacturers of

casting room, store room, core room and cupola room. In the machine shop, 80 x 160 and one storey high, the erecting department occupies the east side. A fifteen ton Niles travelling crane runs the entire length of the shop. The shop is equipped with a large boring mill, radial drill, cold saw, horizontal boring machine, etc. The crane and eleven large machines are driven by individual



MACHINE SHOP OF M. BEATTY & SONS, WELLAND, ONT.

variable speed electric motors. On the west side of the shop, where the light machinery is assembled and erected, a jib crane on overhead tracks does all the handling, and a forty horse-power motor drives the machinery. A standard gauge railway runs through the centre of the building.

The foundry store department is two storeys in height. In the lower storey castings are stored; in the upper storey the heating apparatus is installed and the finished parts are stored.

The foundry department, 100 x 80 feet and one storey high, includes two ten ton Nile cranes with individual motors, a Colleau cupola of five tons per hour capacity, a fan driven by a 30 horse-power individual motor, and two Kinnear patent core ovens heated by natural gas.

Boiler Shop.—This one storey building, constructed of concrete and steel, is 50 x 101 feet. Boilers are made here and all materials for the steel hulls of boats and dredges. Two five ton travelling cranes are used here. The building is fully equipped with shears, punching machine, heavy boiler rolls and a radial drill.

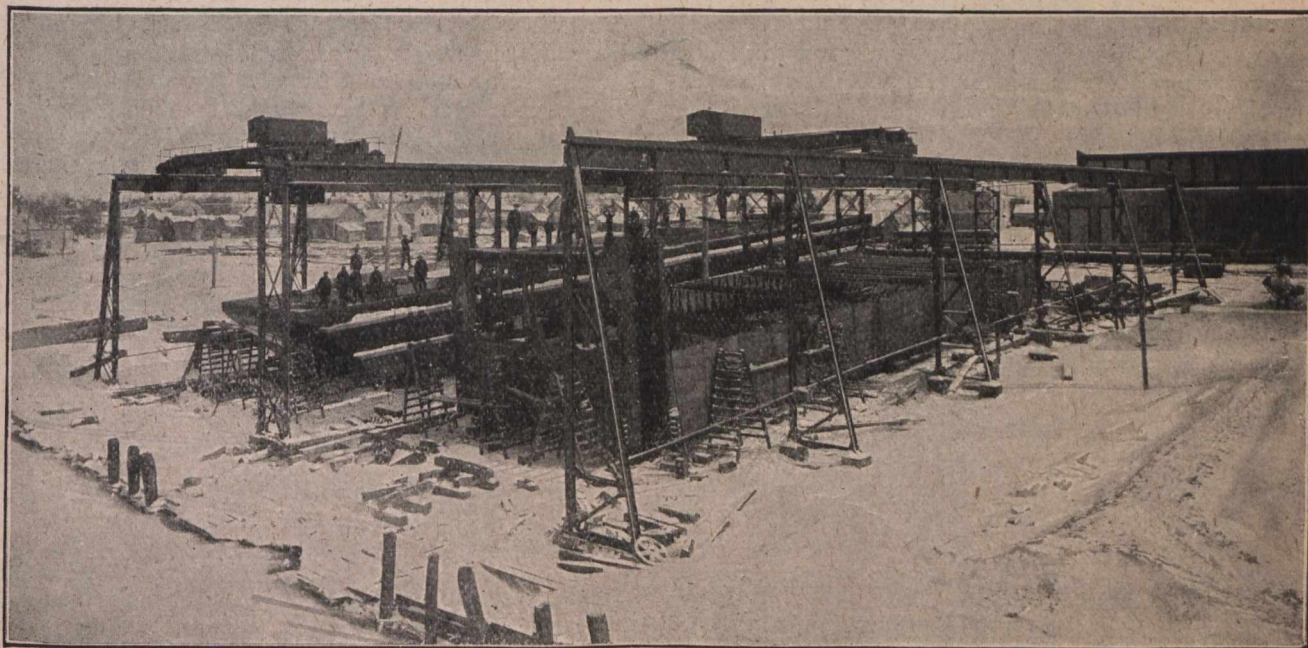
Pattern Store House.—Of concrete and steel, two storeys high, 42 x 144, built in three compartments with concrete fire walls.

Office.—The office, also, is concrete and steel. The building measures 36 x 50 feet, is two storeys high and is finished inside in Georgia pine. Downstairs there are five offices; upstairs, two draughting rooms. On each floor there is a fireproof vault.

Machinery Store House.—Concrete and steel, 36 x 144, one storey.

Power House and Power Equipment. — The power house is a one storey building, 32 x 72 feet, concrete and steel. The roof is also of these materials. For heating purposes a 130 horse-power boiler is installed here. Two air compressors, one with a capacity of 341 cubic feet of free air per minute at 160 revolutions and the other with a capacity of 251 cubic feet are to be seen here.

Power is received from the Cataract Power Company at a voltage of 2,200, and is transformed down to a working pressure of 220 volts.



SHIPYARD OF M. BEATTY & SONS, WELLAND, ONT.

Shipyard.—The shipyard is situated on the bank of the canal at the north end of the boiler shop. At the launching slip two steel towers are erected, 35 feet high, 160 feet long, with a span of 50 feet. One ten ton Shaw travelling crane handles the material. A subsidiary crane handles material from the cars to the launching slip. Compressed air is used for caulking and riveting.

Blacksmith Shop.—The building is 51 x 61 feet, one storey, concrete and steel. Six forges are operated. Each has an improved adjustable hood and an 80 inch fan to carry off smoke. Other features are one 1,100 pound steam hammer, one 250 pounds Beaudry hammer, four three ton jib cranes, and one crane outside the shop.

Carpenter Shop and Patternmakers' Shop.—This is a two storey building of concrete and steel, measuring 42 x 82. In it are a dry kiln 22 x 24 and a vault for storing shavings, 6 x 24. The shavings from each machine are removed by an exhaust fan and deposited in the vault. All patterns are made here.

Both alternating and direct currents are used throughout the different departments.

Compressed air is used in all the departments for chipping, riveting, drilling, boring, etc.

There are eight or ten other buildings, not including lumber shed. All the large buildings are so constructed as to be easily enlarged as business may warrant.

B. F. Sturtevant & Company's heating system is used. Ventilation is perfect. Each department is provided with modern sanitary lavatories.

On the company's ground are 3,300 feet of standard gauge railway, and 3,000 feet of industrial railway.

Catalogue No. 2 of the Triplex Rolls Company has been received. The headquarters of this company are the Boston Building, 1650 Champa street, Denver, Colorado, U.S.A.

In the Triplex Rolls an entirely new departure in roll construction has been undertaken, viz., the insertion of a third and larger roll between the faces and at right angles to the two rolls as ordinarily used. This gives two grinding faces instead of one, as heretofore. Also the grinding faces are kept true automatically. Further, the elimination of grooving means that the product is uniform and that no oversize occurs. The twisting action, caused by the cross directions of the opposing faces, produces a granulating effect; and the smaller angle of nip produces a grinding zone of more than twice the area obtained in the old style of rolls. The Triplex Rolls are therefore to be recommended for their large capacity for fine and uniform grinding. They are not, in any sense, roughing rolls. Their manufacturers claim that a finished product of 40-mesh and finer may be obtained continuously throughout the life of the shells. The item of saving in tire renewals is also of importance.

CATALOGUE OF THE W. S. TAYLOR COMPANY, CLEVELAND, O.

To an ever increasing degree mine managers, and technical men generally, depend upon trade catalogues to keep constantly in touch with the latest and best machinery and accessories.

We have just received from The W. S. Tyler Company of Cleveland, Ohio, their catalogue Number 24—an excellent specimen of the printer's and engraver's art. It contains carefully arranged illustrations of the uses of woven wire and correct lists, weights, and tables relative to wire cloth, with accurate dimensions in decimals of the mesh—a feature originated by this company for the purpose of comparison.

