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CIRCULATION.

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OPPORTUNITIES FOR MINING VENTURES AND INVESTMENTS IN CANADA.

Canada has derived much advertisement from her unequalled mines of asbestos, of nickel, and of silver. One effect of this has been to throw into the background many most interesting mineral areas that, on their merits, should command attention.

The magnitude and diversity of Canada's mineral resources can only be grasped by those who are constantly in touch with mining and prospecting in all their branches. To attempt to draw up an inventory is impossible. But it is appropriate to allude to a few of the sound ventures and investments that are open in unadvertised regions of the Dominion.

We shall preface our remarks with the statement that there is great need of more exact statistics and data regarding the markets for mineral products. Official statistics are meagre. The process of searching out these things is costly and wearisome to the individual. At present, however, it devolves upon each investor to do his own investigating.

Without considering geographical order, we shall proceed to enumerate several fields which, in our opinion, should prove profitable to investors.

Eastern Ontario, particularly the northern parts of the counties of Hastings and Frontenac, is dotted with small prospects, abandoned mines, and not a few paying mines. The accepted opinion as to the gold mines of this Province is that they are not payable. This has not been proved. From private reports that we have read we have formed the deliberate judgment that several of the gold mines can be worked at a profit. And, apart from any question of management, conditions have so improved that costs are no longer prohibitive. But gold is only one of a dozen possibilities. Feldspar, talc, corundum, marble, iron pyrites, and iron ore are being produced on a small scale. The beautiful decorative stone, sodalite, is found in workable quantities. Copper pyrites has been mined. The introduction of cheap hydro-electric power means net profits in many instances.

The gold mines of Nova Scotia, like those of Ontario, require systematic proving. In the opinion of not a few competent judges, the Nova Scotian mines as a rule can be made to pay if worked as nature intended them to be worked. Here, as elsewhere, it is essential that each property be examined on its own merits. This is all the more necessary as the history of the camps has not been properly preserved. The rich tungsten prospects, the gold-bearing antimony ores, the manganese deposits, the gypsum, all await the advent of well-directed capital. Although a small province, Nova

Scotia has been prospected only in the most irregular and unsystematic manner.

The Portland Canal district, in Skeena Mining Division, British Columbia, is rapidly coming to the front. Veins of gold-silver-lead and silver-lead-copper ores hold the promise of good returns. United States investors were early on the spot. The district is large and easy of access by water. Sheep Creek, the gold-milling camp in the Nelson district, has often been mentioned in these columns. Here the chances for those who know something about gold mining are good.

While in Quebec there is much for the investor, there is even more for the prospector. The copper and gold of the eastern townships have been only scantily exploited.

New Brunswick holds out vague inducements. Rich iron-ore deposits are being opened. Antimony, manganese, gypsum, oil and gas, and, possibly, gold should be looked into.

We have omitted mentioning the vast hinterlands of Ontario and Quebec; the tremendous stretch of territory in north-western Canada; the copper and antimony of Cassiar; the gold-quartz of the Yukon. We have not touched upon the coal of Alberta and Saskatchewan. We have confined our attention to easily accessible tracts, lying mostly in the settled portions of the Dominion.

It must always be borne in mind that there is no royal road to success in mining. In pointing out the general fact that good opportunities do exist practically all over Canada, we are giving expression to a conviction that is being strengthened every day. But it is necessary to repeat the assertion that money and time must be spent in investigating not only the deposits, but in investigating also commercial conditions, especially in reference to the market. Not many men are fitted to undertake such work. Other things being equal, it is probable that Canadian specialists, familiar with local conditions, can get the best results. This is true in dealing with minerals, or mineral products, that have a limited market. Some of the minerals mentioned above are marketable in the United States and in Europe. Some of them can be disposed of only in Canada. But in all cases the present market can be largely expanded.

PORCUPINE.

As usual, the discovery of a new gold district has caused an acceleration of the public pulse. Not since, almost fifteen years ago, Ontario went wild over gold in the Lake of the Woods region, has there been such a revival of local interest in the mining of that metal. Porcupine pervades and permeates everything.

And interest in Porcupine is not confined to Ontario. Montreal has taken a hand in the game, New York has asked for cards, and London has made a few side bets. Meanwhile, men and supplies are being hurried over the short winter trail at a tremendous rate.

Before uttering a word or two of warning, we wish to state that to the best of our belief the Porcupine discoveries have much to recommend them. Several prospects are promising. The superficial extent of a few of the bodies is unusually large. Rich pockets are not infrequently encountered. Altogether, the field is worthy of serious attention. This is all that any person is warranted in saying. On the other hand, no good can result from inflated newspaper reports. They may improve circulation, but they hurt the camp.

The fact that the first important discoveries were made just before snow fell precludes the possibility of properly estimating the potentialities of the region. Something will be learned from this winter's work; but certainly not enough to determine finally either the extent or the value of the ore bodies.

Meanwhile, since exact data as to the character of the new goldfield are almost entirely lacking, our provisional opinion must be influenced by the history of other more or less analogous occurrences. We shall disregard the past record of Ontario gold mining camps, a dismal record, and assume that Porcupine is unique, so far as Ontario is concerned,—a quite reasonable assumption. We shall also assume that the gold-bearing quartz will be found in very large quantities. Starting with these assumptions, and guided by the records of certain large gold-mining camps in other parts of the world, it is probable that success at Porcupine will mean the opening of large workings in low-grade ore.

Now, very few people understand what equipping and working a low-grade gold mine means. We shall not attempt to expatiate upon the subject here. But the kernel of the matter may be expressed thus: It may take years of time and millions of dollars to bring a low-grade gold mine up to the point where net profits can be realized.

Of course, "low-grade" is a term that is very loosely applied. Ore carrying \$2.50 per ton in gold is undoubtedly low-grade. Ore assaying as high as \$10 or \$15 per ton may fall into the same category. We believe that the bulk of the Porcupine ore now exposed will range between these figures. In making this statement we are disregarding altogether high assay returns from picked specimens.

There may be a glorious future in store for Porcupine—or there may not. Larder Lake was "boomed" to death. Let us see that Porcupine gets a fair show.

GOVERNMENT POSITIONS.

The mining engineer or the geologist who accepts from a government an official technical position, accepts also a large, though not clearly defined, moral obligation.

Probably in no position are there more opportunities for graft and malversation than in an administrative governmental mining billet. The low salaries

usually paid heighten the temptation. And temptation comes in particularly inviting and insidious forms.

The government mining official is so placed that he gets early news about new discoveries, promising developments, and all the constant changes that make up the history of prospecting and mining. Since he is a public servant, he must regard all such news as absolutely confidential until it can be made public through official channels. His first obligation is to the public.

But there are always those who are keen to pay a price for early and exclusive tips. Requests for such tips may come from persons of great political power. Refusal on the part of the official may lose him his place, or may create dangerous enemies. But to magnate, friend, or foe, the answer must always be the same—a blank, unqualified refusal.

Added to unyielding integrity the official in question should possess an uncommon amount of discretion and a wide knowledge of commercial mining. In more than one Canadian province he must combine the functions of technical adviser, explorer, geologist, information bureau, inspector, and "glad-hand" artist. In fact, he is expected to do the work of a regiment for the pay of a private.

In all this there is evidence of needless stupidity. A province that employs a good technologist to look after its mining interests, and does not give him a free hand and an adequate staff, is throwing away time and money. The most efficient technologist is of little use if he has to waste half his time in attending to office routine that could be done much better by a young clerk. He can only prove his value with the aid of a suitable appropriation and a corps of assistants.

To drive home these obvious truths we may add that there is not a mining province in Canada that would not be fully justified in spending ten times its present appropriation in exploiting the mineral lands within its boundaries. This is equally true of the Federal Government.

"THE GIDDY HARUMFRODITE."

Two peculiar instances are on record that illustrate the unwisdom of permitting special interests to dominate large coal mines. In its early years the Dominion Coal Company was saddled with a contract whereby it supplied the Everett Gas Company with coal at a price too low to leave any margin of profit. The contract was arranged by a person who had very large holdings in both companies.

During 1908 the dividends of the Crow's Nest Pass Coal Company were reduced by almost 50 per cent. In 1909 no dividends were paid. This decline coincides with the assumption of the control of the collieries by the J. J. Hill interests. The majority of the Crow's Nest Pass stock has been for two years in the hands of the Great Northern Railway and the Granby Consolidated Smelting Company.

This is not an age of Christian charity. Mr. J. J. Hill and his associates, in buying their way into the Crow's Nest Pass Coal Company, were animated by no altruistic motives. Their quite obvious desire was to obtain cheap coal and coke. If they can do this without disregarding the minority shareholders, all well and good. At present it seems that they are doing something else.

A GOOD EXAMPLE.

Most praiseworthy is the spirited resolve of the Daily News, of Nelson, B.C., to spare no pains in giving the public an early and authoritative review of British Columbia's progress during the past year. Its Annual Review number, January 5th, is excellently prepared. The section that deals with mining comes from the pen of Mr. E. Jacobs, that indefatigable and accurate journalist. British Columbia is fortunate in possessing such an enlightened paper as The Daily News, and such a competent observer and critic as Mr. Jacobs.

EDITORIAL NOTES.

Silicious ores, carrying low percentages of finely divided chalcopyrite, are particularly difficult to concentrate without undue loss. Several deposits of this kind have been worked in Ontario and in British Columbia, almost uniformly without commercial success.

The late Dr. Ludwig Mond, throughout his life an unremitting worker, found enough leisure to cultivate a hobby. He was extremely fond of oil paintings, and he succeeded in gathering together one of the finest private collections of pictures extant, mostly the work of Italian artists.

We must congratulate our New York contemporary, **The Engineering and Mining Journal**, upon its improved appearance. The changes in the cover-design have not destroyed its distinctiveness; the paging is much more convenient; and the general make-up is brighter and more attractive.

The cost of producing copper at the plant of the British Columbia Copper Co. was reduced during November, 1909, to 7.35 cents per pound. The cost per pound during the preceding month was 8.8 cents.

LEGAL NOTES.

Judgment was given at Vancouver on December 17, in the damage case of Cope vs. Wellington Collieries, before Mr. Justice Clement and a jury, for the plaintiff, and the damages awarded amounted to \$2,400, with costs. The plaintiff sued for damages for the death of his son in an explosion in the collieries at Extension, on January 27th, 1909. Evidence was concluded last night at 5.30 o'clock, and the jury gave its verdict in less than half an hour. Messrs. McNeil & Bird appeared for the plaintiff, and Messrs. C. V. Bodwell and M. Hill for the defendant company.

THE YEAR IN THE PROVINCE OF QUEBEC.

By H. Mortimer-Lamb.

Although as yet production returns are not available, there can be little question but that Quebec's mineral yield for the year will represent a substantial gain over that of 1908. The twelvemonths, in fact, has been a period of notable industrial activity and progress, evidence of which, however, will only be partially disclosed by the statistical records.

The most important event of the year, having reference to the future of the industry in the Province, was the repeal by the Provincial Legislation in April last of the Quebec Mining Act of 1892, and the passage of a new law, the provisions of which are likely to stimulate to an eminently greater degree exploration and legitimate mining endeavour in this field. The old regulations, which, by the way, were based on ancient French law, were radically dissimilar in principle to those in force in other Provinces of the Dominion, where the aim of legislation in general has been primarily to promote and encourage prospecting and mineral development. The Quebec Mining Law, on the other hand, while apparently liberal in intention, was more favourable to the speculative acquisition and idle holding of large tracts of territory than conducive to bona-fide endeavour; and, in consequence, many are inclined to attribute the tardy progress in the development of the mineral industries of the Province in recent years—a tardiness the more apparent when contrasted with the rapid and great advances in other sections of the Dominion—to this cause alone. Whether or not this contention has any foundation in fact yet remains to be proved; but since geologists are agreed concerning the economic potentialities of the area, and it is, moreover, a well-known fact that there exists in the world no finer class of prospectors than the French-Canadian, it is puzzling to account for the very moderate growth of Quebec's mining industry, unless the explanation of unsuitable or defective laws be accepted as adequate. The amended regulations meanwhile go into force with the new year, and it will be interesting to note to what degree they will affect or influence conditions and activity during the coming prospecting season. The disposition of the present Provincial Government, and especially of the Minister who represents the mining interests, to promote the welfare of the Quebec industry is also apparent in the projected reorganization of the Mines Department. The last incumbent of the office of Superintendent of Mines was most inadequately paid for his services. He was appointed to the post very many years ago, at a time when mining in the Province was of little account. His salary was small and although the duties of the office steadily grew more burdensome, the pay of the Inspector (as was until lately this officer's designation) was not commensurately increased. Finally, in July last at the close of twenty-eight years' service Mr. Obalski resigned the Superintendentship in order to engage in private practice as a consulting mining engineer in Montreal. Meanwhile it is satisfactory to learn that, after some little delay and difficulty, a worthy successor to Mr. Obalski has been found in Mr. T. Denis, a distinguished officer of the Dominion Mines Department, who only a week or so ago accepted the vacancy and will shortly assume the duties. It is also understood that conditions under which Mr. Denis accepts direction of the office are much more favourable than formerly, and that he

will be given every facility and assistance in modernizing the Department and in extending the scope of its efficiency and usefulness.

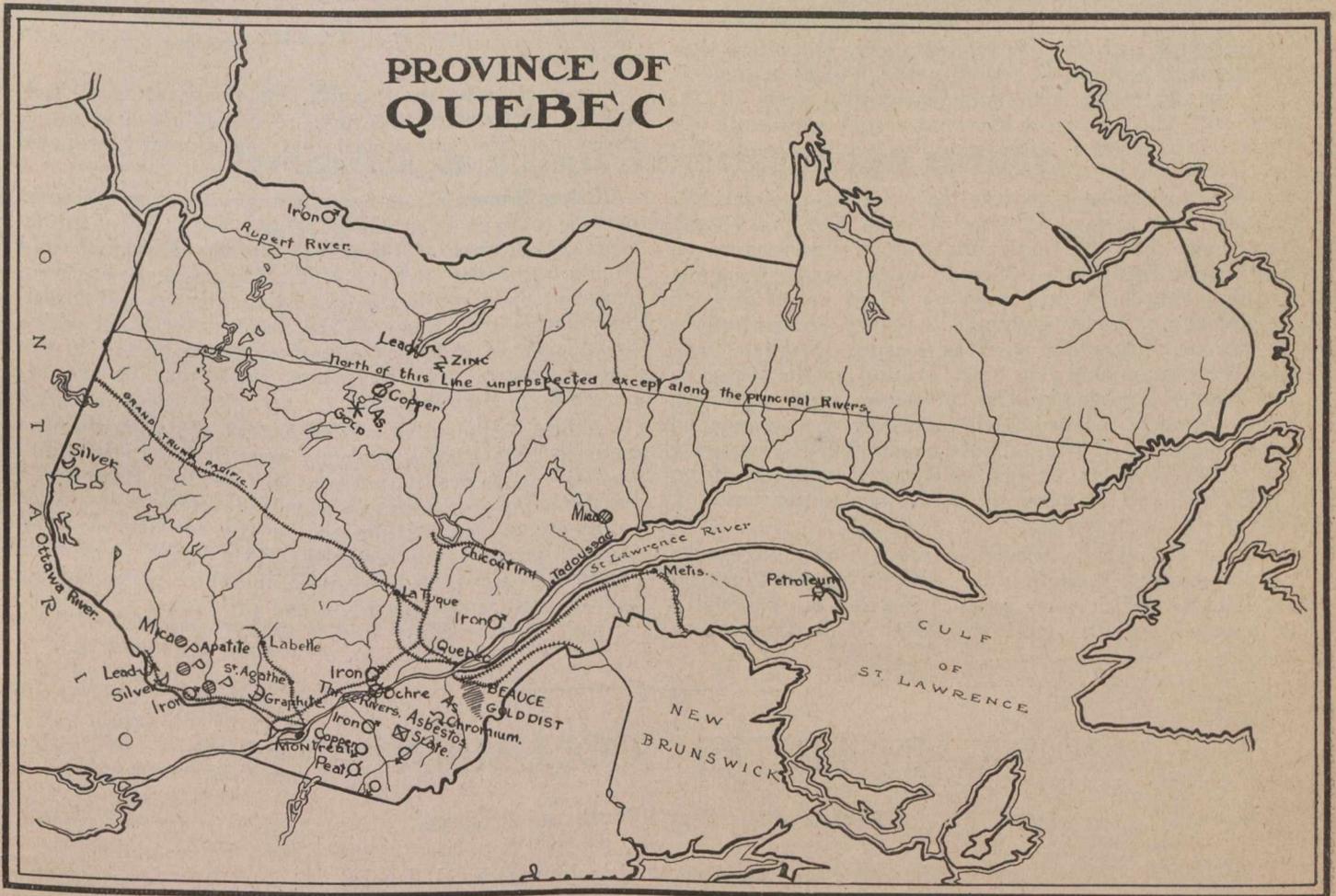
Asbestos.—However one may deplore the greed of promoters as exemplified in the gross over-capitalization of the Asbestos Mergers, and regret that a fine industry should be saddled with so unfair a handicap, it must nevertheless be admitted that the immediate effect of these promotions has been to create remarkable activity throughout the Eastern Townships. Never was there such a busy time-heavy production, new mills going up everywhere, others projected, extensive mineral development under way, and territory over-run by prospectors. Thus at the moment no less than twenty-six cyclones are being installed in the several new mills, and these should all be in readiness for operation within the next few months. As to tonnage shipments of asbestos and asbestic during 1909, there is some difference of opinion whether or not any considerable increase over those of 1908 will appear in the returns since several of the important producing properties have been accumulating or adding to their stocks and have accordingly restricted their actual shipments. Mr. Obalski, however, is of the opinion that the shipping returns will show an increased tonnage output of from fifteen to twenty per cent. for the year, a good enough record in itself but likely to lose in significance when in turn it is compared with what may be expected during 1910.

Referring most particularly to the year's developments in the asbestos area, mention should first be made of the re-opening of a mine near Thetford, dormant for nearly fifteen years, formerly owned by the Thetford Mining Company, but since acquired by the Jacobs Asbestos Company. Here eminently successful development operations have been undertaken, the results justifying in fact the erection of a mill which is now in course of construction. Other new properties also undergoing development in this vicinity are the Clarke, near the Poudrier Road, owned by a Montreal syndicate, and the Demers, situated a mile to the east of the town of Thetford. All the large producing Thetford mines have, of course, been in full operation, night work having been inaugurated at the Amalgamated Asbestos Corporation's King Brothers' Mine here, search lights being employed to give illumination in the pit—an innovation, which by the way is also being introduced by the Asbestos & Asbestic Company at Danville. One important result of the promotion of the Black Lake Consolidated was the re-opening of the Union and the development of the adjoining property, the Southwark; and a mill, which it is hoped will be ready for operation in the spring, is now being erected to serve both mines. Prospecting work in this district has also been prosecuted by the Imperial Asbestos Company.

In East Broughton, a very complete mill has been erected on the Frontenac, while the Beaudoin and Audet Company has opened mines at Robertson. It is also interesting to record that the Berlin Asbestos Company, operating near Broughton, having constructed, regardless of expense, four miles of branch railway to connect its property with the Quebec Central, and likewise erected a mill, is now about to search for asbestos.

At Danville, a new mill has been recently completed, and is now in operation, and with this additional equipment the Asbestos and Asbestic Company is in a present position to handle between fifteen hundred and two thousand tons of rock daily. In the vicinity of Danville, prospecting has been active, a small power plant having been installed for the development of one prospect in the 9th Range of Cleveland, while development has been in progress on an adjacent property in the 8th Range, and on a third property in the 5th Range of Shipton. The Champoux property, near St. Adrien, 6th Range of Ham, has been acquired and is being developed by a Montreal syndicate near Moreceaux. Operations have been restricted to development on the Chicago and Charpentier, and on an ad-

the amount of capital actually invested, these properties have returned to their owners a larger percentage of profit than any copper mines operating in the Dominion. With the exception of perhaps three properties, the Eustis, Nichols and Naughton, there has been practically no attempt to systematically exploit the resources of the district; and this is the more regrettable since the surface indications are so generally promising, and the economic conditions so exceptionally favourable for the establishment of a flourishing industry. Nevertheless, as the result largely of the introduction of more modern methods of mining at the Eustis, it is expected that the past year's copper production will show an increase of perhaps a hundred per cent. over the 1907 returns—and this notwithstanding



joining lot to the south west. The only at all depressing intelligence, if it be considered as such, is that after lying idle for the last two years or so the plant of the Asbestos Mining and Manufacturing Company's mine at Crysofile, Wolfstown (formerly known as the Peters Mine) has been dismantled and sold. To sum up briefly, prospecting and development have been general throughout the asbestos area from Brome to the Vermont.

