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The Canadian Mining Journal

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CIRCULATION.

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CONTENTS.

GLASS HOUSES.

An effort is being made in Mexico to push through legislation that will exclude foreigners from acquiring or retaining the ownership of Mexican mining properties. Our United States contemporaries are protesting vigorously against this drastic and short-sighted proposal. It is believed that President Diaz will not, under any circumstances, consent to the passage of such an unjust enactment.

The moment is opportune for the fervid Republic to our immediate south to do some soul-searching. Is it not so that in some of the States aliens are unable to locate or to acquire mining claims? Or, better, how does Mexico's treatment of the United States investor compare with the treatment accorded foreign investors in mining property in the United States? Is it possible that Mexico is not the only country that has considered enactments inimical to the interests of the stranger within her gate?

"On the question as to whether an alien can make a valid location," says a recognized United States authority, "there has been some conflict among the cases . . . An alien by making a location obtains rights in which he will be protected by the courts against all the world except the Government, which, as the owner of the land, has the sole right to dispute his possession . . . But this is true only so long as the alien allows his rights to rest in location; for he cannot obtain a patent because his citizenship, or declaration of intention to become such, must affirmatively appear before patent be granted . . . Some of the mining States have statutory provisions that the location certificate that is recorded must contain a sworn statement that the locator is a citizen or has declared his intention to become such."

In the light of these facts the situation is not devoid of humor.

CHAMBERS-FERLAND.

La Rose Consolidated was the subject of editorial comment in the last number of "The Canadian Mining Journal." The announcement of the Chambers-Ferland flotation is equally deserving of remark.

The Chambers-Ferland property comprises 124 acres situated advantageously, even strikingly. Part of the property surrounds La Rose. South, east and west the O'Brien and Nipissing are immediate neighbors. Other facts lead to the conclusion that, to say the most, Chambers-Ferland is a property of high promise.

However, none but the most superficial development has been performed. Thus, to a considerable degree,

Chambers-Ferland's value is speculative. Incidentally the owners of this property exhibit the same curious, unmodern self-abnegation. They prefer not to work for their own gain a property that they assert will return enormous dividends. Quite seriously, it is hardly in keeping with previous experiences and fixed beliefs to encounter altruism of this high type. The property could have been leased long ago to operators as other Cobalt mines have been. It would now have been a proved property.

Apart from this element of mystery we see no reason why Chambers-Ferland, even with the drag of a 25 per cent. royalty, should not become a successful mine.

In estimating the possibilities of the enterprise, there are several factors that must not be overlooked. The share capital is $2,500,000. An adequate net profit for a year's operations would hardly be less than $500,000, of which $125,000 would go to the Provincial coffers as royalty. Building and equipment, especially if a concentrating mill is to be erected, prospecting, and surface work, will unquestionably draw largely upon the earnings of the first year or, rather, two years of operation. If the mine yields 15 per cent. per annum to shareholders it will not be doing more than should be expected. With a life of ten years this rate of regular dividend payment would be by no means other than modest. If, however, the shares (which, we are informed, will be offered to the public at 75 cents) are forced beyond parity (one dollar), there is no present foundation for considering them of exceptional value.

At this stage of the game opinions are merely—opinions. Whatever facts have been definitely ascertained should be looked at in all their bearings. The lack of development, the impossibility of making immediate heavy shipments, our ignorance as to how much of the Ferland-Chambers ore will prove high grade and how much will have to be concentrated, the absence of positive ore reserves, are considerations that should be weighed against the favorable aspects of the proposition.

Also there is a sharp distinction as between the *opinion* of a mining engineer as to the possibilities of an unprospected property, and the careful, accurate report upon the actual present physical condition of that property by the same man.

Opinions are merely expressions of personal belief. In a mining engineer's report they are of secondary importance. On the other hand, a report is essentially a record of facts and conditions from a man trained to observe and to correlate accurately. Hence, until reasons based upon observed facts are adduced in support of opinions, the opinion of a mining engineer, whether it be laudatory or damnatory, must be taken as having precisely the same amount of the speculative in it as there is in the mine itself.

We do not question the sincerity of expert opinions quoted or to be quoted. The fact remains, however, that there is much yet to be learned about Chambers-Ferland. And the only path to knowledge is vigorous and economical prospecting.

It may also be added that $2,500,000 is not a low capitalization for an undeveloped mining property.

MINING ENGINEERS IN POLITICS.

Canadian parliamentarians are drawn largely from the ranks of practising lawyers, prominent merchants, doctors, journalists, a sprinkling of farmers and labor representatives, and a miscellaneous residue, including an occasional preacher.

The profession of mining engineering has no direct representative. The industry of mining is attaining an importance that warrants the presence of at least a few mining engineers in our parliaments. Much-needed legislation would then receive fuller and saner discussion than is now possible.

The mining engineer, from the extent of his field and the nature of his work, acquires a knowledge of his country that can hadly be equalled. He would bring to his legislative duties all the qualities of good citizenship with the added special equipment necessary to the practice of an exacting profession.

SCRIBES AND SCRIBBLING.

For the edification of the down-trodden coal miner there are scribes a-plenty. The uplifting screeds of one or two of these excellent persons are the text on which our Nova Scotian correspondent hangs a forceful sermon.

An English writer, quoted in a Canadian newspaper, puts forward the extraordinary statement that from figures quoted "it will be clear that the miners wages are an almost negligible item in the cost of coal." Developing his theme he boldly asserts that if the "swollen profits" of parasites could be excised, coal could be sold at a much lower price.

A complete answer to this argument lies in the fact that in ordinary coal mining operations wages constitute from 70 per cent. to 80 per cent. of the working expenses.

We see little good and much harm in giving a hearing to agitators or others who are so scantily informed on the subjects of which they write. As our correspondent points out, the persistent clamour for class legislation in favor of coal miners is based upon a fundamental error. There is no essential merit in earning one's living by physical labor. Neither is there essential blame or shame. But there is blindness and foolishness in claiming that only the workingman who toils with his hands is deserving of special privileges.

SUDBURY AND TORONTO.

The new Canadian Pacific direct line from Toronto to Sudbury reduces the time of that journey by eight hours. Sudbury is thus brought substantially closer to the metropolis of Ontario. The handling of freight from and to an important mining and railway centre is the keynote of development. The new line will increase materially both freight and passenger traffic facilities.

We do not doubt that an impetus will be given to the opening up of the known copper deposits of the Sudbury region. Present freight rates are by no means at an irreducible minimum. In operation the direct route may reduce competitive reduction of tariffs.

Incidentally Sudbury will acquire added importance as a shipping and distributing point.

A NEW MARKET FOR BRITISH COLUMBIA COAL.

The establishment of a large coaling station on the Pacific coast of Mexico is announced. Manganillo harbor has been chosen as the site. If all goes well it is expected that the improved facilities to be provided at this port will encourage the exportation of British Columbia coal from the coast collieries.

It may be justly remarked that one of the first needs of Vancouver and Victoria and the coast generally is cheaper coal. The prices at which the fuel is sold in these cities are unnecessarily high.

THE MINING OPERATIONS OF THE DOMINION COAL COMPANY.

The Mines of the Glace Bay Basin.

(Article II. by F. W. Gray.)

The Glace Bay Basin has been much more extensively worked than any other portion of the Sydney coalfield, although as may be seen from an examination of the following comparative chart of outputs, it was the last of the basins to be systematically opened up. As will be seen from the chart the output curves of the four basins ran almost together during the first two decades of coal mining in Cape Breton, and it was not until the early 'eighties'' that the production of the Glace Bay Basin began to sensibly exceed that of the other sections of the Sydney coalfield.

From 1880 to 1893 the outputs increased steadily. In 1893 the Dominion Coal Company commenced operations, and from that time on the outputs have increased by leaps and bounds.

The following table gives the outputs of each basin of the Sidney coalfield from 1893 to 1907, arranged in two periods of twenty-five years, showing how remarkable has been the development of the coal mining industry during the quarter of a century just passed compared with that which immediately preceded it.

	Production from 1858 to 1882.	Production from 1883 to 1907.
Sydney Mines Basin	2,636,000	6,963,000
Lingan Victoria Basin	842,000	1,175,000
Morien Basin	1,779,000	1,850,000
Glace Bay	2,596,000	35,900,000
	7,853,000	45,888,000

During the fifteen years that have elapsed since the formation of the Dominion Coal Company, they have produced from their mines, in the Glace Bay Basin, only, a little over 32,000,000 tons of coal, to which the various seams have contributed in approximately the following proportions:

		Per cent.
Gardiner seam	30,000	..
Emery seam	260,000	1
Hub seam	800,000	2½
Harbour seam	4,510,000	14
Phalen seam	26,400,000	82½
Total	32,000,000	100

The basin, or to use a more exact simile, the ''saucer like'' formation of this field is very marked, and the crops of the coal seams have been bared by the scour of the ice-age, so that, owing to the even flatness of the surface, and the regular pitch and consistent parallelism of the coal seams, they appear on the map in strikingly symmetrical concentric form.

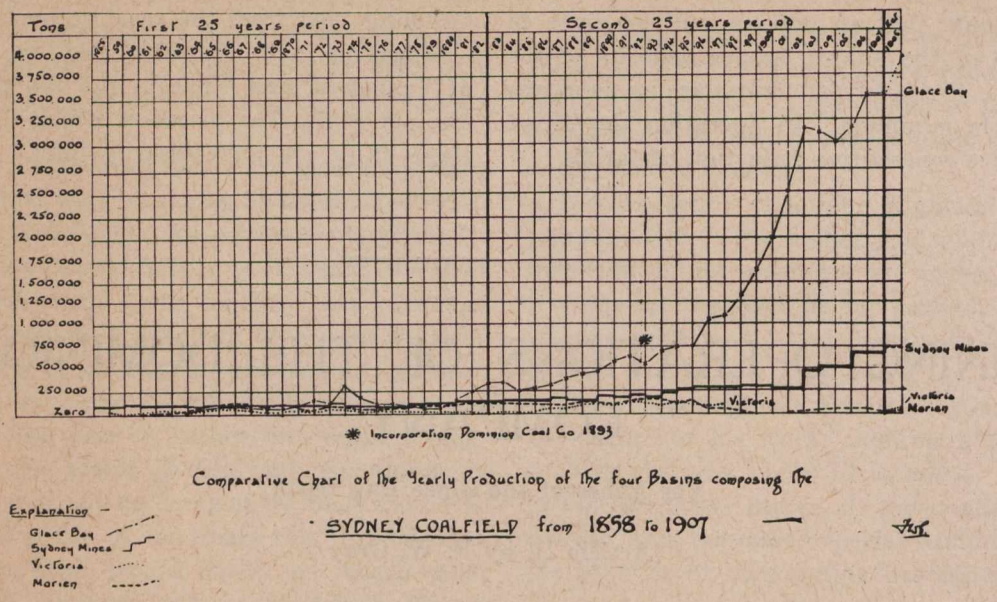
There is a complete absence of faulting or dislocation of the strata in this field, although there are occasional undulations or ''swillies,'' and local changes in the thickness of the seams, such as are to be met with in all coal deposits.

In the earlier days of coal mining in the Glace Bay district the seams apear to have been attacked from the outcrops in a happy-go-lucky and haphazard manner, without much regard for the future. No barriers, or very inadequate ones, were left along the crops to protect the lower and later workings, while the pillars left in the first operation were too small, the consequence being that much coal has been lost by creeps and crushes in addition to which the surface water has found its way through the many openings in the outcrops, leaving a legacy of pumping cost to the present generation. The measures in this district are ''short'' and brittle, and where the cover is light they will

break up today after the excavation of the underlying coal seams, thus admitting the surface drainage.

The land area of the Glace Bay field would have been a positively ideal one for easy and cheap working had it been mined to the rise from properly located shafts. Had this been done, haulage and pumping problems would have been simplified exceedingly, but instead most of the coal has been hauled from the deep.

The genesis of this short-sighted and expensive procedure is to be found in the fact that the coal field was



Comparative Chart of the Yearly Production of the four Basins composing the SYDNEY COALFIELD from 1858 to 1907

operated by independent and rival companies, with inadequate capital, who, to quote from a report made by H. Y. Hind in 1871, "allowed the desire for an immediate profit to supersede the necessity of a judicious arrangement of the mode of working."

It was therefore, very decidedly for the benefit of all concerned in the mining of coal in this district that a consolidation of interests should take place. This occurred when the Dominion Coal Company was formed, and there can be no doubt that had the Glace Bay Basin been worked as a virgin field by this or a similar corporation the result would have been a marked conservation of our national coal resources, and, incidentally, cheaper coal at the present time.

One could hardly conceive from an engineering or economic standpoint a series of mines where an amalgamation of interests was more desirable, or where independent operation was more likely to have disastrous future consequences, alike as regards the profits of the operator, the revenue of the Provincial Government, or the price of coal to the consumer. This statement is based on considerations of an engineering character only. Equally cogent and weighty commercial factors could be adduced in support of this statement, but such considerations are outside the scope of this description. When it is borne in mind that in 15 years the Dominion Coal Company produced more coal by 50 per cent. than was produced in the 35 years that that preceded their incorporation, it will be recognized what their operations have meant to the trade of the Dominion generally, and the prosperity of Cape Breton in particular.

Taking the coal seams in the order of their relative importance, the Phalen seam first claims attention. It is worked from six collieries, commencing with No. 1 ("Dominion") at the western limit, and ending with No. 6 on the eastern side. The land area bounded by Lingan Bay on the west and by Big Glace Bay on the east, is worked by the first five mines. No. 2 mine occupies the centre of the basin, while Nos. 1, 5, 3 and 4 workings cover the rise coal, radiating from west to east in the order given, like the spokes of a wheel. The territory on the other side of Big Glace Bay Lake is worked from No. 6 mine. Nos. 3 and 5 mines have an all-land territory, while Nos. 1, 2, 4 and 6 have submarine territory in addition to their land areas.

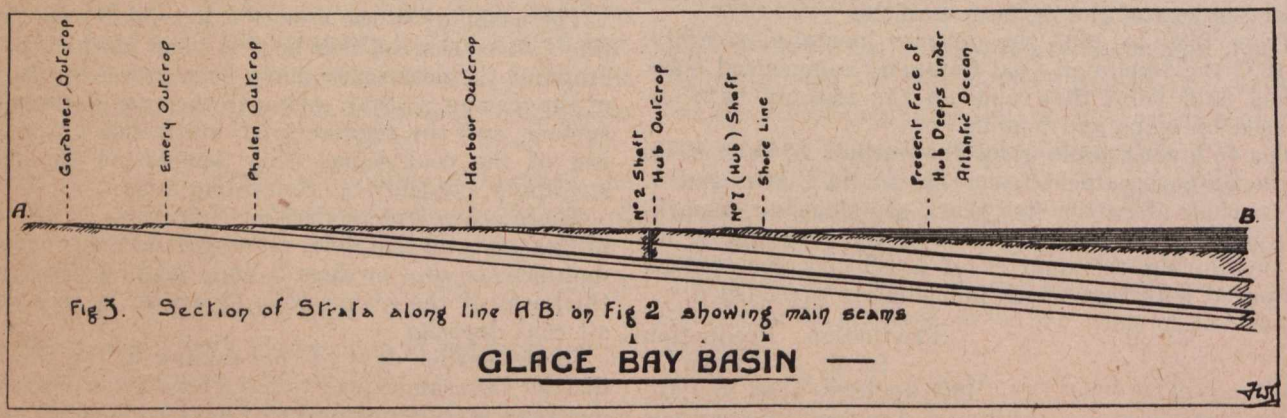


Fig 3. Section of Strata along line A B on Fig 2 showing main seams

GLACE BAY BASIN

It is not necessary to give a detailed description of the general characteristics of the coal mined from the

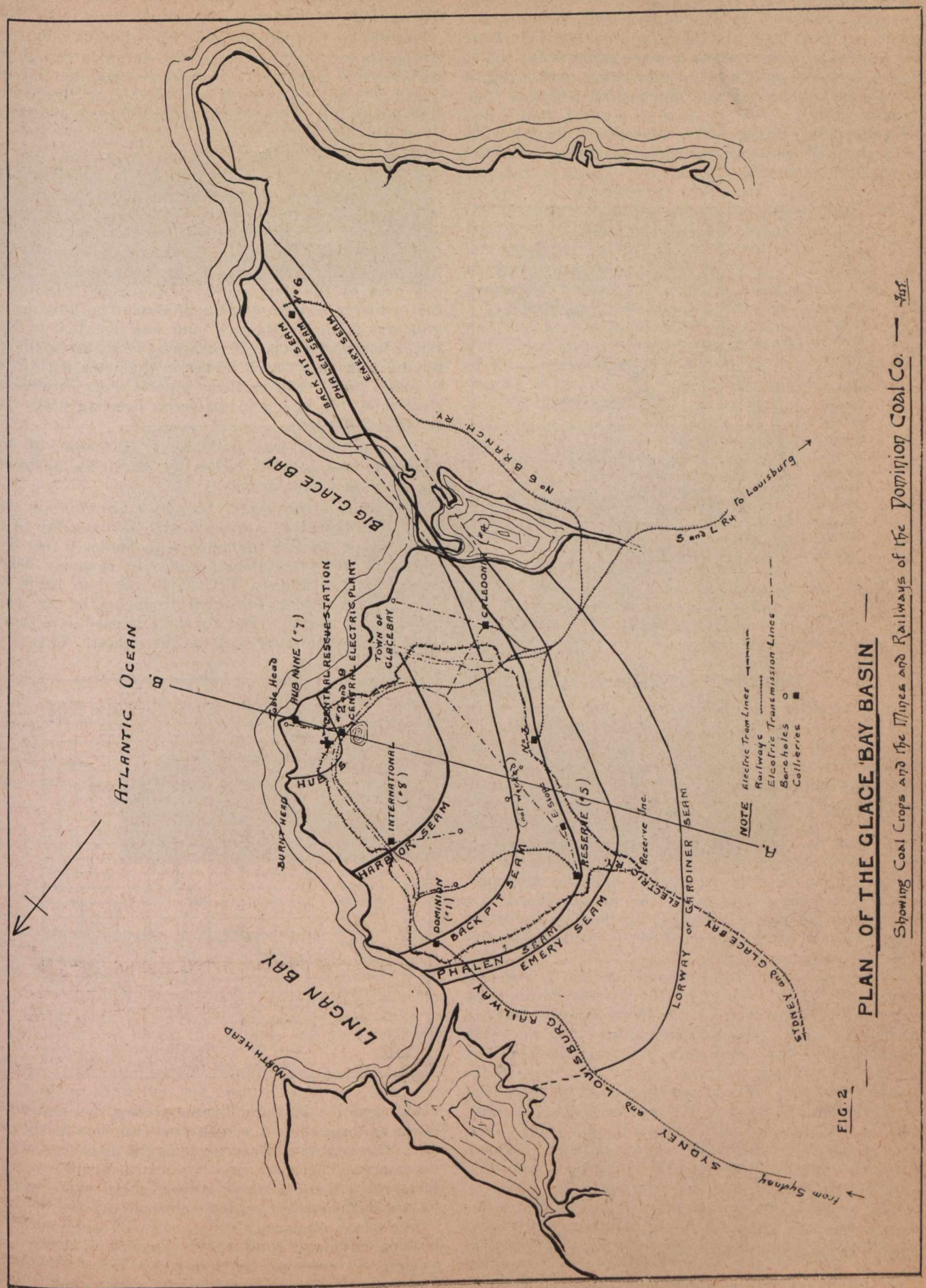


FIG. 2. — PLAN OF THE GLACE BAY BASIN — Showing Coal Crops and the Mines and Railways of the Dominion Coal Co. — Ltd.

