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CONTENTS.

	Page.
Editorial.	569
The Industrial Empires of the Pacific.	569
The Mining Industry and the Dominion Government.	570
The Mines' Report of British Columbia and Quebec.	571
Editorial Notes	572
A Dominion Department of Mines.	572
Correspondence.	573
The South African Half Year.	574
Technical Literature	575
Safety Crossheads	578
Chibougamau Region of Quebec.	579
The Great Cobar, Limited.	581
The Mine Centre Mining District, Ont.	584
Alaska Coal Land Problems.	585
Sherbrooke as a Mining Centre.	586
Personal and General.	588
Slocan City Mining Division, by E. Jacobs.	592
Special Correspondence, Etc.	595

THE INDUSTRIAL EMPIRES OF THE PACIFIC.

The greatest of national assets are coal and iron. It is these that are mainly conducive to industrial supremacy. England, Lord Ramsey asserts, will have exhausted her coal supplies in two hundred years, calculating on the present rate of production alone. Without coal England would not only cease to be the greatest manufacturing country in the world, but she would be out of the race altogether. Much may, however, happen in two hundred years and the problem and its solution will concern more immediately succeeding generations. Long before, however, any such catastrophe can occur from the cause mentioned, the whole trade conditions of the world may be changed by events now developing. Among these are the building of the Panama Canal and, more momentous still, the awakening of China. In a paper on the subject of "International Coal Competition," contributed recently to the Canadian Mining Institute, Mr. Allan Greenwell, editor of The Colliery Guardian, it was shown that if the natural course of trade is allowed free play, a country will inevitably produce for itself and for other countries that in which it has the greatest relative advantage (or least disadvantage). If this product be coal, it will tend towards monopolizing the production of coal, and to causing the countries which previously produced it to direct their labour and capital towards the production of something else in which they have an advantage. Again, "the value of a commodity is a matter of supply and demand; so if a country possesses an unlimited supply and can export cheaply a commodity for which there is a considerable demand, it may be said to be on the high road to commercial prosperity." It is a fundamental law that a coal-driven industry tends to follow the fuel, and not the fuel the industry. Thus a country possessing an unlimited supply of cheap coal can send out its surplus coal to fetch raw material, which it manufactures cheaply by means of its cheap coal, markets the surplus and accumulates wealth. The building of the Panama Canal will reduce substantially the cost on the carriage of raw materials to the Canadian west. It will also considerably enlarge the available markets for our Western coals. By the first, manufacturing may become possible; by the second, a large surplus may be profitably mined for export. Mr. Greenwell sees no reason why the enormous coal resources of British Columbia and Alberta should not, "when the time arrives," be developed to an equal extent with those of the United States. The time is rapidly approaching. He, meanwhile, quotes Jevons to prove that it is a commercial impossibility for any country to se-

cure or maintain a manufacturing supremacy on coal drawn from far distant fields, and the manifest corollary to this conclusion is that there can be no real or lasting inducement to a country to develop its coal supplies in order to foster a manufacturing industry in another country, especially if it can organize such an industry itself. Eventually, as Mr. Greenwell states, competitive manufacturing industries must be carried on in the neighbourhood of the coal supplies, and the surplus production of the latter employed for navigation purposes in fetching the raw materials, and in distributing the manufactures.

The coal resources of the Canadian West are, therefore, destined to become one of the chief factors in the creation of new industrial domination on the Pacific. Such development will be of prodigious advantage to the British Empire. On the other hand we can regard with less complacency the imminence of a competition that within the present century will at any rate make itself felt in the markets of the world, and may eventually be revolutionary in its effects, causing the pendulum of trade to swing in entirely different directions to that of to-day. According to Mr. Thomas T. Read, formerly Professor of Metallurgy at the Imperial Pei-Yang University, at Tientsin, China not only possesses enormous resources in iron, but her coal resources in point of quantity are comparable with those of the United States, while in quality they are in general of higher grade. Thus the amount of lignite is comparatively small, and the proportion of anthracite to bituminous is relatively larger than in the United States. The present production of coal in China is not much greater than that of Canada (about fifteen million tons annually); the iron production is approximately 0.5 lb. per capita per annum as compared with a per capita production in the United States of 600 lb. per annum. But China is awakening. Her people are as imitative, if not quite as adaptable as the Japanese. They are infinitely more industrious, more conscientious, more painstaking. Like the Japanese, the Chinese are now sending students to acquire the knowledge and methods and sciences of Western civilization. In less than a quarter of a century Japan remodelled her entire industrial and social systems. The change from feudalism to modern conditions of life represents in European countries an evolution covering five hundred years. In the first test of strength between East and West, the former was signally victorious. That the equilibrium of trade has been less disturbed than it has by the introduction of the factor of Japanese competition is due to two causes, the natural resources of the country in coal and iron are relatively unimportant, and the labour while cheap is of low efficiency. The development of China will, no doubt, take longer; but when the day arrives when she has mastered the secrets of the West, when she turns to account her natural wealth,—resources that, lying dormant through the centuries, have been thus conserved while those of European nations

have been largely drawn upon,—when she competes for the trade of the world and brings to bear therewith that shrewdness and untiring patient industry and skill that are racial characteristics, then, indeed, will the white race have difficulty in maintaining its own.

THE MINING INDUSTRY AND THE DOMINION GOVERNMENT.

It is now nearly ten years since the Canadian Mining Institute first urged the Dominion Government to create a Portfolio of Mines in order that this important industry might be adequately represented both in the Cabinet and in Parliament. Some time passed before any steps were taken by the administration then in power to comply with the wishes of the mining interests in this regard; but ultimately a sort of compromise arrangement was made by which the Portfolio was created, although the minister to whom it was entrusted was given a dual office, being minister both of mines and of inland revenue. The administrative duties in connection with the Department of Inland Revenue are, however, relatively light and, while there is, of course, no possible correlation between the functions of work of the two departments, the arrangement proved tolerably satisfactory. The Minister was, at least, able to devote a considerable portion of his time to a consideration of the requirements of the mining industry; he came in direct touch with the mining interests, and he was in a position to represent the views and needs of the industry both in Council and in Parliament. With the change of government last year, however, the Portfolio of Mines was to all intents and purposes abolished. It was at first, as before, tacked on to the Department of Inland Revenue; but the Minister in charge of this department, unlike his predecessor, was entirely ignorant of mining conditions and we are inclined to believe, temperamentally unfitted to undertake the administration of a department that, perhaps, more than any other at the present time, requires firm and, at the same time, sympathetic and tactful guidance. This was apparently recognized, for a few months later a change was made and the Department of Mines was disassociated from that of Inland Revenue, and attached to the Department of the Interior. As a temporary expedient the move was, no doubt, justified; but so far as cabinet representation is concerned the mining industry is now in exactly the same position as it was ten years ago. In fact, it is in a worse position, for the administration of the Department of the Interior to-day is a proportionately weightier matter than it was ten years ago, and no minister, however able, could be expected to assume additional responsibilities, nor should he be saddled with them. Already the Department of the Interior is sub-divided into four or more branches, including immigration, lands, Indian affairs and forestry. It is no uncommon thing for a deputy minister of one of these divisions to wait sev-

eral days before he is given an opportunity of interviewing the minister on some question of importance, and one perhaps demanding prompt action. True, the pressure will be, in a very large measure, removed when the new Provinces of Alberta and Saskatchewan are ceded control of their natural resources; but even then there will be ample to occupy the attention of the minister without adding to his duties. The national importance of our mining industry warrants, more it demands, the establishment of a separate and distinct department of mines, under the direction of a Minister who can devote his entire energies to ensuring its efficiency. The lack of proper organization in this department has been a subject of comment for years past. In spite of the fact that an Act establishing the department has been actually passed, conditions at the present time are very nearly as chaotic as at the worst time in the history of the Geological Survey. This is no reflection on individuals. In general, the officials of both the Geological Survey and Mines Branch are able and keen; it is the organization, the system that is defective. So long, therefore, as the fundamental defect is not remedied will the present conditions obtain. The present administration has a great opportunity to render a notable service to the country by the establishment of a Federal Department of Mines on a sound and certain basis.

Elsewhere we print, in part, the text of a memorandum on this subject prepared by the Secretary of the Canadian Mining Institute at the direction of the Council and submitted to the Prime Minister.

THE MINES' REPORTS OF BRITISH COLUMBIA AND QUEBEC.

The efficiency of the public service in Canada as regards the publication of useful information in respect of the mining industries has long been recognized. The reports of the Geological Survey and, more recently of the Dominion Mines' Branch, compare advantageously with publications of a like nature of any country in the world. In none is more attention given to the consideration of questions of economic significance; and our Government literature on mining and geology is, therefore, alike esteemed by the scientific and the industrialist. No less commendable are the annual reports of the Provincial Bureaus, notably those of British Columbia, Quebec and Ontario. In our last issue attention was directed to the eminent presentableness of the British Columbia report. The encomium of our reviewer we heartily endorse. But the British Columbia report has an established reputation; for many years past it has held the palm for typographical excellence. It has been and is still, though in a minor degree, open to criticism in the one respect only, that it includes statements by mining recorders and other non-technical officials, whose information is largely based on hearsay. The practice is dangerous and this

feature of the report might be advantageously eliminated in future. It is less pronounced this year than formerly. The valuable features of the British Columbia report have always been the contributions of the Provincial Mineralogist, Mr. W. Fleet Robertson, whose inability to call a spade anything but a spade, and not an agricultural implement, did not conduce to his popularity with a certain class in earlier "boom" times. Now his sterling and manly qualities are generally appreciated at their proper worth. But surely in a province in which the mineral industry has assumed the importance and proportions of that of British Columbia, a province, moreover, in which the industry has such immense potentialities, the entire responsibility of the technical field work of the department should not devolve on one official alone. Mr. Robertson has done yeoman's service practically unassisted; but he can not be expected to achieve the impossible, nor is it wise to attempt to overwork the willing horse. With an adequate staff of assistants the Provincial Mineralogist of British Columbia would be in a position to vastly increase the efficiency of his department, and never was the time more opportune than the present. The investing public has begun to forget the after taste of the Rossland "boom"; the industry in general has been rehabilitated, and the outlook to-day is more favourable than for years past; and last, but not least, an enormous area of new territory will ere long be rendered readily accessible to the prospector by the completion of the numerous lines of railway now in course of construction. There should, therefore, be a revival of interest, which the publication of special reports by the Provincial Bureau of Mines, on the newer districts, would certainly stimulate. It is true the Provincial Mineralogist has had the assistance of Mr. Herbert Carmichael, formerly the Provincial Assayer, in the reporting on mining areas; but Mr. Carmichael is an expert chemist rather than a mining engineer or geologist, and in any event is not now prepared to devote the major portion of his time to the Government service. Again, it may be urged that since the Geological Survey devotes more attention to British Columbia than to any other province—a discrimination that may be open to criticism—it relieves the Provincial Department of certain obligations. Neither the Provinces of Ontario or Quebec, however, has taken that view; and since the British Columbia treasury derives a very considerable revenue from the mines of the province, it is but fitting that a reasonable expenditure should be made in the direction indicated.