Copper.—There are those who confidently believe that one of these days, and possibly at no very distant day, Quebec, or rather the eastern townships, will become contributors to the copper production of Canada. As a matter of fact, a very fair output has been maintained by one or two mines for many years past, and it is not generally realized that, taking into consideration

that the Nichols mine was operated for only part of the year. The Eustis Company meanwhile is developing a new property, adjoining the Eustis, and known as the Hepburn, while development has also been actively prosecuted on the Suffield and Marrison, owned by Mr. A. O. Naughton; and on the Lake Memphremagog, a prospect owned by Mr. G. E. Smith. Elsewhere, a copper prospect near Weedon, in the vicinity of Quebec, is being exploited, while also development is reported to have been undertaken on copper properties located on the north shore of Chaudiere River.

Gold.—The revival of placer mining activity in the valley of the Chaudiere is worthy of special notice, and the result of developments now proceeding is awaited with very considerable interest. As is well known, the Chaudiere was twenty years or so ago a very rich and

active gold-producing district, but after yielding well for some time operations were finally abandoned. A Montreal syndicate, however, acquired in 1909 the mining rights over 72,000 acres of the Seigneurie Regaud de Vaudreuil, in Beauce County, intending to prospect for copper. Effort in this direction was not successful, but during the late summer auriferous gravel, which promised well, was discovered on a branch of the Gilbert River. Operations were commenced on October 1st, with the employment of a force of thirty-five men, who have been engaged in sinking to and drifting on bed rock. The gold is found lodged in the crevices of the bed rock—a black-clay slate in the gravel for a distance of three feet immediately overlying the bed rock, and also in a band, about four feet thick, of overburden. The bed rock is said to yield values averaging \$4.95 per cubic yard, and the overburden 77 cents. At the beginning of December, about 4,800 square yards of pay ground had been developed here, but since then additional territory of equal value has been opened. The syndicate has also made successful tests of the gravels of the La Plats River, at a spot approximately three-quarters of a mile from the confluence of that stream with the Chaudiere. The gravel from this spot which is presumed to be the locale of an ancient river channel, has yielded returns of from \$3.22 to \$80.82. The conditions for hydraulic mining are moreover exceptionally favourable, since abundant water from the neighbouring high falls may be relied on to give an ample supply under pressure to carry on continuous operations during the working season. Nuggets have also been taken this year from ground on the Ruisseau des Meules, which locality promises well, although when formerly worked much difficulty was occasioned by quicksands. The syndicate, meanwhile, is engaging the services of an expert gold-gravel engineer from California, and propose to commence actual mining operations in the spring.

There is little to record in respect of gold quartz developments. A stamp mill, however, has been erected at Megantic, while some prospecting and other activity is reported from the northern section of Pontiac, where

on the Union Abitibi mine a ten-stamp mill has been erected.

Chrome and Iron.—The chief event during 1909 in connection with the chrome industry was the absorption of the Dominion Chrome Company and of the Black Lake Chrome and Asbestos Company by the Black Lake Consolidated. Otherwise, the year so far as this industry is concerned has been somewhat featureless. Production will probably show a decrease. A plant, however, is now being installed at Coleraine to utilize the Behrend process of concentration on a larger scale than has yet been attempted.

The utilization of the black magnetic sands from the north shore of the St. Lawrence has long been a subject of discussion. Matters have recently been somewhat advanced by experimentation. Shipments of the sands for this purpose have been made to Niagara and elsewhere during the year, but results as yet have not been made known.

Operations by the Canada Iron Corporation at Radnor and Drummondville have been conducted as usual, and it has been announced that the company proposes to establish a foundry at Three Rivers.

Other Minerals.—A new discovery of graphite is reported to have been made at St. Jovite, situated 60 miles north-west of Montreal on the Montreal and Nominating branch of the C.P.R. The property has been acquired by a syndicate that is opening it and installing machinery. Some of the flake material, in which the deposit is rich, has already been marketed in the United States. No important developments are reported from Buckingham.

A first shipment of some 200 tons of magnesite was made in 1908 from a property near Calumet, Granville County. This production was increased in 1909, while the mine has also been extensively developed.

Excellent reports concerning the condition of the cement industry are received, and a largely-increased production for 1909 is assured, the three mills having been in continuous operation and producing at the rate of 5,000 barrels daily.

MINING IN BRITISH COLUMBIA IN 1909.

A Review of the Year's Work and Progress.

Written for the Canadian Mining Journal by E. Jacobs.

The aggregate value of the mineral production of British Columbia for 11 years to the end of 1909 is nearly \$350,000,000. Allowing that the accompanying estimate for the year 1909 shall be proved by the revised returns to be approximately correct, the actual aggregate will be 347,804,000, or but \$2,196,000 short of the larger total first mentioned. Of this aggregate, gold represents \$126,317,000, silver \$30,081,000, lead \$23,298,000, copper \$55,242,000, miscellaneous metals \$991,000, coal and coke \$102,782,000, and building materials, etc., \$9,093,000. The proportions of value are metalliferous minerals \$235,929,000, and non-metalliferous \$111,875,000.

The value of production in 1909 is estimated at \$24,426,500, as shown in some detail in the tables herewith. As the yearly average value for the four years 1905-1908 was \$24,294,000, it is evident that notwith-

standing the comparatively low average prices of silver, lead and copper, production last year was well maintained; in fact showed an increase in quantity on the whole. For the better appreciation of the increase in value it should be borne in mind that the prices at which metals have been calculated for the years 1909 and 1908 respectively, are as follows, those in brackets showing where there was any difference between the two years: Gold, placer, \$20 per oz.; gold, lode, \$20.67 per oz.; silver, 49 cents (50.2 cents) per oz.; lead, 3.8 (3.78) cents per lb.; copper, 12.9 (13.2) cents per lb.; zinc, 5 cents per lb.; coal, \$3.50 per long ton; coke, \$6 per long ton. Silver is less 5 per cent., and lead 10 per cent., of the New York average market prices, as shown by "Engineering and Mining Journal" quotations for ten months. Prices for coal and coke are those ruling generally in the Province.

QUANTITY AND VALUE OF MINERAL PRODUCTS FOR 1908 AND 1909.

MINERAL PRODUCT	CUSTOMARY MEASURE.	1908.		1909.	
		Quantity.	Value.	Quantity.	Value.
Gold, placer	Ounces.	32,350	\$ 647,000	30,000	\$ 600,000
Gold, lode,	Ounces.	255,582	5,383,880	250,000	5,167,500
Total gold,	Ounces.	287,932	5,929,880	280,000	5,767,500
Silver,	Ounces.	2,631,389	1,321,483	3,000,000	1,470,000
Lead,	Pounds	43,195,733	1,632,799	46,000,000	1,748,000
Copper,	Pounds	47,274,614	6,240,249	41,000,000	5,289,000
Zinc,	Pounds	270,000	10,000,000	500,000
Total metallic			15,394,411		14,774,500
Coal,	Tons of	1,677,849	5,872,472	1,940,000	6,790,000
Coke,	2240 lbs.				
Building materials, etc.		247,399	1,484,394	277,000	1,662,000
Total value of production			\$23,851,277		\$24,426,500

PRODUCTION OF MINERAL BY DISTRICTS AND DIVISIONS.

NAME	DIVISIONS		DISTRICTS	
	1908	1909	1908	1909
CARIBOO DISTRICT				
Cariboo Mining Division	\$ 355,000	\$ 350,000	\$ 405,000	\$ 390,000
Quesnel " "	30,000	25,000		
Omineca " "	20,000	15,000		
CASSIAR DISTRICT			298,234	267,319
EAST KOOTENAY DISTRICT			4,802,680	4,991,446
WEST KOOTENAY DISTRICT			5,448,224	5,851,670
Ainsworth Mining Division	422,181	932,134		
Nelson " "	462,836	678,604		
Slocan and Slocan City Mining Division	676,580	1,073,080		
Trail Creek (Rossland)	3,713,392	3,023,711		
Other parts	173,235	144,141		
LILLOOET DISTRICT			13,779	10,000
YALE DISTRICT			7,649,963	6,710,413
Osoyoos, Grand Forks and Greenwood Mng. Divisions	7,545,380	6,426,609		
Similkameen and Nicola	101,583	280,804		
Yale Mining Division	3,000	3,000		
COAST DISTRICT			5,233,397	6,205,652
(Nanaimo, Alberni, Clayoquot, Quatsino, Victoria.)				
			\$23,851,277	\$24,426,500

Reviewing separately the production of the different minerals, the following comment is submitted:—

Gold.—There seems to have been a general decrease in the production of placer gold, the two larger producers of this metal—Cariboo and Cassiar districts—both showing a smaller yield. The estimated decrease in the former is about, \$10,000 and in the latter \$27,000. Nearly all the lesser placer gold camps were also short as compared with 1908, so it is probable the general shortage is attributable to a restricted supply of water, with a resultant shorter period of gravel washing operations. In Cariboo provision is being made for extended operations during the 1910 season, chiefly on the properties of John Hopp, situated near Barkerville, and the leases held by Philadelphia people, represented by Howard W. Dubois, who are constructing

a 20-mile ditch and flume from Swift River to the Quesnel Forks neighbourhood, preparatory to hydraulicking on a large scale.

The Guggenheim hydraulic gold properties in British Columbia, in the Quesnel Forks and Atlin camps respectively, were not worked during the season on the large scale that had been expected, so those added little or nothing to the year's total yield of placer gold.

The decrease shown in the production of lode gold was largely in Rossland camp, a result of the suspension of production at the Le Roi mine, pending the carrying out of systematic exploration with a view to finding new ore bodies of a payable grade in the deeper levels of the mine. The Centre Star group of the Consolidated Mining and Smelting Company of Canada, Limited, made a slightly larger production of gold than in 1908,

while the Le Roi No. 2 produced in 1909 from its Josie mine, about as much as in the year immediately preceding. There was no change of importance among the smaller mines in Rossland camp.

An advance was made in Nelson district, the year's increase having been about 12,000 oz., mostly from Sheep Creek camp, in which several mines are being developed with promising results. This camp is expected to become one of the important lode gold producers of the Province, with at least half a dozen mines yielding profitable returns. At Ymir the only mine that contributed to the district's total for the year was the Yankee Girl, operated by a New York company, organized during the year.

The Boundary district, as in earlier years, made a fairly large production of gold, which in the mines of that district is in association with copper. It is noteworthy that the greater part of the lode gold produced in British Columbia is from ores that are smelted, there being only two mining divisions in which gold ores are milled to any considerable extent, viz., in Nelson and Osoyoos. The Hedley Gold Mining Company's Nickel Plate mine is in the latter division; this was sold during the year to the organizers of that company, so the Yale Mining Company, which was one of the late Marcus Daly's companies, is no longer mining in the Similkameen country of British Columbia. Arrangements are being made to do much development work in 1910, following extensive diamond drilling done in 1909. Additions are being made to power plant at both the mine and the 40-stamp mill; at the mill re-grinders and filter press are being added to complete the cyaniding plant.

Developments on Texada Island are resulting in an increased output of lode gold from two or three mines there, the gold occurring in an ore also containing silver and copper to an extent which admits of a return being received from the smelter of about \$20 per ton, for first-class ore, after deduction of freight and treatment charges.

Silver.—A production of approximately 3,000,000 oz. of silver is an advance of 368,000 oz. on the output of 1908. Nearly half of this increase was made in Ainsworth camp, in West Kootenay, the Blue Bell mine on Kootenay Lake, contributing about 38,000 oz. more than in 1908; the Whitewater and Whitewater Deep mines, situated between that lake and the Slocan mining division, adding about 58,000 oz. to its 1908 total, and the various other mines in the division together making up about 75,000 oz. of the total increase. In Slocan division the Richmond-Eureka mine, owned by the Consolidated Mining and Smelting Company of Canada, Limited produced 197,000 oz., which was 37,000 oz. more than in 1908; while the Van Roi, an English-owned property, produced about 38,000 oz. more than in the year previous.

The production of East Kootenay mines was nearly 100,000 oz. less than in 1908, attributable mostly to the Sullivan group not having been worked, and as to the remainder to a smaller yield from other mines in the district. Several mines in Nelson division contributed to the total decrease, as also did the Silver Cup, in Ferguson camp, Lardeau, and the Marble Bay and Cornell mines, on Texada Island. The finding of much native silver in bornite ore at between 900 and 1,000 feet depth in the Marble Bay mine was one of the most interesting features of the year's mining in the Coast district, the more so since the first-class ore also contained about \$10 in gold to the ton.

The average silver content of the ores of the big Boundary mines appears to have been of slightly lower

value than in earlier years. The difference per ton was not considerable, but the aggregate silver content of the total tonnage—nearly 1,600,000 tons—mined and smelted was distinctly noticeable.

The outlook is that next year there will be a further increase in the quantity of silver produced in the Province, for substantial progress made in 1909 in the Ainsworth and Slocan districts may be expected to be maintained, while better results are looked for in East Kootenay. Boundary mines will increase their tonnage also, and in the Coast district new mines in the Portland Canal district will begin producing. British Columbia's record of silver production was made in 1897, with an output of 5,473,000 oz., while that of 1901 was 5,151,000 oz.

Lead.—The increase in production of this metal was about 2,804,000 lbs. It is probable the revised returns will show the year's total to have been in excess of the estimate of 46,000,000 lbs. possibly by another million pounds. In past years production has ranged as high as 63,358,000, which was the total for 1900, the next highest year's total having been that of 1905, with 56,580,000 lbs. The stimulating effect of the bounty paid by the Canadian Government on lead produced in the Dominion can easily be seen when the statistics of production during recent years are examined. Production for 1903, the year immediately preceding the granting of the bounty, had fallen to 18,089,000 lbs, but since 1904 it has not in any year been lower than 43,000,000, while it has gone up to 56,580,000, which was the quantity produced in 1905. The amount of bounty paid is determined by the price of lead in London, it being on a sliding scale, commencing when the quotation is about £17 and increasing to 75 cents per 100 lb. of lead in the ore when the London price becomes lower, so as to ensure to the Canadian producer a minimum price of £17 per ton inclusive of bounty. As London quotations ranged from £12 3s 9d to £13 15s during 1909, the full bounty was paid to Canadian producers.

East Kootenay produces more than half the lead mined in British Columbia. Its total for 1909 was less by between 3,000,000 and 4,000,000 lb. than that of 1908, partly owing to a suspension of production at the Sullivan Group mine and partly to a decreased output of this metal from the St. Eugene and North Star mines.

The output of mines in Ainsworth mining division was doubled, the figures being about 5,000,000 for 1908 and in excess of 10,000,000 lb. for 1909. More than half of this increase was made by the Blue Bell mine, with a production of about 6,466,000 lb. in 1909 as against 2,600,000 lb. in 1908. The Whitewater and Whitewater Deep mines produced about 3,355,000 lb., as compared with 2,000,000 in the preceding year. The Cork mine, on the south fork of Kaslo Creek also contributed to this increase, though in much smaller degree.

Slocan mines did not produce as much lead as in 1908, the falling off having been approximately three-quarters of a million pounds, the chief losers being the Rambler-Cariboo and Standard mines, both with a materially reduced production. Richmond-Eureka and Van Roi both considerably increased their output, the former with a total of about 1,357,000 lb. to the extent of approximately one-third, and the latter from 594,000 lb. in 1908 to 1,788,000 lb. in 1909.

In Nelson division the Yankee Girl, at Ymir, was a new producer, with between 300,000 and 400,000 lb. to its credit, while the Iron Mountain Company's Emerald mine, situated near Salms, advanced its production from about 400,000 lb. in 1908 to 764,000 in 1909. The La Plate, on Rokanee Creek, near Nelson, formerly pro-

ducing silver-lead in considerable quantity, was idle all the year.

Work has been resumed on the Sullivan group, so East Kootenay may be expected to have shortly the benefit of production from that mine.

Incidentally, it may be mentioned here that the Consolidated Mining and Smelting Company of Canada, Ltd., during 1909, increased the lead smelting capacity of its works at Trail, also enlarged its electrolytic lead refinery. Two lead stacks have each an average smelting capacity of 150 to 170 tons per day, which is more than sufficient to keep the refinery supplied with all the lead bullion it will be able to deal with when enlargements now being made shall be completed. So generally only one will be kept in operation. Steel water jackets have been substituted for iron in these two furnaces; the number of tuyeres increased to 22; a 50-ton bullion pot has been installed, thus admitting of the molten lead bullion flowing continuously from the stack, instead of being tapped off at intervals; and provision has been made for moulding the lead into anodes at the furnace instead of re-melting it and moulding them in the refinery. An improved mechanical feed has been installed at the furnaces. The number of Huntington-Hoberlin circular roasters for lead has been increased to seven and of converting pots to 15. The lead refinery has been enlarged to a daily capacity of about 120 tons of refined lead. The number of electrolytic tanks is now 596, these being housed in a building 600 feet in length.

It is noteworthy that the gradual building up of a lead smelting and refining industry at Trail has resulted in the establishment in Canada of three lead corroding plants—two in Montreal, Que., and one in Vancouver, B.C.—and a lead pipe and shot factory in Vancouver. The market in Canada for lead is expanding, but it is not yet sufficiently large to absorb all the lead made at Trail, consequently a considerable quantity is still shipped to the Orient and some to Australia.

Copper.—Returns obtained to date indicate a decrease in production of copper in 1909 as compared with 1908 of about 6,274,000 lb. It is considered probable though that when the official returns shall be received it will be found that the actual output has been from 1,000,000 to 2,000,000 lb. more than the quantity included in the accompanying estimate. Of the present estimated decrease, about 1,500,000 lb. is directly traceable to the suspension early in the year of production at the Le Roi mine, Rossland. There was, also, a comparatively small decrease in the production of copper by the Consolidated Mining and Smelting Company's Centre Star group, in the same camp; but this was in part compensated for by an increase in that of the Le Roi No. 2 Company's Josie mine. The small mines of Rossland camp did not contribute any quantity of copper worth noting.

In the Boundary district the Granby Company's mines led with a production estimated at between 23,000,000 and 24,000,000 lb. Those of the British Columbia Copper Company with only about 6,500,000 lb. show the effect of three months' idleness consequent on a strike of miners at the collieries from which this company usually obtains its supply of coke for smelting. The result is a considerable decrease in the quantity of copper produced by that company. On the other hand, the Consolidated Company's Snowshoe mine, with 3,775,000 lb., appears to have made a gain of about 2,500,000 lb. as compared with 1908. The Dominion Copper Company, which made a small production early

in 1908, did not in 1909 send any ore from its mines to the smelter.

Comparatively big tonnages and low mining and smelting costs are prominent features of the copper producing industry of the Boundary district. The Granby Consolidated Mining, Smelting and Power Company, in its last annual report for its fiscal year ended June 30th, 1909, stating its costs, including all expenses, at \$3.20 per ton of ore, which, after deducting the value of the gold and silver contents of the ore, made the cost of producing copper ten cents per pound. The manager reported the metals extraction for the year to have averaged 21.81 lb. of copper, 0.2724 oz. of silver, and 0.0434 oz. of gold per ton of ore.