The Tyler Double Crimped Wire Cloth is specially constructed, both as regards material and design, for long service and hard wear.

For use in stamp batteries, jig screens and trommels the Tyler Double Crimped Mining Wire Cloth has a capacity nearly double that of punched slot screens. The openings are square and uniform and the double crimp insures the integrity of the mesh.

Wire cloth to suit all requirements may not be found in the catalogue. But the W. S. Tyler Company is prepared to meet special and individual requirements and specifications.

Particular mention must be made of their rolled slot screens for stamp batteries and rotary mills. The company issues a special catalogue describing this type of screen.

In mining practice, where the acidity of the water shortens the life of the screen, phosphor bronze wire cloth may be obtained. Its initial cost is high, but its long life means a substantial ultimate saving.

The heavy revolving screens made by this company are also of extremely substantial construction.

Bulletin 31 of the Hyatt Roller Bearing Company, of Newark, New Jersey, is devoted to descriptions of the Hyatt Bearing and the Standard Hyatt Bushing. The roller of the Hyatt Roller Bearing is made from a strip of steel wound into a coil of uniform diameter. Its flexibility results in an even distribution of load on the roller itself. All tendency to distortion of any of the bearing faces is done away with. The roller also, from its construction, acts as an oil reservoir and largely simplifies lubrication. The Standard Hyatt Bushing now manufactured in a number of standardized sizes, is designed for all conditions of speed and load, and for all classes of machinery.

BOOK REVIEWS.

TECHNICAL METHODS OF ORE ANALYSIS—
BY ALBERT H. LOW. THIRD EDITION, REVISED
AND ENLARGED. 8 VO. XII. + 344 PAGES, CLOTH
\$3. JOHN WILEY & SONS, NEW YORK.

Within a little more than two years, Mr. Low's book has run through two editions. The third, a marked improvement on its predecessors, has now appeared.

Numerous incidental changes are apparent. But radical alterations and additions have been made in the chapters on aluminium, antimony, arsenic, calcium, lead, magnesium, nickel and cobalt, tin, uranium and vanadium, zinc, coal and coke.

The direct method for aluminium, described in Chapter IV., is clean, delicate and rapid. It may be made more rapid, indeed, by omitting one or two of the steps that Mr. Low recommends. An important foot-note appears on page 21. After the addition of sodium thiosulphate in presence of sodium phosphate to the acidified solution, Blair recommends boiling for 15 minutes. Mr. Low's foot-note mentions that he has found 30 minutes safer. With this the reviewer concurs. The longer period is especially necessary when the precipitate is large.

The chapter on copper is given added interest by the fact that the original methods of Mr. G. A. Guess are

quoted at length and the Guess-Haultain electrodes, for the design of which Mr. H. E. T. Haultain was responsible, is described. Mr. Guess elaborated the method.

The commercial methods for coal and coke are well outlined. It may, however, be pointed out that much more constant results can be obtained with the Chaddock burner in the determination of volatile combustibles, than with the ordinary Bunsen burner. Mr. Low omits mention of the use of blast for the first three and one-half minutes. This conforms with the experience of many chemists. The use of the blast is a fruitful source of error.

In a note is mentioned the serious mechanical loss consequent upon the application of a full flame to lignites carrying high percentages of volatile matter.

Harking back to the chapter on lead, we notice that Mr. Low gives half a dozen methods but does not hint at the electrolytic method now coming more and more into vogue. In this method the lead is deposited on the anode as lead peroxide from nitric acid solution. This was first used for commercial work some thirty years ago in the Mannsfeld Laboratories in Germany. Mr. George A. Guess was the first chemist on this continent to use it for routine work. In 1904 Mr. Guess made it the standard method for lead determinations at the Silver Lake (Col-

orado) laboratory. It is the simplest and by far the most accurate of all methods, and its value does not depend upon the skill of the chemist.

Mr. Low's book is, perhaps, the most usable volume of its kind that we know of. It is written by a man thoroughly acquainted with the difficulties that beset the commercial chemist. Already it is an accepted standard—a position that it merits and will continue to hold.

LEAD REFINING BY ELECTROLYSIS—BY ANSON GARDNER BETTS. 8 VO. IX. + 394 PAGES. CLOTH, \$3. JOHN WILEY & SONS, NEW YORK.

The electrolytic refining of lead bullion is now an established metallurgical process. The volume before us is an exhaustive and reliable treatment of the subject. Electrolytes, slime treatment, deposition of antimony from fluoride solution, refining doré bullion, refinery construction, treatment of lead containing by-products, are among the subjects treated. Three pages are devoted to a bibliography.

There are three appendices, the first of which describes the plant of the Consolidated Mining & Smelting Company of Canada, at Trail, B.C. The lead refining plant at Grasselli, Lake County, Indiana, is described in the second appendix, and in Appendix III. the treatment of lead refinery slime is dealt with.

A noticeable feature of the book is the care with which the author has incorporated practical working details.

PERSONAL AND GENERAL.

Mr. H. E. T. Haultain, who has recently spent some weeks in Cobalt, returned to Toronto on the 19th of April.

Mr. H. C. Burrell, vice-president and managing director of the Sydney Cement Company, paid a short visit to Toronto on the 20th and 21st of April.

The class day address to the class of 1908 of the Michigan College of Mines will be delivered Friday, May 1st, at the College gymnasium by Dr. Charles Richard Van Hise, president of the University of Wisconsin. The class dinner will take place the following evening.

Mr. W. F. C. Parsons, mining engineer of the Londonderry Iron & Mining Company, and Mr. W. Selkirk, of London, Eng., passed through Toronto on April 11th, after a brief visit to Cobalt.

Mr. George H. Doran, managing director of the Foster Cobalt Mining Company, has returned from a visit to Europe, where he interviewed many the leading ore buyers and operators of smelters.

The analytical, assaying and testing business in Montreal, which has for years been conducted in Montreal under the name of "Milton L. Hersey," he recently been re-organized and enlarged. The "Milton Hersey Company, Limited, Chemists, Engineers and Inspectors," is now a joint stock company, of which Mr. Hersey is president, Mr. C. L. Trimmingham vice-president, Mr. C. R. Hagen second vice-president, and Mr. Joel B. Saxe secretary-treasurer. In addition to their offices and laboratories at 171 St. James street, Montreal, a physical testing laboratory has been opened.

SPECIAL CORRESPONDENCE

Nova Scotia.

GLACE BAY.

Mr. Neil Gillis, the local member for the Provincial Parliament, on the 14th April asked for a Commission to investigate the question of an eight hour day for miners, similar in character to the Commission that was appointed to deal with the question of old age pensions. Mr. Gillis gave several reasons in favor of an eight hour day, first that it would minimize the danger to life and health of working underground. He said that the dangers to health from working underground were well known, and instanced the legislation now under way in England and other countries.

The contention that work underground is detrimental to health has been repeated so often that, except by those who know to the contrary, it is accepted as a fact without question. It has in fact become a shibboleth that is glibly repeated by many people, and there is a general tendency to commiserate the unhappy lot of those who in popular parlance "toil in the bowels of the earth." This sentiment is to a certain extent an echo of the terrible and miserable conditions that used to exist in coal mines in England and Scotland before the passing of the Coal Mines Regulation Act. If any person should wish to read a chronicle of unmitigated sordidness, a record of human greed and slave-like ignorance, of the murder of children and the degradation of women, let them read the evidence that was taken before the Royal Commission of the seventies, just before the passing of that monumental and satisfactory piece of legislation—the Coal Mines Regulation Act of 1870. There are graves of children all up and down the mining districts of England who were killed in the mine. One grave in Silkstone churchyard, Yorkshire, tells of the drowning of twenty-one children, ten boys and eleven girls, whose ages ranged from seven to sixteen, who were at work in the mine. Tales were told

before that Commission of girls of tender years who worked half naked in wet and muddy mines, dragging boxes of coal on the pavement without rails by chains attached to the box and passed around their necks. At that time the life of the miner was one of sordid misery and ignorant debauchery, and what underground conditions were like may be gathered from the obelisks and monuments that are scattered throughout the English mining towns telling of the hundreds and thousands laid beneath who died in explosions in the mine.