Phalen seam, as they are so well known. Phalen coal is a rather friable, fat, bituminuous coal, with specific gravity of from 1.28 to 1.30. On account of its high heating value Phalen coal is in large demand for steam raising purposes, and it is a good coking coal, yielding a profitable return in bye-products when burnt in bye-product ovens.

We purpose dealing with each colliery in detail by itself, and will commence with No. 1, or as it is locally known, "Dominion."

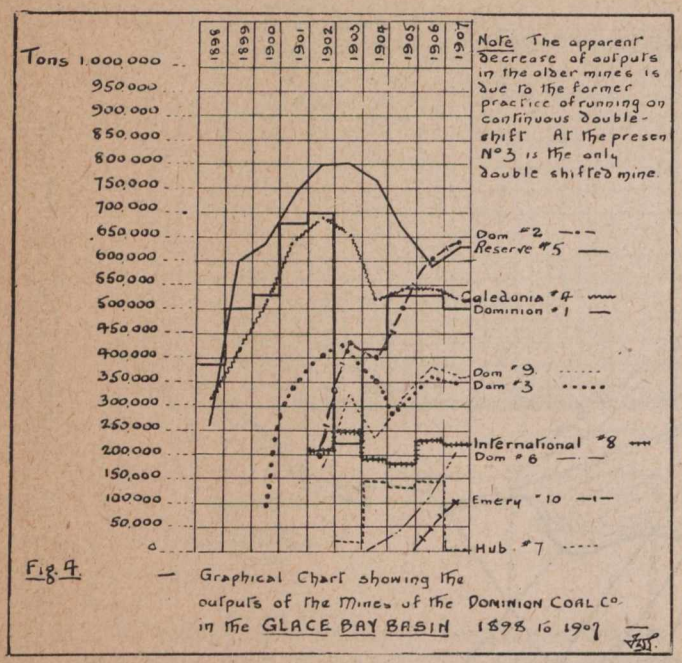


Fig. 4 — Graphical Chart showing the outputs of the Mines of the DOMINION COAL Co. in the GLACE BAY BASIN 1898 to 1907

Dominion No. 1 Colliery.

No. 1 colliery is the first mine that one meets in travelling over the Sydney & Louisburg Railway from Sydney to the colliery towns. It is in a district that saw the first beginnings of the Cape Breton coal trade, and is pleasantly situated overlooking Lingan Bar in the midst of a countryside that is a little more cultivated than the surrounding neighborhood. "Dominion"—not to make any invidious comparisons—has always been regarded more or less as the model colliery of the Dominion Coal Company, and its workmen, mostly life long residents of the neighborhood, are looked upon as men of light and leading, whose native conservatism is a little shocked at the crude modernity of "New Aberdeen."

The territory assigned to Dominion No. 1 was first worked at Old Bridgeport by the General Mining Association in 1830, the workings being largely confined to the crop area. The coal was shipped on the other side of Lingan Bay, being conveyed from the slopes by means of a railway that ran along the course of the Lingan sand bar. Trade proving bad the mine was abandoned by the General Mining Association in 1842, and the colliery was not operated again until 1886, when it was reopened by Mr. Henry Mitchell of Dominion, who continued to operate it under a sub-lease from the G. M. A., until his interests were absorbed by the Dominion Coal Company in 1893. The latter corporation continued mining operations at Old Bridgeport until 1898. They had erected a new bankhead at the time they took over the property, and produced from Old Bridgeport between 1893 and 1898 approximately 640,000 tons, at the end of which period they dismantled the mine.

In 1893 the Dominion Coal Company sunk the present shafts at Dominion No. 1, and equipped the colliery with modern machinery, since when Dominion has produced 5½ million tons of coal, and is at the present time hoisting between 50,000 and 52,000 tons per month on single shift.

There are three shafts, hoisting, material, and air shafts, the material shaft not being in use except for the conveyance of haulage ropes underground. The main hoisting shaft is divided into two compartments, one for hoisting coal and the other for men. It is 24 feet by 10 feet 6 inches inside the buntons, and is 158 feet deep. The cages are of the dumping type generally used by the Dominion Coal Company, running on the ordinary square wooden guides. The hoisting engine was made in Glasgow, and was installed in 1894. It is a horizontal hoist, 20 inches by 54 inches cylinders, having a drum 8 feet 9 inches in diameter with 5 feet 6 inches face. The hoisting rope is a six strand cast steel rope, 1⅜ inches in diameter, hoisting daily from 2,000 to 2,400 tons.

The man hoist was made by I. Matheson, of New Glasgow, and is a 16 inches by 32 inches horizontal engine with 6 feet drum.

The mine is ventilated through a circular air shaft 10 feet in diameter, connected with a Dixon fan of the Guibal type, 24 feet diameter with blades 6 feet 6 inches wide, 100 revolutions per minute, capacity 300,000 cubic feet per minute, at 2 WG., cased in brick and driven by a direct connected 18 inches by 28 inches "Buckeye" engine. The air shaft is used as a down-cast, and the hoisting shaft as the upcast. This is the

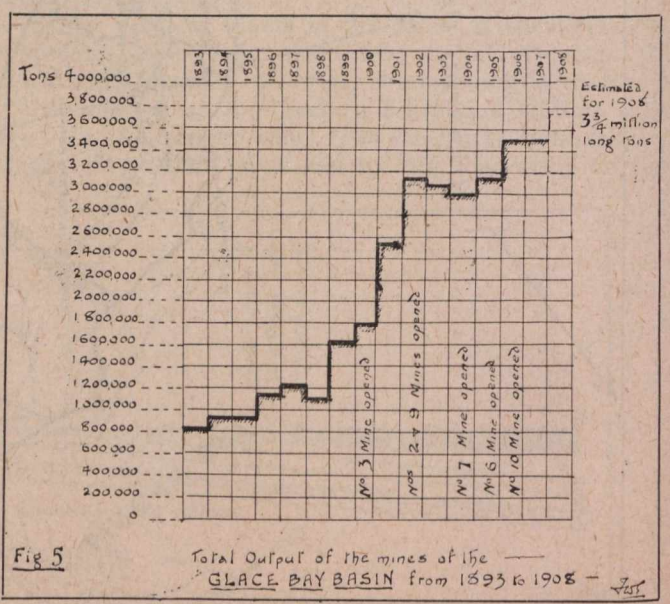
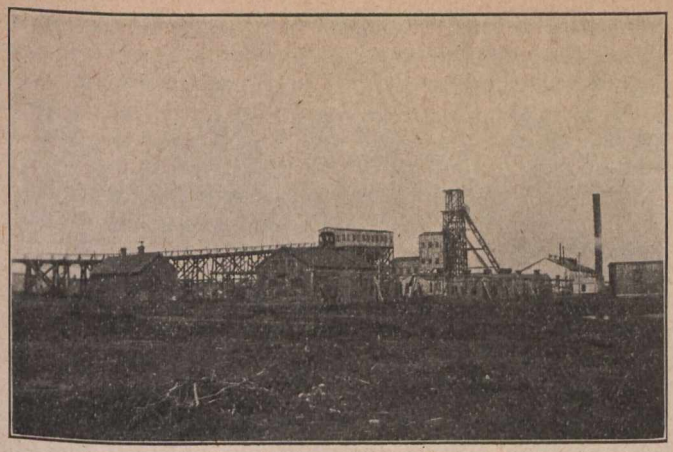


Fig 5 — Total Output of the mines of the GLACE BAY BASIN from 1893 to 1908

usual practice in Cape Breton, being so arranged in order to keep the pit mouth free from ice in the winter. The ventilation can be reversed at short notice if necessary. There are also two spare Murphy fans, 12 feet and 8 feet diameter respectively, which are not in use, but are reserved for emergencies.

The steam plant consists of seven Babcock & Wilcox boilers, having a total rated capacity of 1,696 horse power. There is one brick smoke stack 125 feet high, and one steel stack 74 feet high.



HUB MINE—No. 7 (HUB SEAM).

The haulage plant consists of two large haulage engines 28 inches by 60 inches cylinders. These engines were installed in 1901, having been formerly used on street railway traction in the City of New York. These engines operate two endless ropes, namely, the Angle Deep rope, 13,500 feet total length of 1⅛ inch rope; and the South Deep rope, which is of the same diameter, and 17,500 feet in total length. The South Deep is within 1,000 feet of its full extent, and this haul will not be materially extended.

There are three Ingersoll compressors, having a capacity of 2,500 cubic feet per minute, each, two of which were installed in 1894 and one in 1900. There is also a small straight line compressor, wth a capacity of 900 feet, which was put down in 1903 at the time of the fire.

The surface and pit bottom are electrically lighted from an independent generating unit—100 kw., 250 volts.

The bankhead is a steel structure, housed with corrugated iron, and fitted with shaking screens and picking belts. It possesses no features out of the ordinary. Coal is fed directly to the boilers by two Robins belt conveyors, and there is also a small belt conveyor to the locomotive bunker pocket.

The other surface erections are those to be usually found at a colliery, and include a wash house for the men, a well equipped and new lamp cabin, and a fireman's hall, containing hose and reels, fire fighting appliances, and a parlor for the use of the colliery fire brigade in their moments of diversion. Chemical extinguishers of the "Fire King" pattern are distributed around the colliery, both above and below ground, and the fireman's hall will shortly be fitted with several Draeger apparatus, which will be kept in readiness for immediate use by the colliery rescue corps. The general fire fighting organization of the Dominion Coal Company will be dealt with fully in a separate notice.

Underground the mine is divided into two main districts, known as the South Deep and the Angle Deep. The South Deep district will work up to the barrier of No. 2 colliery, and the Angle Deep has a large submarine territory, the exact definition of which will depend upon the position of the Bridgeport Anticline, and the amount of dislocation attendant on this fold in the strata, which is as yet largely a matter of conjecture. At present the face of the Angle Deep leading place is advanced about 3,000 feet under the sea from the shore line, and about 800 tons per day of submarine coal is being mined.

DOMINION No. 2.

DOMINION No. 2.

The ventilating current is divided into two main splits at the bottom of the downcast air shaft and is sub-divided again on the south side of the mine. The Angle Deep is ventilated by a single split.

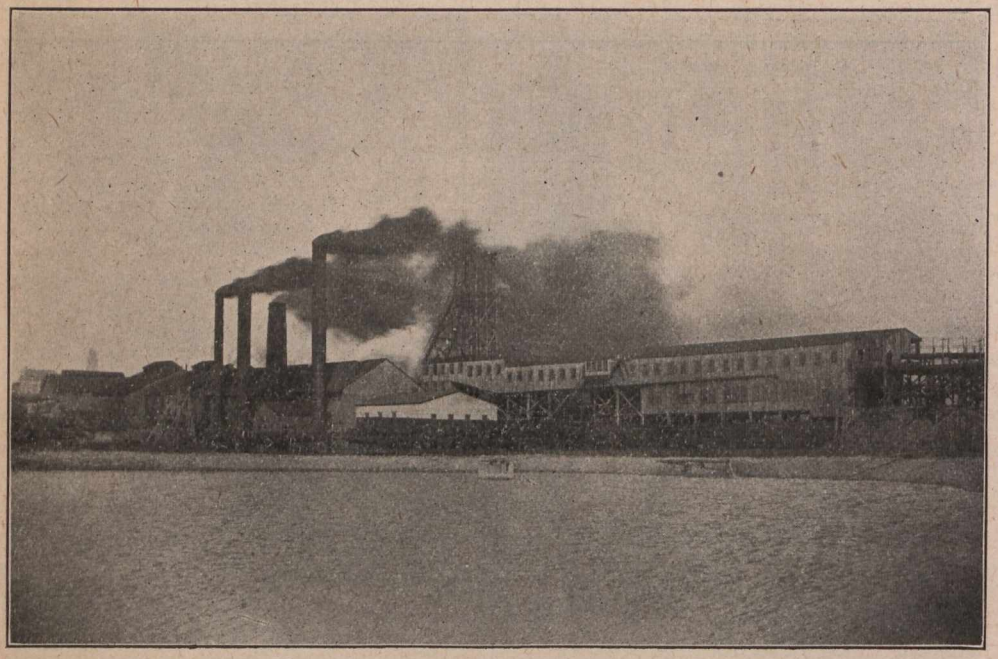
The pumping plant of the mine is as follows: One 20 inches by 8 inches by 24 inches Northey steam pump, one compound Northey pump, 12 inches and 24 inches by 8 inches and 24 inches. One six stage McDougall turbine pump, operated by power from the Central Power Station at No. 2 colliery. The steam for the Northeys is taken from the International boilers through a borehole into the Phalen seam. The three pumps discharge into a common borehole, which empties itself into the Harbour seam above, and is conveyed by means of the International water level to the shore. There is also a large Cameron pump that discharges into the sea through the opening that was made into No. 1 workings from the shore at the time of the fire. There is another large Northey pump on the surface for fire protection purposes and several other pumps for the colliery water supply.

The average force employed at the colliery is round 700 men. The horses number about seventy. The underground equipment consists of about 400 mine cars, 45 compressed air percussive pick mining machines, and about 22 "Little Hardy" shearing mahcines. The mine is fully equipped with Ackroyd & Best electrically lighted safety lamps, with magnetic locks. The underground workings are equipped with sufficient relighters, which are kept under individual and careful supervision.

An examination of the chart of outputs of individual mines, Fig. 4, will show a drop in the output of No. 1 in the years 1903 and 1904. This was caused by a fire, which broke out in the workings on the 19th of March, 1903, and getting beyond control, necessitated the flooding of the mine in order to extinguish the fire. The mine was unwatered on the 13th of June, 1904, but it was not until the middle of 1905 that the output regained its normal tonnage. A full description of the fighting of this fire, and the flooding and pumping operations that followed, will be found in a paper contributed to the Canadian Society of Civil Engineers by the late Shirley Davidson and Norman MacKenzie, the present superintendent of No. 2 district.

The next number of this series will deal with No. 5 Colliery (Reserve), No. 3 Colliery, and No. 4 (Caledonia).

(To be continued.)



RESERVE MINE—No. 5, PHALEN: No. 10, EMERY (SHAFT).

THE SUMMER EXCURSION.

At our request, Mr. H. Mortimer-Lamb, secretary of the Canadian Mining Institute, has outlined the programme of this summer's trip.

"The excursion will start from the city of Quebec either very early on the morning of August 24th (probably shortly after midnight), or early on the morning of the following day, in order that the party may have an opportunity of viewing the scenery along the Bay of Chaleur, which will thus be passed in daytime. Two whole days will be spent in Sydney visiting the steel works and collieries in the vicinity; and one day at Stellarton. Possibly the party may visit Halifax; but all the arrangements in connection with the Nova Scotia visit will be made and carried out by the Mining Society of Nova Scotia, who have kindly offered to consider the Institute and the European representatives as its guests during our stay in that province. It is designed that we shall reach Sherbrooke on Monday morning, August 31st, and leave immediately by the Quebec Central for Thetford and Black Lake, where a day will be spent visiting the asbestos mines. Leaving Sherbrooke early in the morning of Tuesday, September 1st, we arrive in Montreal at noon and spend a day and a half in the city, leaving for Toronto at 10. p.m., on September 2nd. On September 3rd, an ex-

cursion will be made to Niagara Falls, while on the 4th, the party will have an opportunity of visiting the Toronto Exhibition and will be entertained at luncheon by the directors. Leaving Toronto that night, we proceed, via North Bay, to Cobalt and will spend a day there, leaving in the afternoon of September 6th for Copper Cliff, and spending the evening of that day in Sudbury. It is then proposed to have the cars taken, during the night, to Moose Mountain, where the morning of September 8th will be spent. We then go on to Winnipeg, arriving at night on the 10th, and leaving the following morning at noon. At Medicine Hat, a special train will be chartered to take the party as far as Lethbridge, and on the 13th we visit Frank and Blairmore; on the 14th, Fernie; on the morning of the 15th, the St. Eugene at Moyie, arriving at Rossland that same night. A day will be spent at Rossland, and on the 17th, a visit will be paid to the Trail smelter en route to Nelson. Friday, September 18th, will be devoted to visiting Bonnington Falls, and to points of interest in the vicinity of Nelson. Two days will then be spent in the Boundary district, whence the party will journey direct to Victoria, where two days will be spent, leaving on the evening of the 25th of September. After spending a few hours in Vancouver, we are due at Banff on the evening of Sunday, September 27th. At Banff, the party will possibly be entertained at luncheon or dinner by the Government of Alberta. On the return journey, it may be possible to arrange for a visit to the Atikokan iron mine and furnace. The programme, as at present arranged, contemplates the arrival of the party at Montreal on October 2nd.

"The above in brief covers the arrangements as so far made, but details, of course, have yet to be worked out. Upwards of ninety provisional acceptances have been received from members of the several British societies to whom invitations were issued; while in addition, several members of these societies residing in the United States, have also signified their intention of participating. It is scarcely likely, however, that all will come, but definite assurances are expected not later than July 1st. It depends on the number of persons taking part whether, or not, we shall be able to charter a special train for the whole trip, but meanwhile, the railway companies have offered a special rate of half fare. Great interest is being manifested in the excursion to Great Britain, and it may be noticed that at the recent annual dinner of the Institution of Mining and Metallurgy special reference was made to it in a speech by Earl Crewe."

Annual Report of the Provincial Mineralogist Upon the Mining Industries of British Columbia for the Year 1907.

The year 1907 saw the greatest total production on record from the mines of British Columbia. Early in 1908, the "Canadian Mining Journal" gave an abstract of the mineral output The report before us, however, contains a great deal of material that demands attention.

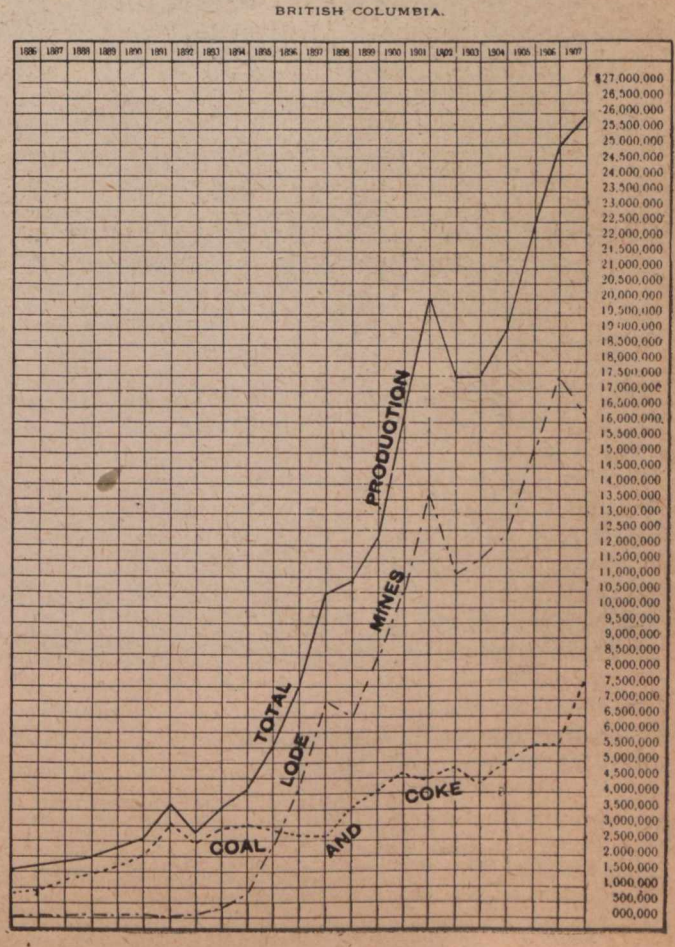
By the established custom of the Provincial Bureau of Mines in estimating the output of the lode mines, the output of a mine for a year is considered as that amount of ore for which smelter or mill returns have been received. This, obviously, does not include all of the ore mined. December ore shipments to the smelter are usually carried over to the new year. This gives rise to but a small error, as where necessary, it is uniformly carried over from year to year.