The Granby Company lately completed the improvements to its smelting plant that were commenced in the previous year. The maximum treatment capacity of the smeltery is now about 4,500 tons of ore per diem, as evidenced by a recent full week's run giving an average of 560 tons per day per furnace for seven furnaces then in blast. The eighth enlarged furnace has since been blown in. The British Columbia Copper Company's smelting and converting plant being quite modern and only in use a comparatively short time, was not changed in 1909. Enlargements of two of the three 700-ton blast furnaces are to be made next year, in order to provide for the bigger tonnage of ore to be available when railway connection with a mine the company has opened in Wellington camp, Boundary district, shall have been completed; also for ore from the New Dominion Copper Company's mines, which it is stated will be treated at the B. C. Copper Company's smeltery. There does not appear to be any probability of New Dominion Copper Company's smelting works at Boundary Falls being used again.

On the Coast, too, preparation has been made for smelting a larger tonnage of copper ore, the Tye Copper Company having installed a second blast furnace at its works at Ladysmith, Vancouver Island. There was no production of copper ore on Vancouver Island in 1909 worth mentioning, but the Tye Copper Company kept its works operating on ores from other parts. During twelve months ended August 31st, 1909, approximately 45,000 tons of ore were smelted at these works, and matte containing about 3,500,000 lb. of copper was produced. This was the largest production of copper by this company in any similar period since the fiscal year ended April 30th, 1905. Besides that from mines in the British Columbia coastal district, ore was received from as far north as Latouche, Alaska, and south as Salina Cruz, Mexico. The new furnace, installed in 1909, is 48 x 160 in. at the tuyeres. Its capacity is estimated at about 12,000 tons of ore per month.

Work has been continued at the Britannia mine, on Howe Sound, and latterly about 100 men have been employed at mine and mill. Extensive exploration of the enormous ore bodies occurring in the mine has been in progress all through the year, but no regular production of ore has been attempted. Some known ore bodies have been found to carry a considerable percentage of zinc, so for the purpose of determining in a commercial way whether the iron and copper can be separated from the zinc, a roaster, cooler, and Wetherill magnetic separator have been installed. At the mill, which has been re-modelled, the improvements made have been with the object of bringing its capacity up to 500 tons per day. Experimental work in saving the chalcopryrite contained in the highly silicious gangue characteristic of Britannia ore is being continued. There is little probability of active production in the near future, the

present intention being to determine definitely both the approximate tonnage of ore available and the best means of preparing it for smelting. The work being done at the Britannia is most important and valuable to the copper mining industry of the lower coast of British Columbia, where there is much ore carrying excess of silica.

On Texada Island, the development of a comparatively large shoot of bornite ore of generally high grade, occurring in the Marble Bay mine, has been continued with much success. The copper runs high in the sorted ore and even when a large proportion of second-grade ore was shipped the average return in copper from between 11,000 and 12,000 tons was 4 per cent. A neighbouring mine, the Cornell, reports an average copper value of 6.2 per cent. from 11,000 tons of ore, and this beside gold and silver to the value of about \$17 per ton.

In the northern part of the British Columbia coastal district there is much promise of a substantial production of copper being established ere long. Among other new properties recently officially reported on by Mr. Herbert Carmichael, assistant provincial mineralogist, are the Red Cliff, distant about 20 miles from the head of Portland Canal, and the Hidden Creek group, on Observatory Inlet, a branch of Portland Canal. On one of the Red Cliff group, Mr. Carmichael found ore some 8 ft. in width. Bands of ore in the mass, 5 to 8 in. thick, were found to contain copper from 6 to 18 per cent., together with gold and silver up to \$37.00. This official also reported as occurring on the Hidden Creek group a large exposure of ore which "has been cleared off to a large extent by surface stripping and shows a height of 300 ft. of mixed pyrite and chalcopyrite ore, carrying $4\frac{1}{2}$ to 5 per cent. copper." The establishment of a smeltery in the vicinity is proposed.

Of the numerous mineral claims on Moresby Island, of the Queen Charlotte group, on which ores containing more or less copper have been found, few have shipped any considerable quantity to the smeltery, so that the commercial value of the ore has not yet been proved.

Iron and Zinc.—Iron mining in British Columbia, at no time of great importance, has been practically at a standstill during the last two or three years. There have been many enquiries relative to the Puget Sound Iron Company's large deposit of iron on Texada Island, and the property has been bonded by some United States men, but no steps have yet been taken by them in the direction of mining the ore. In past years about 30,000 tons of this ore were shipped to Puget Sound, Wash., and smelted in a charcoal furnace erected at Irondale, near Port Townsend.

A company has been organized with the object of establishing iron and steel works at or near Vancouver or New Westminster, the latter within 20 miles of the mouth of the Fraser River, but the plans of those in charge of this enterprise are not yet matured.

There has been more activity during 1909 in connection with the mining of zinc than for several previous years. Zinc has been produced commercially at four or five mines, while at others tailings from silver-lead concentrating plants are being stored for treatment later, when zinc separating appliances shall have been provided. The largest producer of zinc in British Columbia is the company owning the Lucky Jim mine, in the eastern part of Slocan district; much of the crude ore from this mine runs 52 per cent. zinc, so it is shipped without concentration or separation treatment. The Whitewater and Van Roi mines, the former in Ainsworth mining division, and the latter in western Slocan, both make a zinc concentrate. The Whitewater shipped

during the year, 4,360 tons of zinc concentrate averaging approximately 15 oz. silver per ton and 42 per cent. zinc; the Van Roi made about 1,400 tons of similar concentrate assaying about 44 per cent. zinc and 50 oz. silver per ton. The Ruth, at Sandon, also makes a zinc concentrate from its silver-lead-zinc ore; it shipped 655 tons in 1909. The ore of the Blue Bell contains much zinc, but so far no production of the metal on a commercial basis has been made at this mine.

A group of mineral claims on Pingston Creek, opposite Haleyen Hot Springs, on which there is a large surface showing of zinc ore, was lately bonded by New York men who are commencing the development of this property.

Coal and Coke.—The production of coal and coke in the Province in 1909, it seems quite safe to assert, was the largest of any year since coal mining was commenced in British Columbia. Owing to non-receipt of the production figures of one of the larger companies, this may not be stated quite positively, but it appears reasonable to estimate the gross output at nearly 2,500,000 long tons, and the net at nearly 2,000,000 tons. However, to be on the safe side in making up the accompanying estimate, the net production, that is after deducting the quantity of coal made into coke and valued as such, has been placed at 1,940,000 long tons. Of the gross tonnage something like 1,450,000 tons were produced in what is officially known as the Coast coal mining district (Vancouver Island about 1,380,000 and Nicola 70,000 tons) and the remaining 1,050,000 tons in the Crow's Nest district, in south-east Kootenay. Deducting about 450,000 tons made into coke, an estimated net tonnage in excess of 2,000,000 tons remains. Whether this estimate will prove somewhat too high or not will be determined only by receipt of the official figures of production, but in any case the over-estimate if there be one, will not be large. The nearest approach to this tonnage of coal was that of 1907, when a net production of 1,800,067 tons was officially recorded. That year, however, the quantity of coke made was only 222,913 tons as compared with an estimated production of 277,000 long tons in 1909. The highest previous record tonnage of coke was in 1905, when it was 271,785 tons. It is quite probable, therefore, that the production of both coal and coke in British Columbia in 1909 was larger than in any previous year.

While the suggested increase of nearly 400,000 tons in the gross output of coal is to some extent attributable to the fact that three or four collieries, which by the end of 1908 had only commenced to ship coal, steadily increased their production in 1909, it is also evident from the preliminary returns received that the older and larger collieries also contributed materially to the increase.

The older collieries in the Coast district are those of the Western Fuel Company, at and near Nanaimo, Vancouver Island, and of the Wellington Colliery Company (Dunsmuir's), at Cumberland and Extension, respectively. The production of the Western Fuel Company's No. 1, Protection Island, and Brechin mines, reached to higher figures than in any other recent year. Thanks to the courtesy of the manager of this company, the information is available that of the company's gross production in 1909 of about 512,000 long tons, about 51 per cent. was disposed of in British Columbia, while 49 per cent. was exported to foreign countries in the proportion of 32 per cent. to California and 17 per cent. to other parts. No information was received in time for mention in this review of the year's results at the Dunsmuir's Collieries, but it is believed their produc-

tion was larger than in 1908, when a gross output of about 778,000 tons was made, and of this 71,000 tons was used in making coke. It is probable their 1909 output was nearly 800,000 tons gross.

The establishment by the Pacific Coast Coal Mines, Ltd., of a flourishing coal mining enterprise on Vancouver Island in 1908-9, is one of the evidences of progress on the coast. This company, which has its head office in Victoria, B.C., has coal properties at South Wellington and Suquash, both on Vancouver Island, and at Malcolm Island, off the north-east coast of Vancouver Island. Its more important operations have been at South Wellington, in the Nanaimo district, where the year's development consisted of some three miles of slopes, levels and roadways in the coal. The year's production of coal was about 45,000 tons, of which about 11,506 tons were exported, most of it to Mexico, on the west coast of which country a market for this company's coal is being developed. Latterly production has been increased to about 600 tons a day, and a ready sale is found for all coal produced.

Several other coal properties on Vancouver Island have also been worked, but as yet their production is very small. Coal measures on Graham Island, of the Queen Charlotte group, are being prospected by probable purchasers. Coal has been found in various parts of the northern country through which the Grand Trunk Pacific Railway is being built, west of the Rocky Mountains to Prince Rupert, the limits of one area discovered on the Morice River in 1908 by W. W. Leach, of the Geological Survey of Canada, were largely determined by that official during the field-work season of 1909; another area, near the headwaters of Skeena River, was examined by Chas. Fergie, formerly of Nova Scotia, for prospective buyers resident in Great Britain.

In the Nicola country, the Nicola Valley Coal and Coke Company did much development work in its Nos. 1 and 5 mines, Middlesboro collieries, and also gave attention to Nos. 2, 3, and 4. The coal opened in No. 5 is exceptionally clean and hard, and of excellent quality. The addition to mine equipment included the extension of No. 1 tippie for the handling of all coal from Nos. 1, 4 and 5 mines; erection of a boiler and compressor house, and installation therein of two 72-in. by 18-ft. steam boilers, and a Rand compound condensing steam and compound air compressor having a capacity of 2,215 c. ft. of free air per minute, complete with air receivers and necessary connections. The company's output of coal in 1909 was about 70,000 short tons. Labour difficulties restricted production during three or four months, but as the year closed, production was between 9,000 and 10,000 tons per month, an agreement with the men having been come to, and the demand for coal good. Development work was done at the property of the Diamond Vale Collieries, Ltd., also in Nicola Valley, but the production of coal was small.

The extension of the V. V. and E. Railway to Princeton, Similkameen, enabled the Vermilion Forks Mining and Development Company to commence shipping coal. The company's colliery at Princeton is only developed sufficiently to admit of a present output of about 100 tons per day, but transportation difficulties having been overcome, additional plant will be installed and production facilities be shortly increased.

Coal measures occurring near Midway, in the Boundary district, are being opened and coal taken out in small quantity.

The Crow's Nest Pass Coal Company is the largest coal producer in the Crow's Nest country. It has three collieries—at Carbonada, Coal Creek, and Michel,

respectively. Its output is from Coal Creek and Michel, at each of which there are several mines producing freely. Somewhere about 900,000 tons gross of coal were mined, and about 250,000 tons of coke made in 1909. Equipment of these collieries is extensive, designed to meet the requirements of a much larger output than is at present practicable. Additions to power plant in 1909 were the installation of the three Rand-Corliss air compressors, one at Coal Creek and two at Michel. At the former colliery the machine put in is a compound condensing steam 3-stage air compressor, having a capacity of 1,300 cu. ft. of air per minute compressed to 1,200-lb. gauge pressure. A similar machine was installed at Michel, and as well a low-pressure compound condensing steam and compound air compressor having a capacity of 4,523 cu. ft. per minute.

At the colliery of the Hosmer Mines, Ltd., situated between Fernie and Michel, during 1909, there were completed the 3-compartment main and parallel tunnels, these cutting ten seams of coal, of which five, having a total thickness of 48 ft. of coal, are workable. Gross production was between 65,000 and 70,000 tons of coal, more than half of which was made into coke. The power and coal-handling equipment here is for an output of 2,000 tons per day, and the tippie is designed and built for twice that capacity. There are 240 beehive ovens, having a capacity of 400 tons of 48-hour coke per diem.

The Corbin Coal & Coke Company, which, like the Hosmer Company, commenced shipping coal late in 1908, made an output in 1909 of about 65,000 tons. Of this quantity, 80 to 90 per cent. was exported to the United States, chiefly for use in northeastern Washington. Two seams of coal are being developed. On No. 1 seam practically all the development is in coal, there being scarcely any rockwork. The main entry, dimensions 9x16 ft., was driven between 1,800 and 1,900 ft., and the counter air course, 9x12 ft., nearly the same distance. Three main raises were made from the main entry, each 355 ft., to connect with a third tunnel 200 ft. long. The main entry for No. 2 seam was driven between 150 and 200 ft. in coal. Surface improvements made during the year included the erection of coal storage bin with a capacity of 1,500 tons; trestle approach to same 350 ft. long; boiler, power and fan houses; stable and granary, hospital, and 42 dwelling houses.

One of the most valuable coal fields in the province—the northern extension of the Crow's Nest field, in which the last three aforementioned companies are operating—is being prospected with a view to the opening of coal mines in it as soon as railway transportation shall have been provided.

Other Minerals—No commercial production of any of the undermentioned miscellaneous minerals is being made, but their occurrence in British Columbia may be noted here.

Antimony ore is known to occur in the Sloean district, and its discovery in the Lillooet district was reported last summer. For some months of last year antimony was recovered from the electrolytic slimes at the Trail lead refinery, but when the market price of that metal dropped considerably it was no longer profitable to save this mineral. The finding of molybdenum on Quilchena Creek, Nicola District, was announced last September.

The deposits of mica, long known to occur at the head of Yellow Creek, Big Bend of the Columbia District, north of Revelstoke, received renewed attention last summer and autumn. Further work was done

toward developing the mica, and efforts were made to induce the Provincial Government to improve the trail to the property so as to make it accessible at least to pack animals.

A few ounces of platinum were obtained in the Tulaneen River district, but no practical work was done toward producing this metal commercially.

The cinnabar which some years ago was worked in the Savonas district has not been touched lately.

Building Materials.—Marble is being quarried and worked in a commercial way both at Nootka Sound, Vancouver Island, and in the vicinity of Kootenay Lake, West Kootenay. Several large buildings in Nelson have been constructed chiefly of marble from opposite Kaslo, while marble from Marblehead, eight miles from the head of Kootenay Lake, is being freely used for ornamental purposes in buildings and for monuments and tombstones.

Much granite, sandstone, and other building stone, of which there is an abundance and in great variety in different parts of the province, is being used in buildings, especially in the larger cities of the coast. Bricks—common, the silica brick made at Parson's Bridge, near Victoria, and the ornamental building and fire-brick from Clayburn, in the Fraser Valley—are finding an increasing market in the province.

Lime from the Tacoma Steel Company's limekilns at the north end of Texada Island, is much used in Vancouver, Tacoma, and Seattle; while that from the Raymond kilns, near Esquimalt, finds its chief market in Victoria.

Portland cement is still being made in considerable quantity at the Vancouver Portland Cement Company's works on Tod Inlet, Vancouver Island, and this local product has practically driven imported cement out of the British Columbia market, its quality being excellent.

THE COST OF COAL IN NOVA SCOTIA.

Abstract of Article by the Hon. Robert Drummond—
The Original Article Appeared in the Annual
Review Number of the Halifax Morning
Chronicle.

During the year coal prices have been maintained, and no reduction in price is possible. With the present price, which some unthinking people consider high, the smaller operators find it takes them all their time to make ends meet. Wages have also been maintained; there has been a small increase of the lower paid men here and there. The United Mine Workers of America promised our miners fabulous wages, if they would swear by the U. M. W. A. After reading the evidence of McLennan at the "conspiracy" trial some may be inclined to think that if a miner of his limited experience can make six dollars a day, the wages of some are already fabulous. After reading his evidence some coal consumers might be justified in thinking that if coal is high in price it is due to the fabulous wages paid, and yet the U. M. W. A. would seek to make the miners believe that much as they are getting, they could get them more. What a funny way they are setting about it. Trying to convict the managers of our mines of conspiracy to keep up prices, knowing they are ignoramuses if they do not—that if coal prices tumble, down tumble wages.

Here, lest I forget, let me say, and I say it realizing fully what I am about, that the Dominion Coal Company has been the salvation of the coal trade of the province. When the Dominion Coal Company took over the several Cape Breton properties, most of them were on the verge of bankruptcy; they could not have stood it much longer. Coal at that time, it is true, was cheaper than to-day, but the companies were making no profits, and the miners were making no adequate wage. The coal trade of the province was all but at a standstill.

Further, let me say that if the price of coal is not even higher to-day thanks are due to the much maligned company. Were the Dominion Coal Company so minded, it could practically crush out all its contemporaries but one, and should new companies be rash enough to arise it could continue the crushing-out process, and then, competition withdrawn, it could set its own price. This, some may say, is a wild statement; it is made nevertheless in cold blood.

Those who are ignorant of conditions as they exist at the mines, may think coal is high. Those who are familiar with them know the price carries no adequate profit—all the risk and uncertainties attending coal mining considered. Mr. B. F. Pearson in his testimony in the conspiracy case, gave it as his opinion that had coal prices not advanced the smaller coal companies would ere this have been in the hands of receivers. A few years ago Mr. Pearson may have thought the coal barons were making millions. He knows better now.

Let us enquire about the alleged millions the coal barons are making. In his testimony before a Conciliation Board, the manager of the Springhill mines said his company had been losing money for years, and the board believed his testimony. The shareholders of the Eastern Coal Company were promised big money long before this, and as yet they have received not a cent. Had the Strathcona Coal Co. been making barrels of money its colliery would not have been closed down. The Maritime Coal, Railway and Power Company is digging away in the hope of some day getting some return for the money expended.

So much for Cumberland County. Now for Pictou. For the past few years, due to the exercise of the strictest economy, the Intercolonial Coal Co. has been able to declare a five per cent. dividend, but for fifteen years the shareholders went about mourning without it. The Acadia Coal Co. has not paid any dividend of late.

Coming to Inverness, the Inverness Railway and Coal Co. did not for years earn interest on its bonds; it is, however, doing that now, but little more. The Mabou mines were not a financial success. The Port Hood mines were in the hands of a receiver at least once, and later an arrangement had to be entered into. Mr. Black in Fielding's court, the other day, made two statements, the one seeming contradictory of the other. He said that he had been in the Port Hood Coal Co. and was glad to get out of it; and that he had got interest on his bonds. O! the wily fellow, and the unsophisticated lawyers: Why didn't they ask "And how much of the principal?"

Coming to Cape Breton, the General Mining Association, between 1880 and 1900, was able, in some years, to declare a dividend of 5 per cent. The Victoria Mines were a dead weight. Lingan closed down for want of a market for coal, dirt cheap as it was. The Gardner or the Reserve, or the Clyde, or the Collins, or the Toronto shafts never paid or else they would not have shut down.

I state a hard fact when I say that the General Mining Association, the McKeanes, the Archibalds, the McLennans, the Kennellys and the Burchills, the barons of 1892, made more, very much more, money by giving up the coal business than ever they made in it. And there is the Gowrie and Blockhouse, Ltd. Ask the English shareholders how much they made of it, and be buried in their scorn. It is not nice to be forced to write in this fashion, but it is about time the truth were made known, no matter the consequences—to put it that way and not in Lord Milner's emphatic way.

Some are ready to declare, when told there is not a bonanza in coal mining, that it is because our mines are inefficiently managed! The answer to that is: There are no better managed mines in the world, and no more efficient and wide awake managers.

Why then is coal dearer than in the United States? Because nature has made it so. Our seams are, many of them, of high angle, they make more water, requiring expensive pumping machinery; our roofs are more tender, necessitating more and heavier timbering; and our mining laws are more exacting. In the conspiracy case, when the lawyers have come to addressing the Court, those for the defence have a glorious opportunity, when the price of coal has to be dealt with. The lawyers for the defence may ask His Honour "Which will you have, cheaper coal and the lives of the workmen held cheaply, or dearer coal and life safeguarded?" Security and safety enter largely into the cost of production of coal in Nova Scotia.