But conditions have changed since that almost forgotten day. The miner, the "coalier" as he was called, was the last man in the British realm to receive the franchise, but to-day he polls the most telling and solid vote of any section of the working community. What are the actual conditions of life underground to-day? First of all, the miner works probably the shortest hours of any workmen, and also the least number of days. It is very rarely that a miner works more than five days a week, and in very few places, whether the eight hours bill is law or not, does he work more than eight hours a day. He receives high wages, particularly in this part of the world. The conditions under which he works are not, despite all assertions to the contrary, the most inimical to health. Compare the conditions of underground life with those of the alkali worker, the file-cutter, the tailor, women workers in factories and shop, with that of an engine driver on the railway, a stoker in a modern battleship or stoking an ordinary boiler. Compare it for hours with the dress-makers in large cities and the girls employed in huge departmental stores, with the ordinary surface day laborer or the ordinary everyday clerk. There is a great deal of uncalled for sentiment talked about the hard lot of the miner, for which there is no warrant. Statistics are against the popular belief, both mortality and sickness certificates,

and the refusal of insurance companies to insure miners at ordinary rates is not based on a belief that they are the subjects of ill-health, but on the recognized dangers to their lives from accidents which may involve a large number of men at one time. When at work underground the miner is in an equable temperature, not exposed to any of the weather vagaries. Every winter in Cape Breton the surface laborers around the Steel Works flock to the mines to get work under cover, where they are safe from the bitter blasts of our drift-ice cooled atmosphere.

As to the application of an eight hours Act in Cape Breton, the chief objection from the view of the operators would be the further limitation of an already limited season. The only way in which the Cape Breton operators could get the full output out of their mines and properly utilize their machinery would be to work three eight hours shifts per day, but this would necessitate night work. The P. W. A. object to night work, which they consider is even more debilitating than the ordinary work of a miner, and they asked recently for a one-quarter of a cent per ton increase for night work. Such a distribution of the work would produce a very acute situation when the shipping season ended and the collieries went on slack time for the winter. Under the present method of working this sudden diminution of the organization around the collieries at the end of the shipping season has been practically abolished, and this season the amount of double shift work that is being done will be the least of any previous season for a long time past. The fact, however, cannot be got over that the St. Lawrence is the market of the Cape Breton coal field, and that access to the St. Lawrence is barred from the middle of November to the middle of May. This is the problem of the operators, and it is also the problem of the miner. An eight hour day will not help to straighten it out.

In England the eight hour day bill is being forced through the House of Commons by an unwilling Government, against the expressed wishes of the whole community outside of the miners themselves, and against even the wishes of a section of the miners also. The statement of the English operators that it will necessitate an increase of 50 cents per ton in the price of coal has not been disproved. An increase of this amount will mean an increase in the manufactured cost of iron and steel of from \$1.25 to \$1.75 per ton. The effect of such an increase in the price of raw material can easily be foreseen on the English iron trade. The iron trade in England is the great customer of the coal trade, and unless one is prosperous the other must decline. If the eight hours bill is forced through the Houses of Parliament, not only will the English coal miner suffer the pinch of poverty, but his comrades in the iron trade and other trades will know the meaning of adversity.

Nova Scotia is perhaps the Province of Canada that is most closely allied by blood and by tradition to the Mother Country, and the Legislature of this Province has always followed closely the trend of legislation in England. At the present time, however, England is confessedly experimenting in class legislation, and some persons of eminence and learning, not necessarily prophets of evil, say that she is riding to a fall. Nova Scotia would do well to wait and see what happens before she enacts legislation that may very seriously hamper her industrial development, and for which there is no necessity.

The first ship to leave Cape Breton for Montreal this season was the "Norfolk," which cleared from Louisburg on the 9th April, bound for the St. Lawrence. The "Ellen" left International Pier on the 15th for the same destination, and in all probability she may reach port before the "Norfolk," as the latter vessel was detained in the drift ice off Canso.

Regarding the talk about amalgamation of the P. W. A. with the U. M. W. A., we notice Seaside Lodge, Port Hood, passed a resolution pledging themselves to stand by the P. W. A. and calling upon its members to resist the attempts that are being made

to disrupt it. The Golden Rule Lodge, Dominion, have declared against amalgamation, and Equity Lodge, Caledonia, refused to discuss the matter. The "Sydney Daily Post," for some occult reason best known to itself, has recently published several articles which might have been written by the walking delegate of the U. M. W. A. With this single exception the press has been unanimously hostile to amalgamation talk, and in this it has represented the consensus of public opinion. The "Post," however, has never regarded Glace Bay nor its industries with a friendly eye, and it never seems to remember that everything that hurts the industries of Glace Bay must react on those of Sydney. Such counsel as it is wont to give to its readers in the colliery districts may act as a boomerang some day.

Ontario.

COBALT.

Silver Leaf.—The big vein shows up better at 125 feet than it has since the shaft was started. The main vein, which is twelve inches wide in the bottom of the shaft, carries remarkably high values. Two additional veins have been encountered. A 35 ton car of "A1" ore is being loaded. The management estimate the ore to run between six and seven thousand ounces to the ton. One car of low grade ore has been sent to the dry concentrator and over a car load is at the mine ready for shipment. A suit has been instituted by D. W. Maguire, as secretary of the Silver Leaf Mining Company, against the firm of Douglas Lacey Company, brokers, for the recovery of the returns from the sale of treasury stock of the company, sold by defendants and not accounted for to the company. The amount involved is \$167,000.

Silver Queen.—A 22 ton car of ore was shipped to Copper Cliff on the 20th ult., which is expected to average five thousand ounces to the ton. The foundation for the new twelve drill Rand compressor is being prepared.

Colonial.—An important strike was made here last week. In driving in No. 4 tunnel a vein of native silver and calcite, 6 inches in width, was struck, the Tunnel had been driven in on a small seam of little value, but on putting a hole in one wall this rich vein was found. It has already been opened up for a length of 90 feet or more.

T. & H. B.—The crosscut driven north from the shaft has cut the "cobalt vein." This vein occurs at the contact of the conglomerat and keewatin and on the surface showed three feet of smaltite carrying little value in silver. Where cut below it carries silver, smaltite and niccolite.

Silver Bar.—Work has been resumed here. A shaft is being sunk and is now down 25 feet. In the bottom the vein is four inches in width and will average four thousand ounces.

Crown Reserve.—A car of 20 tons of remarkably high grade ore is ready for shipment. It is estimated to run from eight to ten thousand ounces silver. The vein from which the ore was taken is probably the richest so far uncovered in the camp, and one of the widest in the Cobalt district. A party of the directors of the company visited the property on April 11th.

Nipissing.—Mr. T. R. Drummond has left and Mr. R. B. Watson is now in charge here. Mr. Drummond was well liked throughout the camp, and before leaving the mine managers and some of his friends presented him with a silver tea service. The workmen at the mine gave him a gold headed cane. The report for March shows that during that month there was mined ore to the value of \$105,347 and 125.3 tons shipped with a value of \$145,510. The ore available on April 1st is given at a value at \$935,000. On January 1 this was given at \$1,057,000, so this means a decrease of \$122,000. The shaft on the Kendall lead is down 135 feet. The vein in the bottom runs from three to five hundred ounces per ton and is 5 inches in width.

Kerr Lake.—This company is, like many others here, sending shipments to different parts of the world to see where they will get

the best results. They are about to make a shipment of 100 tons of high grade ore to the Beer Ganheimer Company of Hamburg.

LARDER LAKE.

The Maxwell-Harris mill is running and the first brick, valued at \$450, has been brought down from there.