In calculating the values of the products, the average price for the year in New York has been used as a basis. For silver 95 per cent., and for lead 90 per cent., of such market price has been taken. Treatment and other charges have not been deducted.

The increase in value of mineral production of 3.6 per cent. over 1906 is due to the greater tonnage of of low grade ore mined in the Boundary district and to increased tonnage from the collieries. The total for 1907 is $25,882,560 The high market price of meals in the former half of the year was offset by low prices in the latter half.

The tonnage of ore mined during 1907 was 1,804,114 tons, of which the Boundary district produced 65.1 per cent.; Rossland, 15.8; Coast, 4.7; Fort Steele, 8.6; and all other districts 5.8.

Of 147 shipping mines, only 72 shipped more than 100 tons each.



Two thousand, five hundred and eighty-five men were employed underground and 1,112, overground in these mines.

Sixty-one non-shipping mines employed 119 men underground and 127 overground.

Up to the end of 1907, British Columbia has produced coal to the value of $86,972,511, placer gold to the value of $69,549,103 and lode gold to the value of $45,070,717.

The total mineral production for 1907 was more than double that of 1899. The value of the total products of the mines of the province up to the end of 1907 is $299,526,282.

For twenty years coal mining has been a constantly increasing industry. Lode mining, beginning in 1894, has now risen to the $17,000,000 mark, but has been subject to many fluctuations.

Coal.

The fall in silver and lead production, in fact in both branches of gold production and copper also, was more than compensated for by the increased quantity of coal mined. One million, eight-hundred thousand and sixty-seven long tons of coal valued at $6,300,235; and 222,913 long tons of coke valued at $1,337,478 were the figures for the year. The gross output, however, was higher than this, being 2,219,608 long tons of coal. Of this quantity, 44,760 tons were added to stock; 916,262 tons were sold for consumption in Canada; 673,114 tons were exported. Thus the total coal sales for the year were 1,589,376 tons. Of the balance, 419,541 tons were used in making coke and 165,931 tons under colliery boilers.

The Coast collieries mined in 1907 some 1,342,877 tons of coal. Of this, 44,760 tons were added to stock, bringing the coal distributed down to 1,298,117 tons, thus:

	Tons.
Sold as coal in Canada	698,041
Sold as coal in the United States	359,666
Sold as coal in other countries	22,038
Total used as coal	1,079,745
Used under companies' boilers, etc.	121,701
Used in making coke	96,671
	1,298,117

The home market showed an increase of 31.4 per cent. over last year; the United States market a decrease of about 17 per cent.

The Crow's Nest Pass Coal Company, the only operating company in the Rocky Mountain coal field, mined 876,731 long tons during 1907, of which the following distribution was made:

	Tons.
Sold as coal in Canada	218,221
Sold as coal in United States	291,410
Total sold as coal	509,631
Used by company in making coke	322,870
Used under company's boilers, etc.	44,230
	876,731

The amount of coke made from the 322,870 tons of coal used was 206,541 tons (2,240 pounds), of which 5,664 tons were carried over as stock and 200,877 tons sold, 140,987 tons for consumption in Canada, and 59,890 tons exported to the United States The oven yield of coke was 63.9 per cent.

Gold.

Placer gold production for 1907 was about $828,000, a decrease of $120,400 or 12.7 per cent., as compared with 1906. The Atlin district is the principal producer. Three -hundred and forty thousand dollars worth of gold paid royalty here during 1907. The Cariboo district produced $350,000. Dease Lake in the Stikine district, was a disappointment. The lower Fraser and the Thompson river produced practically nothing.

The value of the gold produced from lode mining in 1907 was $4,055,020, a decrease of $575,619 or about 12.5 per cent. About 95 per cent. of the gold is recovered from smelting copper-bearing ores. The only stamp mill of any importance is at Hedley, in the Osoyoos mining division, which mined and milled about 32,000 tons of ore, from which was recovered about $475,000.

Silver.

The total silver output for 1907 was 2,745,448 ounces, valued at $1,703,825, a decrease of 244,814 ounces and $193,495 in value.

About 72 per cent. of the silver produced is found associated with lead, in argentiferous galena, the remainder being found in conjunction with copper-bearing ores.

The Slocan district, including Ainsworth mining division, provided 32 per cent. of the total Provincial output, and Fort Steele mining division 30 per cent., all from argentiferous galena.

Lead.

Forty-seven million, seven hundred and thirty-eight thousand, seven hundred and three pounds of lead, valued at $2,291,458, were produced, a decrease of 4,669,514 pounds and $376,120 as compared with 1906.

	Pounds	Per cent of Total.
Fort Steele mining division	37,526,144	= 78.61
Slocan	4,305,826	= 9.00
Ainsworth	3,654,775	= 7.66
Nelson	1,582,113	= 3.32
All other districts	669,795	= 1.41
	47,738,703	100.00

Copper.

The output of copper for 1907 was 40,832,720 pounds, having a gross value of $8,166,544. As the larger coper-producing mines were only run for nine months, the output is slightly smaller than for the preceding year.

	1907 Pounds.	Per cent.
Boundary district	31,521,550	= 77.2
Rossland district	5,080,275	= 12.4
Coast and Cassiar district	3,757,967	= 9.2
Yale-Kamloops district	36,120	= 0.1
Nelson district	434,222	= 1.1
Other districts	2,586	= 0.0
	40,832,720	100.0

Other Minerals.

Practically no iron ore was mined, with the exception of 1,500 tons of bog iron ore mined and shipped

from Quatsino sound. The deposit was found too shallow for profitable work.

Zinc ore mining was stationary. The Lucky Jim mine in the Slocan, shipped 1,120 tons of ore mined in 1906, but no fresh mining was done. Zinc blende concentrates from Slocan district were produced but neither sold nor treated. The Legislature advanced $10,000 to aid in completing the Nelson plant of the

ROCK FORMATION—ENTRANCE IKEDA BAY, Q.C.I.

Canada Zinc Company. The power for this plant is obtained from Bonnington Falls.

The building stone and brick industries are increasing. Fire brick, fire clay, lime-silica brick, lime and cement are the bases of incidental activities.

The staff of the Bureau consists of the Provincial Mineralogist, the Provincial Assayer, a junior assistant in the Laboratory, and a clerk as temporary assistant during the publication of the Report.

The Provincial Mineralogist visited Ashcroft, Highland Valley, Nicola Valley, Quatsino Sound, Queen Charlotte Islands, Atlin and other districts during the summer.

In May and in December the examinations for assayers were held.

Assay Office.—During 1907 assays are quantitative determinations to the number of 905 were made. Total cash receipts were $1,057. A large number of free qualitative determinations were performed. Only 4 candidates for asayers' certificates wrote on the examinations. Three were successful.

The "Coal Mines Regulation Act" provides that all the officers of a coal mining company having any direct charge of work underground, shall hold Government Certificates of Competency, obtainable only after passing an examination before the Managers' Board. These certificates are First, Second and Third, respectively Manager's, Overman's, and shiftboss, fireboss, or shotlighter's certificate. From three to five years' practical experience is called for before candidates are eligible for examination. Fifty-two out of 56 candidates were successful.

Cariboo District.

A slight increase in the hydraulic gold output was recorded for this district. Coal was discovered in Bear River, about 15 miles from the Fraser. In Quesnel mining division of this district the Consolidated Cariboo Hydraulic Mining Company's property at Bullim, taken over by the Guggenheims in 1906, was abandoned by them.

Cassiar District.

Atlin mining division had a good year. Although 100 fewer men were employed the gold output was not materially reduced. Scarcity of water and labor interfered with what should otherwise have been an unusually good season.

The Stikine and Liard mining divisions had an exceptionally light year.

In Skeena mining division are the Queen Charlotte Islands. The mining activities on Moresby Island have been described in the "Canadian Mining Journal" of recent date.

The other mining districts to the south are reported upon and their year's progress recorded. We need not go over these. They have had regular attention in our columns.

Accidents.

In the metalliferous mines of British Columbia there were 94 accidents in 1907. Out of this total 20 were fatal, 20 serious, and 54 slight. Of the fatal accidents, four were attributed to drilling into old holes containing powder. One serious and one slight accident are also set down to the same cause. The source of the largest number of underground accidents (most of which were slight) was falling rock in stopes, levels, etc. For each 100,000 tons of ore mined there was a total of 5.22 accidents (1.11 fatal, 1.11 serious, and 3.00

NO. 2 TUNNEL, LILY GROUP—IKEDA BAY, MORESBY ISLAND.

slight). For each 1,000 men employed there were 25.4 accidents (5.4 fatal, 5.4 serious, and 14.6 slight).

Looking up the corresponding tables for 1906 we find that there were in that year fewer accidents, only 60 altogether. For each 100,000 tons mined in 1906, only 3.06 accidents occurred, of which only 0.86 was fatal. For each 1,000 men employed there were 15.38 accidents of all classes, 4.61 of which were fatal.

The collieries of the province recorded 154 accidents for the year—31 fatal, 61 serious, 62 slight—a greater number than has occurred since 1902.

Falls of coal were responsible for 8 fatal accidents. Mine car fatal accidents reached the same number and both serious and slight accidents due to this cause, exceeded those from all other individual causes. Explosions of gas caused but one death. There were 6,059 persons employed and 2,219,608 tons of coal produced.

ORES AND ROCKS OF THE COBALT REGION.

By R. E. Hore.

The exploration of the larger areas of silver and Cobalt bearing rocks has disclosed new types of deposits, and has afforded additional information regarding the origin of the deposits and of the rocks containing them. It is the purpose of this article to give some results of study in field and laboratory.

In Coleman township interpretation is difficult on account of the variety of formations—Lower Huronian sediments, Keewatin volcanics, and Post-Middle-Huronian Diabase—in which the silver-cobalt deposits occur. In other parts of the area a less promiscuous distribution of the ore has been found.

The deposits in Casey Township are in Lower Huronian, a few hundred feet from diabase. Those of Pense and Ingram townships are confined to diabase, as are also those in the Elk Lake and Anvil Lakes districts of the Montreal River Mining Division, and the deposits of Portage Bay and Anima Nipissing. Lately discovered deposits south of Lorrain township are said to be in rocks of Keewatin age.

The Diabase.—The intimate connection of the ore deposits with this rock becomes more and more apparent as prospecting advances. For some time it has been the "nishishin sini" of the prospectors. It occurs for the most part in large sills of a few hundred feet in thickness. In the Temagami Reserve the writer has examined a large number of diabase hills which stand from one to two hundred feet above the surrounding country. In several instances the contact with greywacke slate was found, and in all cases it is near the base of the hills. Since the texture of the diabase at the summits is generally quite coarse, it is probable that the original thickness was at least double the height of the present hills.

For the most part the sills are dark grey in color and holocrystalline, the chief minerals being plagioclase feldspars labradorite in many cases) and monoclinic pyroxene. Quartz and ilmenite are frequently present. Near the edge of the sheet it is very fine grained and ophitic texture is more pronounced; but the grain becomes quite noticeable a few feet from the contact. In more coarsely grained portions, often pink in color, quartz is more abundant and generally is found in micrographic intergrowth with feldspars. In petrographical character and in its relation to the Huronian sediments, the diabase is remarkably similar to those of Lake Superior which are regarded as Keweenawan,[1] being the plutonic contemporaries of the copper bearing lavas, or as post-Keweenawan in age.[2]

Veins in the Diabase.—Veins in these sills are not common, and quartz veins are more abundant than calcite. In Coleman township the rich veins have little gangue mineral, in some cases native silver occurring simply in thin sheets along the joint planes; but what little gangue there is is calcite. In other areas some of the quartz veins are cobaltiferous; but the valuable deposits as a general rule have calcite gangue. Argentiferous galena occurs in some of the quartz veins west of Wakmika Lage, along with pyrite and chalcopyrite and a later filling of pale pink calcite. In the Elk Lake district barite veins are said to be argentiferous. All the veins are vertical or nearly so, and probably represent fillings in tensional joints due to cooling and contraction of the igneous sheet.

Intrusives in the Diabase.—There occur in the sills small dikes, some more basic, others more acid than the main mass. In Coleman township there are fine grained dark colored dikes of olivine diabase, while near Temagami there are narrow dikes of diabase porphyry.

More frequent, and of greater economic interest are the light colored aplites. The width of most of these is to be measured in inches, while in length, they are but a few hundred feet. They are frequently mineralized, pyrite, chalcopyrite and galena being present in many, while silver and cobalt minerals have been found in them in the Elk Lake area. They are composed largely of quartz, orthoclase and acid plagioclases; but the proportions vary considerably in the same dike. There is considerable chlorite in darker colored portions, and calcite fills interstices between the other minerals. Small crystals of titanite and apatite are inconspicuous but characteristic constituents.

Disseminated Ore in the Diabase.—In the diabase which extends westward from Anima-Nipissing to Lady Evelyn Lake there are numerous showings of cobalt minerals, both in calcite veins and as disseminated crystals in the rock. There is generally little or no surface indication of the presense of the latter; but on fresh fractures traces of cobalt bloom are found. One deposit, west of Diabase Lake, is associated with an aplite vein. The vein contains some pyrite, but little smaltite. Parallel to the vein for a few feet from its walls the diabase contains disseminated crystals of smaltite, which are more concentrated near joint planes. The chief primary constituent of the ore-bearing rock is feldspar. The smaltite crystals are embedded in calcite and chlorite, and are accompanied by small crystals of titanite.

Another cobaltiferous specimen from this region shows some kernels of augite still undecomposed, and a remarkably high percentage of ilmenite.

Origin of Disseminated Ore.—To the naked eye the detection of smaltite in the diabase suggests the possibility of its being an original constituent. The altered character of the ore-bearing portions and the association with aplite, suggest that the ore had its origin in the gases or hot solutions which accompanied these late secretions of the cooled differentiated magma.

Microscopic examination shows that the smaltite is embedded in secondary minerals and seldom in the undecomposed feldspar. In the latter case high magnification shows numerous small cracks in the feldspar. Some of these are filled with calcite and apparently have acted as channels to introduce the smaltite, so that the latter is secondary.

The absence of augite and the presence of chlorite, which is probably the result of decomposition of the former, suggests that the augite is cobaltiferous; but a specimen of the rock showing augite cores was found to contain no trace of cobalt.

Lower Huronian.—These rocks, like the slate-conglomerate of the original Huronian area north of Lake Huron, represent the result of disintegration and de-

composition of Laurentian and Keewatin. Quartz and great degree of chemical decomposition. Quartz and feldspars are the chief constituents, while chlorite and micas are more abundant in dark colored types. Calcite is seldom found except in the vicinity of veins and apparently did not play an important part in cementing the sand grains.

It has been stated[3] that these rocks are the debris of Keewatin rocks and so play a similar role in formation of the ore deposits, especially in supplying the calcite gangue. The rocks are indeed of such a character that they represent more nearly than do some sediments the composition of the rocks from which they were derived. The very process of their formation, however, would remove some of the more soluble constituents in solution, thus making a deposit relatively inactive, since of more stable and less soluble constituents. Perhaps a more important cause of difference is that the acid igneous rocks of the Laurentian must have contributed largely to the Huronian sediments. It follows, therefore, that if, in virtue of their mineralogical composition, the Keewatin volcanics play an important role in the ore deposition, the Huronian sediments play the same role in but a minor way, if at all.

It is sometimes stated[4] that there is reason for believing that much of the Huronian rocks is of volcanic origin, and represents consolidated ash. If this were true there would be doubtless present many constituents that are unstable in the zone of weathering. Permeating waters would cause many chemical changes, and resulting solutions would be important factors in ore deposition. The rock specimens examined, however, do not show fragments of glass nor minerals characteristic of volcanic tuffs, and there is no conclusive evidence of igneous material introduced contemporaneously with the Lower Huronian sediments.

There is evidence[5] that some of these sediments are glacial deposits. Such material represents very closely the composition of the original rocks. The chief difference between these deposits and the Keewatin rocks would be in their disintegration (and consequently greater ease of decomposition) and admixture with debris of the Laurentian. The examination of a large number of unconformities shows that the basal conglomerate and the underlying surface are by no means similar to that of glacial deposits, while the regular gradation from feldspathic quartzite to the upper conglomerate beds is also not easily explained by that hypothesis. On the other hand, the boulders of the upper conglomerate may be the erratic deposits of drifting ice. It seems likely that glacial debris, if present at all, forms but a small proportion of the sediments.

These rocks then, although not extreme types of weathering, are composed largely of minerals that are stable in the zone of weathering and are far less active than the Keewatin volcanics in ore deposition.

Keewatin.—In Coleman Township this formation is chiefly represented by dark colored, fine grained, basic volcanic rocks. In Harris and in Tudhope there are outcrops of the same nature. Sedimentary types, as well as igneous, are represented at Larder Lake by the auriferous carbonates and at Temagami by carbonates and iron-bearing cherts. The writer has not yet seen cobalt deposits in diabase or carbonates where these are closely associated. This suggests that the volcanic rocks supplied elements other than the carbonate gangue.

The numerous rich veins in Keewatin at Cobalt are not far distant[6] from the diabase sill, while in some cases a vein traverses both formations. The veins in Huronian are in no case more than a few hundred feet from Keewatin. On the other hand numerous areas of greywacke in contact with diabase where there are no Keewatin exposures have always proved barren, even though the diabase is known to be cobaltiferous, as at Lake Wendigo. The same is true of the feldspathic quartzites of Anvil Lake and James Township. The conclusion is that the Keewatin volcanics are an important factor in the ore deposition.

Conclusion.—The ores originate in the diabase. While it has been shown[7] that silver is deposited later than cobalt minerals, the occurrence in aplite indicates that there was no great time interval. Keewatin volcanics assist in the ore deposition, while the Lower Huronian sediments are relatively inactive. The part played by the Lower Huronian is primarily that of a recipient for the ores, and, by virtue of their regular vertical jointing, they carry more valuable deposits than do the irregularly fissured Keewatin rocks.

Prospecting should be fruitful in areas which show Keewatin volcanics in association with the Diabase sills, and especially so where Lower Huronian sediments are also present. There is little doubt that there are many such occurences between Lake Temiskaming and Lake Huron.

References.

[1]Lane, A. C. Geol. Rep. Isle Royal. Mich. VI. Pt. I., pp. 219, et seg.

[2]Lawson, A. C. Bull. No. 8 Geol. Sur. Minn., p. 47.

[3]Van Hise, C. R. Jour. of the C. M. I., X., 1907, p. 51.

[4]Bell, R. Jour. of the C. M. I., X., 1907, p. 63. Miller, W. G., Rep. Bur. Mines, Ont., 1905, Pt. II., pp. 47-48.