How is coal so cheap in the United States? Here is the reason—"The imperfect methods of conducting a mine, incident to the low price of coal are resulting in the death or injury of between 8,000 and 10,000 persons annually in the United States." The speaker was Dr. Holmes of the United States Geological Survey.

Let the question be put strongly and clearly, "Which is it to be?" They have cheap coal in the United States with unsafe operating conditions. Coal is dearer here and life is securer. Again let me ask, in slightly different form, those who are berating the coal barons and bewailing the price of coal: Which is it to be? United States prices with resultant loss of life and property, or Nova Scotia prices with less loss of life and less loss of property? Is it to be, talking of production, a life lost for every 50,000 tons of coal produced there, or a life lost for every two hundred and fifty thousand tons sold here?

COBALT DURING 1909.

A Review of the Past Year in Canada's Famous Silver Camp.

Written for the Canadian Mining Journal.

Whatever wild oats Cobalt may have sown in her salad days, she has settled down now in the paths of conscious rectitude, the dignified paths of productive matronhood. Beyond an occasional spasm of excitement or a rare day of depression, she no longer responds to the mesmeric charms of her Svengali—the stock-market manipulator. In more senses than one, Cobalt has house-cleaned. She takes herself seriously; she insists upon being taken seriously by outsiders. Her high elation of yesterday has to-day become tempered self-esteem. She is an international figure, and she knows it.

Cobalt takes herself seriously. The town of Cobalt, chastened by fire and by an epidemic of typhoid, has emerged a cleaner and a wiser town. The mines of Cobalt, under management that is improving month by month, are yielding returns that are more than gratifying. In a word, town and district are flourishing. One year of unequalled productiveness will, unless all signs fail, be followed by at least one other that will excel it.

The influences that have moulded Cobalt, that have brought it out of the depths of speculative chaos and have placed it on the pinnacle, are distinctly discernable. I think that first of these is the Mine Managers' Association. This body, a strong union of the leading managers and superintendents, has regulated the labour situation, has assisted in all good public movements, has promoted sound legislation, and, when the civic authorities have been found incompetent or indifferent, has stepped bravely into the breach. To the association is due nearly all the credit of grappling with the typhoid plague. Upon the association, also, fell the duty of rounding up the "high-graders" and their confederates.

Possibly, in a review of this kind, it will be better to discuss in separate paragraphs the various subjects and incidents that must be considered. However, this general laudatory mention of the Mine Managers' Association is fully deserved by that body. Moreover, I shall begin my very incomplete review with a paragraph giving a few details concerning the association.

Mine Manager's Association.

The miners' strike of 1906 might have brought very serious consequences had not a group of managers made up their minds that, since a fight appeared inevitable, they would take a hand in it themselves. The strike proved a total failure. Intemperate agitators found that, for once, they had encountered men more resolute and much more resourceful than themselves. Therefore, after exploding some oratorical fireworks, the strike leaders decamped.

From this small beginning the Mine Managers' Association grew, until now nearly all the producing mines and a number of the most important prospects are represented on its roll.

The functions of the association are manifold. It controls the supply of labour. It maintains a free employment bureau, where those seeking work may register their names, and where the records of undesirables are carefully preserved. It enforces its own schedule of wages. But, over and above these duties, the association, as a body, established, supported, and continues to support, the public hospital. When typhoid fever broke out last summer the hospital was free from debt, and had a cash balance on hand. Now, when the disease has been practically wiped out, the hospital carries a debt of more than \$28,000. This debt is secured by notes from members of the association, and is being gradually removed by cash contributions from each mining company, the extent of each contribution being determined by the number of men employed by each company.

The association has been able to secure from the T. and N. O. Commission many improvements in the railroad service. Also from the Provincial Government concessions have been obtained that might not have been readily granted to individuals.

A creditable new building, designed as a home for the Mine Managers' Association and for the Employment Bureau, has just been completed. Also a new hospital is projected.

Canadian Mining Institute Branch.

The Cobalt Branch of the Institute is the strongest offshoot in Canada—at least in point of numbers. I believe that this is not altogether an advantage. The branch has not been as active as might be during the year, possibly because it has become unwieldy. There is any amount of good work that it might tackle in Cobalt. The reading of papers is not everything. If, for instance, the branch could find out what mining men actually want in the way of mining laws, it would certainly win the gratitude of many humble kickers like myself. Still, to do it justice, the branch has established a library and a fine collection of specimens.

Transportation and Other Matters.

The Temiscaming and Northern Ontario Railroad was projected as a colonization road. The men who fathered the idea of a railroad piercing the northern clay belt would have thrown the expected fit had they been told that Cobalt would bring more freight and passenger traffic in a day than they expected from the new line in a month. In fact, the present volume of freight was never figured upon in their rosiest dreams.

Cobalt has made the T. & N. O. It surprised me, and it will surprise the reader, to learn that every month between 600 to 700 freight cars enter the railway yard at Cobalt. The railway's revenue from freight alone in 1908 amounted to \$471,203. The passenger revenue ran up to \$366,504. Ore royalties brought in \$134,820, while receipts from express, telephone, and telegraph services brought the grand total up to \$1,127,885. A net surplus of \$419,488 was earned.

The T. and N. O. Commission charges a demurrage rate of \$3 per day on each overdue car. This is palpably unfair. The Commission has provided no facilities for handling freight. A little lesson in reciprocal demurrage would make the Commission sit up. The passenger service has been improved by the addition of dining cars to the through trains. Further improvements are needed, especially in the matter of hours of departure and arrival.

Cobalt city has a population of about 5,000 souls. In the twelvemonth ending September, 1909, the population showed a growth of 39 per cent. Immediately round and about Cobalt proper there are fully 2,500 people. Three thousand men are employed in the mines. Hence it is not surprising that each day 500 tickets are sold at Cobalt station. Incidentally, the T. & N. O. is putting up a decent station building to replace the indecent shack that had survived its usefulness for some years.

Rents in Cobalt are high. A house that cost not more than \$1,000 to build rents for \$25 or \$35 per month—not an unprofitable form of investment. Some buildings have netted their owners 50 per cent. per annum in rent. Insurance, of course, is very high. I am informed that rates as high as 10 per cent. are charged.

During last summer the Township of Coleman spent \$30,000 on roads. Now most of the mines are connected with Cobalt, and, in many cases, with each other, by means of macadamized roads. Next summer a larger sum will be appropriated.

Waterworks and a sewerage system are to be installed in Cobalt at an estimated cost of \$75,000.

Labour.

There is no scarcity of labour. The general tone of the workmen has been much improved in the last two

years. In efficiency it is generally conceded that Nova Scotian miners are at the top of the list. But a good local breed of miner is being developed. As in every rich camp, the pay-rolls contain names drawn from nearly every nation under the sun.

The miners of Cobalt are exceptionally well treated. The bunkhouses are clean and comfortable. The best of food is provided. Board and lodging, as provided by the mining companies, only costs 60 cents per day. Wages are high. It is a fact that most of the companies lose money in running their bunkhouses. This speaks well for the spirit of the camp.

The Mines.

Twenty-nine producing mines shipped about 30,000 tons during 1909. The silver yield of this ore aggregated 25,000,000 ounces. The record for 1908 was 19,437,875 ounces of silver from 25,624 tons of ore.

In rough figures the total ore produced from Cobalt since the first shipment ever made, is 78,000 tons, yielding in silver about 62,500,000 ounces. In dollars this represents \$33,000,000—of which \$15,750,000 has been paid in dividends. It may also be noted that 16 dividend-paying mines have paid almost 50 per cent. on their total capitalization.

A general survey of the camp indicates that positive ore reserves are larger now than they were a year ago. More than this, the production during 1910 will be larger than in 1909, and costs will be lower. This last is due largely to cheaper power, but partly also to better administration.

The deepest shaft in Cobalt district is No. 3, Kerr Lake. This working is down more than 400 feet. The next deepest is probably one of the Nipissing shafts, sunk to a depth of 300 feet.

Nothing in development has warranted the belief that values continue beneath certain points. Seventy-five to one hundred feet is probably the average depth of greatest vein richness. About 90 per cent. of the silver already produced has come from the Lower Huronian conglomerates and slates.

The relative shallowness of Cobalt ore bodies must not be misinterpreted. There remains yet much ground to prospect. Many of the mines are in better ore than they were a year ago. The mines immediately round Cobalt Lake have greater ore reserves than in 1908, and the ore is generally just as rich.

The Nipissing Company's property is a good illustration of the character and extent of the work done in the camp. The company's total acreage is 846 acres. In five and one-half months 24 new veins were discovered on this property by trenching—14 in conglomerate and 10 in Keewatin. The most important of these were in the conglomerate. The average depth of trenching is 3½ feet. Much of the territory has been trenched in 100-foot squares; some of it in 50-foot squares. Ultimately all likely territory will be trenched completely in 50-foot squares. This will mean, both for Nipissing and for most of the other companies, the prospecting of new territory and the re-prospecting of old. The mines in conglomerate, near Cobalt town, depend largely upon underground prospecting. One encouraging incident that occurred during the year was the fact that after sinking more than 150 feet on a barren calcite vein, one company encountered silver.

Little has been done during the year to add to power equipment—except as required for concentrating mills. In other words, the Cobalt mines are practically

equipped now, and are only awaiting for air to be delivered from the Cobalt Hydraulic Company to increase their drill capacity.

Concentrators.

There are now nine mills in operation. Their total capacity is approximately 850 tons of ore per day. Four additional mills are under construction or nearing completion. These will bring the total milling capacity of the camp up to about 1,250 tons per day. The stamp mill is now acknowledged to be a necessity.

During the past year about 130,000 tons of mill-rock were sent to the concentrators. This compares favourably with the tonnage for 1908, when 50,000 tons were dealt with.

Rock carrying from 15 to 140 ounces of silver is sent to the mills. This includes screenings. Screenings running about 140 ounces are sent to the smelter. The average mill-rock carries about 30 to 40 ounces.

It is generally conceded that one of the customs mills has achieved the best results and has led in developing the milling practice of the camp. At this mill, it is well worth noting, cyanidation is not used, and indications do not point to its adoption.

One mine has done a great deal towards improving ore-dressing by adopting devices for preliminary sorting. All the ore is sent over dumping-tables, which are fitted with screens, succeeded by picking tables, and supplied with running water. To both screens and tables a bumping motion is imparted by means of

air-drill pistons. The fines fall through screens into bins. This material, carrying, say, 50 to 150 ounces of silver, is sampled and analyzed at regular intervals. The assays determine whether it is to be sent to the smelter or to the concentrator. The high-grade lump ore, containing up to 2,000 ounces of silver to the ton, is hand-picked off the bumping-table. The discards are delivered over the end of the table to the dump. All discards are regularly sampled.

By this method the silver tenor of the discards is kept under 15 ounces. Control and records of the value of screenings and discards are made possible. The management is enabled to find out promptly whether the discards are or are not worth concentrating. Handling is simplified and much time is saved. Nine of these devices are in operation. Nipissing, La Rose, and Chambers-Ferland are the mines using them.

Smelters.

The service offered by the smelters is undoubtedly better and more prompt now than it was a year ago. There has been no material change in the schedules of rates, but the market for ores is wider, and competition is keener. A number of the smelting companies have representatives at Cobalt.

It is curious that, although the camp could easily supply all the cobalt needed in the world several times over, yet the total returns from sales of ores of cobalt, since the beginning of the camp hardly exceed \$500,000. This is a question that calls for attention. The arsenic problem also is important.

THE YEAR IN ONTARIO.

By Thos. W. Gibson, Deputy Minister of Mines.

Of the great primary industries, the chief in Ontario has always been agriculture. Lumbering has come next, and until lately mining has lagged far behind. But of recent years the situation has taken on a different aspect, and the mineral industry is claiming its legitimate place. To all appearances, the extraction and utilization of the mineral wealth of Ontario will prove one of the most powerful factors in the future development of the Province.

Ontario is lacking in coal, and in this respect differs from her sister Provinces both on the Atlantic and Pacific, but in almost every other mineral of importance, her resources are large. In certain substances, both metallic and non-metallic, her deposits are unique in quantity as well as in quality. For instance, in nickel, in arsenic, in corundum, she stands practically alone, not only among the confederated Provinces, but among the communities of North America. Petroleum and salt are produced in Canada only in Ontario, and the same may be said of feldspar and iron pyrites. She shares with Quebec the possession of the best mica mines on the continent, perhaps in the world. In fact, the list of Ontario's economic minerals is a long and varied one. It may yet be found to include even diamonds.

The Nickel Industry.

The branches of mining which have made the greatest progress in Ontario are those which are concerned with the production of nickel and silver. The Sudbury nickel mines now supply the greater part of the world's requirements of this metal, and are year by year increas-

ing their output. In 1904 the production was 4,743 tons, in 1908, 9,563 tons and in 1909, about 12,000 tons. The yield of copper from the Sudbury ores for the same period has been about 70,000 tons, worth in the refined state certainly not less than 17 or 18 millions of dollars.

The Canadian Copper Company remains the principal producer, and its possession of immense and proven deposits gives this company a very strong position in the nickel mining business. For some time most of the ore passed through the company's furnaces has come from the Creighton and Crean Hill mines. Both mines yield nickel and copper, but while Creighton is rich in nickel and comparatively poor in copper, the case is reversed with Crean Hill, whose ore is rich in copper and low in nickel.

The other producing concern is the Mond Nickel Company whose works are at Victoria Mines. Both plants turn out now Bessemer matte only which carries about 80 per cent. of the two metals combined, and which is exported for treatment and final separation of the nickel and copper by the Canadian Copper Company to New Jersey, and by the Mond Company to Wales.

The Dominion Nickel Copper Company, which entered the field some time ago with the view of opening up some of the large deposits on the northern nickel range, has not as yet done much actual mining. At present the company is building a spur line of railway from the Canadian Northern to the Whistle mine.

The nickeliferous pyrrhotite found in Dundonald

Township, near the Temiskaming and Northern Ontario railway line, was under bond during the year to the Canadian Copper Company, but after exploring the property by a diamond drill, the company allowed the option to drop. Other shows of nickel have been found in the same locality, and there is a possibility that the Sudbury district may not contain the only deposits of this ore.

The nickel contents of the silver-bearing arsenides of the Cobalt camp are not important, and yield no return to the owners of the mines. The total production of nickel from the mines of the Sudbury district from first to last has been about 96,000 tons. At an average price of 40 cents per pound for the refined metal, this quantity of nickel represents a money value of about \$77,000,000.

Electric power has replaced steam to a very considerable extent in the operation of the mines and works of the nickel district. The Canadian Copper Company has for some time been generating current at High Falls on the Spanish River and transmitting it to Copper Cliff and Creighton. More recently, the Mond Nickel Company has developed a power for similar purposes at Wabageshik Falls, on the Vermilion.

Silver Mining.

The silver mining industry has been developing in Ontario even more rapidly than that of nickel. Six years ago, practically no silver was produced in the Province, the old activities at Silver Islet, and later at the mines of the mainland west of Port Arthur, having entirely spent themselves. In 1903 came the discovery of the wonderful riches at Cobalt. Slowly at first, and with some misgivings, the mining community were led to take an interest in the Cobalt field. But as the phenomenal nature of the deposits became apparent, hesitation vanished, to be followed by the fierce boom which culminated in 1906, and which has had intermittent periods of recrudescence since that time. But the real Cobalt camp reeked little of the vagaries and extravagances of the stock market. It went right ahead producing silver. How rapid was the increase in production may be seen by the following figures:—

	Production.
1904.....	206,875 ounces
1905.....	2,451,356 "
1906.....	5,401,766 "
1907.....	10,023,311 "
1908.....	19,437,875 "
1909 (estimated) .	25,000,000 "

a total output of 62,500,000 ounces. It is doubtful if this record has ever been equalled by a silver camp anywhere.

The Cobalt mines have placed Ontario in the third place among the silver-producing countries of the world. Mexico comes first with about 56 million ounces annually, then the United States with 52 or 53 millions. The production of Ontario in 1909 was considerably more than the production of the two best silver States in the Union, say Colorado and Montana, and little short of the combined output of these two States and Nevada.

The camp has had many advantages; among them, rich ore, a railway running through the field from the outset, a plentiful supply of labour and supplies at reasonable cost. The narrow veins, however, have necessitated a great deal of dead work and the costs per ton have been anything but low.

Last year the shipments of ore and concentrates amounted to 27,721 tons, as compared with 25,624 tons in 1908. The increase in gross tonnage shipped, therefore, has not been large, but fuller details will no doubt show that the proportion of concentrates was much increased.

The concentration of the "low-grade" ores has become a prominent feature in Cobalt practice. Several of the mines have installed plants for the treatment of their own ores, and there are also two custom concentrators, in addition to the smelting and refining works at Copper Cliff, Deloro and Thorold, all of which have been operated steadily throughout the year.

The newer camps of South Lorrain, Elk Lake, Maple Mountain and Gowganda have not developed with Cobalt speed. Several of the South Lorrain mines have made shipments, and so also have some of the properties in Gowganda. The great expanse of territory over which silver has been found in the valley of the Montreal River is remarkable, and it may reasonably be expected that at least some of the deposits will develop into valuable mines.

Gold.

The gold-mining industry in Ontario has had a disappointing history, but in 1909 finds of gold in large quartz veins were reported from Porcupine Lake, in the Townships of Whitney and Tisdale, north of the height of land, and west of the T. & N. O. railway. Some of the veins are of large size, up to 25 feet in width, and contain visible gold in considerable quantity on the surface.

Options have been taken on several of the most promising claims by some Cobalters and also by New York and Scotch capitalists. The diamond drilling and test-fitting now going on will reveal something of the underground quality of the deposits.

Meantime, unaffected by the presence of a foot or two of snow on the ground, the staking of claims is going merrily on, and "discoveries" are being sworn to by the guileless prospector in muskeg and sand plain, quite as readily as on rock exposures. The latter, indeed, form a comparatively small proportion of the surface.

Porcupine holds the centre of the stage at the close of the year, and the indications are that another mining "boom" with its attendant swarm of fake companies will shortly afflict the public and damage legitimate mining.

Iron.

The year just closed was not productive of anything new in the way of iron mining, but previously known mines have been active. The most noteworthy feature was the shipment of a couple of cargoes of hematite from a deposit near Loon Lake, east of Port Arthur. The ore occurs there in horizontal beds near the surface, and is of good quality, so far as regards the absence of impurities, but the metallic contents are not specially high. Drilling has been done on some deposits of magnetite near Moose Mountain, and the reported results are encouraging. Most of the ore actually mined has come, as usual, from the Helen mine, Michipicoten, but Moose Mountain and Bessemer have also contributed to the total.

The pig iron product of the past year will exceed that of 1908, when it was 271,656 tons. The blast furnaces at Sault Ste Marie, Port Arthur, Midland and Hamilton, were operated during the year.