At the Reddick, Mr. W. M. Ogilvy is in charge and supplies for four months are being rushed in before the snow goes. The 20 stamp mill, which has been on the ground for some time, is being set up.

MAPLE MOUNTAIN DISTRICT.

Supplies and equipment are being rushed in to the White properties at Maple Mountain. A small boiler, pump and hoist have already gone in together with lumber, etc., for construction purposes. A large compressor plant will be sent in as soon as navigation opens. These claims have been bonded by an English syndicate and are under the management of Mr. R. W. Foster, M.E., of Cobalt.

THE STRIKE SITUATION.

Botley, the union secretary, addressed the crowd in the square on Saturday evening. He told the workmen that last year's strike had never been called off, that through stress of circumstances they were compelled to work this past winter in "unfair mines," but now that spring had come they should quit work, and any who still worked would be considered as enemies of organized labor. Not more than fifty men in the whole camp left their work and those that did were mostly men who had worked in the mines for the winter and were glad to go back to their farms. For every vacancy at a mine there are dozens of applicants who want work. No public meetings in the square will be permitted this year.

British Columbia.

ROSSLAND.

The mining men at this point are looking forward to a meeting of the Canadian Mining Institute, which will be held here on May 14th and 15th. Several technical papers will be read and discussed and other Institute business will be given consideration. Young mining men here are showing interest in the idea of a mining school being connected with the proposed Provincial university. An institution of this character would be a great aid to the rising mining men of the Province, and it is hoped that in due time it will come to pass.

Rossland continues to look with hopeful eyes toward the South Belt, where considerable prospecting and development work is being executed. The Blue Bird tunnel is now in over 70 feet, and the ledge shows up 4 1-2 feet wide in the face. The ledge appears strong and well defined, and the prospects are good for its downward continuation. The lessees are storing ore in the Homestake bins and now have 50 tons on hand, which will be shipped as soon as the spur is fitted up. Work has been commenced on the Pot, Alberta and Sunset claims. Development on the Giant-California is showing good results.

The following ore shipments were made during the week ended April 4th:—

	Week.	Year.
Centre Star	3,960	46,598
Le Roi	1,680	23,734
Le Roi Two	490	8,418
Evening Star	31	428
Iron Horse	38	38
Blue Bird . . . . .	....	30
Total	6,199	79,246

The shipments for the week ending April 11th only amounted to 5,350 tons, the first three mines only shipping.

The Trail smelter received 6,150 tons of ore during the week ending April 11th. Besides the Rossland ore the following mines contributed to this tonnage: Rambler-Cariboo, 66 tons; North Star, 71; Seerro Verde, 9; St. Eugene, 536; Whitewater, 43; Eva, 23; Snowstorm, 468; Silver Cup, 33; First Thought, 294; True Fissure, 32 tons. The Trail smelter is now producing 20,000 tons of lead per annum, also copper mater, 999 1-2 fine silver, and gold bullion. The copper matte is shipped to the Tamoca refinery, the silver to Ottawa, New York and Hong Kong, and the gold to Seattle.

As will be seen by the above table of shipments, the Iron Horse has joined the list of shippers. This property adjoins the Enterprise, of the Consolidated Company, and has a good showing in the workings. The property has been leased to Rossland men by C. F. Jackson, the managing director, of Spokane. The ore runs from \$14 to \$38. Only four men are working on the property at present.

Smelter men here will watch with interest the results of the car of Cobalt ore sent to the Trail smelter from the Nancy-Helen mines. It is to be hoped that the freight and treatment charges will be found low enough to allow of continued shipments.

PHOENIX.

Phoenix received a visit from Richard Merton, of Frankfort-on-the-Main, Germany, last week. Mr. Merton is closely connected with the Metallgesellschaft, a company that deals extensively in copper, silver, zinc, lead and other metals. Mr. Merton was much interested in what he had seen of the mining industry of British Columbia and stated that during his travels he had seen nothing that compared with the Granby workings as far as low costs and economical operation were concerned. It was his opinion that copper would gradually rise to what should be its normal price, 17c or 18, as soon as the financial sky had cleared up and the manufacturers were again receiving steady orders.

The Granby shipments were somewhat lower during the week ending April 11th than what they had been for some time previous to that. The shipments amounted to 21,063 tons and the smelter treated 22,820 tons.

The 264,581 tons of copper-gold ore (dry weight) shipped from the Granby mines during the first three months of 1908, more than doubled the output for the same quarter of 1907, when the tonnage was only 130,483 tons.

The following comparative table shows the output for both quarters segregated:—

	1907.	1908.
January	34,192	74,203
February	32,465	80,155
March	63,826	110,223
Total	130,483	264,581

The Granby output practically represents the ore production of the Boundary this year, the Snowshoe, Crescent and Sally being the only other shippers. The Granby freight and treatment rate has now been got down to the \$2.50 mark. On the tenth instant at Phoenix the Granby employees received \$55,000 for their March wages, and at the smelter \$35,000 was distributed. Hereafter 15,000 tons of ore will be kept on hand at the smelter as an emergency lot.

A small gasoline prospecting plant has been set up at the Little Bertha and some development work will be done. The Crescent mine has closed down. The plan of operation is to be modified. Mrs. Ida M. Parsons, of Minneapolis, secretary of the Alliance Gold & Copper Mining Company, is in Greenwood on business for that company. This company owns the Moreen, electrically equipped, claim, in Deadwood camp. Word has been received that the men

who are promoting the Greenwood prospecting tunnel idea in Chicago have succeeded in raising funds to begin the work.

SLOCAN, ETC.

The Blue Bell, on Kootenay Lake, which supplied the early trappers with lead for their bullets, is to be worked on a larger scale than heretofore, this season. There are big ledges of lead and zinc on this property. A syndicate of London and Nelson men have secured a lease on the Hall mine, near Nelson, and will begin work at an early moment. As to whether they operate the smelter or not, that will depend upon how the work at the mine turns out. A New York syndicate has purchased the Molly Gibson group of claims in the group. Assays made from the ledge average from \$10 to \$80 and \$100. The Slocan Star Company has encountered a good ore body on the Hidden Treasure. A Nelson syndicate has bought the moiety of a Spokane man in the Nugget on Sheep Creek. A company has been organized to take over the Ophir-Lade, Lucky Jack and Swede groups of the Great Northern Mining Company, and development work is to be started. The Silver Cup mine has a good reserve of ore blocked out and the mine is looking well. The 160 tons of ore shipped in March netted the company \$10,000. A rich strike has been reported from the St. Elmo claim of the True Fissure Company. Shipments are being made to Trail smelter. The ore runs as high as \$80 per ton.

A strike of good ore has been reported from the Half Moon prospect at Moyie, near the St. Eugene. Development on the Aurora, across the lake from the St. Eugene, is giving good results. A quantity of shipping ore is blocked out. The St. Eugene paid out \$40,000 wages for March.

The Big Bend Mica Company has been organized to work 1,400 acres of ground north of Revelstoke. The Tye Copper Company has taken a bond on a rich group of claims on Moresby Island. Great activity will be manifested on the Queen Charlotte Islands

in the future. There are many rich mines there that can be worked with copper at a very low price. Some of the ore now being mined runs from \$60 to \$100 per ton.

The following shipments were made through Kaslo during March:—

	Tons.
Whitewater, concentrate	266½
Whitewater Deep, concentrate	22½
Rambler	179
Ruth, concentrate	40
Reco.	20
Slocan Sovereign	20
Ferguson Mines (sampler)	60
Total	548

The Sullivan smelter will continue to be operated until the supply of ore on hand is treated.

The International Coal & Coke Company have declared a 2 per cent. dividend, payable May 1st. They are shipping 2,500 tons of coal per day and are making preparations to increase their output to 3,000 tons. Diamond drill prospecting is being done on the Royal Collieries ground.

Negotiations are now pending for the sale of the only known large hematite iron ore deposit on the coast. This deposit is on Salt Spring Island, and Seattle people are endeavoring to acquire it.