In striking contrast to the British Columbia policy is that recently adopted by the Quebec Department of Mines. The Quebec report for 1911 has been distributed during the present month (July). The Quebec report a few years ago was not a publication of which the Department or anyone else could be proud. It was poor inside and out; but the officials responsible escape censure because no one can blame a man who fails to

make good bricks without straw. With the appointment of Mr. Theo. Denis some two years or more ago, was commenced a new regime. The department ceased to be apathetic, content merely to remain in the rut of routine, but instead set the pace for the other mining bureaus of the Dominion to follow. The Quebec report for 1911 in typographical appearance and general presentability closely rivals the British Columbia report; as regards the quality of its contents it compares favourably with any Government mining report yet published in the country. During the summer months of 1910 and 1911, and again this year, the programme the Department has mapped, qualified engineers and geologists have been sent into the field to ascertain the possibilities of mining expansion in unexplored territory. So far, unhappily, the results have been largely negative. But negative results have also value. Dr. Barlow's report on the Chibougamau region saved both the Government and private undertakings much useless expenditure; Dr. Bancroft's report on Keekeek District was equally effectual in preventing vain effort and possibly in squelching the aspirations of certain promoters. On the other hand Prof. Dulieux's investigations of the magnetic sands, the titaniferous and other iron deposits of the province promise to have a direct economic value. But whether immediately or otherwise, the energetic and commendable course adopted by the Quebec Department of Mines to facilitate the development of the mineral industry of the Province will bear fruit.

EDITORIAL NOTES.

The English consul at Dairen reports that an asbestos deposit, of an estimated area of about 340 acres, was discovered last year at the foot of Mount Sansom, near Chinchow, and operations were commenced at the beginning of this year. The asbestos obtained is said to be of good quality. It is white or reddish-brown in colour, some of the fibre being over 2½ inches in length.

In a paper read at the annual meeting of the German Chemists' Association at Freiberg, Dr. Bergius, of Hanover, gave an interesting description of experiments conducted by himself to produce coal from its original substances in the laboratory. In a specially constructed apparatus, allowing the application of great pressure at high temperature, he heated either cellulose or peat with water to about 340 degs. under a pressure of more than 100 atmospheres, in each case the two materials being transformed into a product which, according to chemical analysis, was identical with natural coal. At a temperature of 310 degrees the process required 64 hours for its completion; at 340 degrees it occupied no more than 8 hours, the speed of the reaction doubling for every increase of the temperature by 10 degrees. Upon this basis Dr. Bergius calculated that the period of natural coal formation at the temperature of the earth's crust would

be about 8,000,000 years—a figure that approximately agrees with the periods established by geologists.

A capital story is related by The Financier (London), of a syndicate, with a capital of £2,000, which, having been formed to acquire options in Nigeria, despatched an engineer to inspect a property it had obtained the right to purchase. Within a few weeks of his arrival, the following cable was received: "Property absolutely valueless. Coming home." As may be imagined, this caused considerable disgust, but the chagrin soon changed to joy when a further cable was received, announcing that the engineer had been eaten by cannibals. He was insured for three thousand pounds, and out of this sum the shareholders were paid their first and final dividend of 150 per cent. It is to be hoped that the publication of this story will not have the effect of causing a great run on mining engineers, with the object of sending them, heavily insured, to inspect and report on properties in countries where they are likely to be regarded as additions to the visible food supply. At the same time there are some that might be spared; and there is a moral to the tale, indicating that even the most worthless of us may have his uses.

A DOMINION DEPARTMENT OF MINES.

Memorandum: Embodying the Views of the Canadian Mining Institute on the Organization, Purposes and Functions of a Federal Department of Mines; With a Note on a Proposed Mines Act.

In point of productive importance, mining occupies an eminently important position among Canadian industries. Thus the present mineral output exceeds in value and total exports of agricultural products, including animals and their produce; and considerably exceeds the value of the exports of the forest, fisheries and factories of the Dominion.

The development of the mineral industry in recent years is strikingly reflected by the official statistics of production. For example, in the year 1886 the mineral yield represented a value of, approximately, \$10,000,000; in 1895, the valuation was \$20,000,000; in 1900, \$64,000,000; in 1905, \$69,500,000; and in 1910, \$105,000,000; or an increase in twenty-five years of over tenfold. As a further illustration it may be pointed out that while in 1886 the mineral production represented only \$2.23 per capita of the population of the country, in 1910 it was equivalent to about \$13.00 per capita.

There is, meanwhile, every likelihood that the future expansion of the industry will be at least commensurate with past achievement in this direction; more especially as new areas, notably in the direction of Hudson's Bay, in which the geological conditions for the discovery of minerals are peculiarly favourable, are about to be rendered accessible by the construction of railways thereto. It is eminently desirable that an industry of such importance to the country in general should be represented in the Cabinet of the Dominion Government by a minister, who, as such, would devote his time exclusively to the direction and administration of the Department of Mines. This plea has been repeatedly advocated by the Canadian Mining Institute, the

national representative body of the mining interests of the Dominion. It was first acted upon by the late Government, who introduced an Act creating the Department of Mines. Further, a Minister of Mines was duly appointed to assume direction of the Department, although the minister so appointed was also assigned the portfolio of Inland Revenue. It is obvious that there can be no logical association between these two departments.

Prior to the creation of a Department of Mines, the two mining services, namely, the Mines Branch and the Geological Survey of Canada, were branches of the Department of the Interior. The duties of the Minister of the Interior are, however, exceptionally onerous, and it was realized and admitted that while the mining services were attached to this Department they received but scant encouragement, attention or consideration. Again the two branches, each controlled by a separate director, were undertaking investigations or work on very similar lines; and since there was no attempt at correlation or co-operation, a duplicate of results to a very considerable degree was the natural consequence.

It was believed that by the creation of a Department of Mines, properly organized, this state of affairs would be remedied; but, unfortunately, the conditions have not been markedly changed or improved.

The Canadian Mining Institute, therefore, respectfully urges that the Department of Mines be placed in the same position in respect of efficiency and organization as the Department of Agriculture. Under the auspices of the Department of Agriculture, an important educational work has been successfully undertaken for many years past. Experimental farms have been established throughout the Dominion, including those provinces in which the Crown lands are under direct provincial jurisdiction; specialists are employed to visit the various centres and lecture on agricultural subjects; literature is freely distributed, and in many other directions the Department displays an intelligent and active interest in the welfare of this industry. To accomplish a like result it is important that the Department of Mines should receive the undivided attention of the Minister to whom its administration is assigned; and imperative that his chief adviser, the Deputy Minister, should not only possess the highest technical and scientific qualifications to successfully undertake the task of re-organizing the work of the Department, but also the necessary executive qualifications to successfully undertake the task of re-organizing the work of the Department.

In connection with the appointment of a Minister of Mines, two suggestions have been made, which are here outlined: The first is that the Department of Mines should also include and have jurisdiction over forest and water powers. This would then be in effect a Department of Natural Resources (exclusive only of Agriculture). The particular advantage of such a provision would be that practically all the technical or scientific work undertaken by the Government would be directed by the one Department. The other suggestion is that the Portfolio of Mines be assigned for a time, at least, to a member of the Cabinet without Portfolio. It was objected that such a course would be unprecedented. It may, however, be permissible to instance, by way of reply to such an objection, the appointment of the Hon. Adam Beck, in Ontario, a Minister without portfolio in the Provincial Government, to the ministerial direction of the Hydro-Electric Commission.

Dominion Mines Act.

The acquisition of title to mineral lands controlled by the Dominion Government has in the past, and is still, regulated by "Orders in Council." The effect of this system has been to produce a condition of uncertainty and instability, highly detrimental to the interests of mining in the country. The Canadian Mining Institute has, therefore, urged that an Act be placed on the Statutes, which will concisely define the requirements to be observed by those applying to the Crown for title to mineral rights. Acting on the invitation of the late Government, the Institute has drafted a Bill, which is now ready for submission to Parliament, and which it is hoped will commend itself to the favourable consideration of the Government. The principals enunciated by the Canadian Mining Institute in their Bill will unquestionably commend themselves to the Provincial Governments of the Western Provinces to whom it is understood the control of their natural resources will shortly be granted; and it is, therefore, probable, that if the Mines Act is passed by the Dominion Government, it will be unreservedly adopted by these provinces. Such a step would be obviously advantageous and would tend towards the establishment of an uniformity of the mining laws of the several provinces, an object the accomplishment of which the Institute regards as highly desirable.

CORRESPONDENCE

GOLD MINING IN NOVA SCOTIA.

Editor Mining Journal:—

Sir,—The letter you published on July 15th from Mr. Edgar H. Brennan is an appropriate sequel to that of Mr. J. Owen James, who, in the *Industrial Advocate*, of Halifax, imputed to me a number of statements of a fictitious character. To put quotation marks around such statements is not scholarly. Where he found them I do not know, nor does it matter. Most of them are not statements made by me. The criticisms on my little report upon the Nova Scotia goldfields deserve the kind attentions of a humorist; for, as yet, they are mere caricatures. Here is Mr. Brennan complaining loudly that I only made a hurried and superficial examination, and that "probably not having personally examined the Sterling, nor any gold mine in the Province approaching its depth, etc.," therefore my information was "circumscribed," "insufficient," and so forth. Mr. Brennan could easily have ascertained that I made a detailed examination of the Sterling, Dufferin, Richardson, Caribou, Brookfield, and indeed of all the large mines in the region. The Dufferin was unwatered for that special purpose. Naturally I have read Mr. Brennan's own most illuminating report with keen interest, as I did the valuable document submitted by Mr. C. Vey Holman to the *Industrial Advocate*. The people of Nova Scotia will have a large assortment of reports at their disposal if this curious controversy is continued.

London, Aug. 8.

T. A. RICKARD.

CEMENT FOR STEAM AND WATER PIPES.

"Power" recommends the following formula: Paris white, 2 lbs.; litharge, 5 lbs.; yellow ochre, $\frac{1}{4}$ lb.; and hemp cut up small, $\frac{1}{4}$ oz. Mix well with linseed oil to the consistency of putty and use at once. The materials can be mixed dry, and sufficient for immediate use can be made up with linseed oil. This cement will set under water.

THE SOUTH AFRICAN HALF YEAR

A Comparative Study of the Principal Gold Producers of the Rand.

From Our Own Correspondent.

London, July 31st, 1912.

With the Witwatersrand still occupying the supreme position amongst the world's gold producers and with the industry having settled down now to a very fair investment level the particulars of its development are always interesting. The leading mines are divided amongst well-known groups and a review of their progress during the past half year is informative. An interesting series of articles published in a London daily newspaper enable some striking aggregate and comparative results to be tabulated.

Of prior importance is the Rand Mines-Central group covering sixteen properties, eleven of which secured larger profits in the half year ended June than the corresponding period of last year, the net result being a gain of over \$1,100,000. Expansion has frequently been the result of the crushing of increased tonnage only, but in the main there has been a rise in average grade, this being sometimes partially absorbed by extra cost. Taking the case of one mine—the Village Deep—expenses had risen by 34 cents per English ton, but as there was an advance of 80 cents in average yield, the profit per ton advanced by 46 cents. The Bantjes Consolidated has benefited from a rise in grade which has been still more strikingly exemplified in the case of the City and Suburban, consequent upon the better developments in the deeper levels. The New Heriot has met reduced tonnage, arising from an accident, and higher costs by putting up the grade. The Nigel has met a fall in grade with greater tonnage and reduced costs.