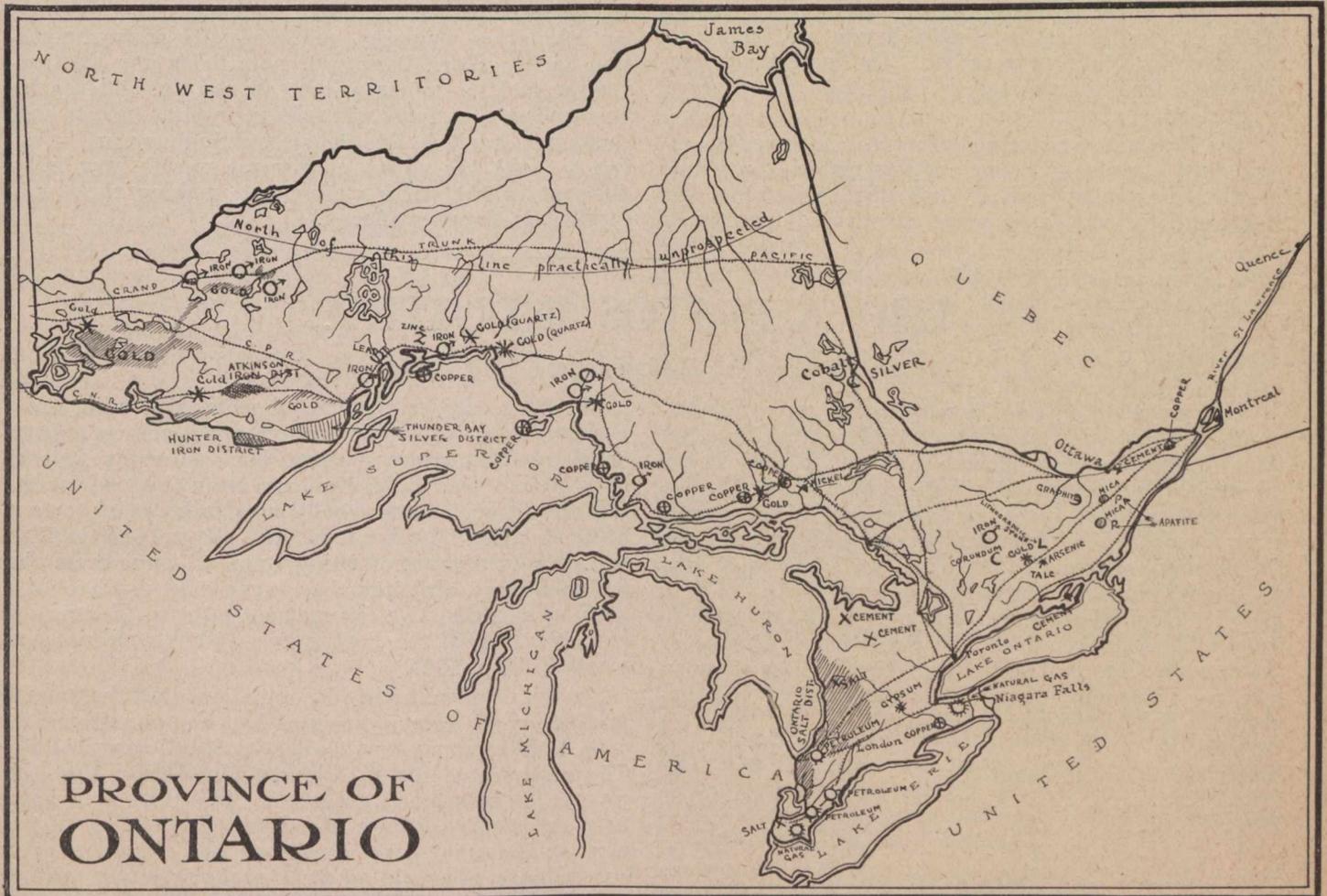
A little zinc ore, amounting to about 785 tons, was raised at the Olden mine, in the county of Frontenac.

Natural Gas.

Of the non-metallic products of Ontario, probably natural gas now holds first place as regards value of output. In 1908 the valuation placed on the yield, at a low price, was about a million dollars, and in 1909, the yield was certainly not less. The greater part is now furnished by the gas field in Haldimand and Norfolk counties, whose production now surpasses that of the Essex and Welland fields combined. During the year several wells were drilled on lands of the Crown underlying the waters of Lake Erie, and good flows obtained.

been yielding oil, but the average output per well is now not much more than 7 or 8 gallons per day. Even at this rate, 7,000 or 8,000 wells yield a large quantity of oil annually, and fortunately for the permanency of the field, the shallow wells of Lambton county can be operated very cheaply.

In East Tilbury and Romney, where two years ago the output was greater than that of Lambton county, the decline has been at a more rapid rate than in the older fields. The number of wells is much smaller, but the average yield is greater. The production in 1909 was probably less than that of 1908, say a little over 17 million gallons. Notwithstanding the bounty of 1½ cents per gallon paid by the Dominion Government on domestic crude, about one-half the quantity of



A satisfactory result of the operation of the tax on natural gas has been the almost entire stoppage of the waste of this ideal fuel, which formerly characterized the operations in parts of the gas territory. The tax is a merely nominal one on gas used in the Province—two-tenths of one cent per thousand cubic feet—but where the gas is exported or allowed to escape into the air, the tax is two cents per thousand feet, which forms a substantial impost. The effect has been twofold—the stoppage of exportation of gas and the cessation of waste. Legislation at Ottawa has also been passed regulating the export of gas and electric power.

Petroleum.

The petroleum fields of the Province of Lambton and Kent counties are falling off in production. For forty years the wells of Petrolia and Oil Springs have

petroleum required for refining purposes is imported from the United States.

Salt.

The salt wells of south-western Ontario produce from year to year the quantity required to satisfy the home market. The output is restricted only by the demand, for the salt beds along the east shores of Lake Huron, Lake St. Clair, River St. Clair and Detroit River are capable of supplying not only all the common salt needed in Ontario and other parts of Canada for generations to come, but also to furnish the raw material for the production of bleaching powder, soda and other chemicals largely used in manufactures.

Minor Minerals.

In the production of mica, graphite, feldspar and

corundum, smaller but still important industries are enjoyed.

The mining and grinding of talc are being carried on at Madoc, where Mr. George Gillespie is turning out a considerable quantity of the finished article in several grades and qualities.

Building Materials.

Ontario is fortunate in possessing ample supplies of raw material for construction purposes. Clay suitable for making bricks, limestone for burning into lime and for use in building, as well as sandstone of good quality are abundant, especially where there is at present the greatest demand, namely, in the older and more settled portions of the Province. The abundance and general distribution of brick-making clays, for instance, is an important matter in relation to the comfortable housing of the people, for in this climate bricks are preferable to timber for building purposes. The increasing practice of under-drainage, too, is leading to an enlarged production of drain tiles.

The Portland cement manufacture continues to expand with the steady growth of this material in public favour. For many uses, it has displaced wood and stone, and for some it is being substituted for iron or

steel. At the inception of the industry in this Province, shell marl was principally used to provide the calcareous elements for cement, but solid limestone, where it can be obtained of suitable quality, is now preferred, as tending to lower cost of production. A number of the cement companies of the Province during the year formed a merger with several companies in the neighbouring Province of Quebec. The manufacture of "natural rock" cement has ceased altogether.

Prospects for the Future.

The outlook for the mining industry in Ontario was never better than at the present time. It would appear that the pre-Cambrian formations, which have proven to be specially prolific in valuable minerals, and which cover the greater part of northern Ontario, are likely to be the scene of great activity for generations to come. As population increases, and especially as transportation facilities are improved, new fields for the prospector and the miner will be opened up, and regions now unknown to fame will take their place among busy communities which, like Cobalt and Sudbury, are bringing to light the stores of mineral wealth now lying dormant in the earth's crust and making them subservient to the uses of man.

THE ASBESTOS INDUSTRY.

Written for Canadian Mining Journal by J. J. Harpell.

In my article on the "Amalgamated Asbestos Corporation, Limited," which appeared in the June 1st issue of the Canadian Mining Journal, I predicted a very rapid increase in the production of South African asbestos. At that time I was speaking from impressions formed by the quantities that were coming into the market and from the information I had regarding its quality and the increasing activity in the mining districts from which it was coming. I am now able to submit figures taken from the Government returns of the exports from British South Africa. These show an increase in production much greater than I had expected. The figures are as follows:—

Year.	Quantity.	Value.	Average price per ton.
1902.....	45 tons	\$3,151	\$70.00
1903.....	305 "	21,218	69.50
1904.....	411 "	29,186	71.00
1905.....	672 "	47,696	70.90
1906.....	680 "	47,901	70.40
1907.....	580 "	38,517	66.50
1908.....	1,605 "	108,250	67.40

During the first six months of this year the exports were 1,056 tons as compared with 718 tons during the same period last year. From this it looks as if the production for the whole of 1909 is likely to exceed 2,000 tons. A significant fact shown by these returns is that the Transvaal, South Rhodesia, and Natal contributed to this production for the first time in 1908. I have seen the material from these last three colonies, and it is of a fine white quality, quite similar to our own Canadian article.

From the above figures it will be seen that the average price per ton would indicate that these exports include only the superior grade. This is to be expected since the industry is not sufficiently established to be provided with mills and machinery necessary to produce the lower grades such as paper stock.

There is also fine grade of material coming from Portuguese East Africa. I have not yet been able to ascertain the entire output, but according to the imports into the United Kingdom from this district the increase in production would seem to be equal to that of British South Africa. In fact, the imports in 1908 lacked only 69 cwt. of being equal to those from the latter country, although they began only in 1906. According to the British Government returns, the average price per ton of the Portuguese East Africa material was \$173.20 in 1908.

In my previous article I pointed out that the annual production of Russian asbestos had gone up from less than 1,000 tons previous to 1900 to 10,331 tons in 1907. Those interested in the Russian mines claim that the production was much greater in 1907 than they have been credited with. But the figures I quoted were the most reliable that I was able to obtain. I have not yet succeeded in ascertaining the average price per ton for the whole of the Russian output. But the British returns show that the average price of the quantity that came into Great Britain in 1908 was \$118.20 per ton.

According to the returns of the Quebec Government, the Canadian production of asbestos during the last nine years was as follows:—

Year.	Total production of superior grades.	Total production of paper stock.
1900.....	21,613 tons
1901.....	19,382 "	14,054 tons
1902.....	19,952 "	10,682 "
1903.....	12,434 "	16,327 "
1904.....	12,143 "	23,336 "
1905.....	14,600 "	34,655 "
1906.....	22,469 "	39,306 "
1907.....	24,330 "	37,655 "
1908.....	17,582 "	47,574 "

According to the same returns, the average price of the superior grades in 1908 was \$80.55 per ton, and the average price of the paper stock only \$23.86.

The heavy cost of transportation has made it impossible for the lower grades of the Russian asbestos to be brought into the market, but this will not be the case with the lower grades of the South African material when mills are erected for its production. Besides, the lower cost of labour in South Africa will mean cheaper production than the Canadian mines can hope to attain under the present high cost of living in Canada. Moreover, it is hard to say what will be the outcome of the present demoralization of the European market for Canadian asbestos.

Furthermore, the report that an export duty is likely to be imposed upon the Canadian material has further aggravated the situation. If this report is not true, it should be denied at once by the proper authorities. On the other hand, if there is any disposition to impose such a duty, a very careful investigation of the whole situation should be made before any such step is taken.

As regards consumption, distribution and manufacture asbestos is quite a different commodity from pulpwood and sawlogs, which commodities, according to rumor, are also likely to be subjected to some special tax. The world's consumption of asbestos at present does not exceed 100,000 tons of all grades.

Undoubtedly the widest application of asbestos is as an ingredient of covering for steam-boilers and pipes. For this purpose it requires no further treatment than it now receives at the Canadian mills. As it comes from the mills it is simply mixed with other materials, which either serve to increase its non-conducting qualities, or to make the composition adhere better to the surface of the boiler or pipe. The percentage of asbestos fibre in such mixture is very much less than is generally supposed. According to Merrill, it is as follows for the respective compositions:—

Asbestos sponge mould.....	4.20%	of asbestos
Fire felt sectional covering.....	8.00%	"
Magnesia plastic	7.80%	"
Magnesia sectional covering.....	7.80%	"
Asbestos felting	32.00%	"

To attempt to increase the manufacturing industry of Canada by imposing an export duty on asbestos used for this purpose, would be like endeavouring to compel masons and builders to transfer their business to Canada by imposing an export duty on the Canadian cow-hair they use in their mortar.

The number of merchants who sell asbestos for boiler-covering, and who are in a position to buy directly from the producers and sell directly to the consumers, is legion. They are to be found in every city of any size throughout the world. But their trade in asbestos, as a general thing, forms but a very small part of their business. In many cases it is so small that if it disappeared altogether it would be hardly missed; yet in the aggregate this class forms a considerable factor in the market for asbestos.

The remainder of the market is made up of those who make a business of manufacturing one or more of the thousand and one different articles into which asbestos enters. But here again very few of such firms devote themselves exclusively to the manufacture of asbestos articles. Textile establishments, in addition to carding, spinning and weaving asbestos, manufacture cotton, woollen and metallic fabrics. As a matter of fact both cotton and metallic thread enter largely into the manufacture of asbestos cloth. Manufacturers of

asbestos mill-board, paper, or felts also make similar articles from other materials, or use other materials extensively in the manufacture of these asbestos articles. Firms making packing and steam joints also manufacture similar articles from rubber and other commodities. The same is also true of firms that produce asbestos fire-proof paints and flooring, etc. As a matter of fact the manufacturing firms of the world, in whose supplies of raw material asbestos forms the largest item, can be numbered on the fingers of one hand.

This being so, can it be expected that an export duty on raw asbestos is likely to bring many manufacturing establishments to Canada? As a general thing these manufacturing establishments are situated where the advantages of either proximity to the market or of cheap living and cheap labour are of much more economic importance to their promotion than the disadvantages of any export duty that might be imposed on raw asbestos, which, at most, can only be a temporary disadvantage. These manufacturers will soon arrange to get their supplies elsewhere.

The cost of living in Canada has reached a point where almost every article, in the production of which labour enters to any extent, and which has to be sold in the markets of the world and hence compete with similar articles manufactured elsewhere, cannot be produced and sold at a profit. The success, therefore, of manufacturing in Canada depends upon the extent of the market that can be found in Canada itself, where the tariff prevents outside competition and compels the people within the country to pay the higher price for the products of the local manufacturer. But since it will be some time before the Canadian market will be large enough to support an asbestos manufacturing industry, the Canadian producers of asbestos must depend upon their export trade for their market.

But, it will be asked, how are the Canadian producers to retain this market under existing conditions? This is the question that is being asked everywhere regarding the production and marketing of almost every commodity. As yet the problem is far from being satisfactorily solved. But, if we have regard to the attention that is being attracted and the jealousies that are being aroused by German methods, we are safe in surmising that these are meeting with greater success than any others. Certainly the manner in which the Germans meet the exigencies of trade is thoroughly practical and generally successful.

According to the recent and most valuable report on the trade in Germany by Sir F. Oppenheimer, the British consul at Frankfurt, we learn that "Owing to the intensified protective spirit of the last German tariff, German export has been rendered more difficult. In spite of the elaborate protection and preparation of statistics upon which to base a scientific tariff, a number of Chambers of Commerce openly complained that the treaties concluded on the basis of this tariff had dealt German exports a serious blow. The course of the exports of the chemical industry is instructive as illustrating the difficulty of sending goods abroad. Even German commercial enterprise, which is notoriously active and which is certainly the keenest in Europe, has not been able to maintain its grasp of foreign trade. It is to-day freely admitted that the difficulties of German export trade are due to the higher protective barriers which Germany was the first to set up."

"The figures for foreign trade in 1908 are considerably below those of 1907 and on analysis disclose some

peculiar characteristics. There is an extraordinary drop in the export of textiles, and this extends to all the more important items of export. A noteworthy falling off is shown further in the export of dyes and chemical products, amounting to over 35,000,000 marks."

This was the situation that confronted the German exporters at the end of last year and it is interesting to note how they met it. After a very careful review of the whole situation, during which much technical and expert advice was sought, an association was formed in March last, known as "The German Export Union for the Extension of German Export Interests and the Protection of its Members before the Law Courts in Foreign Countries." For the purposes of this organization, it has sent its own technical experts and representatives abroad, and on them will devolve the duties "not only of actually getting business but also of constantly watching over customs formalities and duties and any changes therein; over the conditions of transport and the costs thereof; over local laws in the region of patent protection, as well as the protection of trade mark, etc." For the protection of the legal rights of the members of this Association, its representatives will get into direct communication with local lawyers, and will conclude agreements with them on special terms for the furtherance, or protection of, as the case may be, the member's interests in foreign Courts of Law. Already these representatives are hard at work in all parts of North and South America. The efforts they are making in Canada will give the Canadian people some idea of what the representatives of this Association are expected to do.

This latest move, however, only accentuates the principle that has long been the mainspring of German industrial enterprise and commercial economics, viz., organization. Not organization as we have it in Canada by the formation and over-capitalization of combines and monopolies brought about by brokers, bankers, and company promoters; but organization of associations of producers, for the purpose of determining the best and cheapest means of production and of marketing the products of the different members of the Association. It is to this system more than to any other institution that Germany owes the wide application of science to industry for which that country is so noted. The requirements of these associations for information and for the best trained skill have turned the universities into laboratories of original research, have established the best system of technical education, and have put a premium on the services of the trained student.

What this system of organization has done for the German iron and steel industry will indicate its operation and efficiency. "German progress," says a recent writer, "in steel exportation—progress under natural geographical and economic difficulties quite unknown in England—is a monument to the virtue of organization. The production, price and sale of practically every important material of steel manufacture, from iron ore to machinery, are controlled by syndicates or manufacturers' unions. These syndicates do not, as a rule, control any works as do the American "trusts," but merely the products of the works. The usual German syndicate method is for a number of experts to visit each of the associated works and ascertain its capacity of production and aptitude for any special class of work. Then orders which are usually received by the central offices are allotted to the various estab-

lishments, regard being had to the geographical situation and mechanical circumstances of the several firms in order to avoid unnecessary cost of delay in execution. Careful watch is kept by the experts of these associations over new methods and conditions of production, as well as over the requirements and peculiarities of the markets. In fact these syndicates watch over the general interests of their constituents and are in fact manufacturers' trade unions and co-operative societies combined." The efficiency of such a policy can best be judged by results. In 1897 the iron and steel exports of Germany amounted to 1,069,000 tons, and of Great Britain to 3,318,000 tons. By 1908 Germany's export of these commodities had increased to 3,732,000 tons, while England had increased only to 4,233,000. In chemicals German exports have increased by \$55,000,000 during the last twelve years, while those of Great Britain have increased by \$27,000,000; and those of the United States by about \$11,000,000.

Such a policy, whether adapted individually or collectively to the producers of Canadian asbestos, would have been highly beneficial to the industry. In this way they would have been able to keep closely in touch with their market instead of allowing it to drift into the hands of outsiders, who are now in a position to divert this market to other parts of the world for its supplies. With a thorough knowledge of the uses to which their material is put and of the requirements of the market as regards grading, packing, and labelling, etc., they would have been able to sell their material to much greater advantage than has been the case. Such an organization in addition to looking after sales, studying the requirements of the market, and collecting information as regards other sources of supplies, would also have been able to do something towards improving the facilities for shipping and transportation. It seems a piece of gross indifference on the part of someone that there should be no facilities for storing and shipping asbestos at Levis, the nearest and most natural seaport of the Canadian asbestos industry.

Furthermore such a policy of commercial and industrial economy would not be long in discovering that one of the most essential requirements for satisfactory and steady production is faithful and efficient labour, and that such exists in proportion to the labourers' physical welfare and educational opportunities. In Germany, as soon as a new district shows signs of giving birth to an industry, whether mining, manufacturing, or anything else, both the State and those interested in the industry give special attention and encouragement to the development of intensive agriculture. They recognize that this is the first essential of cheap and wholesome living, which, of course, is the basis of cheap and efficient labour. How different are the conditions that still exist in the asbestos districts of Canada, where an important industry has been established for over twenty years. Much of the best agricultural land about the mines is owned by two or three individuals who are holding it for fancy prices. Much of it still remains covered with timber and brushwood. The food stuffs for the miner have to be brought in from a distance and are hence expensive and often of a poor quality. The present Quebec Government cannot be held responsible for the condition of land holdings that exists around Thetford Mines and Black Lake, but they will be responsible for these conditions in new districts such as Chibogamou where they are creating a state of affairs no better than that created by their predecessors in the asbestos districts of the Eastern Townships.

THE NEW PORCUPINE GOLD FIELDS.

Written by Request of the Canadian Mining Journal

By A. M. Hay, Toronto.

The rush into the Porcupine District of Northern Ontario which began a few months ago on the report of valuable discoveries of gold quartz in that section still continues, and the rim of the circle of excitement has already been extended far into the adjoining townships to the north and west, and into the Temagami Forest Reserve to the south.