As the gneiss and schist formation in the Findlay river country is favorable and as there are numerous streams to assist in collecting the precious metal, it is stated that there is no reason why there should not be plenty of gold in that district. It is the consensus of best opinion that the most favorable route to these "diggings" is via Port Essington and Hazelton.

GENERAL MINING NEWS

NOVA SCOTIA.

HALIFAX.—The following bill was introduced by the Commissioner of Mines on Tuesday, April 7th. It is supported by the Dominion Coal and the Nova Scotia Steel Companies, and is opposed by the Dominion Steel Company:—

The bill was read a second time Wednesday and sent to the Law Amendments Committee, before which the struggle is now being conducted.

The text of the bill is:

Be it enacted by the Governor, Council and Assembly as follows:

1. Notwithstanding any provision of "The Mines Act" or any amendment thereto, the Governor-in-Council may, on application of any person interested, cause to be made a re-adjustment and settlement of the boundaries of any lease or leases of submarine coal mining areas situated in the County of Cape Breton or elsewhere in the discretion of the Governor-in-Council, and may if necessary change the boundaries of the area or areas covered by said lease or leases.

2. If it should appear that, by reason of some error or inaccuracy in the description of the boundaries of any lease or leases, areas which were intended by the applicant to be adjoining areas and are shown as adjoining areas on the official plan on file at the Mines Office, do not actually adjoin, but are separated by an area or areas, tract of ground or territory not actually covered by said descriptions, the Governor-in-Council shall have power to extend the boundaries of such lease or leases so as to include such area or areas not covered by said descriptions, notwithstanding that

any such lease may thereby include more than one square mile, and notwithstanding that application may have been made for a license to search or lease such areas or areas not covered by said descriptions or any part thereof.

3. Before any such re-adjustment, settlement, change or extension of boundaries is made, such parties interested in the lease or leases affected and any lease or leases, license or licenses to search which may be affected, as the Commissioner directs, shall, at least ten days before the hearing of such application be notified by the applicant of the time and place of the hearing of such application by the Governor-in-Council.

4. The hearing of such application may be adjourned from time to time, and any surveys may be ordered to be made, and for all the purposes of the hearing of any such application, the Governor-in-Council shall have all the powers which the Lieutenant-Governor has power to confer upon a Commissioner under chapter 12 of the Revised Statutes, 1900, "Of Inquiries Concerning Public Matters."

5. Upon the making of any Order-in-Council under the provisions of this Act the title to the coal in the areas affected by such Order-in-Council shall vest in the respective lessees whose areas are affected thereby according to the terms of such Order-in-Council, and the description of said areas as contained in the respective leases may be surrendered and new leases issued in lieu thereof containing the same terms and conditions as the surrendered leases, but containing new descriptions, varied according to the provisions of any such Order-in-Council. Any lease so changed or new lease so issued shall be valid and effectual for all purposes as if the

same had been issued under the Mines Act and amendments thereto.

6. Unless otherwise ordered by the Governor-in-Council all expenses incurred in connection with the hearing and determination of any such application shall be paid by the applicant.

ONTARIO.

PORT ARTHUR.—The Atikokan Iron Company will soon put the blast furnace in commission again. Orders for pig iron have been placed and only the opening of navigation is awaited.

SAULT STE. MARIE.—On April 9th a notice was posted at the steel plant of the Lake Superior Corporation stating that the works would be closed down until April 13th. Scarcity of pig iron was the cause.

LARDER LAKE.—Mr. Englehart, chairman of the T. & N. O. Railway, was recently presented with a petition requesting the immediate construction of a railroad from Boston station to Larder City. Mr. A. A. Cole, the engineer of the T. & N. O., is to make a preliminary survey of the proposed route at an early date.

COBALT.—The fire at the Foster mine destroyed only a small warehouse, which was fully insured.

During the week ended April 11th the McKinley-Darragh made considerable shipments of low grade ore to the Deloro smelter. Twenty miners are working double shift.

BRITISH COLUMBIA.

FERNIE.—The slack demand for coal has not affected the coke output. The C. N. R. Coal Company's ovens are in full operation.

The Crow's Nest Pass Coal Company is to make extensive improvements in its plants at Coal Creek and Michel collieries. New compressors, haulage system and other machinery have been installed, and the large new steel tippie at Michel is being rushed.

NELSON.—It has been announced that Mr. M. S. Davys, who is now in London, Eng., has succeeded in forming a development syndicate for the purpose of working the Silver King mine. The Hall mines smelter was originally built to treat the Silver King ores.

VANCOUVER.—Gypsum has been discovered in commercial quantity within 60 miles of Vancouver. A plant is to be erected.

Phoenix, April 14.—On Sunday, for the first time in many weeks, practically no work was done at the Granby mines, and for the next two months or more there will be no Sunday work at these properties. Manager Hodges states that this is on account of re-

ducing the shipments somewhat for a time, this in turn being caused by the blowing-out of a furnace for connecting up with the new steel flue dust chamber. Now that the organization is complete and in excellent running order, the management prefers to give the employees a day off every week and not lay off any of the men, those at the smelter being largely absorbed in the new work going on.

To-day the first of the battery of eight blast furnaces was blown out for connecting up, and they will be treated in this way one after another, leaving an average of seven furnaces in blast all the time. When the No. 2 furnace was allowed to go cold to-day, it was the first break in the remarkable run made by the smelter recently—the best in its history. For six or seven weeks the entire battery had been in commission, without a break of a single furnace for as much as 24 hours, which is considered by smelter experts a remarkable achievement in smelter practice with so large a battery of furnaces.

For the months of April and May, at least, the tonnage treatment of the Granby smelter will be, probably, from 15,000 to 20,000 tons less than for the month of March, which far exceeded all previous records at this or any other smelter in Canada.

Part of the structural steel has begun to arrive at the Granby smelter for the extensive enlargement of the converter building, and from this on carloads of material will be brought in from the east for this and other enlargement purposes, which are to begin this summer and give the smelter when completed a daily capacity of 4,500 tons of ore.

ALBERTA.

Calgary, April 16.—Three men were killed and four others seriously burned by an explosion at what is known as the Old Mine at Canmore yesterday. The dead are Gus Capelson and Matt Starr, Finlanders, and W. Wilmott, an Englishman, acting as fire boss. The latter leaves a wife and family of four little ones, who only arrived from England a few months ago. The injured are all Finlanders. The cause of the explosion has not been determined yet, and the mine has been closed, pending an investigation.

Edmonton, Alta., April 16.—An explosion of gas occurred yesterday afternoon at 1.45 o'clock in the Dawdo coal mine on the south bank of the Saskatchewan river, opposite the Alberta Penitentiary, which resulted in two coal miners, Joseph Anderson and Andrew Hugel, being injured. The cause of the explosion is supposed to have been the sudden liberation of some gas which was ignited by the open lights worn by the two men.

MINING NEWS OF THE WORLD.

GREAT BRITAIN.

The quantity of coal mined in the United Kingdom, which was 251,050,809 long tons in 1906, increase to 267,828,276 long tons in 1907. Of the latter quantity, England furnished 187,383,846 tons; Wales, 40,252,178; Scotland, 40,092,548; and Ireland, 99,704 tons. The number of persons employed in workings coming under the Coal Mines Act was 757,887, an increase of 58,273 over the previous year.

Ten miners were killed in an explosion of coal gas in the Norton Hill colliery, Somersetshire, on April 10th. A rescue party were overcome by the fumes and saved only with the greatest difficulty.

FRANCE.

French imports of nickel from New Caledonia have been about 120,000 tonnes during the last three years. The production of

metal at the works of the Societe Le Nickel near Havre is from 1,700 to 1,800 tonnes annually. The company is about to build a plant at Port Bouquet for treatment of ores and refining. After treatment in waterjackets the ore will be transformed into oxide by calcination and then refined for pure nickel. Electric furnaces will also be installed for the manufacture of ferro-nickel.