Company.	Ore Milled, Tons.	Profit.
Bantjes Consolidated.	138,510	\$174,730
1911	131,457	141,500
City and Suburban.	160,819	605,900
1911	156,045	381,340
City Deep.	235,730	675,000
1911	131,693	191,515
Crown Mines.	933,000	3,227,415
1911	759,100	3,079,950
Durban Roodepoort Deep.	143,125	187,195
1911	128,360	154,750
Ferreira Deep	210,270	1,132,435
1911	183,004	981,250
Geldenhuis Deep	337,960	448,300
1911	403,230	648,325
Jumpers.	50,740	47,915
1911	64,890	137,875
New Heriot	68,060	270,620
1911	72,623	271,340
New Modder.	281,000	1,139,990
1911	269,700	850,185
Nigel.	78,950	126,635
1911	54,750	102,400
Nourse Mines	316,600	661,675
1911	331,401	630,030
Robinson Gold	279,600	1,993,295
1911	295,100	2,341,500
Rose Deep.	381,800	1,041,345
1911	331,100	821,500
Village Deep	296,800	674,200
1911	274,900	489,500

Village Main Reef.	1912	237,395	1,038,250
	1911	239,850	1,159,895

Another important group is the Barnato which makes a uniformly good showing, only one property retrogressing. This group is believed to have benefited almost entirely by the abandonment of the policy of low costs at any price which old policy too often meant the milling of unprofitable ore. Under the new method costs have certainly increased, but the more careful selection of ore has brought improved profits. Several properties have scored by crushing more material. The fall in yield at the New Pimrose is probably the natural result of the efforts to prolong the life of the rapidly dying mine.

Company.	Ore Milled, Tons.	Profit.
Consolidated Langlaagte.	123,627	\$260,470
1911	125,249	171,560
Glencairn.	110,773	81,535
1911	112,385	62,585
Ginsberg.	81,721	192,915
1911	66,153	135,720
New Primrose	141,400	523,080
1911	139,321	570,025
New Rietfontein	95,057	119,345
1911	85,915	103,815
New Unified.	63,570	147,555
1911	60,852	125,475
Witwatersrand Gold	223,896	533,030
1911	207,870	466,635

The Neumann group controls five important properties and, on the whole, does not show up so well, three of its mines showing diminished profits. In each of these cases the yield per ton shows a clear shrinkage, although this has not always been the main cause of the decline in earnings. In the Witwatersrand Deep the enormous drop in earnings was mainly due to the flooding of the mine.

Company.	Ore Milled, Tons.	Profit.
Consolidated Main Reef.	123,888	\$254,335
1911	126,872	233,995
Knight Central	142,162	119,930
1911	150,336	151,025
Main Reef West.	97,371	274,945
1911	95,398	333,565
Witwatersrand Deep	224,300	471,950
1911	270,526	859,835
Wolhuter.	174,750	451,455
1911	169,615	425,640

The Robinson group only controls two mines, but these also show up unsatisfactorily. In the case of the Randfontein Central the profits are only shade down in the comparative period, but in view of the tremendous increase in tonnage a substantial expansion of profits was naturally looked for. With regard to the other company the decline in profits is chiefly a matter of grade.

Company.	Ore Milled, Tons.	Profit.
Langlaagte Estate	313,883	\$396,250
1911	312,502	638,250

Randfontein Central	1912	1,264,840	1,980,250
	1911	930,502	1,995,000

Better results are shown by the Albu group from its seven properties and here again the improvement is scarcely as much as might have been looked for in view of the extended scale of operations. Increased costs ranging from 16 cents per ton on the part of the Aurora West to 36 cents per ton in respect of the West Rand Consolidated account for the difference.

Company.		Ore Milled, Tons.	Profit.
Aurora West	1912	76,516	\$ 83,210
	1911	66,186	77,340
Cinderella.	1912	102,718	120,900
	1911	95,746	116,345
Meyer and Charlton.	1912	83,477	489,270
	1911	35,715	132,485
New Goch	1912	158,653	144,855
	1911	166,822	376,105
Roodepoort United	1912	179,661	132,010
	1911	186,960	190,795
Van Ryn	1912	232,450	709,220
	1911	194,320	640,300
West Rand Consols.	1912	166,100	140,270
	1911	148,090	120,450

The Farrar group is another one which shows decline, although less than has been anticipated. The grade of the East Rand Proprietary has been put up practically \$2 per ton; with costs \$1.50 higher, the net gain in average profit has not been sufficient to offset the reduction of 174,000 tons in the output.

Company.		Ore Milled, Tons.	Profit.
East Rand Proprietary.	1912	945,000	\$2,649,770
	1911	1,119,560	2,673,120
New Kleinfontein	1912	247,530	515,000
	1911	223,554	583,725

Very mixed results are shown by the Goldfields group. The seven important properties under its control earned between them \$210,000 less during the past six months than in the first half of last year. In the case of the Luipaard's Vlei an advance in the expense ratio in conjunction with a slight decrease in tonnage has cut down the profits 50 per cent.

Company.		Ore Milled, Tons.	Profit.
Jupiter.	1912	231,700	\$154,525
	1911	143,050	94,220
Knights Deep	1912	352,630	541,465
	1911	353,830	737,610
Luipaard's Vlei.	1912	99,274	36,665
	1911	101,422	76,155
Robinson Deep	1912	301,900	1,083,125
	1911	286,500	917,695
Simmer and Jack.	1912	434,000	1,307,705
	1911	424,500	1,470,750
Simmer and Jack East.	1912	188,060	119,650
	1911	176,270	78,715
Simmer Deep.	1912	277,400	102,975
	1911	258,050	181,280

The only other outstanding group is the Goerz group and the four properties here in the aggregate give disappointing results. The May Consolidated was expected to show a reduction in view of its approaching exhaustion, but the Lancaster West and the Princess Estate, which have been amalgamated and considerably re-organized, were expected to show up much better. The Geduld shows some expansion in profit as a result of the enlarged scale of operations. Princess Estate operations were impeded during the re-organization and better results are looked forward to in the future.

Company.		Ore Milled, Tons.	Profit.
Geduld Prop.	1912	84,320	\$127,700
	1911	68,710	96,065
Lancaster West	1912	125,720	37,955
	1911	128,930	141,080
May Consolidated	1912	78,152	194,005
	1911	91,340	332,670
Princess Estate	1912	101,967	*19,235
	1911	80,640	142,830

* Loss.

Apart from the above groups, the Brakpan is the only other important undertaking. This mine treated 287,000 tons for a profit of \$915,000, the grade being \$7.54, and costs \$4.38. These compare favourably with the results obtained last year.

TECHNICAL LITERATURE

GEOLOGY.

The Genesis of the Diamond.—In the July-August issue of The Journal of Geology, Mr. Orville A. Derby, of the Geological and Mineralogical Service of Brazil, discussing the genesis of the diamond, suggests the hypothesis that the diamond is a secondary mineral crystallized out of some carbon-bearing solution that was capable of dissolving the rock (or some parts of it) in which it occurs and thus of opening space for it. This hypothesis, he submits, can be easily reconciled with the geological conditions in which the diamond occurs in its parent rock, in so far at least as these conditions are known at present. Thus, (1) the diamond occurs in the form of isolated complete crystals closely enclosed in a rock of eruptive origin, occurring in dikes and pipes and having the readily alterable minerals olivine and pyroxene as its leading essential constitu-

ents. (2) This rock, wherever diamonds have been found in it, shows evidence of having been fractured after its consolidation to such an extent as to permit a sufficiently free circulation of subterranean solutions to produce a very advanced stage of alteration in all its olivine-bearing portions, so that the only portions that remained perfectly fresh are certain unfractured pyroxene-garnet segregations free from olivine. (3) The circulating solutions introduced water (locked up in the serpentine and other secondary minerals) and carbo (locked up in the calcite), both of which were lacking in the original rock. (4) The circulating solutions attacked the garnet of the enclosed pyroxene-garnet segregations wherever these were sufficiently fractured to permit it, producing an alteration crust of secondary minerals. Unfractured segregations would naturally be attacked only on their surfaces adjacent

*The English sterling equivalents have been translated into American currency at the rate of 2 cents to the penny for the small figures and 5 dollars to the pound for the big sums.

to the more fractured and thus more permeable olivine-bearing portions of the rock, and thus their (presumably) rounded original form would be accentuated through corrosion, giving them the aspect of water-worn pebbles. (5) After (or concurrently with) the alteration of the garnet, carbon crystallized in the form of diamond adjacent to the secondary crust formed on the former mineral, and also, as Beck demonstrated, in his study of the diamond-bearing nodule from the Newlands mine, in the form of graphite.

ASBESTOS.

Russian Deposits.—A series of articles is now appearing in the London Mining Journal on the economic mineral resources of Russia. In the issue for August 3rd, Mr. E. de Hautpik describes the asbestos deposits. Asbestos is found in Russia in the Urals, in Siberia and in the Caucasus, but production is mainly derived from the Ural field. The principal mines here are in the Ekaterinburg district, in a zone of serpentine rocks extending for a distance of about six miles, and about 1,400 yards wide. The asbestos produced, representing nearly one-third of total production of the Urals, is said to be of very fine quality, comparable with the high grade crude of Canada and Piedmont. The veins are very irregular, and variable in declination and extent. The writer states: "The fall varies between 0 degrees and 360 degrees, now parallel to the level, now thrown vertical, now pinching out, and again appearing. One and the same vein may be followed on two opposite edges of the cutting over a distance of 70 to 100 feet. Only in parts of greatest thickness, or of accidental accumulation, are cuttings made."

The production of the asbestos is conducted by means of open cuttings down to a depth of 70 feet, leaving recesses of 14 feet, besides which, with similar cuttings, one or two approaches are made, from which three branch approaches to each level. The yield of asbestos varies from 0.6 to 1.2 lbs. per cubic foot of serpentine rock." Mining is apparently of the most primitive character and there is no attempt to recover the asbestos from the smaller veins. Nevertheless the industry is developing very rapidly, production having nearly doubled in five years. The output in 1911 was 15,872 tons. Other districts in the Urals are those of Bogosloff, also in the south, but the best asbestos is stated to be obtained from mines on the Asbestovoy Hills, on the River Sissert, and from deposits of the Shelkovoy Hill, between the Shuralinsky and the Teploy Hills. Mines are also worked in the Orsk and Troitzk districts. The asbestos is graded to (1) lengths of 1 to 1 $\frac{1}{4}$ inches and more for spinning; (2) medium ($\frac{5}{8}$ to $\frac{3}{8}$) for boards; and (3) short lengths and asbestos flour for making fireproof materials. The chemical composition of the Ekaterinburg asbestos is: SiO₂, 41.40; MgO, 41.06; Fe₂O₃, 2.03; Al₂O₃, 1.11; H₂O, 14.37=99.97. An ing: SiO₂, 36.30; MgO, 34.84; Al₂O₃, 1.12; Fe₂O₃, 5.28; Cr₂O₃, (F₂O), 7.95; H₂O, 15.26.

There are numerous occurrences of asbestos in Siberia, but it is mined in the government of Yenissei only. The mineral occurs there in dolomite veins attaining to widths of over four feet, of which, however, only a seventh of a foot is commercially recoverable. The yield of asbestos is from 2.5 to 4.5 lbs. per cubic foot of rock. In the Caucasus asbestos is, at present, produced in insignificant quantity from the Sharopan district. There are numerous promising undeveloped areas. In fact, from the information here afforded, it would seem that the Russian asbestos industry is merely in

its infancy, and that scientific exploitation and the introduction of modern methods of mining and milling may very readily result in the development of the industry to a degree that would challenge Canadian supremacy.