The writer accompanied a party of mining men into the section for the purpose of making a cursory examination of the properties upon which work has recently been started under working options obtained from the owners.

Leaving Cobalt on the afternoon of the 4th, of January by Temiskaming and Northern Ontario Railway, the party arrived at Mileage 222 about three o'clock on the morning of the 5th, the train having been delayed

camp and leave early the following morning, so as to reach Porcupine early in the day and enable the party to erect camp before nightfall of the following day. Accordingly a start was made on the morning of the 6th at five o'clock, and Porcupine Lake was reached before noon of that day.

While construction of the camp was proceeding a number of the party drove through a distance of about five miles—over a fairly good now winter road—to the properties which are now being tested under option by Messrs. Timmins, of the La Rose Mine, and by Mr. M. J. O'Brien, of the O'Brien Mine, Cobalt.

On the Timmins properties, which are known as the MacMahon and Hollinger claims, camps have been erected and a force of about thirty men is at work opening up the test-pitting veins, which appear to occur



Davidson Ledge, Tisdale.

through various causes. The camping outfit and supplies taken in by the party were dumped in the snow at this point, no facilities having yet been provided by the Railway Company for the handling either of passengers or freight.

Arrangements had been made for teams to meet the party, and after partaking of a frugal breakfast and sorting out the party's belongings from the chaos of impedimenta belonging to about a hundred passengers heading Porcupinewards, a start was made before daylight, and the party reached the Camp of Father Paradise on the East shore of Frederickhouse River in time for the mid-day meal.

The accommodation at this camp was limited to about thirty or forty, but the meals supplied were excellent. A force of between twenty and thirty men were engaged in putting up new buildings to accommodate about 150 guests.

It being impossible to reach Porcupine until late on the night of the 5th, it was decided to sleep at this

in the form of large dykes or intrusions of quartz in a country of diorite and dioritic schist.

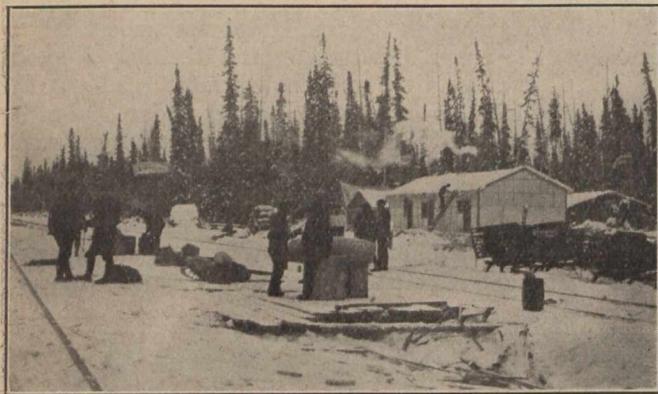
Owing to the snow, it was impossible to determine the extent or continuity of the quartz dykes. They appear however, from examination at different points where they are exposed, to be wide, and of considerable extent. The country rock has apparently been scored off by glacial action leaving the quartz dykes standing up in places in the forms of "hogs backs." At one point where the schist was exposed, it was found to be heavily mineralised with iron pyrites standing vertically at right angles to the quartz, which leads to the supposition that the dyke is striking diagonally across the formation. Except at this point, there were no walls in evidence. Well trodden trails led to various points on the dyke where visible gold had been discovered and exposed, so that there was no difficulty in making an examination of the surface showings of gold, which appear to occur for the most part at points where the quartz has been slightly fissured and considerable ox-

idation has taken place, forming what appear to be pay-streaks, extending in some instances over a surface of several feet in area. No working having been done at these points it was of course impossible to determine whether the visible gold is merely the result of surface enrichment or whether it goes to depth. Numerous samples of rock which had been taken into the camp from points where work had been done gave evidence that the yellow metal had been found at other points

granted to the purchasers. The result of this operation will be looked forward to with great interest by the whole camp.

Returning to camp at the south end of Porcupine Lake, the night was spent in comparative comfort owing to the strenuous efforts of the party which had been entrusted with the task of clearing the ground, erecting the tent and preparing cooking and sleeping quarters.

On the following morning the bulk of the party



Mileage 222 on T. & N. O. Ry.

on the vein, and the management was enthusiastic and optimistic about the ultimate result of the testing operations which were then being conducted.

On the O'Brien properties known as the Gillies and Miller claims a test pit was being sunk at a point where the dyke appeared to pinch into the country both at depth and in length, and at a depth of about six feet the quartz contained a considerable amount of base mineral. Whether this may be taken as an indication of a change in the character of the quartz which may be met with at depth, or whether it is merely a pinch at



Father Paradis'—19 miles on Trail.

started out on foot to visit the claims known as the "Wilson" claims, which lie about two and a half miles south-west from Porcupine Lake. Under the guidance of Mr. Preston one of the owners of these claims, every facility was granted to the party to make an examination of the properties which, in respect of the formation and the occurrence of visible gold in the quartz dykes, were found to be similar to the claims above described. The showings of visible gold were, however, more frequent and spectacular.



Mileage 222, T. & N. O. Ry.

the end of a large lenticular body of ore can only be determined by further work.

A diamond drill had been set up on this property and drilling operations commenced on the day of our visit, the drill being then about three feet in the rock. The hole has been laid out to test the large dyke on which test-pitting was being done, at a depth of over 100 feet, and the management expected that the test would be made in time to satisfy them whether the free milling character and values of the quartz continued to that depth, before the 15th inst., the date on which a payment has to be made under the terms of the option



Davidson Shanty.

The claim on which the best showings occur was originally staked on what appeared to be a small auriferous vein, and the huge dyke of quartz was subsequently discovered in getting out timber while camped on their original discovery.

It was the intention of some of the party to visit the Bannerman claims lying near the north end of Porcupine Lake, but it was learned that no work was going on, and with snow on the ground the trip would probably have been fruitless, so this plan was abandoned.

After another night in camp, some of the party drove through to Mileage 222, arriving there on the

night of the 8th, and left that point for the south by train on the morning of the 9th.

It is not to be wondered at that the occurrence of these rich surface showings of gold quartz dykes of such magnitude should create a considerable amount of excitement in the communities which take an interest in mining affairs. It must not be forgotten, however, that prospectors have been in the Porcupine District for several years, and many large dykes of quartz have

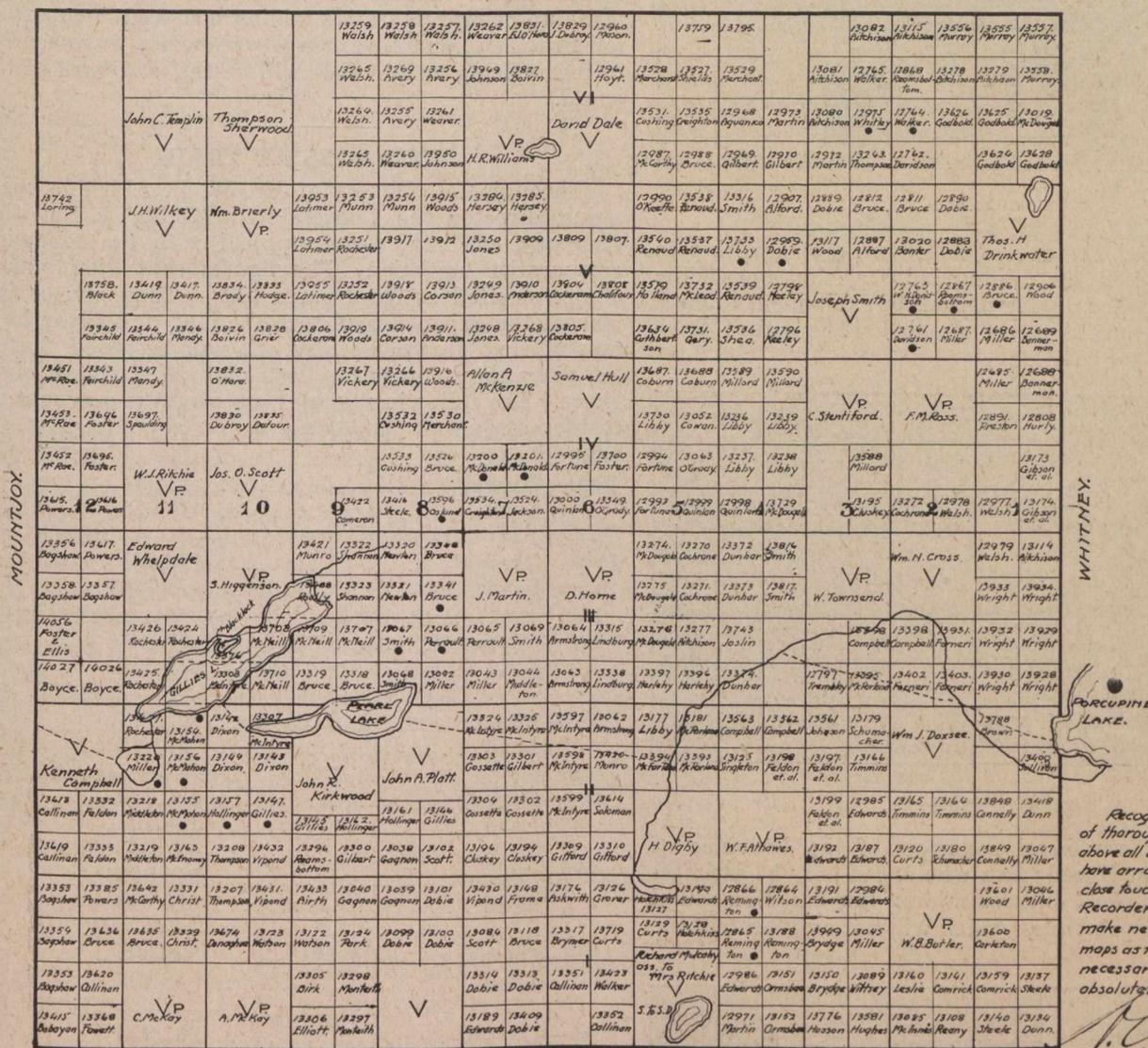
Lake will not show enough rock to admit of being tapped by hammer and steel.

The mining men above mentioned who have acquired options on the claims above referred to, are well able to take care of themselves, and it may be that the high prices asked by the owners of these properties may ultimately be justified.

The danger ahead however, is that many of the Snowshoe claims recently staked, will change hands

Scale by Chains 10 20 30 40

MURPHY.



MOUNTJOY.

WHITNEY.

PORCUPINE LAKE.

Recognizing the need of thoroughly accurate and above all up to date maps, I have arranged to keep in close touch with the various Recorders' Offices, and to make new issues of all maps as frequently as necessary to keep them absolutely up to date.

A. Goudie

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REPORTED FREE GOLD FINDS.

TEMAGAMI FOREST RESERVE.

ITISDALE TOWNSHIP.

been known to exist in the section but were disregarded on account of the low values which they were found to contain. Mining licenses on some claims were granted four or five years ago, and the location on which Father Paradis camp is placed was staked by him over three years ago and a mining company incorporated to acquire and develop same.

The history of the Porcupine District cannot be written in advance, but it is safe to prognosticate that the bulk of the claims which have been staked over the swamp and muskeg country surrounding the Porcupine

and be used as a medium for interesting the public in companies promoted, not for the purpose of developing mines, but for the purpose of reaching money out of the public purse.

That the Government is alive to this danger, and to the injury which will inevitably follow any ill considered boom, is evidenced by the words of warning which have been given out by the Hon Mr. Cochrane, Minister of Mines, through the press.

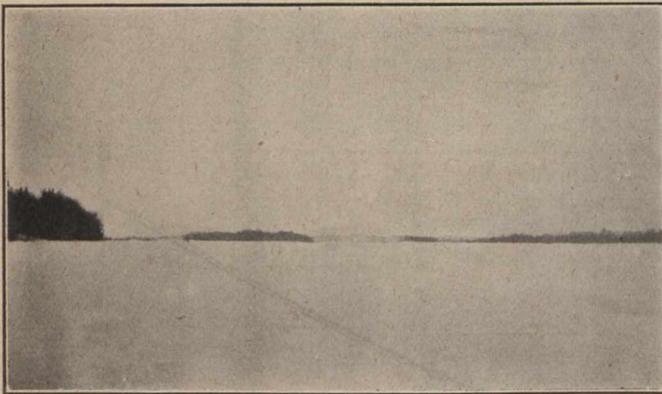
All roads lead to Rome, and the signboards point to the fact that the mining laws of the country must ul-

timately be laid on lines that will prevent the acquisition of mineral lands from the Crown for anything but legitimate mining purposes. There are many ways in



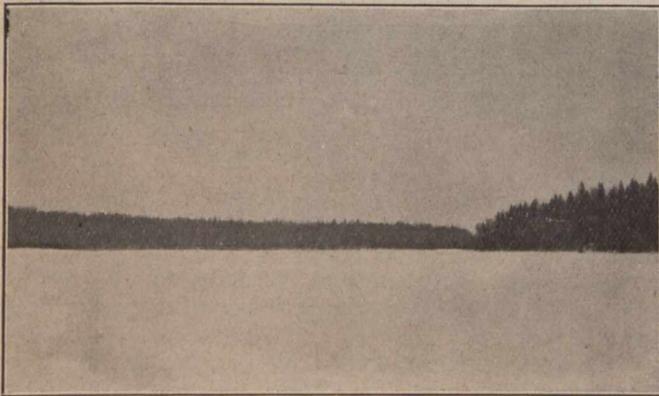
On the Trail.

which this might be accomplished without hardship to those engaged in the mining industry, but spasmodic legislation enacted during periods of excitement to meet special conditions, is to be avoided. The future deve-



Night Hawk Lake.

lopment of the mineral resources of the Province of Ontario and of Canada as a whole, can only be satisfactorily accomplished under a mining law based on sound and equitable principles, which will not only protect the



Frederick House River.

man who engages in the business of prospecting and mining, but will prevent the legitimate mining business being travestied by speculators for sordid ends.

Such a law must also contain provisions not only to encourage capital to engage in the mining industry, but to protect such investments by enactments which will stand for stability of title and continuity of vested interests.

While the mining law exists in its present form and is subject to modification by Orders in Council, enactments may be made to meet special cases as they arise, but a final and satisfactory solution of the problem can only be reached by the method which has been recommended by unanimous vote of the members of the Canadian Mining Institute, to the Dominion and Provincial Governments, namely to create a Royal Commission made up of representative mining men and Members of the Provincial and Dominion Governments, to co-operate in formulating an Act that will be the standard of the world.

TONNAGES AT TRAIL.

Through the courtesy of Mr. W. H. Aldridge, managing director the Consolidated Mining & Smelting Company, we have been supplied with the following comparative statistics. The figures show the tonnage of ore smelted at Trail since 1899. They give a fair idea of the expansion of both the lead and silver business at that growing centre. It will be noted that in ten years the tonnage has been multiplied almost eight times. The following tabular statement is a synoptical history of one of Canada's greatest industries:—

1899	55,702 Tons
1900—Copper	91,194
Lead	13,615
	—————104,809 “
1901—Copper	122,035
Lead	21,736
	—————143,771 “
1902—Copper	56,793
Lead	15,539
	—————72,332 “
1903—Copper	152,914
Lead	16,892
	—————169,806 “
1904—Copper	139,760
Lead	18,197
	—————157,957 “
1905—Copper	214,969
Lead	25,347
	—————240,316 “
1906—Copper	238,983
Lead	18,102
	—————257,085 “
1907—Copper	263,910
Lead	35,021
	—————298,931 “
1908—Copper	266,579
Lead	51,895
	—————318,474 “
1909—Copper	374,069
Lead	55,507
	—————429,676 “

Note.—Tonnage for December, 1909, is estimated.

BRITISH MINERAL RIGHTS TAXATION—MINERAL RIGHTS DUTY—PROPERTY TO BE ASSESSED.

The rental value of all rights to work minerals and of all mineral wayleaves. But brickclay, sand, chalk, limestone and gravel are exempted.

By the rental value is meant the amount of rent paid by the working lessee under a mining lease, or where minerals are being worked by the proprietor the amount which he would have received as rent if he had let the right to work the minerals.

If the rent has been enlarged by reason of any capital expenditure on the part of the proprietor, the rental value to be assessed is to be reduced proportionately.

The duty is to be paid annually as a debt to the Crown by the proprietor if he is working the minerals, otherwise by the immediate lessor of the working lessee.

Where there are one or more successive sub-leases it is clear that the rental value is being enjoyed by each of the lessors in proportion to the rent which he receives, and that each ought, therefore, to contribute to the duty in proportion. To effect this it is provided that, the whole duty having been paid by the first lessor, each lessor may deduct from the rent paid by him a sum equal to the duty on a rental value of the same amount as the rent which he pays. Agreements affecting this incidence of the duty are to be void.

The duty is to be charged at the rate of five per cent., or 1s for every £1 of rental value.

The value of the right to work minerals is part of the site of land; therefore were owners of minerals to be subjected to the general taxes on site values in respect of the value of their minerals as well as to the special mineral value duty, they would be paying twice over in respect of the same property. To remedy this the bill provides that no reversion duty or increment value duty is to be charged in respect of the determination or grant of a mining lease; and makes the following further provisions:—

No increment value duty is to be charged in respect of minerals which were the subject of a mining lease or were being worked on April 30th, 1909.

Where increment value duty does become chargeable in respect of minerals the increment value is not to be estimated as a capital sum, but is to be taken to be the excess of the rental over the annual equivalent (two twenty-fifths) of the original capital value of the minerals; and the duty is to be charged annually.

A payment of increment value duty in this manner is to count as a payment on account of mineral rights duty.

The capital value of minerals referred to above is their total value, deducting capital expenditure necessary to bring them into working; and their total value is the value of the fee simple sold by a willing seller in the open market.

The original capital value is that determined by the general valuation as on April 30th, 1909, in which all minerals leased and being worked are to be separately valued.

The opening up of the Gillies Limit attracted considerable attention to the Keewatin. Up to date the development work on recent discoveries does not show that Keewatin will equal the Lower Huronian. Incidentally, the future of this section has been heavily discounted by several promoters.

PERSONAL AND GENERAL.

Mr. A. G. Kirby, who is superintending the erection of the new stamp-mill and cyanide plant at the Nova Scotia mine, Cobalt, will remain there during the coming winter.

Mr. F. J. Bourne, general manager of the Northern Customs Concentrator, Cobalt, will shortly visit the Portland Canal country, British Columbia. Meanwhile Mr. M. F. Fairlie has been given charge of the plant.

Mr. E. R. Reid, formerly manager of the Union Bank, Parrsboro, N.S., has been appointed sales manager of the Maritime Coal, Railway and Power Company, Limited, and will, in the future, have full charge of this department of the company's business.

Mr. Alexander H. Smith, late of Oaxaca, Mexico, has been engaged by A. E. Osler & Co., of Toronto, as consulting engineer in connection with the development of a large group of claims in the Porcupine district. Thirty men are now starting on assessment work. Mr. Smith will remain in the Porcupine district most of the winter.

SPECIAL CORRESPONDENCE

ONTARIO.

Cobalt.—At the annual meeting of Cobalt Central Mines Co. held a short time ago in Augusta, Me., it was found that the present control of Thos. Nevins & Sons was sustained. Mr. J. S. Bradley, who is the leading factor in the fight against the present management, cast votes for over 1,000,000 shares, but he was not strong enough to take over the control. Tests have lately been made at the concentrator at Cobalt to see if enlarging the mill would be productive of more economical results. So far the experiments carried out have been satisfactory and it is probable that the capacity of the mill will be increased to 120 tons a day.

The Crown Reserve mine has presented all its employees with a bonus of 15 per cent. of their wages for the year as a Christmas present. The unfavourable reports that were circulated regarding this property some time ago appear to have subsided and the recent finding of high-grade ore on the 200 foot

level has helped to disprove many of these rumours.