The French production of ferro-manganese and spiegel in 1907 was 27,000 tonnes.

INDIA.

A discovery of tungsten ore has been made at Agargaon, some 25 miles south of Nagpur in the course of prospecting for manganese. The occurrence of the ore which is found in quartz stringers in a belt of mica schist has been proved for a distance of 1,400 feet.

A special survey of the tin mining industry in South Burma is being undertaken by the Indian Geological survey. The industry has expanded considerably during the last two years, the output of tin ore from the Mergui and Tavoy districts having advanced to a value of £13,574 in 1906-7.

NORWAY.

The Norwegian Government has appointed an official commission to make an investigation into the actual condition of the manufacture of pig iron and steel in Europe by the electric process.

ITALY.

A 15,000 horse-power hydro-electric works has been built on the River Pescara, at Piano d'Orte for the manufacture of cyanamide by the process invented for the fixation of atmospheric nitrogen.

GERMANY.

The zinc ore production of Prussia in 1906 was 702,932 tons of which 188,249 tons consisted of calamine and the remainder of blende. The number of workmen employed was 16,366.

RUSSIA.

Gold mining in the Amur region is undergoing a serious crisis the yield of gold having fallen from 642 poods in 1901 to 470 poods in 1905 and preliminary estimates for the last two years placing the yield at about the same figure as that of 1905. Increased cost of labor and unsettled conditions are assigned as the cause.

The year 1907 witnessed a great development in the manganese ore industry of the Nikopolsk region, South Russia. There were 15,500,000 poods extracted and 16,320,000 marketed in that year

as compared with 9,580,000 poods extracted and 12,650,000 marketed in 1906.

SOUTH AFRICA.

The experiment of giving work in the Rand mines to the unemployed has proved a failure. It was proposed to take on 400 men for unskilled labor, some of the mines offering 4 and others 3 shillings per day but the men generally declined to accept these terms.

The working costs of the Robinson mine, Johannesburg during March amounted to 13 shillings per ton which is a record figure.

BRITISH GUIANA.

Gold mining in this colony has been declining steadily since 1900. In that year the output for the fiscal year ending June 30th, was 114,102 ounces and the number of miners employed 16,588. In 1906-7 the output had fallen to 85,505 crude ounces and the number of miners to 8,234.

UNITED STATES.

An agreement was effected at Toledo, Ohio on the 17th of April between representatives of 200,000 bituminous coal miners who recently went out on strike and the operators, under which work in the central districts affected was resumed. The old rate of 90 cents per ton was agreed upon, and a referendum vote on the two-years agreement is to be taken. The working day was fixed at 8 hours.

The Great Bonanza Gold Mining Company of London, England, has bought the Next President and Bledsoe mines near Denver, Colorado, for \$40,000.

The American Society of Civil Engineers will hold their annual convention in Denver, June 23-26.

The total value of the metallic production of Colorado in 1907 was \$40,847,835, a decrease of \$3,051,240 as compared with 1906.

COMPANY REPORTS.

The seventh annual general meeting of the shareholders of the Le Roi No. 2, Limited, was held in London, Eng., on March 3rd, Lord Earnest Hamilton (chairman) presiding. The chairman, in his report, said that the small results of the past year's work do not in any way reflect upon the intrinsic value of the company's property. Advantage was taken, he stated, of the coal and smelter troubles, which restricted the output, to push development in the mine on a more extensive scale than in previous years, and the result has been strikingly successful—so much so that against the poor returns of the past financial year there is a more distinctly favorable outlook with regard to the future than it has been possible to record at any previous meeting.

In regard to the life of the mine, the chairman stated that Messrs. Hill and Stewart, who four years ago declined to guarantee more than eighteen months' life, give it as their opinion that the company can now look forward to three years of production at the rate of from 2,000 to 2,500 tons a month. The probable reason for Messrs. Hill & Stewart extending the lifetime of the mine to three years is the H Vein, which for a long period on the 500 foot level had been the chief source of supply, has, during the past twelve months, been definitely located on the 700 and 900 foot

levels; on both of which levels payable values occur. The diamond drill has also located a payable ore body of considerable size at a depth of 1,350 feet, or 450 feet below the bottom of the shaft. With regard to the immediate future, the chairman stated that there is reason to believe that the company can look forward with tolerable certainty to a succession of good returns from the mine, though it must not be lost sight of that the returns for January were abnormally high and must not be looked on as a sample of what can be expected every month. Still, with returns considerably lower than this, dividends of a satisfactory character can be paid.

In the case of the Concurry Syndicate, the chairman stated that a profit is at the present moment actually secured.

Chairman Hamilton told the meeting of the success that the company was making of the Vancouver property, in the Slocan, which had developed most favorably during the past eighteen months. The Vancouver mine was one of exceptional value. He stated that it was proposed, with as little delay as possible, to float the Vancouver as a separate company. In this case the Le Roi Two will be in the position of the company promoter and all

the advantages attached to the deal will be offered in the first place to the shareholders of this country.

The chairman paid a high tribute to Paul S. Couldrey, the representative of Messrs. Hill & Stewart at the mines of the company, and said it was almost entirely due to his personal enterprise, energy, ability and devotion to his work that they are in such prosperous condition. He asked Mr. Couldrey to give some information in regard to the company's mines.

Paul S. Couldrey said: With regard to the Josie mine, you will be pleased to learn that we are now working the Hamilton vein on four levels, namely, the 300, 500 and 700 foot, and intermittently on the 900 foot level. I do not think working has ever been so distributed throughout the various levels of the mine as at the present time, certainly not in connection with any one vein. We have now nine or ten stopes working on the Hamilton vein alone, of which the West H stope on the 500 foot level is at the present time about 500 feet long itself. We feel that, having now opened up at so many points and over such a large area, the most regular vein we are ever likely to find in our Rosslund properties, the chances of sudden and simultaneous impoverishment everywhere are getting smaller every day. With regard to the ore reserves, we would now have no difficulty in estimating with tolerable exactness the quantity of ore which lies ahead of us in certain specified blocks of ground, but any such estimate would be totally inadequate if they conveyed to you the idea that this was all the ore the mine contained. In opening up the Hamilton vein we pushed the work on the 500 foot level (having ore to follow) so far ahead of all the other levels that it is only now that we are getting to points vertically above and below the eastern end of our West H 500 stope. Hence the impossibility as yet of estimating the ore which lies above or below the 500 West H. without which any estimate would be altogether valueless.

Mr. Couldrey gave considerable attention to the Vancouver mine and stated that concentrates and ore to the value of \$100,000 had been shipped in eighteen months. The development work and its good results were reviewed at length, and revealed that the mine is in a favorable condition.

C. Bartlett wished to know how it was that the shipments had not been increased when the prices were high, and now that they had gone down they were increasing their shipments.

The chairman, in reply, said they were more or less in the hands of the smelters, and it did not suit the smelters to take more than a certain quantity of their ore at the then price of copper.

Mr. Bartlett pointed out that the shareholders had not received any pecuniary benefit by the increased cost of copper. That was a most extraordinary state of things.

Mr. Couldrey stated that none of the neighboring companies had reaped any benefit from the increased cost of copper, for the simple reason that when copper went up wages went up, and the Amalgamated Copper Company could afford to pay these wages better than this company could, and they and other powerful companies immediately raised them. After a great deal of heart searching this company raised the wages to \$4 a day. Almost immediately after that the copper slump occurred.

Mr. Lionel Harris thought last year's working had been most satisfactory. They had heard with great satisfaction from Mr. Couldrey, and also the chairman, that although they could not look forward to returns, such as they had last January, they might continue to look forward to very satisfactory returns.

The retiring director, Lord Ernest Hamilton, was re-elected.