[5]Coleman, A. P. Jour. Geol., XVI., 2., Feb., 1908.

[6]See Prof. Miller's map of Cobalt area.

[7]Campbell, C., and Knight, C. W., Econ. Geo., I., 1906.

THE CHAMBERS-FERLAND MINING COMPANY'S PROPERTY.

A long protracted dispute as to the ownership of the Chambers-Ferland property was settled last year. The title was secured to the present owners; but the government imposed a royalty of 25 per cent. on the future output of the mine. Last summer a certain amount of surface prospecting was performed. Otherwise, beyond two shafts now being sunk, there is no development work done.

The organization of the Chambers-Ferland Company and the announcement that shares are soon to be placed upon the market, have created much interest. Following hard upon the heels of the La Rose flotation, Chambers-Ferland will undoubtedly receive much attention.

Because of this, the "Canadian Mining Journal" has got together all available information and, is presenting it to its readers, with the object of giving them as impartial an account of the property as it is possible to obtain.

The holdings of the company comprise 124 acres practically surrounding La Rose. As will be seen by the cut accompanying this article, the property is bounded on the south and east by La Rose extension, on the southeast and north by the O'Brien and La Rose, on the west and south by the Right of Way, Nipissing and O'Brien mines.

Although, as remarked before, very little work has been done on the Chambers-Ferland, yet, because of its position, definite results have been obtained from the little done.

For instance, the main vein of La Rose has been traced across the Right of Way over onto this property. An extension of the O'Brien main vein has been cut and a seventy-foot shaft has developed a fair body of ore. Besides these veins there have been at least nine other so-called veins cut, some displaying high-grade ore and some otherwise.

The preponderating number of veins found in the Huronian throughout the district has led to the conclusion that properties lying in this geological horizon are more valuable than others not so situated. With the exception of a few acres all of the holdings of the Chamber-Ferland lie in Huronian. Hence prospecting will be conducted with a strong expectation of good results.

Mining should be reasonably cheap as eight or nine veins, grouped on either side of one shaft will be worked together. Not all of these veins are payable, neither is there good ground for the statement that ore shoots on contiguous properties are continuous for over 1,000 feet. As a matter of fact, there is no evidence that would lead one to postulate ore shoots of more than a few hundred feet. However, such ore shoots are found to recur in close succession. This fact, applied to Chambers-Ferland will modify any speculative estimates to ore reserves. Positive reserves, of course, there are none. But the developments in La Rose, O'Brien and Nipissing lend a value to Ferland-Chambers possibilities. Although "ore in sight" is a phrase applicable only to bodies developed on three sides, yet the next best thing is ore from veins traversing a property from developed neighboring mines. In other words, high probabilities have a commercial significance only second to established fact.

We have seen no estimates touching the probable cost of mining the cost and visible supply of timber, the cost of the necessary machinery, and buildings. These and many more such facts should be included in the report and given to the public.

Several Cobalt mining engineers when asked for an opinion regarding Chambers-Ferland, spoke very highly as to its possibilities. This is well. An opportunity is now before the promoters of the flotation to set a standard for clean and business-like methods. If advertisements are necessary, let them be couched in decently moderate language. Also let them, in every respect, conform to the requirements of the Companies' Act. Moreover, reports of progress, expenditure, and income should be made public at regular intervals.

The capital of the new company is $2,500,000, in shares of the par value of $1 each. Three hundred thousand dollars is to be reserved as treasury stock. The officers and directors are: President, W. C. Chambers; vice-president, Harper Armstrong; secretary-treasurer, Alex. Fasken; directors, W. B. Russell, Arthur Ferland, George H. Sedgwick and Archibald T. Struthers.

THE OCCURRENCES OF TUNGSTEN ORES IN CANADA.

By T. L. Walker, University of Toronto.

(Ottawa Meeting of the Canadian Mining Institute, March, 1908.)

In 1904 the Geological Survey of Canada issued a bulletin on the occurrence of molybdenum and tungsten[1] in Canada. At that time the known occurrences were the following: Inverness and Queens Counties, N. S., Beauce County, P. Q., and a reported occurrence of wolframite in a boulder on Chief's Island, Lake Coutchiching, Ontario. More recently[2] Mr. R. A. A. Johnston, curator of the Geological Survey's museum, has recognized scheelite in the heavy sands from gold washings in the Yukon, while wolframite, scheelite and hubernite have been found in the tin deposit near New Ross, Lunenburg County, N. S.

Occurrences Already Recorded.

Slocan district.—In the reports of the Minister of Mines for British Columbia several localities have been indicated. The report for 1903[3] mentions the discovery of masses of scheelite occurring in vein quartz in the form of lenses at the Meteor mine in the Slocan district. The lenses vary in length from one to three feet, a total of 500 pounds being saved after the identification of the mineral.

In the subsequent reports of the Minister of Mines no reference is made to the production of scheelite in this district. The occurrence of scheelite or of other tungsten minerals in silver lead veins is unusual.

Cariboo district.—In 1904 an important discovery of scheelite was made on Hardscrabble Creek in the Cariboo district. Mr. Akin first discovered this mineral in the black sands obtained in gold washing and later succeeded in locating the scheelite in place. He describes the geological occurrence as follows:[4]

"This consists of highly altered country rock, the scheelite being scattered through it in small patches, but it is in the quartz stringers that most of the mineral is found. Some of these, varying from one inch to four inches wide, contain about one-third scheelite, with a little galena, and products of decomposition of iron pyrites. This zone appears to be from 12 to 20 feet wide, as determined by work done up to July, 1904, and gives every promise of turning out a valuable deposit."

After experimenting on the concentration of the scheelite by washing, a quantity was sent to Chicago to be tested and as a result of these tests was stated to be worth $460 per ton at the prices then current.

Promising as this report seemed it does not appear from the later reports of the Minister of Mines to have been followed by active development.

Occurrences Not Previously Reported.

Wolframite—Sheep Creek, B. C.—In the vicinity of Salmo in British Columbia some of the gold quartz veins carry considerable proportions of wolframite, specimens of which were collected recently by the writer from mines on Sheep Creek. The wolframite on ex-

amination in the laboratory was found to have a specific gravity of 7.137. With it are associated ferruginous quartz and wherever the mineral has been exposed to secondary action, yellow more or less powdery tungstite occurs. On chemical examination the following result was obtained:

WO_3	74.90
FeO	17.75
MnO	2.75
CaO	1.52
MgO	2.66
SiO_2	1.02
Total	100.60

So far as I am aware no economic use has been made of this material. I had not an opportunity of examining the mode of occurrence personally, the material being given me as coming for the Kootenay Belle mine, though its nature and value appear to have been unknown at the time.

Tungsten and scheelite.—Sheep Creek.—The writer has elsewhere[4] described in detail the occurrence of masses of hydrated oxide of tungsten in the gold quartz veins of the Kootenay Belle mine. The tungstite appears in more or less reniform concretionary masses in the vein associated with wolframite and scheelite, from which it was derived by alteration. In the tungstite specks of native gold may be observed. It was as gold ore that this auriferous tungstite along with the accompanying gold quartz was shipped. I have reason to believe that in the subsequent treatment the tungsten values were not recovered even when they were very much more valuable than the gold contents.

From an analysis of the tungstite-wolframite-scheelite ore in the laboratory the following results were obtained:

	Per Cent.
WO_3	86.20
FeO	1.20
CaO	.54
Fe_2O_3	4.14
Water	7.72
Total	99.81

The tungstite is golden yellow in color and very heavy—pure tungstite 5.517 and of some of the ore specimens nearly as heavy.

St. Mary's River, B. C.—Recently Mr. E. Walter Widdowson, assayer of Nelson, B. C., showed me a very fine specimen of crystallised wolframite from the St. Mary's river north of Cranbrook. I do not know anything of the quantity of this mineral available and am unable to say whether it be an economic deposit or not.

Scheelite from Victoria Mines, Sudbury District, Ontario.—At the Victoria mines of the Mond Nickel Company in 1904 Mr. T. M. Paris, assayer for the company, presented to me a few small fragments which he had determined as scheelite. I do not know anything as to the mode of occurrence, but so far as I know this is the only place in the Sudbury dictrict where tungsten mineral has ben found. The general studies of the genesis of the Sudbury ore deposits lead us to anticipate the occurrence of such minerals as scheelite.

The mineral is quite white and of very vitreous lustre; specific gravity 6.167. On the fragments in my possession no crystal surfaces are visible, but from the continuous cleavage surfaces it is probable that they are crystal fragments.

A chemical analysis showed that the mineral is exceedingly pure.

	Per Cent.
WO_3	79.36
CaO	19.96
Total	99.32

Conclusion.—The ever increasing importance of tungsten in the industries calls for an examination of these various Canadian occurrences with a view to determining their possible economic value. Within the past year the government of the United States has appointed an officer to examine and report on such occurrences within their borders. In Canada we know of tungsten minerals only as specimens and curiosities and as those engaged in developing properties do not know these minerals or their value, such an appointment might be beneficial in many ways.

[1] Molybdenum and Tungsten, by R. A. A. Johnston and C. W. Willmott, 1904.

[2] Summary Report, Geological Survey of Canada, 1907, p. 82.

[3] Report of the Minister of Mines, 1903, p. 138.

[4] Report of the Minister of Mines, 1904.

[5] American Journal of Science, 1908.

A NEW IRON ORE FIELD IN BRITISH COLUMBIA.

By John E. Hardman, S.B. Ma.E., Montreal, Que.

Ottawa Meeting Canadian Mining Institute, March, 1908.

The discovery of large deposits of iron ore near the shore of the Bay of Chaleur, in the province of New Brunswick, in formations belonging to the Pre-Cambrian, or Cambro-Silurian, period comes as a surprise both to geologists and mining men, who hitherto may have regarded New Brunswick as containing less profitable mineral wealth than any of the other provinces. When to this statement is added the further one that, the present facts indicate the probability that this district contains as large, or larger, deposits of merchantable iron ore as have hitherto been found in the Dominion, there will be no excuse needed for presenting to the notice of this Institute a preliminary, and somewhat fragmentary, account of the field.

No geological reconnaissance of this portion of New Brunswick has been made (so far as the publications of the Survey show) since the seasons of 1879 and 1880, when Dr. R. W. Ells examined the district as well as could then be done by canoe traverse of the principal streams which flow into the Bay of Chaleur. The county of Gloucester was then, and in parts is to-day, a wilderness which is traversed in the winter only by

trappers and lumbermen, and in the summer time by sportsmen, for the river and its tributary streams have long been choice ground for salmon and trout fishing.

The district under consideration lies approximately along the meridian of 65 degrees 50 feet West Longitude, and the parallel of 47 degrees 25 feet North Latitude, and is near the southern boundary of the county of Glouchester. The limits of the field have as yet been by no means defined or determined, but may be taken, according to present knowledge, as having an extreme length of some 20 miles north and south, with a width of not less than 5 miles. This extreme length takes in the field on the "Mill Stream" (so called) lying some 8 to 9 miles northwest of the town of Bathurst, as well as the portion, which is hereafter described more fully, on the northern bank of the Nipisiguit river. The larger section has an area of approximately 30 square miles. There is a linear gap of about 16 miles between the Nipisiguit area and the small area on the Mill Stream.

The rocks in which these deposits of iron ore are found are all metamorphosed or crystalline. They have been mapped as Pre-Cambrian,and belong, probably, to one of the Huronian members.

In a general way they consist of micacaeous and chlorite schists and slates with some quartzites. They are infrequently cut by small veinlets of quartz, and are also infrequently penetrated by dikes of jasper.

The surface rock about the outcrops is a mica schist, but the immediate hanging wall of the deposit is igneous, being a gabbrodiorite; the underlying rock or foot wall is a completely altered rock showing,under the microscope, only chlorite and muscovite, and its origin is uncertain, but is suggests (as is shown in the hanging) that it comes from a true volcanic.

The foot wall rock is filled with cubic crystals, both large and small, of pyrite on the edge near the body of iron ore, but its lower portion is more free from this metallic sulphide. The structural and stratigraphical relations remain to be worked out.

The designation of the ore found in this field is best given by the words "Magnetic-hematite." It has, as a rule, the characteristic cherry red streak and dark grey color of hematite, but in spots and in the vicinity of jasper intrusions is altered to a black ore which is magnetite. As a rule the ore is attracted by the magnet, a frequent characteristic of many grey specular ores. The magnetism, however, does not permeate all portions of the ore body, but is most frequently noted in the vicinity of the small intrusive veinlets of quartz and jasper which here and there penetrate the ore mass; in such places the ore has been convertd into a strict magnetite which gives the characteristic black streak, but remote from such intrusions the red streak of hematite is everywhere noted.

At the northern edge of this field (on the Ellis property) the only ore seen is a grey specular, which has not been exploited, but which appears to be more steeply inclined and to have a width of not over 5 or 6 feet.

The shore of the Bay of Chaleur contains a narrow strip of rocks belonging to the lower and middle Carboniferous, which is followed to the south by red and purple shales and sandstones which represent, probably, the Mill Stone Grit, as they are followed by, and include some of, the typical coarse grey sandstones of the Grit. This Carboniferous system extends along the eastern bank of the Nipisiguit river for 13 or 14 miles, but the western bank shows only the old granites and gneisses of Laurentian Age for the same distance. The inclination of the Carboniferous is very slight, the average running from 3 to 4 degrees from the horizontal. Above, or to the south of, the Laurentian and lying directly upon the granite are reddish and grey schists and slates, shading into blue or black slates which, in places, are highly disturbed and occasionally cut by quartz veins which render the schists more quartzose and less feldspathic. Frequently the black slates are ferruginous with pyrites, and in places the silicification has formed hard green quartzites whose color is doubtless due to a mixture of chlorite.

It is in this series of altered schists and slates that the iron beds occur. Twenty-eight years ago these schists and slates were provisionally regarded as "Cambro-Silurian" or portions of them as "Pre-Cambrian." Although unaltered eruptives were not noticed in the field the microscopic examination of the hanging and foot wall country indicate their presence in the vicinity.

Geological exploration of the region is exceedingly difficult owing to the dense growth of timber which covers it, and to the frequent patches of thick moss which cover the rock exposures. Undoubtedly a field party will be put into this new district during the coming summer in an endeavor to more clearly define the probable limits of the field, and to make a correct section, if possible, of the rock series in which the ore occurs.

Geography and topography.—The property lies about 21 miles from the town of Bathurst in a southwesterly direction, and on the north bank of the Nipisiguit river. The country rises quite rapidly in this distance, so that the elevation of the beds is about 450 to 500 feet above the sea level. Going southwest the country rises steadily until the hills of this section are reached, which vary in height from 800 to 1,500 feet above the sea level. The general character of the country is hilly and broken, with stretches of level lands along the main river. The general direction of the slight elevations which give a rolling character to the country is northwest and southeast, and across these ridges, with a general strike of nort northeast, run the bands of the formation which carry the iron ore, and which in consequence are sometimes exposed along the crests of the ridges.

Discovery.—The first discovery of ore in this field dates back to the year 1902, when Mr. William Hussey, of Bathurst, in attending some traps which had been set on Austen Brook (a tributary of the Nipisiguit River) hurt his foot upon a rock beneath the snow which turned out to be a piece of float ore from the crest of the hill nearby. The heavy character of this small boulder puzzled Mr. Hussey, who knocked off a piece and took it home with him, where it was shown to one or two people, and, by the kindness of Mr. T. M. Burns, was taken to Fredericton for examination by a Provincial Government official there, who at once pronounced it to be iron ore of a fairly good quality.

The previous history of iron ore deposits in New Brunswick had not been such as to make their mining particularly attractive as a venture, and it is not therefore surprising to find that little interest was shown in the matter. I am informed that a representative of the Dominion Iron and Steel Corporation visited the locality a few years ago, but saw only the scattered and comparatively small outcrops in the area which is now designated as "No. II." I am also informed that this

gentleman entertained a favorable opinion from the small surface exposures he was then able to see. But, in the winter of 1905, when in the same locality, Mr. Hussey remembered his previous mishap and and made a short but more thorough examination of the region, with the result that he found other outcrops and an abundance of fragments or boulders of ore on the southern bank of Austen Brook. This convinced Mr. Hussey and Mr. Burns that the ore was distributed over a quite extensive area, and these gentlemen secured rights to search upon several five-mile locations in this district.

Through the assistance of friends, advice was received from Dr. Eugene Haanel, the Dominion Superintendent of Mines, and under his authority Mr. Einar Lindemann made a survey of a portion of the field with the magnetometer, in whose use Mr. Lindemann was skilled. The Government of New Brunswick were also petitioned (under statutory regulations) for the use of the diamond drill belonging to the Province, which was granted, and the first hole was finished about the beginning of December, 1906, by which time Mr. Lindemann had completed his magnetometric survey and filed his report. Mr. Lindemann's opinion, as expressed in his report, was favorable to the existence of large bodies of ore, but could not, of course, indicate the purity or otherwise of such ore. For this reason the then owners decided to continue the work of drilling the field and obtaining analyses of the ore found in the cores.

(To be continued.)

BOOK REVIEWS.

A Text-book of Assaying, by C. and J. J. Beringer. 11th edition. Revised by J. J. Beringer. Crown 8 vo. Cloth, 10s. 6d. Charles Griffin & Co., London.

Is not the appreciation of high standards our higher education, and is it not to the Old World that we look for our standards? This book is one of the standards. It is one of that most excellent series of metallurgical books edited by the late Roberts-Austen. Published in 1889, it has now reached its 11th edition. One of its authors was at one time chief assayer to the Rio Tinto Copper Company. Its 11th edition has been revised by the Principal of the Camborne Mining School, a school that boasts, and rightly, of being one of the most practical mining schools in the world. Not only is it in the heart of a mining district but it owns a mine that is worked by the students. And because it is in an old district in which there are few openings for mining engineers these students are trained not specially in tin mining but for work all over the world.

This book certainly should be one of our high standards, not alone in assaying, but a standard for all technical works; it should be a standard in technical teaching; a guide not alone for students but for professors.

It contains 450 pages, sparsely illustrated, showing in its remarkable freedom from errors great care in its production. It has a fairly good index and an elaborate table of contents. The book is divided mainly into three parts, of which the first, covering only 86 pages, deals generally with methods, apparatus and reagents and more specifically with chemical equations and the determination of specific quantities. Part II. deals with the metals and alkali earths and covers 258 pages. Part III. deals with the non-metals in 90 pages, of which only two are given to coal. In all, the determination of 56 elements, besides cyanogen and ammonium, is outlined with greater or less elaborateness, and eight pages are devoted to the examination of water, including the determination of albuminoid ammonia. This sounds more like an encyclopedia than a text-book. In fact, it is somewhat of both. Gold, silver, and tin are dealt with fully. In copper and lead the treatment is not so complete. Iron from the ordinary assayer's point of view, not the iron specialist's, is fairly well taken care of, as are also manganese and sulphur. The rest of the determinations are touched on chiefly in outline.

All this is excellent; the general plan is good, but when we come to the details, alongside much that is good we find much of which to complain. As a rule the descriptions are clear, the effort is made to show each step distinctly, and the writers have generally in view an ignorant and untrained students; but the writing is often rambling and repeats itself, and does not leave the clear, succinct impression that is essential for laboratory work.