COAL.

Use of Stonedust in Mines.—We recently reviewed in this column a paper in which the use of stonedust as a means of preventing coal dust explosions was advocated. The first report of a committee appointed by the British Government to investigate the question of explosions in mines, has since been issued. This committee, while remarking that the experiments so far as they have gone, are sufficiently striking to merit serious attention, consider that further experimentation is necessary before any final recommendation can be made. The effect of the stone dust on health is also considered, the conclusions reached by the expert to whom this investigation was submitted being that: (1) The effects produced vary with the time of exposure and particularly with the quantity and quality of the dust which is inhaled. (2) The more concentrated the dust in the atmosphere the more rapidly will fibrosis be produced; and the more irritating the dust the more intense will be the fibrosis. (3) The inhalation of such stonedusts as are rich in silica seems particularly injurious. (4) That powdered shale (used in the experiments to which we called attention) does not produce more irritation in the lungs than does coaldust, and judging by the comparatively non-injurious effects of coaldust on the general health of the workers, powdered shale may be regarded as comparatively harmless.

LOW GRADE ORES.

The Successful Mining of Low Grade Ores.—The Mining & Engineering World directs attention in a recent issue to the success now attending the operation of low grade ores in America.

Our contemporary remarks:

"The conditions of mining have so changed that it is the low grade mines that are paying the steadiest and most certain dividends. This is made possible only by the advanced state of mining, transportation and reduction guided by men of the highest technical and business ability. Profits are not now measured so much by the grade of the ore as by the quantity handled and the degree of economy practised at every step. The magnitude of the results achieved are illustrated by operations of the great dredging plants on the gold placers of California, the Homestake of South Dakota and the Alaska Treadwell of Alaska, the great porphyry coppers of Utah, Nevada and Arizona, and others. The Homestake has paid in dividends to date over \$22,000,000; the Alaska Treadwell, nearly \$12,500,000; the Utah copper, nearly \$14,500,000; and the Nevada Con., nearly \$8,000,000. The great copper mines of the Lake Superior region belong to the low-grade class yet they have been remarkable dividend payers as will be seen by reference to the dividend table on another page. As an instance may be cited the Calumet & Hecla, which has paid dividends to the total of very close to \$118,000,000. Other big properties are now getting under way and will be heard from in due time." The grade of ore, then, is of less consequence than the size and uniformity of the deposit and the economy with which the product may be handled and converted into money. The progress that has been made in recent years in making it possible to profitably operate low-grade mineral deposits has been due to great changes in mining

and metallurgy, and the application of up-to-date business methods. There is no reason to believe that this advancement has yet reached its highest point, or anywhere near it. It is not at all improbable that what we now call low-grade ores, will some day be looked upon as rather high grade.

In Canada the profitable mining of the low grade copper ores of the boundary district in British Columbia is another case in point.

ASBESTOS.

One of the Inspectors of Mines of South Australia has reported on two asbestos properties in that state, one of which is situated in the Hundred of Bright, 23 miles northeast from Endunda, and the other in the Hundred of Arkaba, 9 miles from Hawker. In each case the asbestos occurs in small seams and bunches of from 1 to 4 inches wide. The asbestos-bearing formation is said to be decomposed slate and sandstone. The asbestos is of the blue variety known as Crocidolite, of fairly good quality, estimated to be worth from \$50 to \$75 a ton; while it is anticipated that a large quantity is available.

COAL.

The Difficulties of Colliery Management.—In a paper contributed to The Canadian Mining Institute a year or so ago by Mr. W. D. L. Hardie, of Lethbridge, attention was directed to the increased difficulties of colliery management due to recent industrial progress and invention, including, for example, the extended application of electricity to colliery working, and, in general, the employment of new appliances and methods in contrast with the simpler if less efficient means of coal-winning of even twenty-five years ago. Mr. W. C. Blackett, the newly elected president of the North of England Institute of Mining Engineers, in the course of a speech at a meeting of this society in Newcastle a week or so ago, gave expression to very similar ideas, but showed that the lot of the mine manager in Great Britain was rendered the more irksome by the annoying and eccentric legislative provisions recently enacted, such for instance as that requiring the manager to sign from two to three hundred documents a day. Sixty years ago, Mr. Blackett remarked, the manager actually had leisure to devote to the real object of his profession. He could study and devise means whereby disasters and accidents could be avoided. "To-day, the mining engineer of the North of England and elsewhere in the kingdom was spending the most strenuous moments in his life in devising ways and means of meeting all those Acts of Parliament and all those Orders in Council, and so had no time left to indulge in scientific pursuits."

COAL.

A new device, the object of which is to minimize the liability to misfire when shotfiring by electricity is now in use in some of the Welsh collieries. An essential part of the appliance consists of a detonator shield of copper or other suitable material, to the base of which the cables are attached, so that the detonator itself is relieved of all stress. For the insertion of the detonator and shield an appliance is employed comprising an external copper tube graduated for measuring the depth of the hole, and an internal copper rod, fitted with a removable spike. In operation the base of the primer is opened with the copper spike to a convenient depth for accommodating the detonator and shield. These are then passed through the tube by means of the copper rod, from which the loose spike has been previously

removed, and inserted in the primer. To provide against the dislodgment of the detonator upon the withdrawal of the rod, the shield is provided with tongues engaging with the cardboard base of the primer. These tongues are designed to collapse under a pull of about 10 lb., to enable the detonator to be withdrawn in the event of a misfire, by tugging on the shotfiring cables. The detonator having been placed in position, the hole is stemmed, a semi-circular rammer being used for the purpose, while the balls of stemming employed are shaped on a former to fill the section of shothole unoccupied by the inserting appliance. This has the advantage that the cables, which pass through the tube, are not subjected to force liable to cause abrasion of the insulation—a conspicuous cause of misfires. When the stemming has reached to within from 4 to 6 inches of the mouth of the hole, the copper tube is withdrawn and the orifice is completely stemmed. The shot is then fired in the usual way. Should a misfire occur the detonator and shield can be withdrawn immediately by hauling on the cables, after which the hole may be approached with impunity. The advantages claimed for the appliance are greater safety in handling simplicity in use, and the obviation of the possibility of unspent detonators being left in the coal to the peril of the workman and the consumer.

DRILLING.

Commenting on a dust eliminator in connection with drilling machines, invented by Thomas Mitchell, foreman of the North Butte Mining Company, "Mining Science" states that the apparatus does not conflict with the changing of drills, and the device can be manufactured for 50 cents. An exhibition test demonstrated that not a particle of the dust from the drilling escaped, being all caught in a canvas tube. By way of comparison, the drill was operated without the eliminator, and within a few seconds the air in the raise was filled with dust-particles which presently were so thick that it was difficult to distinguish persons at a few feet distant by candle light. A patent has been applied for, and already some of the mines of the Anaconda Company are using the apparatus.

ZINC.

Zinc Dust as Precipitant.—The problem of the physical constitution of zinc dust was recently investigated by Mr. M. T. Murray (Jour. Chem. Met. and Min. Soc. of S. Africa, 1911). Screening tests showed the following: None of the material remained on a screen with aperture 0.0197 in.; 94.5 per cent. of the whole passed the smallest screen used (aperture 0.0030 in.). The average diameter of the particles was calculated as 0.0011506 in., which corresponds to a surface of 144.8 sq. ft. per lb. of material; this is about three times the surface exposed by 1 lb. of filiform zinc. Under a microscope, zinc oxide and other impurities were seen to be present, but quite separate from the metallic particles which were approximately spherical and retained their bright metallic lustre even after several weeks' exposure to the atmosphere. H. A. White stated that a threefold increase of surface was insufficient to account for the greatly increased rate of precipitation by zinc dust compared with that obtained in the usual extractor boxes, so that there must be another factor involved.

NICKEL.

The Mining and Scientific Press suggests that the nickel deposits of China are, through the re-organization of the government and the building of railways, becoming more of an economic possibility. Nickel is

believed to occur extensively in Southwestern China. From time immemorial the Chinese have smelted mixtures of tin, lead, zinc, copper and nickel ores, forming natural alloys of variable composition which approximate German silver. Comparatively little is known, however, of the source of the nickel ores, since they occur in Southwestern China, where, until recently, it has been impossible to carry on systematic exploration on account of the difficulties of travel and of the hostility of the native tribes. Within the last few years railways have been built through this area, but so far apparently no attention has been paid to the nickel deposits. Duclos, the engineer who accompanied the Mission Lyonnaise, reported that he found nickel ores occurring associated with copper in two localities in Yunnan and Ssu-chuan. The ores must be comparatively rich, otherwise the Chinese never would have worked them by their native methods. They do not commonly work copper ores of a lower grade than 15 per cent.

A CHEAP METHOD OF STOPPING.

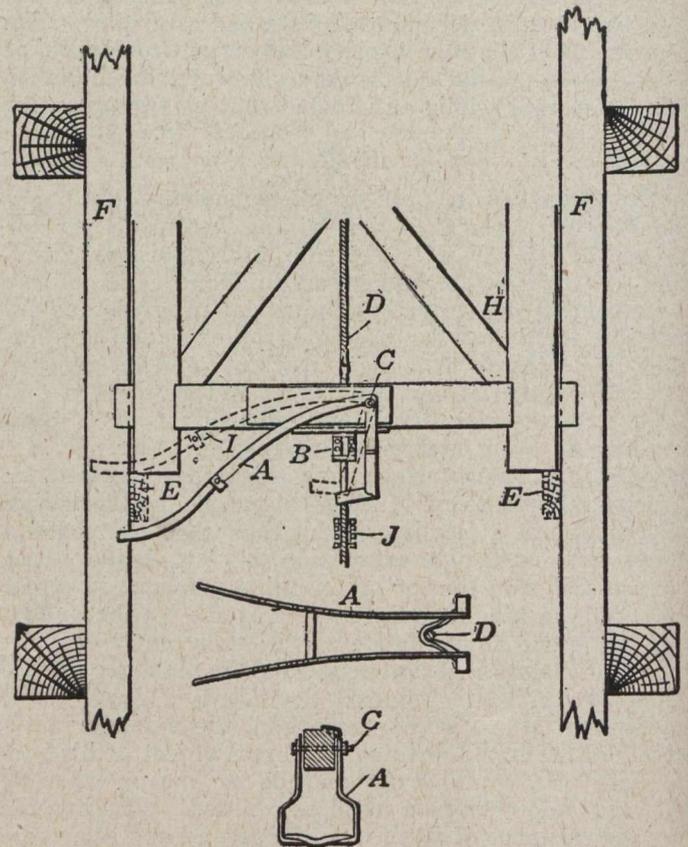
Mines and Minerals for August contains an interesting article on the timbering methods and the filling system as employed by the Homestake Mining Company, Lead, South Dakota, in which the costs are compared of three methods of stopping, namely with timber, by the so-called Homestake method and by the present system, are compared, showing the very considerable economy effected by the latter. The present system does away with all the sill floor timbers. Drifts are excavated in the hanging wall and in the footwall, a short distance from the ledge. The ore body is then divided into stopes 60 feet wide and pillars 40 feet wide. A 6-foot cross-cut is driven through the centre of each pillar from the hanging wall to the foot-wall. Along the cross-cuts, headings are driven about every 30 feet, and extend from the cross-cut in both directions to the stopping ground. The stope is then opened by taking out ore through the headings on either side of the stope. On one side only of the stope timbered manways are carried upwards as the stope progresses. These manways are not in the pillar, but in the broken ore, a few feet from the pillar. As the ore is drawn out into the cross-cuts, the miners are at work on top of the broken mass. Shovellers keep the ore drawn off just sufficiently to give the miners enough room for their work. With this system the stope can be worked about 120 feet high. When this quantity of ore has been taken down, raises are driven to the level. Then the ore is entirely removed, a mud-sill is laid down, and the waste thrown in. The stope is next filled with waste, nearly to the arch of ore between it and the level above. When the filling is completed, square-set timbers are placed on top of the filling and the remaining arch of ore is taken out, the square sets acting as supports. A stope on one level is directly below a stope on the level above. As the arch is removed, waste rock is filled into the timbered part of the stope. After all the stopes are worked out and filled, the pillars of ore that have been left are worked by means of ordinary square set timbering. The waste rock is prevented from running into the stope by lacing the outside set of timbers. The features of this method are: Levels may be placed at comparatively long vertical intervals; a minimum quality of timber is used; ore is broken at a small cost; nearly all the ore can be extracted; the output is large and regular; there are always large ore reserves, broken and in

the pillars. The system has, moreover, resulted in a saving in costs of 22 cents per ton compared with the old method of timbered stopes.