The 200 foot level is in the Keewatin and although the values dropped off to some extent, the veins still continue richer than the average veins of the camp. A short time ago a station was cut on this level preparatory to sinking a winze an additional 100 feet, and the first cut toward widening the drift exposed a branch of the main vein about three inches in width carrying high values in native silver. A raise was also started from the 200-foot level, at a point in the vein where the values were small, but the second round showed about eight inches of high grade ore.

During the year 1909 Nipissing shipped about 6,000 tons of ore, which is almost 75 per cent. increase over any previous year's shipments. A large proportion of this has been of course low grade ore, as this company ships about in the proportion of one car of high grade to four cars of low grade ore. During the month of December the No. 64 vein, near the Hudson Bay Mine produced 100,000 ounces. On the lowest or 275 foot level, which

is in the Keewatin, a drift is being run on the vein toward the east to cut through the contact between the conglomerate and the Keewatin, where it is expected that the high values will come in again. The shaft on the Meyer vein has been sunk to a depth of 190 feet and at that point a station is being cut, from this level a cross-cut will be run to cut the veins that dipped from the shaft at a depth of 75 feet. The shaft that is being sunk on vein 122 discovered last summer, will be continued to a depth of 200 feet and will have three levels. Great hopes are entertained for the future production of this vein as it has been traced for over 800 feet on the surface.

It has always been known that the Cobalt mines suffered to a greater or less extent from high-grading, but the discovery of an organized gang and the extent of their depredations showed that Cobalt had lost more by this means than any other camp in Canada. Under the old law it was exceedingly difficult to obtain a conviction for high-grading as it was necessary for an owner or mine manager to positively identify the stolen ore. Last year the law, however, was changed and now it is necessary to have a written authority from a mine manager or owner in order to keep or dispose of silver ore. Several well-known men in Cobalt and Toronto were arrested, and are now in custody. The ore, when it was stolen from the mines, was turned over to regular fences who took it to Toronto and disposed of it to a small private smelter. The smelter's books show a purchase of four tons of ore for the month previous to the arrests. When it is considered that this ore is the very purest that can be taken and that its value would run about, \$4.00 to \$5.00 a pound, some idea of the extent of the operations may be gathered. One man admits of having made seventeen trips to Toronto in the past few months carrying each time about 100 pounds of ore.

The Townsite has been getting some good results lately from development, and the physical condition of the mine has much improved from what it was when operations were first resumed on the property. From the No. 1 shaft a cross-cut is being run parallel to the T. & N. O. tracks to pick up some of the Right-of-Way veins. This cross-cut will be continued to cut the McKinley-Darragh vein which was worked by the Right-of-Way. In the No. 7 shaft a good vein about one and a half inches in width of high-grade ore was found. There is also a good width of milling ore, in some places six feet that will carry about 30 ounces. In shafts Nos. 2 and 5 there are also narrow rich veins and large tonnages of milling ore. The company is considering the advisability of putting up a mill next spring.

It is interesting to note that for the year 1909 the Crown Reserve will have distributed \$1,238,168 in dividends as against \$353,762 for 1908. It is stated that the surplus remaining in the treasury at the end of the year amounted to about half a million dollars.

A new road is being built into the South Lorrain district that will have a beneficial effect in cutting down the cost of transportation of supplies. Formerly the old road went round by way of Lake Temiskaming and was only available during the winter months. The new road will be about ten miles shorter and can be used the year round. It is probable that a telephone line will also be installed between Cobalt, Haileybury and South Lorrain.

During the present year the following companies have paid dividends on their issued capital as follows: Cobalt Central 4 per cent.; Buffalo, 32 per cent.; City of Cobalt, 13 per cent.; Coniagas, 9 per cent.; Crown Reserve, 71 per cent.; Kerr Lake, 13 per cent.; McKinley Darragh, 10 per cent.; Nipissing, 22½ per cent.; Right-of-Way, 37 per cent.; Temiskaming, 12 per cent.; Trethewey 25 per cent.; Temiscaming & Hudson Bay 2400 per cent.; La Rose, 16 per cent.

It is reported that the Big Six property at Miller Lake has encountered high grade ore at a depth of 90 feet. The first property to send out ore from this district for this season is the Blackburn which recently made a shipment of about 36 tons of

very rich ore. The Reeves-Dobie has also considerable ore ready to send out, that for richness will compare favourably with the best that has been produced in Cobalt. In the Elk Lake district the Lucky Godfrey has sacked about forty bags of rich ore from the vein found a short time ago.

The Dr. Reddick Co., of Larder Lake, has issued a statement to the shareholders, explaining that the reason for asking for the issue of 118,600 shares was on account of there not being sufficient money in the treasury to carry on their operations. This company is spending a considerable sum of money in systematically developing its property, to find out the extent and values of its ore bodies, and see if they will justify the erection of a plant.

In a drift from No. 1 shaft down by the Drummond, the Hargraves has run into about six inches of high grade ore, in the conglomerate. The vein in which the silver was found was first discovered last summer on the surface, where the showing was very fine. A shaft was sunk in the diabase and a few feet below the surface the values in the vein practically disappeared. The shaft was continued to a depth of 75 feet and a drift was started toward the east. When in a few feet it passed through the contact between the diabase and conglomerate, and the high grade ore was found in the latter formation. At the 380-foot level of the main shaft the drift on the vein carrying high grade ore has been run to the boundary of the Kerr Lake.

The Buffalo has recently cut two small, but rich veins on the 85-foot level, with about four feet of milling rock. Since the mill has been running with electric power its capacity has been much increased.

The road into the Maple Mountain district has now been cut through from Mountain Chutes to Mackenzie and Stull Lakes and machinery is already being taken in.

Two suits have been brought against G. H. Brown and the Equitable Trust Co. to recover some \$21,000, being money invested in the stock of the United Cobalt Exploration Company. The plaintiffs allege that the company was to sell \$500,000 of stock to develop properties in this district but that when only \$373,000 had been sold the promoters gave up. They claim that they returned \$50,000 to persons who bought stock, and squandered the rest of it in payments to persons who were not entitled to it.

Although the shipments for the year 1909 only exceed the shipments for the previous year by about 4,500 tons it is expected that this year's silver production will exceed last year's by at least 4,000,000 ounces. Up-to-date the shipments are as follows:

Prior to 1908	23,182.49 tons
Year 1908	25,362.10 "
Year 1909	29,865.66 "

This large increase in the number of ounces produced is attributable to a great extent to the concentrators that are treating the rock, a large part of which was formerly going on the dumps. Almost \$1,250,000 has been invested in concentrators in this section and it is probable that during the coming year this sum will be considerably augmented. It is exceedingly interesting to note that during the past year the amounts paid out in dividends represent about 50 per cent. of the value of the production of the camp, and when it is considered that the City of Cobalt, Right-of-Way, and O'Brien pay 25 per cent. the Hudson Bay 15 per cent and the Crown Reserve 10 per cent. of the gross value of their ore to the Ontario Government in royalties, these figures are even greater than they appear.

BRITISH COLUMBIA.

Rossland.—During the past ten days or two weeks the Consolidated M. & S. Co. of Canada has given ample proof of its expansive policy in the acquiring of several very valuable mines. These are the Ikeda copper group on Moresby Island, the No. 7 in Central Camp, Boundary, and the Sullivan group in East Kootenay. With the advances made by the Consolidated in the

acquisition of new mines the closing down of one of the older properties would not affect the status of the concern in the least, whereas, if operations were confined to the properties being worked at present, news of the closing down for an indefinite period of one of those mines would be received with dismay by the stockholders. It is all a matter of being progressive.

The Ikeda group of about 26 claims, is probably the most valuable copper-gold property in the New Queen Charlotte fields. The mine has been worked for several years by its Japanese owners and is well equipped to handle a tonnage of about 1,000 tons per month. Average "first-class" ore as shipped averages approximately 14% copper, \$6 gold and \$2.50 silver; "second-class" ore, as shipped to smelter, which is about two-thirds of the total output, 6% copper, \$4 gold and \$2 silver. The Consolidated Co. will very likely improve the mining plant and if future development warrants, will erect a smelter near the property. This smelter, if built, would no doubt be a paying proposition from the point of view of customs ores and would be of great benefit to the surrounding mines of the Queen Charlotte Islands, and the nearby mainland mines. A sufficiency of coal for such a plant is to be found on the same island, and the ore is practically self-fluxing.

The No. 7 group consists of eight claims and fractions, situated in Central Camp. In the past the cost of hauling this ore to the railway has been about \$3.50 per ton, but the Consolidated Co. is going to build a concentrator at Boundary Falls and send the ore from mine to concentrator by a tramway a couple of miles long. The concentrator site has already been secured. The ore is a quartz, carrying gold, silver and lead and is quite amenable to concentration. By means of the tramway the cost of conveying the ore from mine to mill will be reduced to about 15c. per ton. It is reported that there is an ore body "in sight" in the No. 7 of about 200,000 tons.

The Sullivan group has been acquired by lease and bond and initial work begun by a force sent over from the "hill workings" of the St. Eugene which have been closed down. It is understood that there are 150,000 tons of ore in this mine that will average 15% lead and 6½ oz. silver. The Sullivan Co. just before closing down in 1908 had some trouble at the smelter with the zinc content of this ore.

The Rossland mines of the Consolidated Co. are looking very well and steady tonnage is being shipped to Trail smelter, averaging about 400 tons per week. The Le Roi, Le Roi No. 2, Ltd., and Velvet are also shipping steadily each week.

It is seen as the year draws to a close that the Centre Star and Le Roi 2, Ltd., will show a slight increase in ore shipments, but the drop in Le Roi shipments of about 66,000 tons, is going to cause a decrease in district shipments, compared with last year of about 60,000 tons.

Phoenix.—This district has been favoured with the payment of dividends by two important companies during the past ten days, both the Granby Company and the Hedley Gold Mining Co. (Nickle Plate mine) making a division of profits with the shareholders. The Granby dividend was 2%, which on the 135,000 shares, of \$100, each, outstanding amount to \$270,000. This dividend, which was fully anticipated by those who knew the good financial condition of the company, makes a total of \$3,778,630 paid by this company in dividends since December, 1903. The dividends in 1907 were a total of 9%; 1908 total 4%; 1909 altogether 2%. The decrease has been caused by the big improvements, which this year alone, to smelter and converter, will cost over \$250,000. Good dividends will no doubt be paid in 1910. Granby mines are shipping nearly 30,000 tons per week to the Grand Forks smelter, where the eight augmented furnaces are working. Total Granby shipments for the year are now over the million-ton mark and for the year will show an increase of about 29,000 tons, over 1908.

The Hedley Gold Mining Co., which acquired the Nickle plate mine at Hedley from the Daly estate last August, at a fig-

ure of about \$715,000, has declared a dividend of 30c. per share, amounting in all to about \$36,000. The air compressor, mill, tramway, etc. are being enlarged and operations will be doubled during 1910. It is thought a saving of about \$1 can also be made in the treatment of tailings.

After rumour upon rumour during the last few months, work has now been started on the Rawhide group of the New Dominion Copper Co., diamond drilling being the order of the day, although it is expected shipments will be started at no late date. A crew of 15 to 20 men is employed; power is being derived from the company's Brooklyn air compressor plant.

Between the Mother Lode and Oro Denoro mines the B. C. Copper Co. is shipping over 12,000 tons of ore per week to its Greenwood smelter. Despite the several months shut-down the increase in Mother Lode shipments over 1908 will be over 38,000 tons; Oro Denoro shipments however, will drop about 49,000 tons. It is stated the profits of this company for November amounted to \$54,000 and that the cost of copper production for that month was cut to .0735c. per lb., naturally, it is to be expected that the yearly average will run much higher.

The Snowshoe, being operated under superintendent Chas. Biesel, is sending about 4,000 tons per week steadily to Trail smelter. The output of this mine for 1909 will exceed that of 1908 by about 114,000 tons, which will be just about the amount of increase for the year in the Boundary district. While the Granby and Mother Lode show a big increase, the drop in Oro Denoro and the mines of the Dominion Copper Co. hold the district increase to the amount of increase shown by the Snowshoe, which is under lease to the Consolidated.

Nelson.—The convention held in this city on December 15th, to discuss the zinc problem, was a most enthusiastic one, and it is hoped that the influence of this movement will culminate in the establishment of a commercial zinc smelter in this district. It does not seem probable that the Dominion Government can fail to be impressed with the importance of this question to this district, to the Province and to the Dominion generally. An invocation has been addressed to the government asking for aid in experimental work. A protective tariff on manufactured zinc products entering Canada might also help and tend to greater consumption of the product of this district in Canada. At the present time about 1000 tons of zinc ore is being sent per month from this district to United States zinc smelters, and being about 50 per cent. zinc is paying nearly \$10. duty and approximately \$10. freight—quite a burden. It is to be trusted that this question will be satisfactorily and economically solved before another season has gone past.

Ore shipments for Nelson-Slocan section will show an increase of about 46,000 tons this year over 1908. The net increase for the whole of Southeastern British Columbia will be about 100,000 tons more than for the year 1908.

A new plan of development is to be worked presently in the Payne mine. A rich ore shoot has been located on the eighth level that is thought to be a continuation of the old, rich ore deposit.

Vancouver.—It is stated by E. C. Wallander, manager, that the Kamloops Mines, Ltd. will open up its property on a large scale in six weeks or two months and that the company has in view the establishment of a smelter at Kamloops, if developments warrant it, of course.

A wagon road is being built into the property of the Red Cliff Mining Co., over which to take the boiler, air compressor and general mining plant recently bought from the Canadian Rand Co. All of the Portland Canal mines look promising and it is expected there will be considerable activity in the district next spring, in the way of plants going in, etc. Active work is being done on the Portland Wonder and Tye.

Torontonians have bonded three copper-gold claims on Banks Island at a figure of \$25,000. There is a ten-foot vein on the property carrying an average of \$43. in gold, silver and copper.

GENERAL MINING NEWS.

NOVA SCOTIA.

Halifax.—A decrease of nearly 1,000,000 tons in the production of coal and a loss to the Province in revenue of over \$100,000 since the inauguration of the strike in the Nova Scotia collieries was the statement by Hiram Donkin, Deputy Commissioner of Works and Mines, on the witness stand in the alleged coal conspiracy case.

Since the strike there has been a falling off in the production of 910,000 tons up to December 1st.

The Dominion Coal Company's production was 700,000 tons less, and the Cumberland Collieries 210,000 less.

Last year more American coal was sold in Canada than ever before. This was on account of the surplus stock on hand.

The sales of American coal are increasing rapidly in Canada. 130,177 tons were sold in November, 1909.

From 1886 to 1906, he estimated that the aggregate advance received by the men was about thirty per cent.

The production of gold in Nova Scotia for the year just ended was in round figures 12,500 ounces, which shows a slight increase over the production of the year 1908.

The principal producers were the New England Mining Company (formerly the Boston Richardson Mining Co.) at Goldboro, The Oldham Sterling Gold Company at Oldham, The Great Bras D'Or Gold Mining Company at Middle River, Cape Breton, The Ponhook Mining Company at Malaga, and the Sydney Gold Mining Company at Country Harbor, altogether about twenty-five mines were in operation employing a total of 550 men.

During the year the Dominion Mining Company at Tangier has changed its plant from steam to hydro-electric, generating power at the Tangier River, about one mile from the mine. This new plant was completed in October and has since been in operation, giving satisfaction.

At Middle River, Cape Breton, the Great Bras D'Or Gold Mining Company has commenced sinking a shaft on the Lizard lead and in the spring purpose to greatly increase their equipment.

At Caribou a disastrous fire destroyed the mill power buildings and shaft house at the Hake property, greatly handicapping the operators. New buildings, however, have been completed, and work underground is to be pushed during the coming year.

At Malaga Barrens the Ponhook Mining Company has reopened the old workings on the Main Rabbit lead, and has installed new and up-to-date equipment.

Although the production shows no great increase there has been much greater activity throughout the province during the past year in connection with the gold mining industry, and indications point to still greater activity during the coming year.

ONTARIO.

Toronto.—Ten of the accused in the Cobalt ore stealing cases were, on January 6th, committed for trial before a jury. They are Alex. Littlejohn, Geo. Barber, J. H. McGale, H. A. Van Winkle, Wm. Lander, Wm. Johnson, Nicholas Zorfaty, Jacob Cohen and Morris Rowchinsky.

Zorfaty was in addition fined \$25 for carrying a revolver. Dimitras Andras was discharged and Jaako Hukkala was remanded to obtain an interpreter.

The charge of receiving stolen property laid against Dr. Wilkinson, head of the smelter company, will not be taken up until the theft charges are disposed of.

Ottawa.—A nice little New Year's greeting in the form of \$33,000 reached the holders of Right of Way Mines, Limited, Cobalt stock on Jan. 1st. Though the dividend is 2 per cent,

it is equivalent to 6 per cent. on the old basis (that of the Right of Way Mining Company).

Cobalt.—Edward Burley, an Englishman, employed at the Rochester, died on December 29th from injuries received at the mine. Burley and his brother were working at the 75-foot level. Preparation had been made for blasting. Burley had lighted the fuse and was walking away to a place of safety when an explosion, possibly caused by a defective fuse, took place. Burley's body was badly broken up by the flying rock. He was thrown on his face and his left shoulder was badly crushed. Dr. Melbourne, who was at Kerr Lake, was called in, and removed the victim to the Red Cross Hospital, where he succumbed to his injuries just after noon.

BRITISH COLUMBIA.

Fernie.—General Manager Ashworth of the Crow's Nest Pass Coal Company, reports that over 2,000 tons of coal are being turned out daily at the Coal Creek mines, and as much at Michel, thus making an average of over 4,000 tons a day from all the mines. About 800 tons of this coal is being turned into coke at the Fernie ovens and nearly as much at Michel. The Morrissey mines are not being worked now and it will be some time before they will again be operated, as new development work, both at Coal Creek and Michel, is occupying the attention of the management at present.

Cranbrook.—The Fort Steele Mining & Smelting Company, who recently secured the property of the Sullivan Group Mining Company, which is located at Kimberley and Marysville, has leased the property to the Consolidated Mining and Smelting Company.

The property is leased to the Consolidated Company for a period of two years, with an option to purchase.

The lessees are to begin work immediately. Thirty per cent. of the net proceeds of the ore taken from the mine is to be spent in development work. The lessees are bound by their agreement to mine and take out 30,000 tons of ore during the life of their lease, and to pay to the Fort Steele Mining and Smelting Co. 20 per cent of the net profits derived from the sale of said ore.

If the Consolidated Company succeeds in taking out 30,000 tons of ore inside of six months, they, under their agreement, are compelled to purchase the property.

The property consists of three mining claims, the Hamlet, Shylock and Hope, and is located about two miles north of Kimberley. At Marysville, the property leased consists of an up-to-date smelter, having a capacity of about 200 tons, which can be increased to 500.

The mine is equipped with a first-class compressor, hoisting and pumping plant.

The showing of ore in the mine is enormous. According to examinations made, there is over 200,000 tons of ore in sight ready for stoping. With this large amount of ore in sight, the lessees will have no trouble in mining 30,000 tons of ore inside of the stipulated six months.

The trouble with the Sullivan ore has been the difficulty and expense of getting the proper flux to mix with the ore from the mine, but with ore from the North Star, or the St. Eugene, it is said that the combination will make a self-fluxing proposition.

The resumption of work on the Sullivan will bring renewed prosperity to Kimberley, and with the starting up the smelter at Marysville the residents of these two mining camps will receive a New Year's gift that will bring prosperity to all.

MINING NEWS OF THE WORLD.

EUROPE.

Roumania.—During October the Roumanian oil production amounted to 108,000 tons. For September the output was 111,500 tons.

INDIA.

Calcutta.—During 1908 the tin mines of South Burma yielded an output of 1,887 cwt., valued at £11,015. This production is above the average of that of the past five years.

An important survey is contemplated by the Geological Survey of India Department in the coalfields and oil-bearing areas of north-east Assam.

AUSTRALIA.

Sydney.—The railway and tramway services have been restored. North Sydney was in darkness on the night of Dec. 20th. A supply of coal from the Western district is expected soon. The Western miners resumed work on December 21st.