Proper weight is not given to methods and statements; several methods being given to accomplish the same end without any statement as to which is the best or sufficient explanation as to when one may be better than another. For example, the subject of the parting of gold and silver is dealt with in detail, eight pages geing devoted to it. The three methods of proceedure of parting in flashes, parting in test tubes, and parting in glazed crucibles, are given equal emphasis. From an academic point of view they are all three equally interesting; but from a commercial point of view, when one is working against time, they are not in the same class. This consideration is not even hinted at. Again, despite the eight pages of details of parting, we have to go back several pages to learn that it is not necessary to flatten out the bead before parting, that it may be done in the round form if sufficient silver is present, and nowhere are we told that if sufficiently dilute acid is used and the operation allowed to proceed slowly a coherent gold skeleton may result. This is a very simple point, but is sufficient to make or break the possibility of getting out the day's results.

This diffusing or scattering of the information occurs in other places, for example, in dealing with cupels. In Chapter II. on Methods of Assaying, in the description of apparatus there are a few lines on the making of cupels. In Chapter IX. under the heading of Gold there is some more information on the making of cupels. But in the whole book there is not enough information to teach a man how to make a satisfactory cupel. There is nothing about the desirable qualities of the bone ash or its necessary coarseness or fineness. There is not a word about the many cupel making machines in use at the present day, nor a hint at possible substitutes, such as Portland cement, that so many use with complete satisfaction. There are seventeen pages altogether on cupellation, and except for the lack of succinctness, they deal fairly thoroughly with the sub-

ject. The academic side is well handled, the practical or the commercial side does not seem to have occurred to the authors. And yet in other parts of the book detailed instructions are not lacking. We are told that coke furnaces should be started with wood, as the coke is hard to ignite. We are even told that when preparing samples "one ore should be done at a time." But these are minor details, only of importance as they shed light on the general trend of mind or method of the teachers.

On the all-important question of the choice of methods of proceedure the book is safe and solid. Except in the one case of tin it makes no effort to be up-to-date; it stands by the old reliable methods, and sometimes one is almost tempted to call it Archaic. One fails to find any attempt at quick methods or short-cuts. In fact, accuracy, and accuracy only, seems to be the qualification sought after. Time and simplicity of operation are so unimportant that one fails to find even a hint concerning them. The preliminary roasting of ores, sometimes in roasting dishes, sometimes in crucibles buried in coke (!) is recommended, and only once are nails referred to. It is true, it is sometimes recommended to use a bar of iron with sulphide ores, but we who never roast (or hardly ever), and to whom nails are as common in the assay office as crucibles, cannot help wondering at these methods.

There are, however, two good things in the way of methods. The authors condemn the pot or dry assay for lead. They say "it is only applicable to rich ores and with these only gives approximate results." They also damn the cyanide method for copper. This is good. They also in a great many cases show the effect on the accuracy of results of changes in the conditions of proceedure. This is often in the form of series of actual results. This is most excellent; it is the best point in the book, and one to which we would draw especial attention.

But though we have spoken well of their methods of determination, it must not be considered that even here their standards are such as we should look up to as high. They devote nearly six pages to the dry assay for copper. To the historian this method may be of interest, but why teach it to modern students? They say the electrolytic "is the most satisfactory method for copper," and they give eight pages to it, in which they describe old-fashioned apparatus, recommending the use of two cells of the old type Danniel battery, the porous pot of which "must be emptied out and recharged daily." They allow the current to act for sixteen hours and then say: "It still remains to determine any copper left undeposited in the solution," and they proceed to estimate this colorimetrically!

Now the electrolytic method for copper is not only the most useful that we have, but it is second to no other assay in accuracy of results, and it is less dependent on the skill of the assayer than any other assay. On the other hand, the colorimetric method depends entirely on the judgment of the assayer, and at best is only an approximation. To complete the electrolytic by the colorimetric is like doing most of a survey with a transit reading to minutes, and then finishing up with a prismatic compass; or perhaps a better simile would be to say that it was like making a journey in most part by automobile and then finishing up by walking the last few miles on foot. This may be all right and pleasant if one is an amateur and time is no object, but we learn assaying to earn money by it and we must get results. The electric current can be used to leave no measurable trace of copper in the solution, and even 10 years ago it did not take sixteen hours to do this. Nowadays it does not take four, and even on the weakest solutions the electrolytic method is much more accurate than the colorimetric.

However, as we have said before, the authors make not effort to be anywhere nearly up-to-date, except in the case of tin. In assaying cyanide solutions for gold they evaporate to dryness in a lead dish and make no mention of the zinc and lead acetate method. They always precipitate copper with sulphuretted hydrogen and make no hint of the possibilities of using aluminium. And their sulphuretted hydrogen they make in an ordinary bottle (upon which they waste one of their very few illustrations), that goes on making gas uninterruptedly till all the material is consumed!

Upon the whole question of apparatus they are very weak. They only mention two types of furnace, the wind furnace and the muffle furnace, both using coke. They illustrate these with the ash pit scorching the legs of the assayer. They mention no other fuel but coke, say nothing of gasoline furnaces, and never think of putting a crucible in a muffle, always using it in a bed of coke. They say that the fused material may be left in the crucible and "separated from it by breaking when cold." Also "wrought iron crucibles are very useful for making galena assays." And these statements, which appear to us foolish, carry as much emphasis in their book as their most valuable ones.

The whole subject of sieves is dismissed in three lines, and practically nothing is said about the degree of fineness to which a sample should be crushed, until they get to Appendix C, where there is a disappointing lecture on the theory of sampling. The only crushing appliance they mention is a "bruising-plate" which looks like our buck-board. It is used with a "bruising-hammer," which has a face four inches square! Not a word is said about any of the crushing or grinding machinery, which is so necessary to us. There is not even a word about the riffle-samplers (of the Jones or other types), which we consider essential. They impress the importance of thorough mixing, but they give not one word as to how it may be done beyond laboriously forming the material into a cone. In fact, all the way through the book no evidence is given of the slightest appreciation of the value of time. Very little is said about balances, nothing about their care. It is not even mentioned that more than one kind may be required in an assay office. In fact the only specification in regard to balances is the unqualified statement that "a fairly good balance should be sensitive to 0.0001 gram." Of course everyday gold balances are sensitive to one-tenth of this.

But enough! Evidently this book, despite all pretentious environment of its birth, is not a standard, at least not a standard for us. What is the matter? It has several faults, but from the broadest view it has two main faults. It shows no sign of progress in the art. With the one exception of the chapter on tin, this book might have been written almost entirely 20 years ago. The second fault is that it is academic and not commercial. What is the cause of these faults? There are probably many causes, and we are not in a position to define them, but, with all deference, we must remember that the book was produced in Cornwall. Now the sum total of progress in mining in Cornwall divided by the number of years they have been mining there is less

than in most other spots on the globe. The Phoenicians mined in Cornwall. This must needs have its effect. Though this may be a reason, it should not be allowed as an excuse.

We have before us several medical books no more pretentious than this, and they all breathe the spirit of progress in every page. One in particular on miscroscopical work, which is comparable with our assaying, gives its best efforts to illustrating time-saving and effort-saving methods. The latest mechanical devices and the latest stains whose greatest claims lie in their ability to do more and better work in a given time are given precedence over everything else. Surely medicine is not less academic than mining.

This book is not a high standard—for us it is no standard at all. A student trained only in this book would not be able to carry on successfully even a small commercial assay office in this country, and unless he had a very kind chief could not rightly fill the position of assistant in a large one. It is a useful book for reference, there is much to be learned from it, but it is of a type of which the weak points must be recognized by both our students and our teachers.

H. E. T. HAULTAIN.

EXCHANGES.

Mining and Scientific Press, June 6, 1908.—The fourth of Mr. T. A. Rickard's articles on Goldfield appears in this number. Its subtitle is "Rich Ore and Its Moral Effects." The article is an instruction summary of "high grading" in a country where that nefarious art was carried to a high pitch of perfection. We shall transcribe a few paragraphs from the paper:

"Rich ore invites theft. Wherever men find minerals so valuable that a small weight of it represents money, there the temptation to steal is inevitable, the weakguard of conventional morality is broken, and the conscience of the miner is debanched . . . . 'High-grading' is larceny."

The peculiar labor conditions gave the labor union a dangerous control of the stock market. "Mining operations were condutced under leasehold; the owners of the mines were, for the most part, without experience of mining; they had no capital, and they did not know where to look for ore; so they granted leases to parties of working miners willing to work, and to adventurous operators willing to furnish the money for exploration."

"The ore was rich indeed. In the Francis Mohawk lease at a depth of 200 feet, there was eight inches of stuff that assayed $250,000 per ton; it was free gold and calaverite or telluride of gold. The various leases on the Mohawk mine yielded a total of $50,000 per day for 106 consecutive days. One carload shipped to the Selby smelter weighed 47 tons, and assayed 609 ounces of gold per ton, so that the shipment was worth $591,637, that is, more than $6 per pound. There were many places in the mines where men knew thy were breaking ore worth 10 to 15 dollars per pound. It was easy to steal several pounds of ore. And they did . . . It is estimated that last summer over $1,000,000 worth of ore of which no proper account was made went out from the Mohawk and Combination mines, and $500,000 to $750,000 from the Florence. Not less than $1,000 per day of illicit bullion passed trhough the United States mint at Carson . . . . Only $300,000 was recovered last year from the whole camp, despite every effort to find the stolen ore. It is most difficult to trace the 'high grade,' for the thieves crush it at once and so destroy the chance to identify the poduct from any particular mine. Unless identified positively, the legal evidence is incomplete. The stolen ore is usually taken to a bogus assay office, the proprietor of which pays about 50 per cent. of its real worth. The ore is treated by chlorination . . . . In one case a plant was raided while in operation. The heading assayed 260 ounces gold per ton; the tailing assayed 15 ounces. Larceny does not wait on accurate metallurgical method."

The owner of the establishment said that "this residue would be sold to a man who intended to salt the oxidized ore on a neighboring claim. Even when the circumstantial evidence seems convincing, the local justices are afraid to convict; public opinion regards 'high grading' as rather humurous, the labor unions preach a doctrine by virtue of which a little rich ore is the miner's perquisite, the rush to become wealthy possesses everyone, and in the excitement the moral law is left high and dry."

"Regular harnesses were invented for carrying ore under the working clothes of the miners. They would step from the cage or bucket and stumble heavily laden on their way homeward without being arrested, although the officials knew why they walked so clumsily." Picturesque incidents are cited, especially of the connivance of the labor union. "And thus we come to the root of it all; the subservience of the lessees to the labor union. Why? Because the ore was rich, and the terms of the leases were short, the lessees could not afford to delay the extraction of ore by having trouble with the men; the men knew it, and so stole as much as they could . . . . The rights of property were not respected because the judges who preside over the local courts owed their position to political election."

But stealing was not confined to the miners. Stories are told of others, among them one of a mining company president who filled his suit case with specimen ore each time he visited the mine. His stealings in one year amounted to $22,000.

"During the strike that was ended in April, 1907, the stock market was worked by the labor union leaders. They would call a meeting under pretext of settling the strike, and the announcement of this fact would lead to the buying of shares by the general public; they would sell short, and then cover their shorts by open purchases made through their wives; this stimulated more buying; then the counting of votes cast at the meeting of the union would be dragged along so as to afford the time necessary to complete the stock transactions. Thus they see-sawed the market five or six times. This broke the brokers, who had been breaking the public. It was a merciless game of depredation. . . . There was not much to choose between them all; it was a case of catch as catch can, with the odds in favor of the one who first placed his hands on the ore—the miner himself."

The Mining World, June 20, 1908.—Henry A. Mather writes in this number of the mining and metallurgical industry in Georgia. The hydraulic gold of Georgia is generally so flaky that more than 50 per cent. escapes the riffles. When the sandy quartz veins are stamped and amalgamated less than 50 per cent. is saved. The mines generally credit the hydraulic dirt with $3 to the yard, though some of it showed over $100.

The deepest shaft in Georgia is 160 feet and the total gold extraction from 1825 to date is about $10,000,000, of which 80 per cent. has been obtained from hydraulic operations. No dredge has yet been operated in the country although dredging would probably be profitable.

Mining property is difficult to purchase at a fair valuation. Some of the older miners use blanket boxes as auxiliaries, to the rifles and there are reports of savings of over $60 per yard from the finer vegetable mold which necessarily churns up into silt and escapes the riffles.

The Colliery Guardian, June 12, 1908.—The Norton Hill Colliery accident is commented upon in the recent number of the Colliery Guardian. The investigation following the explosion brought out much conflicting evidence. The question as to whether the explosion was due to coaldust, to firedamp, or to both of these agencies, could hardly be settled. There is yet much difference of opinion amongst investigators. But "the official view that because some kinds of coaldust may produce an explosion, therefore all coaldust is to be regarded as dangerous, and precautions are to be taken accordingly, is without doubt the safest; but until there is more unanimity upon the coaldust theory, these precautions will not be taken in all cases, especially while any discretion is left to the management as to what is to be considered a dry and dusty mine."

PERSONAL AND GENERAL.

Mr. W. K. McNeil, manager of the Canadian Laboratories, Toronto, was united in marriage on June 17, to Miss Welsh of Markham, Ont.

Mr. J. J. Harpell, business manager of the "Canadian Mining Journal," is visiting Great Britain on business. He will be absent throughout July.

Mr. J. F. Black of Sudbury, Ont., visited Toronto on June 12. Mr. Black is the original discoverer of the Moose Mountain iron ore deposits.

Mr. S. Cohen, manager of the Crown Reserve mine, Cobalt, Ont., was injured recently in a runaway accident. Mr. Cohen's right shoulder was broken.

Mr. H. H. Sutherland, late of Haileybury, has returned from Rawhide. Since last February Mr. Sutherland has been working in that new camp. He has now secured an advantageous lease on a claim and is opening the property at a rapid rate.

Mr. W. Fleet Robertson, the provincial mineralogist of British Columbia, is exploring the Finlay River district. He will be absent two and a half or three months. He will examine the extent and value of the reported discoveries of placer gold at and around McConnel creek. On both trips Mr. Robertson will, by means of wide detours, explore the country. He will report upon the desirability and probable location of roads.

CORRESPONDENCE.

To the Editor,
"Canadian Mining Journal."

Dear Sir:—In your issue of June 1st, Mr. F. Hille makes some criticisms of two papers read by me before the Canadian Mining Institute, to which I desire to make a brief reply. Criticisms of such papers are welcomed by the Institute and by the writers, and if more written ones were made the Institute's Journal would gain in value. Such criticisms should, however, be of the facts given, or of the inferences drawn, and here Mr. Hille lamentably fails. To shorten this note I will not reply to his criticism of my paper on "The Iron Ores of Ontario," leaving that to Professor Leith, who is charged with the same error as myself.

As to my paper on "The Origin of Deposits of Pyrites" (Jour. Can. Min. Inst. X, 118-123, and Can. Min. Jour. Nov., 1907), Mr. Hille has done me the doubtful honor of reading it so carelessly as to be unacquainted with its contents. For instance, he says: "He attributes the origin of a large number of the pyrites deposits to sedimentation, and refers for support to Beck, Kemp and others." On the contrary, Beck and Kemp give no support whatever to my thesis, and I cited their two recent books on Ore Deposits to show current opinion on the topic.

Again Mr. Hille writes, "I fail to find any explanation as to what kind of sedimentation he ascribes their occurrence." Let me call his attention to the following quotations. "The third theory (sedimentary beds) assumes the precipitation of iron sulphide from solution as a bed at the bottom of shallow water. Other chemical and mechanical sediments occur above and below such beds." (page 1 pamphlet edition). "The pyrites in the iron ranges can be satisfactorily accounted for as a chemical precipitate" page 10. "We conclude, then, that for a number of our Ontario pyrites beds the origin has been one of chemical sedimentation" page 11, and further on pages 8, 9, and 10 details are given of how sedimentation was effected.

Again Mr. Hille says that I attribute to the pyrites deposits near Schreiber a sedimentary origin. On the contrary I wrote, "Near Schreiber. . . . . is a deposit of a different character," and specifically mentioned that "the ore is associated with an eruptive diabase, and is considerable mixed with pyrrhotite carrying small amounts of nickel and copper."

I can only acount for these mistakes by a very casual reading of my paper. There are other mistakes in his letter of a different class.

For example, Mr. Hille writes:

"There is no doubt that the Helen ore is to a large extent an oxidation product, from pyrites and siderite, but these minerals are not of the same age as the Animikie rocks, as has been repeatedly asserted, but date from the time of the greenstone eruptions, which occurred after the Animikie had been laid down."

I know of no competent geologists who asserts that these minerals are of the same age as the Animikie rocks. On the contrary such men as Van Hise, Leith, Coleman, Merriam and others agree in considering the pyrites and siderite of Keewatin age. Mr. Hille alone asserts that they are of post-Animikie age and we may reasonably ask for some proof of this amazing statement. I may note in passing that pebbles of pyrites and siderite from the Helen formation occur in the Lower Huronian conglomerate which much antedates the post-Animikie eruptive greenstones.

With Mr. Hille's suggestion that the "pond like places or rounded depressions are the collars and vents of craters, vents of geysers, or fumaroles" I have no sympathy. The pond at the Helen mine is undoubtedly due to solution (see paper by Coleman in Geol. Soc. Am.). At Goudreau Lake numerous examples are found of hollows from a few feet in diameter to several hundred. That they are due to solution has been admitted by all who have seen them.

Apparently Mr. Hille believes that the iron pyrites beds of Ontario are due to expiring vulcanism. If so, will he please explain why all these volcanic deposits happen to be associated with the Keewatin iron sediments? The Michipicoten pyrites for instance, he associates with post-Animikie greenstone. Why did these eruptions all occur for 60 miles along a narrow band of Keewatin iron sediments at most under 1,200 feet wide, and never in the Keewatin schists, or in the lower Huronian conglomerates and slates, or in the Laurentian granites which border this strip? How does he account for the microscopical character of these pyritous cherts which seem to all observers to be chemical sediments? Has he any evidence to offer that the pyrites was deposits in the siliceous and sideritic beds subsequently to their deposition as sediments? Criticism of this character would be valuable.

Yours truly,

A. B. WILLMOTT.

INDUSTRIAL SECTION.

The Manufacture of Grinding Wheels and Other Abrasive Products.—Before the invention of the electric furnace artificial abrasives suitable for grinding wheels were unknown. Wheel manufacturers necessarily depended upon natural products, chiefly corundum and emery. As emery occurs in considerable quantities in various parts of the world, it came to be recognized and used as the chief raw material for grinding wheels and other products employed in grinding metals. On this account the modern grinding wheel made of any abrasive is popularly known as the "emery wheel."

The Norton Company has during the past few years been operating an electric furnace plant at Niagara Falls, in which has been developed and brought out an abrasive known as alundum, which possesses the characteristics of sharpness, uniformity and right temper.

The introduction of alundum in the field of grinding has been remarkably successful and rapid. The requisites sought for and attained in this abrasive are extreme hardness and sharpness, combined with uniformity and proper temper. These qualities in alundum have had much to do with its successful development.