SAFETY CROSSHEADS FOR HOISTING BUCKETS.

Because accidents have been caused by the falling of crossheads in shafts, the Canadian Bureau of Mines calls attention (in its report for the year 1911) to the safety crossheads that have been designed and patented by Mr. Morin, master mechanic at the Nipissing, and Mr. Sargeson, master mechanic at the Waldman Mine.

The object of the design of these crossheads is to prevent them from falling when they stick in the shaft. In the Sargeson crosshead, which is shown in the ac-



Safety Crosshead Used at a Cobalt Mine

companying illustration, the attachment A is fastened to the crosshead at C. If the crosshead sticks, this arm automatically engages the clip B, attached to the cable, and so stops the bucket. In sinking operations the arm A is automatically tripped by the stop block E, allowing the bucket to descend to the bottom of the shaft.

In the accompanying illustration, A shows the attachment in normal position; I, the attachment tripped by the crosshead stop; B, the clip in normal position; J, the clip lowered through the tripped attachment; C, the draw pin; D, the cable; E, the crosshead stops; F, the guides; and H, the crosshead.

The same principle is followed in the design of the Morin crosshead in the bucket follower, shown in the illustration. It is further equipped with an automatic safety device, which, by the aid of springs, enables dogs to grip the guides, thus preventing the crosshead from falling.

CHIBOUGAMAU REGION OF QUEBEC

The accompanying illustrations are reproduced from some of the admirable photographs taken by Dr. Alfred E. Barlow on the occasion of his visit to the Chibougamau region last year.

tion and prospecting may result in discoveries of economic value.

Our first illustration is of the McKenzie gold mine, which we understand was regarded as being a promis-

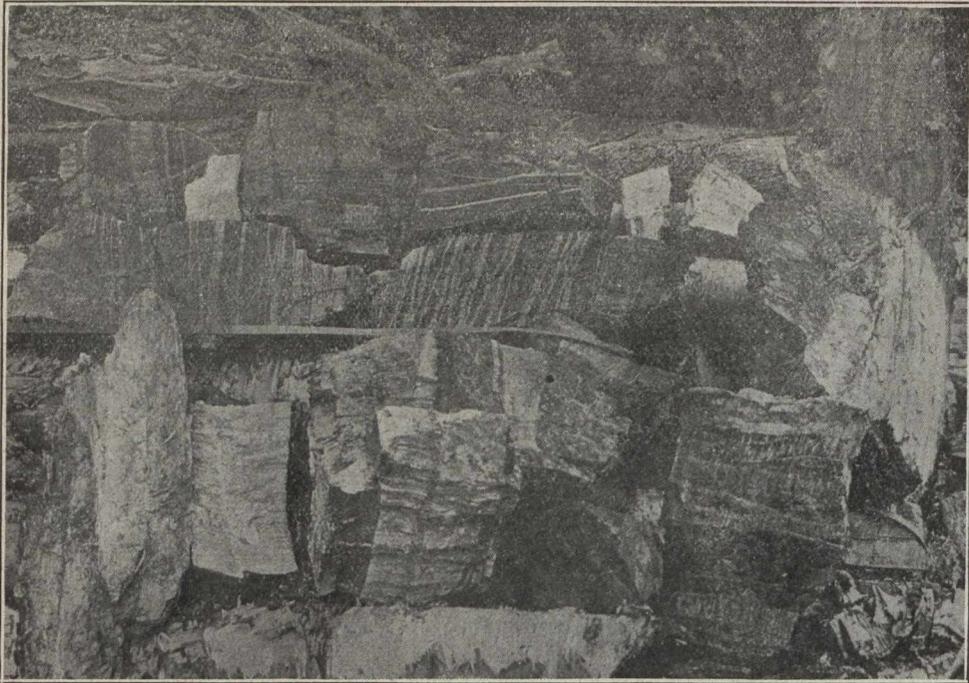


McKenzie Gold Mine, Portage Island, Lake Chibougamau

In spite of the fact that the Commission's report was in general adverse, there is still considerable interest in this area and it is even possible that further explora-

ing prospect by Mr. John E. Hardman.

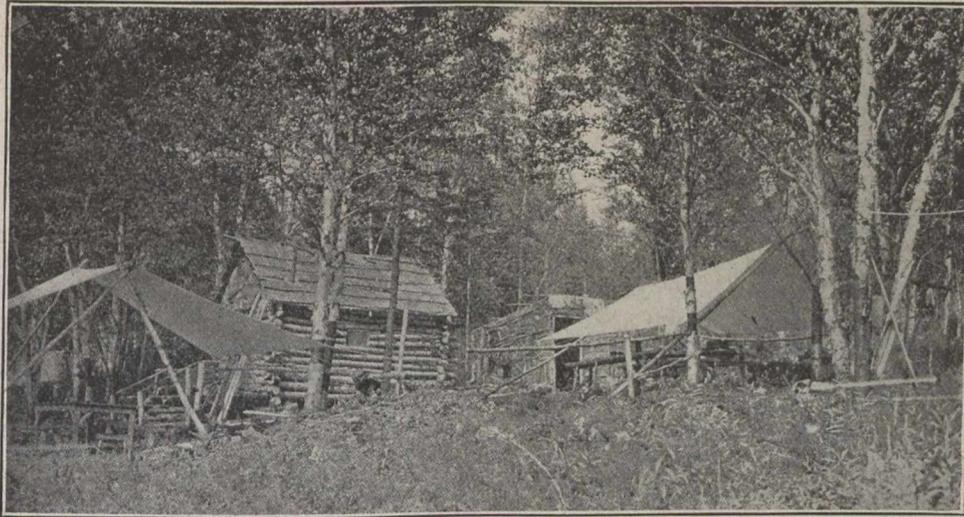
The second illustration shows specimens of so-called asbestos, but mostly picroilite, obtained from one of the



Specimens of so-called Asbestos (mostly picrolite.)—Pit No. 5, Asbestos Island, Chibougamau



Professor Gwillim and Mr. Bateman at work in the Sampling Mill, Pointe aux Bouleaux



Headquarters' Camp.—Pointe aux Bouleaux, Portage Island, Lake Chibougamau

pits on Asbestos Island.

The third photograph presents a most characteristic portrait of Prof. Gwillim, one of the members of the

Commission, engaged in the task of sampling, while the fourth illustration is a view of the Commission's headquarters' camp, and also gives some idea of the vegetation in Northern Quebec.

THE GREAT COBAR, LIMITED

(Abstract from the Mining and Engineering Review.)

Next to Broken Hill, Cobar is the most important metal mining centre in the State of New South Wales, and the future of the town and district is wrapped up in the fortunes of the Great Cobar, Ltd. The mines owned by this company are the Great Cobar, Cobar Gold (Fort Bourke), Chesney Copper, and, some six miles further south, the Peak and Conqueror gold mines. Midway between the Great Cobar and the Peak is the Occidental gold mine. Apart from the foregoing, any other mines in the immediate vicinity are either unworked or operating on a very small scale.

The predictions of Mr. H. C. Bellinger, the general manager, are that the annual production of the mines will shortly reach 10,000 tons of copper, 50,000 oz. of gold, and about 250,000 oz. silver per annum. For many years the Mount Boppy G. M. Co. at Canbelego, some thirty miles from Cobar, held the record as the largest gold producer, but now that the ore from the Fort Bourke mine is being treated, the Great Cobar, Ltd., holds the pride of place, both in regard to copper and gold. The following table shows the output during the last six years:

Output of Great Cobar Mines.

	Ore Raised.	Blister.	Value.
1906	198,168	4,030
1907	167,005	3,459
1908	234,877	5,127	334,251
1909 (10½ months)	203,746	4,855	378,842
1910 (10½ months)	298,652	6,248	524,000
1911	346,303	6,548	366,688

From 1876 to the end of 1911 the production of copper stands at 89,009 tons.

In order to show that the returns are steadily increasing, the figures for the first five months of the present year may be quoted:

	Copper. Tons.	Gold. Oz.	Silver. Oz.
January	423	2250	16,751
February	504	2180	13,767
March	576	3920	23,716
April	583	5147	32,744
May	701	5137	21,561

The main shaft at the Great Cobar mine is down to a depth of 1,400 feet. Its dimensions are 15 feet by 8 feet, in three compartments, two of which are for hauling, and one for pumping, air pipes, and ladder-way. The shaft is equipped with a pair of coupled horizontal expansive non-condensing Corliss valve winding engines by Andrew Barclay and Sons. Cylinders, 22 in. diameter by 48 in. stroke; winding capacity, 2,000 feet per minute, with a 2-ton load of ore. The drums are 10 feet in diameter by 4 feet, and are fitted with steam release brakes. The loose drum is also fitted with steam released friction clutch and hand brake.

The head gear is 67 feet in height to the centre of the winding sheaves, and is constructed of steel sections. Each cage lifts two 16 feet cubic feet capacity, box pattern mine trucks to the brace, and lands on chairs. The trucks are then pushed over the bin and tipped by means of rotary tippler into the brace bin, which holds 450 tons. From this bine the ore is fed through pneumatically operated doors to two Hadfield-Heclon gyratory breakers, then over the picking belts and into the bedding bins. From here it is waggons, and a small portion from each waggon is loaded into a special

truck, which, when full, is delivered to the sampling mill.

The Sample Mill.—The ore is delivered to a Babcock and Wilcox tray conveyor of the endless chain end discharge pattern, having a capacity of 50 tons per hour at 45 f.p.m. This delivers on to a similar conveyor rising at an angle of 20 deg. This conveyor delivers to a No. 5 McCully gyratory ore discharged into 30-ton capacity steel hopper ore breaker. The ore is then lifted by a belt elevator (66 feet centres), which delivers to a 64-in. Simplex sampler, 15 per cent. cut. The sample then gravitates to a No. 3 McCully crusher. This delivers to a 44-in. sampler, 20 per cent. cut. The sample then gravitates to a 24-in. x 14-in. rolls, 69 r.p.m. It is again sampled with a 28-in. sampler, 15 per cent. cut, and again passes to another set of 24-in. x 14-in. rolls, 144 r.p.m. The product then passes to a 28-in. sampler, 15 per cent. cut, and from there gravitates to a sample grinder.