The chairman stated that the Vancouver was to be incorporated. The capital stock of the company would be £100,000 in £1 shares, divided into 30,000 preference shares and 70,000 ordinary shares. The 30,000 preference shares would be the working capital, which would be offered for subscription. Those who subscribed for these 30,000 preference shares would get as a bonus 20,000 ordinary shares. With regard to the distribution of the profits it was proposed that an annual dividend of 10 per cent. on the whole of the

capital of the company would be first paid. This would absorb £10,000. Any surplus profit available for distribution after that 10 per cent. had been paid was to go to the holders of the 30,000 preference shares until they had been paid in full. From that moment the preference shares would cease to exist as preference shares, but they would rank as ordinary shares. It was not intended to take any formal vote on the matter at this meeting. He might add that they proposed to offer these 30,000 preference shares to the shareholders of this company, so that the advantages accruing from this flotation will be divided amongst the shareholders either qua shareholders pure and simple or as members of this company.

On the motion of Mr. Lionel Harris, a cordial vote of thanks was passed to the chairman, directors and staff for the way in which they had conducted the affairs of the company.

SILVER QUEEN

The annual meeting of the Silver Queen Mining Company was held in Toronto on April 22nd.

The Directors Report presented the following facts:—

Receipts during the past year from production or ore amounted to \$112,552, and there is still due from the smelters (not including the 22 1-2 tons shipped the other day) \$61,860.00, or a total of \$174,421.79. General expenses were \$90,285.38 leaving a balance on hand and due from smelters, as of March 31st, of approximately \$120,000.00.

During the last ten months of the current year the mine produced 20 car loads of ore, three of high grade, four of second grade and thirteen of low grade.

The old officers were re-elected. They are Lieut-Col. John I. Davidson, president; F. L. Culver, first vice-president and general manager; R. W. Gordon, second vice, and J. H. Stephens, secretary-treasurer.

The directors are R. W. Gordon, F. L. Culver, A. J. Young, Lieut-Col. Davidson and P. S. Hairston.

A regular quarterly dividend of 3 per cent. was declared and a bonus of 2 per cent. was added to the first dividend.

SYDNEY CEMENT COMPANY.

The annual report of the Sydney Cement Company, Limited, for the thirteen months ending 31st December, 1907, is extremely encouraging. The total output was 63,498 barrels, more than double the production of the previous year. The sales amounted to 60,496 barrels, as compared with 33,522 during the preceding year.

The net profits show up in a most gratifying way, amounting to \$21,446 for the thirteen months, as against \$1,468 for the eighteen months preceding.

A dividend of seven per cent. in the preferred stock has been declared, and will, if sanctioned by the shareholders, be paid on June 1st next. In addition to this a total of \$13,239.17 was spent during the year in improving and extending the plant.

The installation of a fourth tube will be recommended. This would increase the capacity of the plant by 150 barrels per day, or approximately thirty per cent.

The Sydney Cement Company is the only cement manufacturing plant in Canada east of Montreal. From the geographical position of Sydney, the Company's shipping facilities for the export trade are unexcelled.

The plant has now reached its estimated output. In spite of handicaps, and periods of enforced idleness, the output has steadily increased. When the arrangements have been completed for

doubling the output, costs will have been reduced to such a low figure that the Maritime Provinces' trade can practically be controlled.

"Rampart" cement, the Sydney Cement Company's brand, has won a strong position in the Canadian market. As it is the

only slag cement manufactured in Canada, its reputation is of more than passing interest.

Mr. H. C. Burchell, who is Vice-President and Managing Director, has our hearty congratulations, as also have the other executive officers.

STATISTICS AND RETURNS.

The Nova Scotia Steel and Coal Company will send in the vicinity of 270,000 tons to the St. Lawrence this year.

Following are the figures of output for the Dominion Coal Company and the Dominion Steel Company.

The Coal Company's output for the first three months of the year compares as follows with 1907:

	1908	1907
	Tons.	Tons
January	314,322	269,090
February.....	282,508	226,190
March.....	344,000	212,000
Total.....	940,830	707,280

The Steel Company is also showing big gains, the output for the three months being:

	1907	1908
	Tons	Tons
Coke	91,350	116,500
Pig iron	50,167	79,045
Ingots	54,327	73,764
Blooms and billets	64,664	74,967

The output of the Crow's Nest Pass Coal Company's collieries for the week ending April 17th was 12,908 tons, a daily average of 2,151 tons. All collieries were idle on Good Friday.

COBALT ORE SHIPMENTS.

Following are the weekly shipments from Cobalt camp, and those from January 1 to date:—

	Week end	Since Jan. 1.
	April 11.	Since Jan. 1.
	Ore in lbs.	Ore in lbs.
Kerr Lake	60,330	330,710
La Rose	226,800	1,313,352
McKinley	103,780	942,400
Nipissing	43,260	943,430
Nova Scotia	40,000	120,790
O'Brien	63,810	1,448,190
Temiskaming & H. B. ..	43,260	361,260

The total shipments for the week were 659,040 pounds, or 329 tons. The total shipments from January 1 to date are 9,574,288 pounds, or 4787 tons.

GRANBY SHIPMENT LIGHTER.

Granby shipments were somewhat smaller for the week ended April 18th, amounting to 22,329 tons. The total for the year to date is 314,625 tons.

ROSSLAND MINE SHIPMENTS.

The shipments from the Rossland mines for the week ended April 18th and year to date are as follows:—

	Week.	Year.
Centre Star	3,136	51,598
Le Roi	1,423	24,435
Le Roi 2	676	10,211
Other mines .....	.....	500
Total	5,244	86,944

COBALT ORE SHIPMENTS.

Following are the weekly shipments from Cobalt camp, and those from January 1 to date:—

	April 18.	Since Jan. 1
	Week end	Since Jan. 1
	Ore in lbs.	Ore in lbs.
Buffalo	45,200	517,520
Coniagas	380,910
Cobalt Lake	180,610
Cobalt Central	46,880	96,580
City Cobalt	228,080
Drummond	92,340
Foster	168,600
Kerr Lake	330,710
King Edward	127,240
La Rose	123,900	1,437,252
McKinley	60,000	1,002,400
Nipissing	943,430
Nova Scotia	120,790
Naney Helen	140,420
O'Brien	1,448,190
Right of Way	60,210
Provincial	143,210
Standard	39,730
Silver Queen	480,200
Silver Cliff	52,000
Silver Leaf	62,000
Townsite	85,100
Temiskaming & H. B.	539,000
Temiskaming	237,250
Trethewey	487,116
Watts	114,430

The total shipments for the week were 275,980 pounds, or 137 tons. The total shipments from January 1 to date are 9,515,318 pounds, or 4757 tons. The total shipments for the years 1907 were 28,081,010 pounds, or 14,040 tons, valued at \$6,000,000. In 1904 the camp produced 158 tons, valued at \$130,217; in 1905, 2144 tons, valued at \$1,473,196 in 1906, 5129 tons, valued at \$3,900,000.

BRITISH COLUMBIA SHIPMENTS.

Following are the shipments for the week ended April 11th and year to date:—

Boundary shipments—

Mine.	Week.	Year.
Granby	21,063	292,496
Other mines .....	.....	462
Total	21,063	292,958

Rossland shipments—

Centre Star	3,513	49,662
Le Roi	1,193	23,003
Le Roi 2.....	835	9,535
Other mines .....	.....	500
Total	5,531	81,700

Slocan-Kootenay shipments—

St. Eugene	563	7,654
Whitewater	43	401
Whitewater, milled	280	4,060
Poorman, milled	250	2,850
Second Relief, milled	145	1,230
North Star	71	929
Richmond	22	490
Rambler-Cariboo	66	413
Nugget	11	317
Kootenay Belle, milled	25	200
Eva	23	159
Silver Cup	3	115
True Fissure	32	32
Sierro Verde	9	9
Other mines .....	.....	12,328
Total	1,733	33,634

The total shipments for the past week were 28,327 and for the year to date 408,292 tons.

GRANBY SHIPMENTS.