The process of making alundum consists in taking the purest amorphous oxide of aluminium found in nature, bauxite, purifying and melting it in immense electric furnaces, the power for which is furnished by the Falls of Niagara. Upon cooling, this molten mass solidifies in solid ingots of alundum. Beautiful crystals are found in the centre of these masses, showing nearly all the variety of colors found in the ruby and sapphire, of which alundum is one variety. The rarer col-

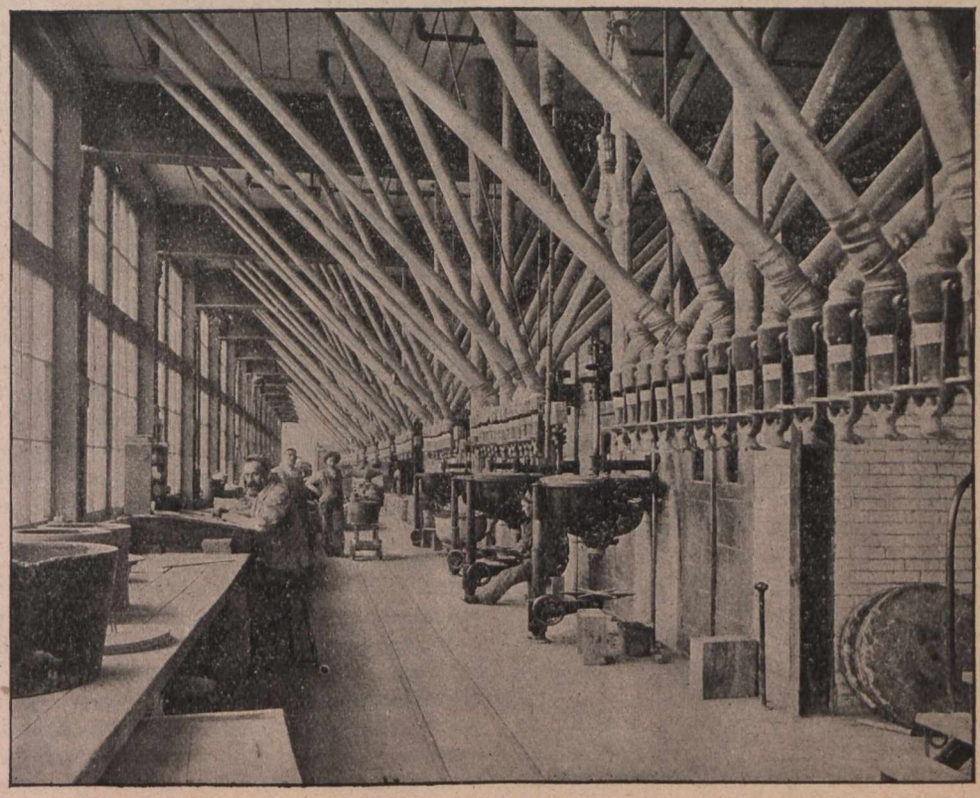


FIG. 3

ors of light pink, blue and purple found in Oriental gems are sometimes noticed in small crystals.

Bauxite is the purest naturally-occurring amorphous oxide of aluminium known. This mineral was originally found at Baux, France, from which it derives its name, but purer forms are now obtainable on this continent. The best quality only is used in the manufacture of alundum, and in its preparation practically all impurities are removed. The high grades of bauxite used are of rare occurrence. The Norton Company, however, owns its own mines from which the purest grade is obtained.

The bauxite is heated in calciners to drive off the combined water, and is then melted directly in electric furnaces of special design. It was not practical to fuse bauxite commercially until the invention of this process. The temperature in these furnaces probably ranges from 5,000 degrees to 6,000 degrees Fahrenheit.

The operation of these furnaces and the composition of the molten bath is under the control of the furnace operative. Exact quality and uniformity, which are so important in steel manufacture, are fully as important in the manufacture of alundum. The highest grades of steel are now being made in electric furnaces because impurities can be removed at the high temperatures obtained by the electric arc, and the quality of the molten bath uniformly maintained. In the alundum furnace both the purity and uniformity of the alundum are assured. Each step in the process is under the close supervision of expert chemists, who are constantly directing and following the work by careful analyses in the Norton Company's chemical laboratory.

After the ingots of alundum have cooled they are broken up and the pieces are then reduced to smaller pieces by means of powerful crushers. After this reduction the material is still further reduced by being passed through smaller crushers and several sets of grains, which are required in the manufacture of grinding wheels. After passing through rolls, it is subjected to the usual washing and drying processes to prepare it for manufacture into grinding wheels, rubbing and sharpening stones and other articles.

The solid massive alundum, while resembling the purest natural corundum in chemical composition, has the remarkable quality of being considerably harder than the natural product. This is due to the perfectly fluid condition in which the mass is brought, the control of its composition, the rate and method of its cooling and solidifying by which it receives its temper, and the absence of water of combination.

The necessary requisites for the most efficient abrasive for grinding wheels are: 1st, sharpness; 2nd, hardness; 3rd, right temper; 4th, uniformity.

In order to insure rapid and continued cutting so far as sharpness is concerned, a peculiar quality is necessary. There must be a fracture which will give a number of sharp cutting points.

In the matter of hardness the recognized standard is the diamond, which is the No. 10 in the scale of hardness; nothing that man has yet discovered or made equals the diamond in hardness. The term "hardness" is, therefore, a comparative term, the hardness of a mineral being ascertained by its ability to scratch another mineral of a known degree of hardness, or to be scratched by such a mineral.

Pure crystalline corundum, represented by the best sapphire or ruby, has always been the standard for No. 9 in the scale of hardness. This is readily scratched by alundum; in fact, alundum powder is used for cutting and drilling rubies and sapphires for watch jewels, etc.

By "temper" is meant its strength of grain and the character of its fracture under grinding pressures. An alundum grain is remarkably tough and will stand more crushing pressure before breaking than any other abrasive grain, but when it does break it breaks with a sharp crisp fracture, giving a fresh, keen cutting edge. This is a most important quality in an abrasive.

Purity, besides resulting in greater hardness and better temper, is necessary in the bonding of the grain into wheels in order to secure accurate and uniform results. Uniformity is necessary to secure constant efficiency of grade and temper in a wheel, so that wheels can be accurately duplicated at any time and maintain their standard of work.

Uniformity is one of the most important requisites in an abrasive. The ability to duplicate grinding wheels is essential to obtain the best results. In grinding wheels the abrasive grain of a given size is bonded together to produce a certain grade or temper for a certain kind of work. The term grade, as applied to wheels to designate the degree of hardness, is the resistance of the particles to the pressure employed in the act of grinding. A wheel from which the particles are easily broken is called soft, while one which retains its particles longer is called hard. Wheels are graded from soft to hard, depending upon the class of work on which they are used. Different grades of wheels are obtained, according to the amount of bond employed, the wheel becoming harder as the amount of bond used increases.

Different grades are required for different materials to be ground; cast iron, steel, brass, glass, bone, leather, wood and other substances demand wheels of special grade, which must be duplicated to make the grinding operation continuously efficient.

Then a record of each wheel is entered on a prepared form, with description on wheel, number of revolutions, order number, and for whom the wheel is intended. This record is signed and sworn to by the tester of the wheels each day before a Justice of the Peace, and carefully filed by the Norton Company. A record is preserved of each order, so that it can be duplicated exactly as to composition, cutting quality, shape and size.

Very few people realize the many uses for which grinding wheels are employed. They are used in the machine shop for sharpening all kinds of tools, cutters, reamers, taps, dies, etc. In the foundry for grinding castings. The sawyer gums and files his saws with an alundum wheel with no danger from drawing the temper of the tool. The leather manufacturer finishes the leather for suede gloves on a grinding wheel. The manufacturing optician grinds the edges of lenses for eye glasses. In the great glass works beading, fluting, edge grinding of tumblers, checkering fine stars, and fine work of all character calls for grinding wheels and abrasive stones.

The Canadian Fairbanks Company, Limited, are the selling agents for Norton grinding wheels, and stones, and carry large stocks in their several warehouses at Montreal, Toronto, St. John, Winnipeg, Calgary and Vancouver. Catalogues and booklets describing the manufacturing of alundum into grinding wheels will be mailed to any address on application.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

Glace Bay.

The management of the Nova Scotia Steel & Coal Company have not appointed their representative on the Board of Conciliation which was applied for by the P. W. A. upon this company's refusal of the men's demands for an increase in wages. The Nova Scotia Steel & Coal Company say they cannot afford to grant any increase in wages in the present state of the market, and their action in closing down their Sydney Mines steel plant should speak for itself, when considered in connection with the passing of the Scotia dividend. The fact of the matter is that the present state of the coal and iron market tends rather to a reduction in wages than any increases, and it was only the peculiar territorial conditions that attend the operations of the Dominion Coal Company that enabled that company to grant the increase they recently consented to under the Board of Conciliation held in March. It is evident that the Sydney Mines company cannot grant any advance in wages, and whether the leaders of the P. W. A. will have the courage to accept the inevitable, in the face of what will be urged against any such action by the fiery spirits who want to fight, remains to be seen. The fact of the matter is that the labor market is a shade too easy to warrant a strike in Cape Breton.

Mr. Graham Fraser's residence at North Sydney has been turned into what is now the Harbor View Hospital. The funds for the work of this much needed institution have been raised by the workmen of the Nova Scotia Steel & Coal Company, assisted by the company, and by a general public subscription at Sydney Mines. Everybody knows the crying need for proper hospital accomodation in colliery and steel towns, and the citizens and workmen of Sydney Mines are to be congratulated on their successful efforts in this direction.

The long agitated question of whether the P. W. A. shall amalgamate with the U. M. W. A. is to be decided by a general vote of all the members of the P. W. A. to be taken on the 24th of June and may the best men win. Like Josh Billings, we prefer to prophesy after the event.

So far the outputs of the Dominion Coal Company for the month of June have been remarkably good. To the 15th they aggregate 185,000 tons, and if all continues to go well the month of June, 1908, will be in every respect a record one. Indeed records are flying all over just now. All the mines from No. 1 to No. 12 are on the producing list, and new and old keeping up a steady average. In previous years June has shared with October the production of large outputs. The three summer months between are, however, fraught with uncertainty, it being the holiday and picnic season. Picnics are an institution dear to the heart of the Cape Bretonian, but they do not interfere dreadfully with outputs. We have often though it would be better if men would take their vacation in such a way as not to utterly disorganize everything at one time. It is a scheme that has worked well elsewhere. Every man is entitled to his yearly vacation, but one can understand the language of a colliery manager when his outputs go down and his costs go up, coincident with a picnic. Still, it is pleasant out o' doors in Cape Breton when the wild iris blooms.

One of the Halifax papers contained an article borrowed from English sources, having reference to the influence of a legislative Eeight Hour day on the price of coal in that country, which classes as fallacious all arguments forecasting an increase in the price of coal following the enactment of an Eight Hour day, and proceeds as follows: "Poor men ask why they who work much longer than the miners, and receive far less than the miners, should pay more for a common necessity of life in order that the hours of a body of workmen much more fortunately placed should be still further reduced." This sentence is a gem of truth in the midst of a matrix of error, for the article goes on to insinuate that these same workingmen are being designedly stirred up against their fellows by the bogey of dear coal. But leaving this aside, we consider the question asked is a very natural one, and a question moreover that many, very many, British workingmen are asking themselves to-day. In conversing with an English emigrant recently the writer was told that the "British Workingman"—that favored person whose glorious possibilities and privileges are daily held up for the fatuous admiration of credulous workmen in this part of the Empire—was walking the streets of Sheffield, Manchester and other large manufacturing centres of England, thousands upon thousands of him, looking for work, asking nothing but work. This man expressed himself as being deeply grateful for the chance that had enabled him to leave his favored homeland to find a less favored spot where he could nevertheless find work and bread. He was a British workingman himself, but he expressed his views on radical legislation in terms that occasioned us some surprise, and led one to ask whether there were not many British workingmen who were thinking along similar lines, and whether the day was for distant when there would be a distinct revulsion against the present craze for class legislation gone mad.

Kipling, in one of his "Letters to the Family" properly arraigns the soi-disant British workingman in the following unvarnished way: "Englands' weakness is an excess of voters who propose to live at the expense of the State. They pride themselves an being an avowed and organized enemy of the Empire. which as others see it, waits only to give them health, prosperity and power beyond anything their votes could win them in England." The fact is the true spirit of labor, the spirit that has made England and her family over the seas, still survives in England, and the blatant demagogue who preaches political economy according to his lights over the beery table of the alehouse, is not the British workingman. There are, to quote Kipling again, "millions of silent careful folk accustomed even yet to provide for their own offspring, to bring them up in the resolute fear of God, and to desire no more than the reward of their own labors. . . . It is one of their preoccupations to send their children to Sunday school by roundabout roads, lest they should pick up abominable blasphemies." And Kipling sums up the matter thus: "Meantime the only serious enemy to the Empire, within and without, is that very Democracy which depends on the Empire for its proper comfort, and in whose behalf these things are urged."

We have digressed from the main point at issue. Our writer states that the price of coal will not be increased by an Eight Hours Act, and he goes even further than this, in the following remarkable statement: "It would be possible to produce and distribute coal at a much lower price than that now ruling, though the workers labored for even less than eight hours, and though the wages were even higher than the trades union standard." After stating that there will be no increase in the price of coal, he states that any increase which may after all take place is explained by the fact that the coal owners "might artificially raise the price of coal to direct public opinion against the Eight Hours Bill." We find it hard to see why the coal owner, who has to pay a higher wage for a less labor return, should need to resort to artificial methods of raising the price of coal. His cost sheets will go up quite naturally, and we think the only thing artificial will be the dividends. At the risk of being thought unprogressive we still think the capitalist is entitled to some return.

The article goes on to prove how small is the share of the miner in the price obtained for the coal, and gives the following figures, which may be taken as correct:

Cost of production per ton, including wages.....	5s. 6d.
Railway rates..	7s. 0d.
Cost of distribution to the consumer in London....	2s. 0d.
Wagon hire (car hire)	1s. 0d.
Contingencies....	1s. 0d.

We quote the comment: "From these figures it will be clear that the miners' wages are an almost negligible item in the cost of coal, and that if the swollen profits of the various grades of parasites could be eliminated coal would be sold at a much lower price." We wonder how much would satisfy the miner? We have hear this same kind of argument (?) put even more crudely than by the present exponent. Miners' leaders have been known to argue that if a miner received say 50 cents for his mining, and coal sold at $2.50, the difference between these two amounts was the profit of the coal owner. There does not seem to be much more in the argument above.

What then is the wonderful remedy for a state of affairs so disastrous to the poor miner? Nothing novel, but the same old gags, state owned mines is one panacea, another is mines owned and operated by co-operative societies. We are sagely informed that a combination of coal consumers would be able to "bid defiance to the mine owner, the railway magnate, the middleman, and all other exploiters who are at present busily engaged in playing off their victims one against another." Really! We once knew a co-operative coal mine in Lancashire, England. It dropped a good many thousand pounds of good co-operative funds before it was allowed to go to a rapacious capitalist. The management of that same mine was enough to make the angels weep. Co-operation is a good thing, in its place, but its place is very distinctly not in coal mining.

We remember also a certain trades union that bought a coal mine and operated it. However, it did not work, as the workmen asked for more wages, and had they continued as they began the defence fund would have disappeared altogether. It was a miners union by the way, and what they didn't know about mining was very little, so they said. It hurts a Yorkshire miner to be asked about this mine.

Quite what relation all these views on co-operation and state ownership have to do with the price of coal as affected by the Eight Hours Bill we fail to see, although the article is headed with a large title to this effect. It is on a par with other half digested views on economics that are being daily put before our workmen.

But what are the actual facts as regards the returns obtained by English capitalists in coal mining. According to the most accurate figures that can be obtained the earnings of the coal owners in the Northumberland coalfield taken over twenty-one years averaged 5 per cent., and allowing for redemption of capital, 3 per cent. on the money invested. It will be found that 5 per cent. interest represents about all the profit that can be legitimately looked for by a coal mining concern over an extended period. Sir Christopher Furness, than whom we know of no better authority, states that out of the money expended in raising coal, exclusive of reserves for depreciation and remuneration of capital, labor receives 75.8 per cent. as its share.

The following remarks are taken from the Colliery Manager's Pocket Book, and English publication that has been issued annually for 39 years:

"If coal mines, then, with their great risks, as an investment only yield upon an average the same interest as Consols, why do persons put money into them at all? The answer of course is that it is the chance of a large profit that tempts investors. If many lose their money altogether, some few make larger profits, and each one hopes to be one of the lucky few. Moreover, it is the lucky ones that are in evidence. They are necessarily men of ability as well as fortunate, because coal mining is by no means a mere matter of chance. The successful coal owner usually goes into parliament, makes a figure there, becomes a baronet, and may even rise to the dignity of becoming the subject of a cartoon in Punch. He comes prominently before the public, and gives a fictitious importance to the advantage of coal as an investment. The unsuccessful coal owner, on the other hand, disappears from the scene, and is quite unknown to the general public."

The following figures are taken from the returns of the English Board of Trade covering the period 1886 to 1900.

Tons drawn, 2,807,395,000.
Value at pits mouth, £953,477,000.
Average value per ton, 6s. 9.65d.
Expenditure on wages, £642,386,000.
Remaining over for expenses other than wages, £311,092,000.

The amount remaining over is thus distributed by Lord Joicey, whose figures are based on accurate facts:

		Per ton.
Wages..	£642,386,000	4s. 7.01d.
Rents..	75,904,000	6.50d.
Materials, etc.	157,646,000	1s. 1.50d.
Profit....	77,542,000	6.64d.
	£953,478,000	6s. 9.65d.

Applying these figures to Nova Scotian Coal mining, what do we find? The item of rents, which in the English coal owners' balance sheet bulks as largs as his profits and oftentimes larger, is represented in Nova Scotia by the Provincial royalty on coal. The cost of transportation by rail is paid to a Government owned railway. The cost of materials represents an expenditure without which many Canadian manufacturers would die. Are all these parasites?

Another person signing himself "Aberdeen" publishes an "Open Letter to the Workingmen of Cape Breton," in which these poor benighted beings are told a few of their hitherto unrecognized miseries. We take it that this same person is an Englishman, for his writing shows a detachment and a complete failure to recognize the genius of his neighbors in Cape Breton. He says that the Town of New Aberdeen, which we are informed is as large as any in Nova Scotia, is "literally covered by houses owned by the Dominion Coal Company," and that this town is Government property, which the representatives of the people have leased to the Coal Company for all eternity! We are further informed that the real owners, that is the workingmen, are unable to get an inch of it on which to build a dwelling or to do business. Evidently this gentleman never heard of the company's standing offer to build a house for any of their workmen, giving the lot at $25, at 6 per cent. interest on the building cost, giving more liberal options to the purchaser than are to be found in any building society anywhere. The following clause in the company's lease may explain without further comment why the Coal Company have to be so careful with their leases: "The said land and any buildings thereon shall not be used in any event for the sale of intoxicating liquors, or for any illegal or immoral purposes." We are yet further told that the company's "shacks" are rented at $12 a month. Perhaps we may explain that these "shacks" are semi-detached blocks, each standing in a large lot. There are two houses in each block, which rent for $6 per month each. Each house has two large rooms and a kitchen downstairs, and three good-sized bedrooms, opening on to a central hall upstairs. When one considers that in the Town of Glace Bay rents are as high as $15 for two rooms, and that it is impossible to get a house

equal to the Coal Company's houses at less than from $15 to $20 per month, it will be seen how dreadful the Coal Company's charges are. Further, this writer says the company's store is an oppression. Perhaps this gentleman will explain why the Coal Company have voluntarily closed five of their stores in two years. He says the Coal Company supply the miners with goods "after the goods are paid for, of course." The trouble is that so many persons objected to paying for their goods.