Before briefly describing the smelting equipment, a few words may be written regarding the company's mines.

The Great Cobar Mine.—According to Mr. J. E. Carne (assistant Government Geologist), the Cobar lode consists of three lenses, extending in a N. 10 degree W. direction, with a slight dip to the east. The centre or principal lens has an average length of about 450 feet, and a depth of about 70 feet (the maximum being 120 feet at the 800 ft. level). The north lens is separated from the centre by 140 feet of mineralized slate carrying low-grade ore. Its length, so far as proved, is 300 feet, and its width 90 feet. The south lens is separated from the centre by a blank of about 50 feet in the upper levels, but merges into it below No. 3 level. Its width averages 50 feet, the maximum being 75 feet in No. 7 level, and its greatest length 150 feet. South of this lens the ore dies out in country, though slight metal values and quartz leaders continue in the rubbly channel slate.

The ore lenses are simple impregnations and replacements in slate and fine sandstone, with more or less quartz in places. Iron and copper sulphides occur solid for the most part, but are occasionally mixed with slate and quartz, the north lens being especially basic even where low in copper. No true eastern wall exists, the ore dying away gradually in the country, and in the mineralized slates between lenses. A marked distinction, however, is noticeable between the channel slate and the west country, the latter being more jointed and blocky.

During the reorganization of the surface plant, development work underground has been pushed ahead, and the ore reserves exceed 2,000,000 tons, averaging 2.6 per cent. copper and 1 dwt. gold.

The Cobar Gold Mine.—The next most important mine, although the most recently secured, is the old Fort Bourke, purchased from the Cobar gold mines in 1910 for the sum of £120,000. The Cobar Gold Mines, Ltd., was registered in 1896 and reconstructed in 1898. The plant included a mill of 100 stamps, and, when the ore became too refractory to treat by amalgamation, something like £80,000 was frittered away in fruitless experiments. When the company shut down the ore reserves amounted to 141,053 tons, assaying 1.3 per cent. copper and 10.5 dwts. gold. The ore is now dumped into large storage bins and railed to the smelters as required. The total output of gold to the end of 1907, according to official returns, was 113,509 oz., valued at £351,101, and

the present production is approximately 3,000 oz. per month.

The ore reserves total some 350,000 tons, averaging 1.5 per cent. copper and nearly 10 dwts. gold. No dividends were ever paid by the old company, but the mine will go a long way towards providing an adequate return to the present holders.

The Chesney mine was originally worked as a gold proposition, and a large quantity of the auriferous slate from the oxidized zone was treated by battery and amalgamation, the outcrop betraying no evidence of the copper ores below. In 1901, about 4,500 tons were treated at the Great Cobar smelters, for a return of 3 per cent. copper and 1 dwt. gold per ton; and in 1904 the property was purchased by the present owners. The shaft is 800 feet deep. At the 464 feet level the ore body has been worked for a length of over 800 feet, with an average width of nearly 40 feet. The Fort Bourke ore, being richer in gold, now forms the main siliceous flux, and consequently the reserves at the Chesney mine are not being extracted on a large scale. The ore reserves total 750,000 tons, averaging 2.7 per cent. copper and 1 dwt. gold. The value of the Chesney southern ore body at numbers 6 and 7 levels south is, however, nearly 4 per cent. copper and 6 dwts. gold.

The Peak mine is also a valuable property, and has been a consistent producer for the past 18 years. Last year what is apparently a continuation of the lode was discovered, containing high gold and silver values. Further development work is being carried out to determine the tonnage available. All the mines are under the management of Mr. Nicholas Treloar.

Smelting Department.

There are four blast furnaces, each 240 in. by 56 in., at the tuyeres, with a total capacity of 2,000 tons per day, although at present the average does not exceed 1,250 tons. The proportion of ores from the various mines used in the furnace charges is approximately four parts of Cobar ore to one part of siliceous ores from the Cobar Gold, Chesney, or Peak mines. No ordinary furnace slag is used on the charge, but the converter slag is retreated to recover its values. When the scheme of reorganization is complete, and production on a large scale commenced, the output will perhaps exceed the figures mentioned by Mr. Bellinger. The only other factor is the price of copper, and at anything like present figures large profits can be earned.

There are two tiers of water jackets, five upper and five lower, 10 ft. by 4 ft., with 5 in. water space on each side, and one upper and one lower at each end. The bussel pipe supplying 40 tuyeres is 34 in. in diameter, whilst the blast main is 42 in. diameter. The height from ground to tapping floor is 8 ft. 6 in.; from tapping floor to charging floor, 26 ft. 6 in.; from charging floor to top of superstructure, 16 ft. 3 in.; from top of superstructure to top of auxiliary stack, 34 ft.; from top of superstructure to top of down-take, 19 ft. 6 in.; from ground to top of auxiliary stack, 85 ft. 3 in.

The furnace charge cars are 34 and 44 cubic feet capacity. They are hauled up the incline by a motor-driven geared winch, capable of hauling 8 tons up a gradient of 1 in 8 at the rate of 8 tons per hour.

The molten metal from the furnaces is continuously run into forehearth or settlers. Originally five circular settlers, 18 feet in diameter and 4 feet 6 in. deep, capacity when lined 389 cubic feet, were installed, but now only two of this type, those at the extreme ends, are retained.

Between the furnaces, where one circular settler was formerly used, two of the oval type have been placed, making a total of eight. The dimensions of these latter are 9 ft. 6 in. by 4 ft. 6 in., capacity 270 cubic feet. From these forehearth the slag forms a continuous flow on the east side, delivering into slag pots. The matte is tapped intermittently on the west side (which is the converter building) into 8-ton segmental matte ladles.

There are four standard improved Berg cinder cars, 200 cubic feet capacity, 80,000 lbs. capacity, fitted with automatic couplings. The slag pot is supported directly within the C.I. trunnion ring, and is tipped to either side of the track by forged worm and cut gears electrically operated. There are also three Dewhurst's patent end tipping slag ladles and cars, capacity 10 tons, and two Dewhurst's patent side tipping slag ladles and cars, with split ladle. Capacity of ladle, 280 cubic feet.

The converters are of the barrel type, 84 in. by 126 in., carrying 14 tuyeres. There are three blowing stands, set end to end, and blowing into a common flue, with dust chamber inserted along the flue. The gases from the converter pass into hood; from hood into C.I. flue; from C.I. flue to dust-settling chamber; from dust-settling chamber to brick down-take; then through underground flue to fume scrubber; from scrubber to brick stack. The converters are handled by two 40-ton electric overhead cranes manufactured by Messrs. Babcock and Wilcox, Ltd. These cranes will hoist 40 tons at 16 ft. per minute. Transverse travelling, 110 f.p.m.; longitudinal travelling, 250 f.p.m. Span of crane, 49 ft. 8 in., centre to centre of rails. Height from ground to top of crane rail, 36 ft. Crane controlled by driver in cab, travelling with main girders. Each crane is fitted with an auxiliary hoist of 5 and 10 tons capacity.

Mr. F. J. Murphy, who has had experience on all the principal smelters in the United States, is in charge of the furnaces.

Power Generation.

The power generating station is not by any means the least important section in such an undertaking. The boilers, numbering six, each having a heating area of 3,580 square feet and a grade area of 70 square feet, are of the Babcock and Wilcox make, fitted with chain grate stokers and superheaters. The coal is unloaded direct into a steel hopper, the top of which is at rail level. This hopper feeds direct into a B. and W. four-roll coal crusher, from which the coal gravitates to the rotary feeder, which feeds a B. and W. standard gravity bucket conveyor. This conveyor elevates the coal over steel hoppers, set over and in front of the boilers which deliver through doors to the mechanical stokers. The conveyor buckets are dumped by means of mechanical dumpers over any of these hoppers. The conveyor then returns under the boiler-room floor, where the ashes are loaded into same. When ashes are being loaded all the buckets are dumped over the ash hopper, which delivers into railway waggons.

Steam is supplied to three Browett-Lindley forced lubrication, three-crank, three-cylinder, triple-expansion, vertical engines, each of 250 i.h.p. They are directly connected to three Siemens' three-phase alternators, each 300 kw., 355 k.v.a., 440 volts, 50 periods, 375 r.p.m., directly coupled to F type, direct current exciters, to supply the necessary excitation current for the above alternators at 100 volts.

Direct current is supplied by two three-phase synchronous motors, fitted with slip rings, at 380 r.p.m. on a 440 volt, 50 period circuit, directly coupled to two compound wound, continuous current generators to give 250 k.w., or 1,040 amperes, at 240 volts. This current is used for the electric locomotives, winding winch, lighting, etc.

The blast for the furnaces is supplied by four Morley's patent horizontal tandem compound engines coupled to two Conersville special smelter blowers, 48 in. by 78 in. by 96 in., and with a capacity of 36,000 cubic feet of air per minute at a pressure of 42 oz. per square inch. The converters are supplied with air by a Walker Bros.' cross compound Corliss engine, coupled in straight line with direct acting reciprocating blowers. The capacity of this plant is about 9,000 cubic feet of air per minute, at a pressure of 36 to 48 oz.

There are two air compressors in the same building for supplying power underground and to a number of pneumatically-operated hoists and other devices about the surface plant. These are also by the firm of Walker Bros., Wigan, England. The i.h.p. of each engine is 350.

The workshops and foundry are able to cope with all the ordinary requirements of a large plant. One machine worthy of mention is the Numa drill sharpener, fitted with 2 3/4 in. diameter Sullivan air cylinders. It will sharpen about 600 drills in 24 hours and the engineer (Mr. T. Maslin) considers it a very superior tool. Underground Ingersoll Rand drills are used.

Summary of Costs Per Ton.

- Cobar Mine, 1908, 8/11.30; 1909, 8/4.08; 1910, 8/7.25; 1911, 9/5.
- Smelting, 1908, 11/4.30; 1909, 9/4.10; 1910, 8/9.36; 1911, 7/5.26.
- Converting, 1908, 2/2.61; 1909, 2/7.20; 1910, 1/9.24; 1911, 1/8.62.

It may safely be assumed that the figures for the current year will show a reduction on those above quoted, bringing the operating cost below 18/- per ton.

The authorized capital is £1,000,000, in 200,000 shares of £5 each; 185,000 shares are issued and fully paid, including 39,800 credited as paid. The capital was increased from £750,000 to £850,000 in July, 1910, to acquire the property of Cobar Gold Mines, Ltd., and to present amount in October, 1910, the proceeds to be applied in liquidating a portion of the debenture debt. There are £750,000 six per cent. first mortgage debentures in bonds at £20, £50, and £100 each, redeemable by drawings at 5 per cent. premium, or purchase below that rate.

PHOTOGRAPHY UNDERGROUND.

We are indebted to Mr. W. F. Ferrier for the following formula of a flash-light mixture for illuminating large stopes, etc.:

In clear weather, in the open, this light is visible at 100 kilometres and is equivalent to 20,000 candle-power. 20 seconds comb.

- Powdered magnesium 20 parts.
- Barium nitrate (BaNo₃) 30 parts.
- Flowers of sulphur 4 parts.
- Beef fat 7 parts.

The fat is added in melted state, and mixture cooled in zinc boxes, 10 c.m. high and 7 c.m. diameter. Weight about 1/2 kilo.