Of the fifteen lodge officials and delegates prosecuted for offences against the Industrial Disputes Act, in connection with the coal strike, thirteen have been fined £100 each, with two months' hard labour in default.

SOUTH AFRICA.

Johannesburg.—From present indications, and judging by the most recent data, there is reason to believe that in the coming year the mines of the Rand will be operating profitably on 2½ dwt. rock and further reducing expenses by half-a-crown per ton.

As conflicting reports are reaching the Rand as to the results being obtained on the Abercorn Banket Company's property, it has been decided to have an independent examination.

The dividend-aggregate for 1909 from Rand mines promises to equal, and will, in the final results, probably surpass that of 1908, notwithstanding total profits are below last year's level.

Reports are to hand of diamond discoveries in the Carnarvon district of Cape Colony.

Rhodesia.—In view of the great development of Rhodesia's mining industry and the multifarious duties now devolving upon Mr. Ackermann, the Chartered Company's engineer, who has hitherto been at liberty to engage in private work and to report for outside parties, it is now considered in Rand-Rhodesian circles that, in the interests of all concerned, the time is arrived when Mr. Ackermann's services should be solely at the command of the company.

Latest private telegrams from Rhodesia state that the Giant mine values in the seventh level are proving as good as in the upper levels. It is added that Rhodesian mines generally are opening up well and that a big move is inevitable at no distant date.

TRINIDAD.

The annual report on the trade of Trinidad states that a considerable amount of development work was done during the year 1908 in boring for oil at La Brea and Guano, and at both places gushes of oil to a height exceeding 60 feet occurred as the result of the operations. A total of 3,758 feet of borings was made during the year with satisfactory results.

UNITED STATES.

The world's production of gold and silver for the calendar year 1908 is estimated by the Bureau of the Mint to have been:

Gold, 21,378,480 fine ounces, of the value of \$441,932,200, and silver, 203,186,370 fine ounces, of the commercial value of \$108,684,000.

Compared with 1907, there was an increase in the gold product of \$31,376,900, and in silver an increase of 18,992,300 fine ounces. The greatest increase in the product of gold in any country of the world was in Africa, which increased from \$151,899,600 in 1907 to \$166,520,500 in 1908.

Butte.—President J. D. Ryan has ordered the closing of Amalgamated Copper Mines. He has issued a statement in which he states that this is due to action of the miners' union refusing to take any stand or action to aid in the resumption of switching and handling of ore at Great Falls. It has been decided that Anaconda, Butte and Boston, Boston and Montana, Washoe Copper, Parrot, Trenton Co., Red Metal Co., and North Butte could not continue operations under present conditions and must be closed pending such action as would relieve the situation.

The Buell property, near Central City, Colo., which is said to have produced about \$2,000,000, principally in gold, has been absorbed and will be operated soon by the U.P.R. Milling and Mines Company, arrangements for financing the property being well under way. The mill of the company is to be electrified and labour-saving devices installed for closer amalgamation and concentration of ore from the property as well as for custom ore.

New York City.—The deadlock at the annual meeting of the Cobalt Mines Company held in Augusta, Me., has been broken, and the old directors are in control, all being re-elected. President Nevins represented 2,250,000 shares, while James P. Bradley, the leader of the opposition, had 1,075,000 shares. The result is regarded here as a vindication of Mr. Nevins, on account of the failure of Mr. Bradley's vigorous campaign to rally greater strength. The directors' meeting will be held in New York soon, when it is expected that all the old officers will be re-elected.

With the payment of the dividend of \$8 a share, Calumet & Hecla will have returned to its shareholders for the calendar year 1909 the sum of \$27 a share, against earnings estimated at \$35 a share. The company's mineral output for the year will be equal to 80,000,000 pounds of refined copper, but as the company is curtailing its ingot output by 14 per cent. only 86 per cent. of this mineral is being smelted. The refined copper output therefore, should be about 69,000,000 pounds.

Globe, Ariz.—The foundation work for the concentrating plant at the Miami property is going rapidly forward, with the exception of a part of that for the power house site where the bedrock upon which the concrete work is to rest is at a greater distance from the surface of the ground than it is at other parts of the site. When the third churn drill has arrived, it may be put to work on this site to ascertain the depth and character of the bedrock at this point.

The two Star churn drills which have already arrived at the property are in position for drilling the first holes, and the management is anxiously awaiting the arrival of some of the tools which were delayed in shipping, so that the prospecting work can be begun. The first two drill holes will be put down in a north and south line and only a few hundred feet from the line of drill holes which the Inspiration Company's drills put down on its property, which adjoins that of the Miami Copper Company on the northern end.

The new office building of the Miami Copper Company is rapidly nearing completion. All the framework is about finished. A new warehouse near the concentrator site is being built.

Company Notes

The International Nickel Co., has declared 1 per cent. and an extra dividend of $\frac{1}{2}$ per cent. on its common stock.

AN ASBESTOS BUREAU.

The operating asbestos mining companies in the Black Lake and Thetford districts and the various manufacturers of the finished products of asbestos, have decided to establish an Asbestos Bureau. A meeting of the representatives of all the companies interested was recently held in New York, when the preliminary arrangements were made and special committees appointed to look after all the details. One of the main objects of the Bureau will be to keep the public advised as to the new uses to which asbestos may be put and of the development of the various properties situated the world over.

Mr. E. B. Greenshields, the President of the Amalgamated Asbestos Corporation, attended the meeting on behalf of the company.

At the annual meeting of the Nova Scotia Silver Cobalt Mining Company the financial statement was approved. It showed \$121,000 as having been expended on underground development and over \$50,000 on surface work.

The engineer's report showed that the company had over 1,600,000 ozs. of silver blocked out, which would give a net return the first year of some \$60,000, and after the completion of their cyanide and amalgamating mill now under construction, and which will be ready early in the spring, the company will be in better condition than at present.

A by-law authorizing application for supplementary letters patent, increasing the capital stock of the company by \$500,000, was ratified by the shareholders.

This stock is to be offered to the shareholders at 50c per share, pro rata to their holdings, being at the rate of one to four held, and arrangements have been made with a syndicate to underwrite any of the new issue at this price, which may not be taken up by the shareholders.

The old directors were re-elected with the exception of Mr. A. M. Reaper, who resigned in favour of Mr. A. L. Bayley, of Sherbrooke.

The Buffalo Mines have declared a 5 per cent. quarterly dividend, with 3 per cent. extra bonus, which is equivalent to 32 per cent. for the year.

The Nipissing dividend of $7\frac{1}{2}$ per cent, and the La Rose of 2 per cent, will be payable on the 20th. The transfer books of the respective companies will re-open on January 17th.

The Temiskaming & Hudson's Bay Co. has paid dividends of no less than 15,100 per cent. on its issued capital of \$7,761 of \$1 shares.

The Granby management has decided to issue 13,500 shares of its 15,000 shares of treasury stock. This will be issued to stockholders of record on the basis of one share of new stock for every 10 shares now held at \$85 a share. Granby's authorized capital is \$15,000,000. The stockholders several years ago voted to issue stock to pay for the company's investment in the shares of the Crow's Nest Pass Coal Company, and it is presumed that the proceeds from the stocks now to issue will be used in paying the indebtedness incurred in the acquisition of these shares. It is understood that the Granby Co. entered the year 1910 with several hundred thousands of cash in its treasury. At the present time the company is operating at the rate of about 30,000,000 pounds per annum. The maximum capacity is 35,000,000 pounds, and the management has no plans for the enlargement of smelting capacity beyond this figure.

The Crow's Nest Pass Co. has recently increased its dividend to 6 per cent.

A review of the operations of the Nova Scotia Steel and Coal Company, Limited, during 1909 shows large increases in practically all branches as compared with the previous year:—

	Tons.
Coal mined and shipped.....	830,000
Iron ore mined and shipped.....	460,000
Coke made	85,000
Limetone and dolomite mined.....	70,000
Pig iron made	62,000
Steel ingots made	63,000
Billoms and billets cogged	54,000
Finished materials, bars, plates and forgings shipped from New Glasgow	53,000
Amount of freight paid to the Intercolonial Railway	255,000
Freight carried by Sydney Mines Railway of the company exceeded	1,400,000
Coal and ore freighted by boats owned or time chartered by the company..	925,000

The total wages paid by the company during the year was nearly \$2,500,000:—

Wages paid at Sydney Mines.....	\$1,698,000
Wages paid at New Glasgow	425,000
Wages paid at Wabana	350,000

With the exception of coke made, the figures named above all show increases over the past year.

The improvements in plant and equipment made in the closing months of 1908 resulted in savings in the cost of manufacture, so that the cost of converting iron ore into the 50,000 odd tons of finished material shipped from the New Glasgow works was less than ever before in the history of the company. Practically all of these savings should be credited to improved physical condition of the plant, as no reduction in wages was made during the period under review.

At Wabana, the slopes, which in the latter part of 1908, after passing through the boundary of intervening ground between the land areas and the submarine areas of the company, had reached the submarine territory of the Scotia Company, have been extended during the past year more than a quarter of a mile. Bore holes put down in the submarine territory of the company have proven the quantity of underlying ore to be greater in thickness than shown on the land or in the inner portions of the submarine extensions of the seams, while the quality has been fully maintained. All the work done during the past year has served to confirm and increase the evidence of the extent and value of these submarine deposits.

At the New Glasgow mills, enlargements and extensions of the furnace heating plant, accessories, and all other devices required for handling the increased output are now being installed. These mills are expected to be in operation during the coming summer. The additional rolling mill capacity now being provided should increase the output of the finished material from the New Glasgow mills by about 20,000 tons per annum.

For 1910, the coal output of the company from its "Old Sydney" mines, will, it is expected, show considerable increases, and will total 900,000 tons.

The unfilled orders for steel products on the books of the company at the beginning of 1910 will aggregate a larger tonnage than at any period during the past two years. Indications point to an increased demand for all classes of the finished iron and steel products of the company.

PORTLAND CANAL ANNUAL MEETING.

At the annual meeting of the shareholders of the Portland Canal Mining Company, Limited, held at Duncans, B.C., on the 11th December, the following reports were presented by Mr. C. H. Dickie, President and Managing Director:—

"Your directors report that during the current year they entered into negotiations with a firm of underwriters, and the

sum of \$100,000 was secured to the company in return for a block of the company's shares.

The above capital was required for, and is being used in the installation of a concentrator, aerial tramway, water power plant and for general purposes of the company.

The concentrator and power plant are well under way and will be completed at an early date if the snowfall is not excessive. Had normal conditions prevailed during the past season, the plant would probably now have been complete, with the exception of a part of the concentrating machinery, which has not yet arrived from the manufacturers.

The concentrator has been termed a 50 ton unit, but as our ore will only require coarse concentration, we expect to be able to mill about 100 tons every 24 hours. The tramway, which is of the Bleichert type, is now about completed, and will be 8,000 feet in length and bring ore from the mine at an altitude of 2,100 feet to the concentrator in Bear River Valley. It can be equipped to transport 200 tons every 24 hours and will be utilized for conveying all supplies from the mill to the mine.

Our water power is a splendid asset, and will be ample for all requirements when we multiply the capacity of our concentrator, and this we expect to do at no distant date. The water is brought from the head of a waterfall in a 2 feet by 4 feet flume along the side of a canyon, over a trestle 70 feet high, across Glacier Creek and along the mountain side to the mill, a total distance of 1,400 feet, the effective head being 100 feet. Owing to the fact that there was a large tonnage of ore in the mine available for stoping, and our camp facilities were being taxed to their utmost capacity to provide accommodation for tramway employees and others, it was considered inadvisable to carry on an energetic campaign in the mine during the summer.

No. 1 Tunnel was advanced 110 feet to a total length of 180 feet, 35 feet of cross-cutting was also done in this tunnel, which, with the exception of a few feet, where purely local distorted conditions prevailed, may be said to be all in good ore. No. 2

tunnel is 124 feet in length, and, with the exception of a few feet of what might be termed low grade concentrating ore, is also all in good ore. No. 3 tunnel was advanced 65 feet to a total distance of 300 feet, and a raise and crosscut connecting Nos. 3 and 2 tunnels were completed. At 280 feet from the portal of No. 3 tunnel a splendid body of ore was encountered, the development of which will be vigorously prosecuted this winter. This ore body is the downward continuation of that disclosed in Nos. 1 and 2 tunnels and carries the same or better values, native silver and argentine being fully as conspicuous as in Nos. 1 and 2 tunnels.

Your directors have no hesitation in assuring the shareholders that they consider the property one of the most promising in British Columbia, and there is absolutely no doubt but that substantial dividends should be paid when the complete plant has been in operation for a reasonable period."

NORTH STAR CO. INTERIM REPORT.

The following interim report has been mailed to the stockholders of the North Star Mining Co., Ltd.:-

The directors are able to announce that the long-continued exploration work now shows a measure of success.

Under date of the 20th December, 1909, Mr. Curran, the manager at the mine, reports as follows:-

"The ground adjoining the north incline is being opened out in three different places, 100 feet apart. Total length of ground now being explored, 300 feet. At each place we have found good shipping ore, principally carbonates, but underlying the carbonates is a body of sulphate ore. This body of sulphate ore has not yet been explored."

Later, the manager reports that "work done at these points has materially improved the extent of the carbonate ore. This ore is all the way from three feet thick, and the value of the metal contents is improving as the work advances."

It is not possible so far to make any estimate of the extent or value of this newly found ore.

STATISTICS AND RETURNS

MINERAL OUTPUT OF NOVA SCOTIA FOR 1909.

Preliminary estimates of the mineral outputs and metallurgical products of Nova Scotia for the year 1909 are as follows:-

Coal	\$14,200,000
Coke	2,000,000
Gold	250,000
Gypsum, limestone and other materials	750,000
Stone and building materials	1,100,000
Pig iron	1,100,000
Steel	4,250,000
Steel rails, rods, etc.	9,500,000
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	\$33,150,000

DOMINION COAL COMPANY, LIMITED.

Comparative Statement of Outputs by Collieries, 1908, 1909.

	1908	1909
No. 1	532,248	576,072
" 2	704,139	552,868
" 3	340,654	227,689
" 4	418,247	319,987
" 5	479,420	357,894

" 6	218,194	59,405
" 7	125,326	88,993
" 8	194,454	155,864
" 9	344,657	204,557
" 10	162,983	143,580
" 12	32,393	38,603
" 14	3,594	13,495
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Total	3,556,309 tons	2,739,007 tons

Output by Months, 1908, 1909.

	1908	1909
January	314,108	200,176
February	285,649	209,656
March	346,529	253,622
April	303,249	294,017
May	335,829	316,205
June	346,036	354,485
July	368,508	136,736
August	310,295	154,475
September	257,160	178,241
October	266,048	206,030
November	246,252	220,871
December	175,405	214,493
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	3,556,309	2,739,007

COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending December 31st, and those from January 1st, 1909, to date:—

	Dec. 31. Ore in lbs.	Since Jan. 1. Ore in lbs.
Argentine		40,000
Buffalo	54,400	1,148,417
Beaver		101,470
Carnegie		63,410
Chambers-Ferland		961,010
City of Cobalt		1,204,927
Cobalt Central		815,267
Cobalt Lake		141,340
Cobalt Townsite		54,369
Coniagas		1,504,378
Crown Reserve	222,480	6,285,247
Drummond	100,000	2,282,100
Foster		187,800
Hudson Bay		1,350,120
Keeley		96,000
Kerr Lake		2,555,641
King Edward		275,522
La Rose	215,376	13,768,234
McKinley-Darragh	166,504	2,147,039
Naney Helen		167,834
Nipissing	631,892	13,138,343
North Cobalt		40,000
Nova Scotia		480,810
Peterson Lake		324,040
O'Brien	64,010	2,855,763
Right-of-Way	63,302	2,981,148
Silver Queen	54,000	738,844
Silver Cliff		241,820
Stewart H. J.		62,392
Timiskaming		1,806,060
Trethewey	142,055	2,152,878
Wettlaufer		224,700

Ore shipments to December 31st from January 1st are 60,196,932 pounds, or 30,098 tons.

Total shipments for week ending December 31st are 1,714,019 pounds, or 857 tons.

The total shipments for 1908 were 25,463 tons, valued at \$10,000,000.

MARKET REPORTS.

Metals.

Jan. 10th (Quotations from Canada Metal Co., Toronto):—
 Spelter, 6½ cents per lb.
 Lead, 3.75 cents per lb.
 Antimony, 8½ to 9¼ cents per lb.
 Tin, 35¾ cents per lb.
 Copper, casting, 14¼ cents per lb. (market active and strong).
 Electrolytic, 14¼ cents per lb.
 Ingot brass, 9 to 12 cents per lb.
 Jan. 10.—Pig Iron (Quotations from Drummond McCall Co.):
 Summerlee, No. 1, \$23.00 (f.o.b. furnace).
 Summerlee, No. 2, \$22.50 (f.o.b. furnace).
 Midland, No. 1, \$22.00 (f.o.b. furnace).
 Coal—Anthracite, \$5.50 to \$6.75.
 Bituminous, \$3.50 to \$4.50 for 1¼-inch lump.

Coke.

Jan. 5th.—Connellsville Coke (f.o.b. ovens):—
 Furnace coke, prompt, \$2.65 to \$2.75 per ton.
 Foundry coke, prompt, \$3.10 to \$3.25 per ton.

Jan. 5th.—Tin (Straits), 33.40 cents.
 Copper, prime Lake, 14.00 cents.
 Electrolytic copper, 13.80 cents.
 Copper wire, 15.25 cents.
 Lead, 4.70 to 4.75 cents.
 Spelter, 6.25 cents.
 Sheet zinc, 8.50 cents.
 Antimony, Cookson's, 8.50 cents.
 Aluminium, 21.75 to 23.00 cents.
 Nickel, 40.00 to 49.00 cents.
 Platinum, \$29.50 to \$33.25 per oz.
 Bismuth, \$1.75 per lb.
 Quicksilver, \$52.50 per 75-lb flask.

SILVER PRICES.

	New York. cents	London. pence.
December 18.....	52¾	24¼
“ 20.....	52¾	24¼
“ 21.....	52¾	24 1-16
“ 22.....	52¾	24 3-16
“ 23.....	52¾	24¼
“ 24.....	52¾	24¼
“ 27.....	52½	24¼
“ 28.....	52¾	24¼
“ 29.....	52¾	24½
“ 30.....	52¾	24¼
“ 31.....	52¾	24¼
January 3.....	52½	24 3-16
“ 4.....	52¾	24¼
“ 5.....	52¾	24¼

Metal Movements During 1909.

The following table shows the highest, lowest, and average prices of metals for the year 1909:

	Highest.	Lowest.	Average.
Straits Tin, New York	34.12½	27.30	29.76
Lake Copper, New York	14.62½	12.75	13.39
Electrolytic Copper, New York ...	14.37½	12.25	13.11
Casting Copper, New York	14.25	12.10	13.02
Cooksons Antimony, New York ..	8.62½	7.87½	8.27
Pig Lead, New York	4.75	3.95	4.30
Spelter, New York	6.50	4.75	5.52

Boston, January 6.—There were sales of Lake Copper made yesterday at 14½c, and Boston copper interests refused to sell at that price. Electrolytic is quoted about 13¾ to 14c.

Messrs. Samuel Montagu & Co. report, December 24th, 1909, as follows regarding silver:—The market has been rather more animated, with a good tendency. The support has been chiefly from the Continent, with very little competition. Consequently, the price has been largely dependent on the amounts offering, especially as the quotation has been maintained over Eastern parities. The fluctuations have also been assisted by speculative operations, for which wide movements are a tempting bait. The stock in Shanghai stood, on 13th inst., at 164 lacs of sycee and 1,875 bars. There was a falling off in 1908 of £21,000,000 in the total foreign trade of China, and as the total imports fell off £15,000,000, against £6,000,000 reduction in exports, the net difference of £9,000,000 readily accounts for the huge stock of sycee in Shanghai and the bars held for China account in London. A shipment of £30,000 has been made from San Francisco to the Far East. The quotations yesterday were 1-16 above those quoted a week ago.