At the end of the letter "Aberdeen" says (in capital letters) that he is elated to think he is the son of a workingman. He would have reason to be ashamed were he not. We have no room for leisured gentlemen in Nova Scotia. But is not the cult of the workingman being overdone? There is a dignity in labor, but we protest against the modern limitation of the term "workingman" to a particular class, or the gratuitous assumption that no person labors but the "horny handed son of toil," which is the way in which the soft handed agitator usually refers to the man who is working out the primeval curse. We venture to assert that the grind of modern life, the relentless wear and tear of nerve and tissue, does not fall to-day upon the workingman—so-called. There are men who labor, although their hands may be white and soft, who would gladly exchange places with the manual laborer, men whose brains crave for the "sweet sleep of the laboring man." The laboring man has a vote, but it is not upon him there is laid the stress of government, the burden of empire, the guiding of great emprise. There are men who work sixteen hours a day: work, that is, not endeavoring to give the minimum return for the maximum remuneration, but the right of these men to the title of workingman would be denied by many whose hands are horny, but whose convolutions are few.

We further question very much whether in this Canada of opportunity, this the land of true democracy, there is any virtue in being a workingman, if such virtue consists only in working with hoe or shovel for a day's wage. The Canadian should be the lord, not the helot of his hand, and very often the claim to the distinction of being a workingman is the reward of incapacity, or a dislike to exertion, to put it mildly.

And we are so convinced that the average Canadian appreciates this view as to believe that it will be a long time before the insidious leaven which is at present permeating the working classes of Great Britain, and which threatens to reduce them to a host of state fed paupers as were the citizens of degenerate Rome, will begin to work in Canada.

Therefore we fear that the persons who write so luridly and so sympathetically about the woes of Canadian workingmen are weaving ropes of sand. Nova Scotian workmen, in particular, must be getting quite case-hardened to the heart stirring depictions of their parlous case that daily appear in their newspapers, and by this time they must be about as effective as sermons usually are.

ONTARIO.

Cobalt.

The rails have been laid as far as the Lawson mine on the Kerr Lake branch of the T. & N. O. R. R. The track will shortly be completed to the terminal at the Drummond mine. This will effect a very great saving in mining costs of some of the important shipping mines, and a large number of promising prospects. The Kerr Lake, the Drummond, Foster, Cobalt Central, Silver Leaf, Crown Reserve and Lawson will be able to load ore and unload coal and supplies from cars directly on the property. The Temiskaming, Badger, Beaver, Rochester, Shamrock and many others in this section will with the completion of the improvement of the wagon road also be in a much better position to get in supplies and ship ore.

The activity in the southeast section of the Cobalt camp, which resulted from the discovery of a good vein on the Shamrock, and the very satisfactory development of the Badger, has affected a large majority of the properties in this section. At the Rochester mine ten men are now employed and one drill in operation drifting at the 50-foot level, the management hope to be in a position to largely increase their working force in the near future. A small force of men has been employed trenching and stripping on the Cobalt Merger.

The shareholders of the Beaver Consolidated have authorisd the issue of 480,000 shares of stock to the shareholders of record for the purpose of providing funds for further development of the property. Twenty men are now employed, No. 1 shaft which is down 110 feet will be sunk to a depth of 200 feet and drifting started at this level.

At the Shamrock 22 men are now employed. The shaft is being sunk to a depth of 150 feet. It is the intention to cross cut to the vein recently located with a diamond drill. The foundation and buildings for the new plant are well under way.

On the Coleman development property cornering on the Temiskaming, a vein from five to six feet wide of calcite and quartz with smaltite galena and small silver values has been found. A test pit is being sunk on this vein and a drift started from the main shaft, on the No. 1 vein at the 100-foot level to strike the new vein. Thirty men are employed under the management of A. R. Webster. A new compressor has been installed and is now in operation.

The shaft on the Paterson property, which adjoins the Cobalt Development, is now down 70 feet and will be sunk to the 150-foot level.

A contract has been let to sink the shaft on the Progress to a depth of 100 feet and trenching will be started on several leads.

On the Wetlauffer property preparations are being made to start work at once.

Little Nipissing.—This company has leased the property of the Amalgamated Cobalt lying directly east of and adjoining the Trethewey mine.

The work on the Peterson Lake lease of this company is progressing very satisfactorily. The shaft is now down fifty feet. On June 9, a car of ore was shipped to Copper Cliffe, another will be shipped within a few weeks.

Cobalt Lake.—Mr. Justice Riddell has given judgment in the action of the Florence Mining Company vs. the Cobalt Lake Mining Company. The decision dismisses the action with costs from April 20, 1907, the date of the Act of Legislature confirming the title in the Cobalt Lake Company. Justice Riddell says in part: "It seems to me the only recourse for the plaintiffs is to appeal for consideration of the Lieutenant Governnor in Council, with the manner in which such an appeal should be dealt with the Court has nothing to do."

Mr. Fraleck, the engineer in charge, in his recent report to the management states as follows:

"Re mining.—The north shaft is now down 139½ feet. At the 130-foot level a drift has been started towards the lake, a distance of twelve feet. The work for this machine for the past month comprises 21½ feet of sinking, 12 feet of drifting and in addition to this, the level station has been timbered.

No. 4, 1st level.—The north cross cut is now in 318 feet from No. 3, or 421 feet from the drift on No. 4, making the driving for this machine duirng the month, 53 feet, and in addition this cut to the south is now in a distance of 360 feet, making the driving for his machine for the month, 70 feet.

2nd level.—The north cross cut is now in a distance of 123 feet and the west drift is out underneath the lake a distance of 209 feet, making 63 feet of driving for this machine.

No. 6 shaft.—This shaft has been sunk to a depth of 145 feet, with 45 feet of driving at the 138-foot level, making

three feet of sinking and 35 feet drifting for this machine, but in addition the level station and the bottom portion of the shaft has been timbered and planked during the month.

Our total footage for the month was 257½ feet.

Crown Reserve.—The foundations for the new plant have been completed and work started on the buildings. The plant will consist of a six drill Sullivan compressor, 100 h.p. Jenckes boiler, an Allis-Chalmers hoist, etc. A complete electric light plant will also be installed. It is expected that the plant will be in operation by July 15th. The working shaft will be sunk fifteen feet deeper to the 100-foot level and a cross cut run to the big vein.

City of Cobalt.—An option for 30 days has been given to an English syndicate. An engineer representing the syndicate is now examining the property. On June 10th, the directors declared a dividend of three per cent. with a two per cent. bonus payable July 10th.

Red Rock.—Drifting has been started at the 100-foot level. Twenty men are now employed.

Trinity Cobalt.—The compressor and boiler recently ordered have been delivered on the property and will be set up at once. The shaft which is being sunk on the shore of Cross Lake, is now down 25 feet.

T. & H. B.—Another dividend of $2 per share will be declared this month, making a total of $103 in dividends on every share.

Silver Cliff.—Dr. Beattie Nesbitt and associates have taken a working bond on this property, which lies directly north of the King Edward. Five machine drills are being run, power being obtained from the King Edward and Colonial.

Coniagas.—A thirty stamp battery with 1,250 pound stamps, is to be installed.

Montreal River District.

The recorder of this district, Mr. Thos. H. Torrance, received instructions on June 18th, to take immediate steps to move the office from Latchford to Elk Lake. Mr. Torrance will arrange for the construction of the necessary office building at once. This decision of the department is a very wise one and will be received with great satisfaction by the miners and prospectors in the various camps in the vicinity of Elk Lake. The mail service is so very unsatisfactory at all seasons and the difficulty of getting in to and out of this district in the winter months is so great that the necessity of going to Latchford, 52 miles away, to conduct all business in connection with the Recorder's Office or Department of Mines, has entailed a very considerable hardship on the prospectors. Under the present conditions it is also much more satisfactory for all parties concerned that the hearing of disputes and settlement of the many troublesome questions arising from under the Mines Act, be heard and decided on the ground. Elk City is beyond question the most central point for the seven or eight hundred men now in the district and is rapidly becoming a substantial town.

Semi-official announcement has been made that only one inspector has been assigned to this district and no inspection will be made except of disputed claims or at the request of the licensee.

Cobalt.

The flotation of the La Rose Merger has been the most important event, affecting the camp, that has happened for some time. It means the active development of properties of merit that have been lying idle for so long. It also means a greatly increased production from La Rose itself, where until now nothing but development work has been going on and ore taken out in that work is all that has been shipped. There is actually blocked out, a greater value in high grade ore, in this one mine, than the total capitalization of the Merger, namely $7,500,000. There is a large tonnage of low grade ore on the dump and blocked out in the mine, and undoubtedly a concentrator will soon be put up.

Crown Reserve.—A car of ore, 22 tons in weight, was shipped to Copper Cliff on the 5th inst. Taking the probable value of this car into consideration, about $135,000 worth of ore has been shipped to date.

T. & H. B.—On the 8th of June a dividend of $2 per share was paid. This brings the dividends paid per share to $101. There are about 7,700 shares issued, the capitalization being $25,000.

Century.—A small force which is to be increased very shortly, is at work here sinking a shaft. The shaft is down 84 feet and a contract has been let to sink an additional 40 feet. A boiler hoist and pump have been installed.

Temagami Reserve.—An option has been given on the Stirling mine at Arsenic Lake near Temagami. Work will be started at once. The ore deposits are big, comparatively low grade ones. The ores are copper-gold bearing mispickel. Five leads have been opened up. From a cut on one of the mispickel leads, 100 tons have been taken, now on the dump, that will average 30 per cent. arsenic and $12 in gold and silver.

ALBERTA.

Lethbridge.

The past few weeks have seen some very heavy rains in this district. These rains have been welcomed by the farmers as assuring them a bountiful crop in the fall. Miners and all classes of the community have likewise appreciated the rain as good crops mean good business for the West and good business means good coal trade. However, the rains have not been an unmixed blessing, as all the mountain streams are in heavy flood and considerable damage has been done to bridges, etc. The Belly river overflowed its banks and did a great amount of damage, all the "flats" being flooded.

The Alberta Railway & Irrigation Company have considerable mine workings lying under these "flats" and in some cases where pillars were drawn the caves had gone right up to the surface. It was foreseen some time ago that should these "flats" be flooded the water would find its way into the mine, and in anticipation of this several dams had been built. As expected the water soon began to flow into the mine when the river overflowed, and had it not been for these dams confining the water to one district, the whole mine would have been flooded.

It is the intention of the company to pump out this water as soon as additional pumping machinery can be laid down. It is supposed that it will take several months to finally free the workings from water.

The mines are only working two and three days per week, but is is reported that better time may be made in the near future.

Bankhead.

Mr. John Galvin, vice president of District No. 18, U. M. W. of A., has been negotiating with the management of the Bankhead Mines Limited, with a view to setting a contract price on pillar drawing in No. 5 seam. Mr. Galvin and the Local Committee met the management but failed to come to an agreement, and the question has been referred to the Disputes Board for settlement. This board meets in the middle of each month to decide all cases which cannot be settled direct at the mines.

At present the pillars are being taken out by day labor, the rate of wages being the union rate of $3 per day, and the management claim that the contract price the men are asking would mean a wage very much in excess of this.

BRITISH COLUMBIA.

Michel.

The dispute between the Crow's Nest Pass Coal Company and its employees has been settled at a meeting between the district officers of the union and the management. The men who were discharged, have been reinstated, while the case of the employment of Henry Marchant, over whose non-employment the trouble started, has been dropped.

It now appears that Marchant is not a union man and the union therefore refuse to further his case. The action of the secretary of the Michel Local union is being strongly condemned on every hand, and it is the opinion of the district officers that every greivance of the Michel miners could have been settled without losing a single day's work.

Rossland.

On the Surprise and You Know portion of the Le Roi Two property an active campaign of development work by diamond drilling is in progress. The surface showing on these claims is very promising and the management are of the opinion that the time has arrived to further prospect these indications of ore. The output of the Le Roi No. 2, Limited, for May was 2,410 tons and some of the ore gave an average assay of 3.77 ounces gold and 6.7 per cent copper, making it worth $88.80 per ton. The lode in which these values were found was of an average width of two feet and another vein of an average width of four feet one inch carried 2.82 oz. gold and 9.7 per cent. copper, equal to $79.68 per ton.

In the lower levels of the Le Roi mine encouraging results are being obtained and once more the affairs of this concern are brightening. It is expected that the gross receipts from the operation of the mine during May will equal those of April, if they do not exceed them, and as the April receipts were $90,000 if those for May are greater it will tend to show that things are getting better with the big mine, and that the results of the campaign of extensive development work carried on last year are about to be realized.

The shipments for the week ending June 6th, and for the year to date, from Rossland camp show the following tonnage shipped:

	Week.	Year.
Centre Star	3,860	76,971
Le Roi	1,610	37,349
Le Roi No. 2, Limited	385	11,919
Giant California	....	95
Blue Bird	....	110
Red Eagle	....	20
Evening Star	....	428
Total	5,855	126,892

Work is going on in a busy manner around the small properties of the camp and a busy and profitable summer is looked forward to.

Phoenix.

The shipments from this district for the week ending June 6th, amounted to 25,807 tons, of which the Granby shipped 18,051 and the B. C. Copper Company properties 7,756 tons. This runs up the total amount of the Boundary for the year to date to 478,244 tons.

The information that the Granby Company had declared dividend of two per cent. payable June 13th, on their outstanding stock was welcome news to the many shareholders throughout this section and also to the business interests here generally. This act augurs well for the season's work that now lies before the Boundary miners. There will be no child's play in the winning of dividends from Mother Earth's stores of gold and copper in that section, but the sharpest and most far-seeing minds will have to use their best efforts to bring about this much desired result, owing to the low price of copper and the other difficulties to be contended with.

This is dividend number nine to be paid by the Granby since 1903, they having divided profits in these nine dividends with their stockholders to the sum of $3,238,630, this, of course, including the dividend now declared and about to be paid. Up to date the Boundary mines have paid $3,806,776 in dividends; the B. C. Copper Company having paid $201,200; Cariboo-McKinney, $546,837; Consolidated Company of Canada, $781,885, and the Providence $38,224, in addition to the above named sum distributed by the Granby.

Work at the B. C. Copper Company smelter has been started since last writing and the plant is now handling about 1,950 tons of ore daily. During the week ending June 13th, this smelter treated 12,215 tons. The Granby smelter for the same week treated 19,030 tons of ore, the ore shipments averaging about the same as for the week mentioned above. Four cars of blister copper were sent away from the B. C. Copper Company's smelter during this last week, and the new Rand duplex compressor which will be one of the largest and most up to date machines in the country, is expected to be making air within a few days now. One of the prime features of this machine is that it cuts out automatically to only 75, 50 or 25 per cent. of its capacity (3474 cubic feet) and consequently only consumes a proportional amount of power; making no more air than is being used. The compressor is driven by a 600 h.p. motor—rope drive.

The total ore shipments from the Granby for May totaled 93,316 tons, which is the greatest quantity ever shipped from the mines, with the exception of March. While all of the smelters furnace equipment was in operation in March, however, two of the furnaces were out of commission most of the time during May. For the first five months of this year the Granby shipments are 294,317 tons, a third more than for the same period last year, which is a pretty good showing under existing circumstances.

Events are so shaping themselves that work will be started on the Dominion Copper Company interests here in the near future. Preliminary statements to this effect have been received with gratification here. It is expected that the final word will be given shortly after the convention of the company's officials at Salt Lake City.

The Phoenix M. S. & D. Company recently formed has added another promising claim to its list of properties. Work on the E. P. U. is being steadily executed and in the course of the work this week at a point 900 feet in the tunnel another stringer was cut which gave an assay of $145.

A one-quarter interest in the Ajax and all of the Munster claim are to be sold at auction to satisfy a judgment obtained by F. M. Kerby against the McKinley Mines, Limited, for $406.80.

Nelson.

At the Queen Victoria mine, on which there is one of the largest showings of low grade copper ore in this district, a careful sampling of the property has been made and a 100-ton lot shipped to the Northport smelter for a test. Work has been resumed on the Buffalo, under management of Bruce White. The controlling interest in the Buffalo is held by Spokane mining men who are determined to give close attention to development work on the property. A mine that was a shipper from the Slocan twenty years ago, the Alpha, is once more being worked and the near future may see this old timer once again on the shipping list.

The Free Silver group, on Quartz Creek, is to be developed

extensively this coming season. There is a promising showing of galena on the group and the men behind the scheme are of sterling character.

Now that it is a forgone conclusion that the lead bounty will be extended for another five years, from June 30th, and with the two or three improved features which it will embody, the lead miners of the Slocan are already lying back with a sigh of relief, assured that for this further period they will be assured of a stable minimum price on the product of their mines.

GENERAL MINING NEWS.

NOVA SCOTIA.

Sydney Mines.—The closing of the iron and steel departments of the Nova Scotia Steel & Coal Company will reduce the output of the company's collieries by several hundred tons per day. The rumours of labor difficulties have been greatly exaggerated. The suspension of active work in the iron and steel departments is due to the fact that heavy stocks are now on hand.

The closing of the company's open hearth and blast furnace plants mean the throwing out of about 800 men engaged in these departments, with a pay roll of about $40,000 to $50,000 per month.

This does not take into consideration the effect this closing of the steel plants may have on the output of the mines.

The amount of coal consumed at the blast furnaces and open hearth is 600 tons per day, which represents the output of about 200 men engaged directly and indirectly in the handling and mining of this amount of coal.

The company have now this additional 600 tons of coal per day to find a market for.

Sydney Mines.—The new mine, Sydney No. 4, of the Nova Scotia Steel Company, commenced to be a producer on a promising scale on the first of the month. The management made no attempts at an output until everything was in readiness for a good start. The output for the first week of operation was expected to be 400 tons per day, and this ought to be doubled as soon as another machine is installed.

The company's coal shipments for May and the five months were as follows:

Shipments, May 1908	67,758
Shipments, May 1907	43,348
Increase, May 1908	24,410
Shipments, 5 months, 1908	223,495
Shipments, 5 months 1907	163,627
Increase, 5 months 1908	59,868

Sydney.—Three steamers are expected by the Dominion Steel Company to load rails for lake points for the Canadian Pacific, Canadian Northern and National Transcontinental Railways. Each of these vessels will carry 6,000 tons of finished steel. Arrangements have been made by the Steel Company to load twelve steamers with rails during the next two months, all of which will be shipped to lake points. American engineers, presumably of the Hill system, are at Winnipeg watching the results after the Cape Breton rails have been placed, and should they prove satisfactory, it is the intention to place several large orders with the Dominion Steel Company. The local plant is running twenty-four hours, with every skilled laborer available in harness.

Sydney.—The Dominion Iron & Steel Company has purchased half the property known as the Carlins Farm in the vicinity of the company's blast furnaces. It is believed that the object of the purchase is to allow the company latitude to ultimately increase its blast furnaces equipment.

Glace Bay.—From figures secured it is found that 810 of the Dominion Coal Company employees were off duty on Monday following pay day—that is, 10 per cent. of the total number employed. There were no picnics or other attractions to cause this.

The company figures that they lose at least 130,000 tons of coal per year by men absenting themselves from work.

The loss in wages to the men is $130,000; to the Government in royalty, $16,250, besides the value of the coal and the company's profit. This staying off work costs Cape Breton half a million dollars annually. Lay-offs are due largely to picnics and pay days.

ONTARIO.