THE MINE CENTRE MINING DISTRICT, ONTARIO

Recently the writer visited the Mine Centre district and was much impressed by what he found there. In the old days the country was so wooded that prospecting was a very difficult proposition, but now, that the fire of two years ago stripped the country of all vegetation, every ledge and vein is visible and the prospector will have no difficulty in finding good ore outcrops, if such are in the region, as facts demonstrate there are. The region is a gold country as is well known. The ore seems to be found in ledges and veins of quartz protruding up through the Keewatin series. A small vein just west of the depot at Mine Centre, a vein not thicker than my hand, showed free gold, and almost any vein in that region, however thin, carries some gold.

This was a great mining centre in the latter part of last century. But in that time it was terribly handicapped on account of the inaccessibility of the region. There was no railroad then and all supplies had to be hauled 100 miles through an almost trackless wilderness in winter. In addition, those who opened the mines expected to find high grade ores in quantity. The Canadian Northern Railroad, having been built through the region and the improved methods by which low grade ores can be handled at a profit now make mining in the district profitable. Mining under experienced and economical management will pay in this district.

Even with the railroad running through the region, the mines are yet much handicapped, as roads are not built to the mines, or if built need to be much improved. The Foley mine is putting in a telephone line to Mine Centre and to offset its poor road the management contemplates putting in a large gasoline boat to ply on Rainy Lake between the mine and Fort Frances, Ont. Furthermore, if the road is not made passable by the Government from Mine Centre, the company will have its coal hauled by barge from Ranier to the stamp mill for fuel, instead of hauling it out from Mine Centre.

There has been an awakening in a political way recently for the benefit of this mining country. The head geologist of Canada is speaking for the region. Captain H. A. C. Machin declared recently on the floor of the Provincial Parliament that this part of Ontario rejoiced in mineral wealth. Politically, industrially and financially, a new regime promises justice and the mining of the region will take on new and vigorous life.

The increasing interest in this section is bringing miners and prospectors from all over the country to it, from Porcupine, Cobalt districts is the principal influx, but men are here even from California and Mexico. Below are some of the mines now being re-opened:—Golden Crescent, Lucky Coon, Ferguson, Old Golden Star, Calm Lake Mines, Steep Rock, Elizabeth, Olive and Foley. The last five will receive more notice.

Calm Lake.—The mines in this vicinity are owned by the Calm Lake Gold Mining Company. This company has a shaft down 85 feet. At a depth of 75 feet this shaft cuts a system of veins. At this point a cross-cut of 50 feet has been made to intersect the veins and make them workable. A vein known as "No. 2" was also cut through and was found to be 50 feet wide. It showed some free gold, but not entirely a free quartz. A vein dubbed "No. 3" is also expected to be cut through soon. At the surface it is wide and shows up

well. Camps were built on the ground owned by this company last summer. A steam hoisting plant is also in operation and everything is in good shape for extensive exploration and developing this summer.

The Olive Mine.—A company is preparing to reopen this mine this summer and had considerable preliminary work done when the writer visited the region. But no actual work on the mine had been done. It is one of the old, and paying mines of the old times and will need considerable overhauling.

Steep Rock.—A company composed of Thomas Rawn and associates are doing diamond drilling work on iron properties here and report has it that some very good results have been obtained. Gold prospecting is also going on in the vicinity. The writer was advised that developing work would be carried on on a large scale in this section this summer.

Elizabeth.—This is one of the old mines and was a payer. It was owned by Alan Sullivan. Considerable work was done on it, a ten-stamp mill was installed and good camp buildings erected. The mine is on Harold Lake. Mr. Sullivan had a fine log house built there for himself, had a fine fireplace built in it, had his floors covered with oriental rugs and had his walls decorated with the paintings of the old masters. But the mine failed and a Canadian bank took it to satisfy loans that had been advanced on the property. But with the coming of new life to the region, a Mr. A. McKinnon bought the mine off the bank and has been developing it during the winter. He had fifteen men employed when I visited the mine and stated that he had secured some very fine ore. More men are to be employed this summer.

The Foley.—This set of mines are located on Shoal Lake under the management of the Foley Gold Mines Company, Limited. This company intends putting in a large garden this year to offset the cost of supplying its camp. It also expects to clear more ground near it for future use in the same line. Vegetables do well in that section and fresh vegetables will help make the table more palatable. New quarters and more commodious ones are to be erected for the accommodation of the employees.

The mine is one of the old mines and has a stamp mill and other heavy machinery at hand. This, however, will need painting and overhauling. This is to be done this spring. Two years ago the engine house at the south shaft was burned and the engine much damaged. A new engine house will be erected to replace the one burned and a new boiler will be purchased soon to replace the ruined one.

A shaft will be sunk on the Lucky Joe and the old mine will be unwatered. Then some drifting to the northward on the lower level. Ores to the northward are found to be very heavy in iron sulphides. When last stamped it is reported that the iron sulphate concentrates assayed \$773 per ton. The free milling quartz ores from the vein also ran \$20 per ton per ore handled. A shaft will also be sunk on the galena vein. Ore from this vein taken in a pit 17 feet beneath the surface assayed \$30 per ton in gold, \$3.58 in silver and 5 per cent. in lead.

At the south shaft owned by the Foley Mining Company much dead work has been done. The shaft has been sunk 200 feet. From this then a cross-cut has been

driven eastward 325 feet. This cross-cut has cut four veins from five to eight feet in width and a fifth very rich vein 17 inches in width. These veins are now al-

ready for drifting and mining operations and a great tonnage of pay ore can be blocked out at a small expense of time and money.

ALASKA COAL-LAND PROBLEMS.

In the last issue we referred to a paper read for the Association of American Geographers by Mr. Alfred H. Brooks on the subject of Alaskan Coal Supplies.

In the Bulletin of the American Institute of Mining Engineers for August, Mr. H. Foster Bain contributes a paper which bears further on this subject, under the title of Alaskan Coal Land Problems. After stating that present conditions in Alaskan coal fields are extremely unsatisfactory he points out that large areas of excellent coal remain unopened within a few miles of tide water, while railways and other enterprises now import coal at a cost of from seven to nine dollars per ton on the dock. In the interior of the country the price of coal is practically prohibitory and the development of any industry requiring handling of large tonnages is impossible, except at the sea coast.

The following extracts from the paper will be of particular interest to many of our Western readers:

"Industry in Alaska always will be at a disadvantage, owing to the difficulties and expense of navigation along its coasts, and of transportation into the interior. This, however, is all the more reason why full advantage should be taken of any favourable local feature, such as abundant and excellent coal.

"In examining the matter of the opening of the Alaska coalfields, two distinct questions must be considered. The first, and more pressing, is how to get coal on the market quickly in quantities sufficient to satisfy immediate demands. The second is, what disposition shall ultimately be made of the coal lands, and under what conditions coal shall be mined in the future. Both questions involve railway problems and are complicated by existing rights of coal land locators. It is not likely that any satisfactory solution of the second problem will be found immediately. The ramifications of the matter reach such varied interests, and so many things must be taken into account, that a quick determination might well prove a wrong determination. The first problem, however, that of promptly furnishing Alaskan coal in such quantity as is really needed, seems capable of speedy and safe solution.

"Various suggestions have already been made as to how the government should proceed in case it be decided to open a government mine in Alaska. An independent commission has been proposed, but this is, I think, unnecessary and likely to prove expensive. It has also been suggested that the army be placed in charge, and the merit of this lies in the fact that the people have entire confidence in the non-political character of the army and the honesty of its officers. The excellent work, in particular, done at Panama, has greatly raised the popular respect for the Engineer Corps of the army. It is also true that to meet a similar scarcity of coal in the Philippines, the army opened a colliery there and conducted it not only ably, but in such a manner as to demonstrate the value of the coal and of the field, and this led ultimately to the opening of private mines. The army, however, has other work than mining coal, and no good purpose is served by diverting its officers from

their own sphere. Aside from that, the government has in the Bureau of Mines a corps of men especially well qualified to handle this particular matter. In this bureau are all the experienced men necessary to man a colliery, from pit boss to general manager. Attracted by the opportunity for travel and study, an unusually capable and well-trained lot of engineers has joined the service. A better manager for the proposed enterprise probably could not be found than the chief mining engineer for the Bureau, who has seen extensive service in the coal-fields of Colorado, Iowa, and Illinois, and has served as engineer, superintendent, general superintendent, and consulting engineer for a number of large companies. He has opened, equipped, and run a number of collieries as large or larger than any needed in Alaska, and is thoroughly familiar with coal-mining, not only in every part of the United States, but in England, Germany, and France. There are other men in the Bureau who have had valuable if not as extensive experience, and they are all men of high character, of just the sort to place in charge of a difficult enterprise. Put the matter in their hands with sufficient capital and adequate authority, and the mine will be well and honestly run.

"Since the coal is valueless unless brought to the coast, transportation problems must enter largely into any solution of the coal problem. This is true whether the government or some company mines the coal. To reach the Matanuska field, it will be necessary to take over and extend the Alaska Central Railroad. The most difficult part of the road is already built, though much money would be needed to put it into good condition. Owing to grades and curves between Seward and Knik, the line would not be easily or economically operated; and large tonnages over this division would be expensive to handle. It is proposed to establish a summer harbour at Knik, and to ship the bulk of coal from this point, to which railway transportation is easy. The line to Seward could handle quick freight and afford an emergency route for coal.

"As to the need of a trunk line to the interior of Alaska there can be no question, if the country is ever to be developed. The practical question is wholly as to means and method. Into the Behring River coalfield, the one most easily accessible, a number of surveys have been made. There are, however, only two routes that need to be considered. The first is a direct line approximately 25 miles long to Controller Bay or Katalla. This requires the making of a harbour, and any estimate of expense of shipment by this route must take this into account. Eventually one or more such lines is likely to be built, but for the present the cheapest route would seem to be the longer one to Cordova. This requires a road from the mines almost to Katalla, then north to a junction with the Copper River & Northwestern Railroad. The distance is longer, 58 miles, but of the total, 33 miles form part of the main line of the road already built, and the cost of an extra harbour is avoided. This is the more feasible route for the present. It would have the advantage of permitting through shipment to the copper mines of the interior, while the other would re-

quire transfer to boats at Katalla and retransfer to cars at Cordova.

"The problems that now confront our bituminous coal mining industry arose a few years ago in the same form in Germany. In that land of orderly industry, the coal business was in as bad condition as was ever that of Pennsylvania or any other American State. There was this difference: the Prussian government, as the owner of many miles of railroad, was concerned, in place of, as in America, a group of private individuals; but, further, the government there did not, as here, own a large part of the known coal. Difficulties in railroad operation, as well as the general disorganization of industry, focused public attention on the coal industry. The State railways sometimes enjoyed cheap coal, and at other times paid dearly for it. At times the lines had much traffic, and at other times little. For short periods the collieries made large profits, and these periods were succeeded by long lean years. The methodical Germans studied the situation, and then met it in a practical manner, undeterred by theoretical considerations of what might happen. The government purchased enough mines to give it control of approximately 40 per cent. of the coal-producing capacity of the country. Then, on the basis of the ownership of these mines and a thorough knowledge of the business, the government joined in a syndicate for mining and marketing coal. While there has been some criticism of the results, there has been steady work, moderate but regular profits, and better prices. English coal companies, it is true, have made inroads on the Berlin market, but the Germans gaze with equanimity upon this. They regard the low-priced coal furnished by competing English companies as just so much gain. Germany has regulated the coal monopoly by becoming a party to it.