Exactly 264,581 tons of ore, dry weight, were shipped from the Granby mines during the first three months of 1908, which is more than double the output for the corresponding quarter in 1907, when the figures were 130,483 tons. The March run at the smelter was also phenomenal, the entire battery of eight blast furnaces being operated almost every hour in the 24 for every one of the 31 days in the month. The shipments for March totalled 110,223 tons, the smelter tonnage treated being slightly smaller as a reserve of ore was accumulated at the smelter for cases of emergency.

For the purposes of comparison, the following table will show the output of the Granby mines for each month of the first quarter in 1907 and also in 1908 in tons:—

	1908.	1908.
January	34,192	74,203
February	32,465	80,155
March	63,826	110,223
Totals	130,483	264,581

For 1908 the above figures practically represent the output of the entire Boundary, as the only other shipments made from the Boundary since January 1 from any other mines were but a few hundred tons. April will doubtless show a smaller output for the

Granby owing to the necessity of blowing out each of the blast furnaces while being connected with the new steel flue dust chamber now about finished and ready for use.

SMELTER RECEIPTS.

	Week.	Year.
Granby	21,063	292,496
Consolidated Company	6,150	77,446
Le Roi	1,241	24,514

The total receipts at the various smelters for the past week were 28,454 tons and for the year to date 400,186 tons.

The production of gold in the Transvaal during March was the greatest for any month, with the exception of last December, according to the face of the figures; in reality, last month's output of 574,902 ounces is better than the December total of 583,526 ounces, inasmuch as the later figure included quite a percentage of reserves that were added to the clean-up of the year. The value of the Rand's yield for 1908 should approximate \$160,000,000. In face of more or less serious labor troubles the South African output has almost steadily increased ever since the discovery of the Witwatersrand less than a quarter of a century ago, and the reef has not by any means been exhausted. Science every year brings new ore bodies within reach of the shovel, especially at great depths, while, of course, the cyanide process has enabled the extraction of a much greater percentage of the metal from the ores.

According to L. Vogelstein & Company the figures of German consumption of foreign copper for the months of January and February, 1908, stand thus:—

	Tons.
Imports	29,817
Exports	1,413

Consumption 28,404

as compared with consumption during the same period in 1907 of 16,044 tons. Of the above quantity 21,910 tons were imported from the United States.

WORLD'S COPPER PRODUCTION.

Messrs. Henry R. Merton & Company, Limited, London, has just issued some valuable statistics showing the production of copper.

The 1907 production is figured at 716,435 tons, against 714,100 tons in 1906 and 682,125 tons in 1905.

The principal producing countries are figured to have turned out copper in the past four years as follows:—

	1907.	1906.	1905.	1904.
United States ..	395,090	409,650	389,120	365,050
Spain and Portugal ..	49,675	59,320	44,810	47,095
Mexico ..	56,565	60,625	64,440	50,945
Chili ..	26,685	25,745	29,165	30,110
Canada ..	25,615	25,460	20,535	19,185
Japan ..	48,935	42,740	35,910	34,850
Germany ..	20,490	20,340	22,160	21,045
Australia ..	41,250	36,250	33,940	34,160
Miscellaneous ..	52,130	42,720	42,045	41,560
Total ..	716,435	714,100	682,125	644,000

The world's production for a number of years compares as follows:—

1907	716,435
1906	714,100
1905	682,125
1904	644,000
1903	574,775
1902	541,295
1901	516,628
1900	489,514
1899	472,244
1898	429,626
1897	399,730
1896	273,363
1895	334,565
1894	324,505
1893	303,530
1892	310,472
1891	279,391
1890	269,455

Market Reports.

COKE.

April 21st—Connellsville Coke, f.o.b. ovens—

Furnace coke, prompt, \$1.60 to \$1.70.
 Foundry coke, prompt, \$2.15 to \$2.25.

PIG IRON.

April 21st—Pittsburg—

No 2 foundry, \$16.15 to \$16.55.
 Bessemer, \$17.50 to \$17.90.
 Basic, \$16.30 to \$16.40.
 Malleable, \$16.90 to \$17.15.
 Southern, No. 2, \$16.90 to \$17.40.

OTHER METALS.

Tin, Straits, 31.90 cents.
 Copper, prime lake, 12.90 to 13 cents.
 Lake, arsenical brands, 12.85 to 12.95 cents.
 Electrolytic copper, 12.875 cents.
 Sheet copper, 17 cents.
 Copper wire, 14.75 cents.
 Lead, 4 to 4.05 cents.
 Spelter, 4.675 cents.
 Sheet zinc, 7.5 cents.
 Antimony, Cookson's, 8.87 to 9 cents.
 Aluminum, 33 to 35 cents.
 Nickel, 45 to 47 cents.
 Platinum, \$23.50 to \$26 per ounce.
 Bismuth, \$1.75 per pound.
 Quicksilver, \$45 per 75 pound flask.

SILVER PRICES.

	New York. Cents.	London. Pence.
April 2	55 1-8	25 1-2
April 3	55 1-8	25 7-16
April 4	55 1-8	25 7-16
April 6	55 1-8	25 7-16
April 7	55	25 2-8
April 8	54 7-8	25 5-16
April 9	54 3-4	25 1-4
April 10	54 1-2	25 3-16
April 11	54 1-2	25 3-16
April 13	54 5-8	25 3-16
April 14	54 3-4	25 1-4
April 15	55	25 3-8

There is little prospect of reduction in Lake Superior ore prices. Hence a number of blast furnaces may be blown out presently.

The copper market is still dull. The belief is current that heavy purchases will soon bring up the price.

SAFETY MEASURES.

In addition to what were previously considered as safety precautions, the Fairmont Coal Company is attacking the three known enemies, powder, gas and dust, in every manner possible, some of which may be of interest here.

Powder.—Ordinary black powder was formerly used in all mines of the Fairmont Coal Company, and it was considered practically safe so long as it was not accumulated in large quantities and not used where gas was generated. Its advantages were that it could be readily secured in any amount at economical cost and that it produced coal of better quality than any other known explosive. These advantages have been sacrificed and black powder is being removed, as a safety measure, as rapidly as flameless powder can be procured in sufficient and regular quantities. The largest mines have already been put on a flameless powder basis with regular shot firers, and the practice is rapidly being extended to the other mines, until black powder will be entirely eliminated. The advantage of the flameless type of powder is that it will not ignite gas or dust, even with a wild or blown-out shot. This feature is, of course, assumed from the numerous demonstrations and past practice. While flameless powder cannot be called safety powder, it certainly does eliminate to a great extent the dangers that accompany the use of black powder.

Firedamp.—Gas has ever been the greatest enemy of the mines. Its properties in the simple state are thoroughly known and the danger of its presence appreciated. The common methods of its detection depend considerably on personal opinion and fail entirely on low percentages. Mine air in which no gas can be detected by the ordinary safety lamp, is considered safe for all practical purposes. This would certainly be the case if only gas was to be contended with, but complicated with the two other dangers, powder and dust, this decision loses its positiveness and becomes a matter of degrees. Literature does not enlighten us on how much firedamp is allowable in the return air course or the return of a split. Whatever the general opinion may be it certainly should be less than could be detected by a safety lamp of the Wolf pattern.

While none of the mines of the Fairmont Coal Company are considered gasey, in the opinion of the State Mine Inspector, yet for additional security it was decided to put on a gas inspector to report on such of the mines as have shown an accumulation of firedamp. This inspector is provided with, in addition to the Wolf safety lamp, an aneroid barometer, anemometer, water gauge, wet and dry bulb thermometer and sample can for taking mine air samples. The anemometer measurements are for the purpose of checking up the mine foreman's reports on ventilation and also to estimate the quantity of water carried by the air in connection with the humidity as determined by the hygrometer.

The mine air samples are taken to the laboratory, where the CO₂ and CH₄ are determined. The method used can be relied upon to one-hundredth of 1 per cent. It has been found that one inspector can cover five mines a week, do all the analytical work and make his report.