Cobalt.—The Chambers-Ferland property, which is the basis of latest flotation on the Toronto and New York exchanges, comprises 124 acres adjacent to the La Rose, Nipissing, O'Brien, and Right of Way. It is under the same penalty as the O'Brien—the necessity of paying a royalty of 25 per cent. to the Ontario Government. Messrs. Frank Loring, M.E., and J. Edwards Leckie reported on the mine for the promoter, C. J. McCuaig of Montreal. The capitalization is $2,500,000 with but $300,000 in the treasury.

Port Arthur.—The Beaver Superior mill is being equipped. Twelve months' supply of ore is said to be stoped out.

ALBERTA.

Coleman.—More coke ovens are to be built at the works of the International Coal & Coke Company. The number at present in commission is 200. This is to be doubled. Materials are already assembled and ground has been broken.

BRITISH COLUMBIA.

Hazelton.—Returning prospectors from the Finlay river gold fields bring many contradictory reports. A few facts, however, are to be acepted on their face. Prospectors may choose one of two trails—the Omenica and the N. W. M. Police trail. On the latter trail the Skeena has to be crossed twice. Pack-horses must swim the current and packs are taken over in boats. On the Omenica trail there is only one small stream to ford. A trail is being blazed to Bear Lake. Supplies are scarce and horses are difficult to obtain.

Phoenix.—Official notice was received early in June that the mines and smelters of the Dominion Copper Company would resume work on June 15th, and instructions were forwarded to get everything into shape. The interest on $800,000 of 6 per cent. bonds has been settled. All the machinery is in good condition. At the Boundary Falls smelter sufficient fuel in stock to last for a month. There is also seven days' ore supply there in the bins. The Rawhide mine, with its enlarged trackage will be able to output 1,000 tons per day.

Vancouver.—The Ikeda mines, on Ikeda Bay, Moresby Island, send now about two hundred tons of ore per month to the Ladysmith smelter. This ore is won largely by development work. A four-drill compressor has been installed and

larger shipments will hereafter be made. A figure of 2,000 tons per month is expetced. The hand sorted ore carries 12 per cent. copper, $5 gold, and sixty ounces silver per ton. A dump of 1,000 tons second grade ore carries 8 per cent. copper and slightly less gold and silver than the first grade. Eighty-seven men are employed. Four tunnels open up the ore-body. The vein varies in size from five feet of high grade ore to eleven feet of low grade. Ore bunkers are being built.

YUKON.

Dawson.—The claim in 38 below Hunker, mostly unworked ground and supposed to be very valuable, was relocated by three Dawson citizens on May 19th. The Guggenheim dredge No. 7 is working immediately above this claim.

Dawson City.—Dave Cunningham, a miner working on No. 3a, below Discovery on Last Chance, made a brave rescue recently. A young Slav was overcome by gas whilst working in a shaft on the claim. His partner deserted him; Cunningham hurried down the shaft, made fast a rope about the unconscious man, and, after reaching the surface, worked for three hours in resuscitating the victim. His efforts were successful. Cunningham's bravery was the sensation of the day.

The Bear Creek dredge, the pioneer large machine on the Klondike river, is running in good form. The ladder has been lengthened seven feet and new buckets have replaced the old.

MINING NEWS OF THE WORLD.

GREAT BRITAIN.

The general report relating to mines and quarries for 1907 shows a total output of coal for the United Kingdom amounting to 267,830,962 tons, as compared with 251,067,628 tons in 1906. The production of iron ore was 15,731,604 tons, as compared with 15,500,406. The total number of persons employed in or about the mines was 972,220. At the mines under the Coal Mines Ast there were 1,245 deaths by accident, an increase of 29. The mines under the Metalliferous Mines Act had 34 fatalities, and there were 89 deaths by accident in the quarries, being a slight decrease in both cases.

A committee of coal owners in the Swansea districts has been formed for the establishment of a central rescue station at Swansea for the training of men in rescue work.

The Conselt Iron Company, of Newcastle-on-Tyne, has associated with a number of British, German, French and Belgian iron manufacturers to open up iron ore deposits in Algeria, where mining experts report a large quantity of ore of good quality about 100 miles inland from the port of Bona.

NORWAY.

The government has granted a concession for the Rustvangen mines in Hedemarken, to the Pehrson & Dovre Company for 75 years, the property to revert at the end of that period to the State without compensation. Only Norwegians are to be employed, and all material must be bought in Norway so long as it is not 10 per cent. dearer than that obtainable abroad.

RUSSIA.

A rich find of gold has been made in the lands of the Avriano-Petrovoski works of Orenburg province and development work has been begun.

Near the village of Biaely Klyutch, in Tiflis district, large deposits of manganese ore have been discovered by prospectors. The metal content is given as over 65 per cent.

UNITED STATES.

A new mining camp in Nevada, situated near Cactus Springs, 22 miles east of Goldfield, and within 15 miles of the San Pedro Railroad, has been christened "Rockefeller."

The United States Steel Corporation has taken over the iron ore properties of the W. L. Le Rue and Robert Whiteside of Duluth, in the Baraboo district, Wisconsin, and is preparing to undertake the development of mines. The only shipping property yet developed in this field is the Illinois mine of the International Harvester Company.

In May the two mines of the Butte district, Montana, produced about 27,537,300 pounds of copper from 346,425 tons of ore.

The consolidation of a number of producing zinc mines in Wisconsin is being negotiated at Benton with the object of erecting a joint ore-separating plant of the galena roast type.

MEXICO.

The new smelter of the Douglas Copper Company at Fundicion, Sonora, has been blown in and is expected to be an important factor in the development of mining ore on the west coast of Mexico. Hitherto all ore had to be shipped in the crude state to distant points for shipment. The smelter was mainly constructed to treat ore from the company's neighboring mines, and so far only the first unit of the plant has been installed, but with the development of theindustry it is expected that outside supplies will be extensively purchased.

The Benito Juarez Company has received machinery for its 150-ton mill and cyanide plant at Penon Blanco, San Luis Potosi. The plant will have a battery of 1,050 stamps and there will be 23 steel cyanide tanks for sand and slime treatment.

The Cananea Consolidated Copper Company has been granted a concession by the Mexican government for prospecting for oil in the State of Sonoro. The company will use oil in place of coal in its operations.

AUSTRALASIA.

There are nearly 1,000 miners at the Oaks Rush, Queensland where gold has been found at various points over an area extending for three miles. At the Three Nobs rich stone is being obtained at a depth of 30 feet.

A large deposit of iron ore is being opened up about six miles north of Mudgee Township near Lowes Peak, New South Wales. Two hundred tons have been sent to Lithgow for treatment and of the bulk sample proves equal to former tests an important industry will be established.

The lack of a sufficient water supply threatens to cause the closing down of the Great Cobar copper mine, New South Wales, employing 960 men.

In the Hill End country, New South Wales, quicksilver has been discovered in two places a mile apart.

SOUTH AFRICA.

Further substantial reductions in Rand working costs were made in April last. In the eight mines of the Eckstein Central Administration group, the average cost per ton milled was cut down to 17s. ¾d. The Robinson company records working

costs for the same month as 12s. 9-8d., as compared with 13s. in March.

What is claimed to be a world's record in underground driving has been made by two men employed on the Simmer Deep property, who carried a drive 24 feet in 61 consecutive shifts of 10 hours each. The size of the drive was 5 feet by 7 feet. One white man and six Chinese were employed on each shift, and they operated three Ingersoll-Sergeant rock drills on a bar.

CHINA.

The East Chinese Railway Company has for some years been working several coal mines in the Usswri district of Manchuria, and has recently started to work on two new coal deposits not far from the Lihmienpo and Harbin stations. The total requirement of coal for the road will bes upplied by these mines in future, and the company has organized a special department for their management.

STATISTICS AND RETURNS.

Outputs of Dominion Coal Company, June 1st to 15th, 1908.

No. 1	28,280
No. 2	34,980
No. 3	17,460
No. 4	21,240
No. 5	25,770
No. 6	11,940
No. 7	6,500
No. 8	11,130
No. 9	18,460
No. 10	8,620
Total	184,380

International Coal Company, Westville, N. S.

Shipments, May, 1908	22,623
Shipments, May 1907	24,813
Decrease, May, 1908	2,190
Shipments, 5 months, 1908	112,678
Shipments, 5 months, 1907	109,553
Increase, 5 months, 1908	3,125

Acadia Coal Company, Stellarton, N. S.

Shipments, May, 1908	25,483
Shipments, May, 1907	24,047
Increase, May, 1908	1,436
Shipments, 5 months, 1908	131,898
Shipments, 5 months, 1907	112,255
Increase, 5 months, 1908	19,643

COBALT ORE SHIPMENTS.

Following are the weekly shipments from Cobalt camp and those from Jan. 1st to date:.

	Week end. June 13.	Since Jan. 1.
Coniagas	63,100	568,680
Kerr Lake	57,980	462,300
McKinley	123,600	1,497,160
Nova Scotia	43,990	271,545
Little Nipissing	40,110	40,110
O'Brien	276,330	2,817,300
Right of Way	61,050	303,290
Temiskaming & H. B.	65,000	664,000
Trethewey	67,600	1,065,056

The total shipments for the week were 878,760 pounds, or 439 tons. The total shipment from Jan. 1st to date are 15,874,508 pounds, or 7,937 tons.

The output of the collieries of the Crow's Nest Pass Coal Company for the week ended June 12 totalled 22,769 tons, a daily average of 3,795 tons.

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

	Week end. June 20.	Since Jan. 1.
Buffalo		653,710
Coniagas		568,680
Cobalt Lake		246,455
Crown Reserve		84,000
Cobalt Central*		156,380
City of Cobalt		452,110
Drummond		148,600
Foster		238,400
Kerr Lake		462,300
King Edward		127,240
La Rose	104,670	2,486,322
McKinley	60,000	1,557,160
Nipissing	239,880	1,983,000
Nova Scotia		271,545
Little Nipissing		40,110
Nancy Helen		140,429
O'Brien	128,120	2,945,420
Right of Way		303,290
Provincial		143,210
Silver Leaf		196,620
Silver Cliff		52,000
Silver Queen		634,510
Townsite		85,100
Temiskaming & H. B.		664,000
Temiskaming		325,000
Trethewey	65,670	1,130,726
Watts		246,020

The total shipments for the week were 598,340 pounds, or 299 tons. The total shipments from January 1st to date are 16,533,118 pounds, or 8,266 tons.

*Concentrates.

Cobalt's output shows a big increase over last year. The tonnage of the first five months of 1908 is 2,649 tons more than that of the corresponding period of 1907.

The following monthly table shows the shipments of the camp for the first five months of the years 1907 and 1908:

	1907.	1908.	Inc.
January	908	1,325	345
February	903	1,173	270
March	1,027	1,852	805
May	1,158	1,601	443
April	533	1,317	784

Total shipments for five months, 1907, 4,602 tons; 1908, 7,251 tons; increase, 2,649 tons.

British Columbia ore shipments for week ending June 6th:

The shipments from the mines and the receipts at the smelters of the districts of South-eastern British Columbia for the past week and year to date were:

Ore Shipments.

	Week.	Year.
Boundary shipments—		
Granby	17,339	479,860
Mother Lode	5,476	17,202
Oro Denoro	3,270	6,740
Other mines	.....	545
Total	26,085	504,347
Rossland—		
Centre Star	2,612	76,888
Le Roi	1,556	35,883
Le Roi No. 2	546	13,433
Other mines	.....	518
Total	4,714	126,722
East of Boundary river—		
Whitewater (milled)	280	6,580
Poorman (milled)	250	5,100
Queen (milled)	185	4,245
Second Relief (milled)	140	2,535
St. Eugene	89	9,139
North Star	73	1,254
Silver Cup	31	250
Ymir	22	43
Other mines	.....	15,328
Total	1,070	45,287
Grand total	31,869	676,356

Smelter Receipts.

Grand Forks	17,339	479,860
Trail	4,284	122,572
Greenwood	8,746	23,942
Northport (Le Roi)	1,748	38,495
Marysville	.....	5,730
Total	32,117	670,599

The output of the Crow's Nest Pass Coal collieries for the week ending June 19 was 24,273 tons; daily average of 4,047 tons.

Following are the figures of German consumption of foreign coper for the months, January to April, 1908:

	Tons.
Imports of copper	56,533
Exports of copper	2,723
Consumption of copper	53,810

as compared with consumption during the same period in 1907, of 36,225 tons.

Of the above quantity 52,259 tons were imported from the United States.

Reported by L. Vogelstein & Company, New York.

Production of Coal in United States for 1907.

In the year 1907, coal production in the United States reached high water mark. The increase in production over 1906 was 66,292,764 short tons, or 16.01 per cent. in quantity, and $101,751,740 or 19.83 per cent. in value. The following table gives the quantity and value of the coal production in the United States in 1907, by States:

State.	Quantity (short tons.)	Value.
Alabama	14,250,454	$18,405,468
Arkansas	2,670,438	4,473,693
California and Alaska	24,089	91,813
Colorado	10,790,236	15,079,449
Georgia	362,401	449,686
Idaho	a7,588	a31,119
Illinois	51,317,146	54,687,382
Indiana	13,985,713	15,114,300
Iowa	7,574,322	12,258,012
Kansas	7,322,449	11,159,698
Kentucky	10,753,124	11,405,038
Maryland	5,532,628	6,623,697
Michigan	2,035,858	3,660,833
Missouri	3,906,294	6,399,616
Montana	2,016,857	3,907,082
New Mexico	2,628,959	3,832,128
North Dakota	347,760	560,199
Ohio	32,142,419	35,324,128
Oklahoma (Ind. T.)	3,642,658	7,433,914
Oregon	70,981	166,304
Pennsylvaia:		
Anthracite	85,604,312	163,584,056
Bituminous	150,321,437	155,837,770
Tennessee	6,810,243	8,490,334
Texas	1,618,069	2,778,811
Utah	1,947,607	2,959,769
Virginia	4,710,895	4,807,533
Washington	3,680,532	7,679,801
West Virginia	48,091,583	47,846,630
Wyoming	6,252,990	9,732,668
Total	480,450,042	614,831,549

a. Includes production of Nebraska and Nevada.

Great Britain's production of coal in 1907 was 267, 828, 276 long tons, or 299,969,669 short tons, and Great Britain is the second coal producing country of the world. The coal production of the United States in 1907 exceeded by 180,480,373 short tons, or more than 60 per cent. that of the British Isles. It was more than double that of Germany, and was equal to 40 per cent. of the total coal production of the world.

COMPANY NOTES.

The Crown Reserve Mining Company, Limited, has declared a half yearly dividend of four per cent. for the current year ending June 30,being at the rate of eight per cent. per annum. The dividend is payable only to shareholders of record on June 15th.

The directors of the Nova Scotia Steel & Coal Company on June 13th declared the usual dividend of two per cent. on the preferred stock payable July 15th, to shareholders of record June 30th. The transfer books will be closed from July 1st to 5th, inclusive. The directors decided not to pay any dividend on the comon stock for the quarter ending June 30th.

The annual meeting of the Dominion Iron & Steel Company will be held on June 25, and the annual statement to be presented then was made public in Montreal to-day. The company's fiscal year ended May 31st, and it is pointed out that the earnings of the company have again to be considered in the light of the judgment against the Dominion Coal Company. In the previous year, all the coal used has been charged against

operations at the contract price of $1.28 per ton. Interest charges for the year amounted to $696,814, and the net earnings were $1,917,011. From this there has been transferred to contingent account $1,376,831 to offset the sum which has been charged to the Dominion Coal Company for money paid during the year in excess of contract prices for coal. The remainder has provided for the sinking fund on first mortgage bonds, and maturing instalment of second mortgage bonds, leaving a balance of $220,417. Gross earnings were $2,613,815, compared with $2,247,566 for the preceding year. The output of steel was 280,00 tons, against 255,500 last year.

The directors of the Kerr Lake Mining Company on June 9th declared their eleventh regular quarterly dividend of two per cent and a bonus of one per cent. on the capital stock of the company, payable July 1st, 1908.

The Temiskaming Mining Company on June 18th declared a dividend of three per cent. on the par value of each share issued, payable July 1st, 1908.

The City of Cobalt Mining Company has declared a dividend of three per cent., with a bonus of two per cent., payable on July 1st, 1908.

Dominion Steel Company's Claims.

The Steel Company's claim of damages against the Coal Company is as follows up to May 31:

Paid for extra cost of coal purchased from Dominion Coal Company	$1,847,550.18
Paid for extra cost of coal purchased from others	465,005.76
Damages due to short deliveries in August, September and October, 1906	132,252.75
Damages due to cessation of deliveries in November, 1906, estimated	479,000.00
	$2,923,808.69

The interest to the same date amounted to over $80,000.

MARKET REPORTS.

Coke.

June 22—Connellsville coke, f.o.b. ovens—

Furnace coke, prompt, $1.50.
Foundry coke, prompt, $2 to $2.10.

Pig Iron.

June 22—Pittsburg—

No. 2 foundry, $15.50 to $15.90.
Bessemer, $16.90 to $17.15.
Basic, $16.15 to $16.40.
Malleable, $15.90 to $16.40.
Southern No. 2, $16.40 to $16.90.

Other Metals.

June 22—

Tin, Straits, 27.95 cents.
Copper, prime lake, 13 cents.
Lake, arsenical brands, 12.9 cents.
Electrolytic copper, 12.9 cents.
Sheet copper, 17 cents.
Copper wire, 14.75 cents.
Lead, 4.55 cents.
Spelter, 4.60 cents.
Sheet zinc, 7.50 cents.
Antimony, Cookson's, 8.60 to 8.65 cents.
Aluminium, 33 to 35 cents.
Nickel, 45 to 47 cents.
Platinum, $21 to $24 per ounce.
Bismuth, $1.75 per pound.
Quicksilver, $43.50 per 75 pound flask.

Silver Prices.

	New York. Cents.	London. Pence.
June 8	52⅞	24¾
June 9	53	24 7-16
June 10	53⅛	24½
June 11	53⅜	24⅝
June 12	53⅜	24⅝
June 13	53⅜	24⅝
June 15	54	24⅞
June 16	53⅞	24⅞
June 17	53⅞	24⅞
June 18	54⅜	25 1-16
June 19	54⅜	25⅛
June 20	54¼	25 1-16
June 22	54½	25⅛
June 23	55⅛	25⅜

The first five months of 1908 show a decrease of £1,746,488 in silver shipments from London to the East as compared with 1907.

MARKET NOTES.

An advance of a dollar a ton in iron bars is predicted early in July. A large volume of business was booked in the first week of June in iron and steel bars.

The following table shows the present prices of certain classes of steel under the revised schedule, compared with a year ago:

	June 10. 1908.	1907.
Bessemer iron	$16.50	$24.35
Bessemer billets	25.00	30.00
Plates	1.60	1.70
Structural steel	1.60	1.70
Wire nails	1.95	2.00
Iron bars	1.40	1.75
Steel bars	1.40	1.60
Sheets	2.40	2.50
Tin plates	3.89	4.09
Steel rails	28.00	28.00

It is estimated that the annual production of copper in the United States and Canada totals 1,000,000,000 pounds. The cost, making no allowance for depreciation, sinking funds, etc., is as follows:

250,000,000 lbs. ore produced at a cost of less than 10c per lb.
500,000,000 lbs. ore produced at a cost of about 12½c per lb.
250,000,000 lbs. ore produced at a cost of about or over 15c per lb.

The average cost of production is just about the present selling price.

Late in the week ending June 6th, Corrigan, McKinney & Company made a cut of 50 cents per ton on iron ore.