"In Alaska it is extremely difficult to successfully develop an enterprise, and only the most efficient form of organization can hope for more than sporadic success. The coalfields may be developed more quickly, economically, and efficiently by a single great syndicate than by a number of small warring concerns. The first step in the solution of the Alaskan coal land problems should be the opening of a government mine, primarily to supply the government needs of coal. If necessary, the government should build the needed railway to the mine. The second step should be the opening of private collieries on leased ground, and the formation of a selling syndicate to pro-rate all contracts. The government itself should be a member of this syndicate and should be represented in its management by an expert resident official of ample authority. If any of the present claimants of lands succeed in getting patents, they should be invited to become participants in the syndicate, and they would probably find it greatly to their advantage to join.

The immediate thing is to provide for mining some coal now and still leave the policy of the future to be shaped to meet its own needs. This seems to be to be most easily accomplished by following the opening of the government mine with an offer of a limited number of leases to any one who may care to undertake the risks involved in opening collieries in Alaska. These risks, from a business point of view, are bound to be large for many years, and the government in offering a lease should be prepared to safeguard in every reasonable way the lessees as well as the public.

"Leases should be granted upon liberal terms, fixed in advance, should run for a period of preferably 25 years, and should cover in each case sufficient area to permit continuous operation of a modern plant through the life of the lease.

"All applications for leases should be accompanied by bond, and after two years within which to open the mine, royalties should be collected for the proportionate tonnage of each year whether coal be mined or not. Such royalties should apply on future production, their payment being merely required to prevent indefinite suspension of operation. The detailed terms of the suggested leases might profitably be varied somewhat, but the following general principles should be held to (1) Terms liberal and known in advance; (2) all companies to participate in sales and contracts; (3) the government to be fully informed of all details; (4) the government to be in position to prevent extortion by permitting the opening of additional mines; (5) royalties to be determined by the companies themselves by means of competitive bidding; (6) revenue over and above the cost of maintaining the service should go in large part, if not entirely, to the local Territorial government; (7) leases should be freely transferable, and subject to cancellation only for material failure to observe their terms and after court review.

SHERBROOKE AS A MINING CENTRE.

(By Charles E. Bradford, Secretary Sherbrooke Board of Trade.)

The Eastern Townships, of which Sherbrooke is the centre, plays a prominent part in the mining interests of the province. The growth of the mineral industry can but be shown by the values of mineral production, which was as follows: 1911, \$8,567,143; 1900, 2,546,076. Over half of this amount is produced in the Eastern Townships.

Among the minerals to be found here are asbestos, gold, silver, copper, granite and marble deposits. There is a great need at this time for a customs smelter, and Sherbrooke would be the logical location for such an industry. In the Sherbrooke district there are nearly 70 known copper properties, which cannot be profitably developed until such a smelter is established. The larger mines will, no doubt, be successfully operated, as heretofore, but individual owners will not be mined until proper smelting accommodations are produced.

Many of these properties are very promising, and there is little doubt that many of them would develop paying mines.

While mining is in its infancy in the Eastern Townships, the outlook is very encouraging, and undoubtedly the outcome will justify the hopes of the most sanguine.

In connection with the establishment of a customs smelter, or other industries, the City of Sherbrooke is, of course, advantageously located for such enterprises. Aside from its natural advantages namely, proximity to raw materials, railway facilities, price of power, labour market, living conditions, and general outlook, the general optimism and energy of its citizens, makes it appeal at once to the man who is on the lookout for a good factory location. The recent activities of the Sherbrooke Board of Trade have attracted considerable attention, and their willingness to co-operate in any way possible with prospective manufacturers is commendable. The latch string hangs out and the invitations is extended to you.

WEST SHINING TREE GOLD DISTRICT*

This district is situated near the western edge of the Temagami forest reserve, and is limited by the boundaries of the townships of Asquith, Churchill, Macmurchy, and Fawcett. It adjoins the Gowganda district on the east and is some 55 miles south of the Porcupine district. The nearest railway point is Ruel, 72 miles distance from Sudbury, and from this point a trail leads to the district. Topographically, Shining Tree differs little from other mining districts in northern Ontario. The predominant rocks of the district are Laurentian and Keewatin age respectively. The Laurentian is represented by granites, gneisses and granite-porphyrates. The Keewatin is present over the greater part of the four townships in the form of rhyolite, quartz porphyry, amphibolite and andesite with metamorphic variations of these rocks. The metamorphic rocks are mostly greenstone schists. The andesite is the commercially important formation, for associated with it are all the gold showings of the district. Only in a few places does the andesite occur unaltered, appearing generally as a schist.

In the Shining Tree district there are two of these andesite areas, one about West Shining Tree Lake, and the other, seemingly smaller, to the east and north in the township of Macmurchy. There is little difference between these two areas except, perhaps, that the small veins seem to predominate in the smaller area, which is known locally as Wasapika. In both areas the quartz is plainly a derivative of the schists with which it occurs and into which it grades in many places.

There are two types of quartz bodies in the district, large irregular masses with indefinite and poorly defined walls and small veins of proportionally greater length, but which resemble the larger bodies inasmuch as they have splintery walls with stringers of quartz running off and disappearing into the wall material. One vein of this type seemed to be about 20 ft. wide with a strike which could be definitely determined along the straight edge of the northern side of the vein. Upon breaking into the surface of the quartz it developed that the quartz was but 2 ft. wide and had "flowed" over the foot wall at surface. The quartz in the "overflow" portion of the vein was decidedly brecciated.

The author states that: "It is improbable that Shining Tree will be of commercial importance in the immediate future. The gold, while it is present on many claims in the district, is not concentrated in quantities which would pay for working. The rich pockets are few and small, and so far the prospecting of the district has been slow and inadequate. There is a tendency on the part of the prospectors to require abnormally large 'first payments' on options for small showings. Most of the claims have received little attention beyond a desultory trench here and there. The only serious attempt at thorough exploration was made by Vjctor Rakowsky, of Duluth, on the Gosselin claims. The heavy timber of the country prevents easy prospecting and requires considerable work with the axe before the pick and shovel can be used. Could the prospectors be persuaded to go below the surface on a small scale, the district might afford a good berth for a small ore-buying company."

CORRESPONDENCE

THE SLIP PALPABLE

Editor Canadian Mining Journal:

Sir,—The Canadian Mining Journal of August 15 has just reached me. Your correspondent, Alex. Gray, states that "E. J." avails of a palpable slip, to intimate that Mother Lode, Sheep Creek, recovery per ton is in doubt." May I suggest that a "palpable slip" should not be expected in the case of such a practised writer as is Mr. Gray, especially as he appears to look for readers of mining journals taking him as an authority on matters he writes about. It is bad enough for common-place correspondents like "E. J." to occasionally make a "palpable slip," but surely such a big gun as Mr. Gray should not do so. However, let me quote Mr. Gray's statements, and a paragraph recently printed in the Toronto Globe, and then readers of the Journal may try to unravel the tangle for themselves:

(1) Alex. Gray, in The Mining Journal, London, May 25:

"The mill of the Mother Lode mine started crushing on May 6. . . . The 10-stamp mill is rated at a daily capacity of 70 tons, and assuming a recovery of \$14 a ton and averaging 26 working days, a net profit of \$25,000 per month is expected."

(My comment on this statement was: "It should be added that if Mr. Gray is correct in the statement that a recovery of \$14 a ton is expected, he appears to have omitted working costs when calculating expected net profits.—E. J.")

(2) Alex. Gray in Canadian Mining Journal, August 15:

"My calculation that a monthly profit of \$25,000 would probably be earned, was based upon the assay plans of Mr. Watson and the milling returns on several shipments to smelters. A net recovery—and the 'net' was inadvertently omitted from what appeared in The Mining Journal of London—of \$14 per ton, is what is expected. This allows for working costs of \$7 per ton. So that, whatever the contrary view may be, it is beyond question that the Mother Lode ore developed is expected to yield a per ton profit of \$14. With low power costs and a very high extraction, there is no reason to doubt a profit of 66 per cent. on the gold contents being recovered."

(3) News item in Toronto Globe, August 13:

"The Mother Lode gold mine of Sheep Creek, British Columbia, owned largely by Mr. John McMartin, had its first monthly clean-up for July. Although there are minor details yet to be perfected before the management attains to the fullest possible crushing capacity, during July the mill ran 29½ days and crushed 1,860 tons, the average daily milling total being 60 tons. The average value per ton milled was \$17.28, from which an extraction of 97.98 per cent. of the gold content was obtained. The gross value of the ore milled was \$31,497. The operating expenses amounted to \$12,210, so the net profit was \$19,287. The working costs per ton include milling and mining charges. These costs amounted to \$6.56 per ton milled. The profit for July is at the rate of 18.5 per cent. on the capital of the Mother Lode Company."

*Abstract of an article contributed by W. R. Hodge to the Engineering and Mining Journal.

In the foregoing the average value per ton milled (\$17.28) does not work out to the total gross value stated. A comparison of Mr. Gray's several expectations with the stated results as published in the *Globe* suggest over-sanguineness on his part. The profits—or rather, the difference between the value per ton shown to have been recovered and the mining and milling costs appears to have been, for July, \$10.37 per ton. There is nothing to indicate what the general expenses, other than mining and milling costs, were per ton, consequently the final net profits, available for distribution to shareholders, should such a course be deemed advisable, do not appear to be shown. The suggested profit at the rate of 18.5 per cent. assumes similar figures—days run, quantity crushed, average value of ore, and average “very high extraction”—the year through. Such expectations may or may not be realized, but if they shall be the Mother Lode Company will be unique in its experience in a country where severe weather is usual in the depth of winter.

I should like to add that when in the interior of this province a few weeks ago, I wrote to Mr. Wm. Watson, in his capacity as resident manager of the Mother Lode Sheep Creek Mining Company, requesting him to be good enough to give me some information as to operations and results, but seemingly he did not show me the most ordinary courtesy of a reply, for no communication from him has yet reached me. In this respect the Mother Lode Company is almost alone, for few, if any, mining companies of good standing operating in British Columbia ignore my courteously worded applications for information—either they give me notes of what they are doing, or they reply that, for reasons deemed sufficient, they may not do so. Information about the Mother

Lode property has reached me from other sources during quite recent months, and it is not so favourable as either that given me last year by the manager or has since been supplied for publication from sources that, on the face of it, do not appear entirely disinterested. Of course it is for the management of the Mother Lode Company to say to whom they will supply information, but I may state as my experience, as the accredited correspondent of half a dozen influential mining publications, that when my request for information have been ignored it has sometimes transpired that the operators concerned “had no use” for a correspondent who would publish only facts. Repeatedly lately the question has been put to me as to whether the Mother Lode Sheep Creek people have not been trying to create a market for their stock, but since I am not concerned whether anyone is trying to “unload” or not—only seek particulars as to operations, production, and other information connected with the industrial side of mining, I do not pretend to know anything about stock market affairs.

That there may not be even the slightest misconception as to my position in regard to the Mother Lode and some other Sheep Creek mines, I will state that I have information from a number of men I think reliable, who agree as to the general merit of Sheep Creek mines and the favourable outlook for profitable production from them. More than that, it may not be expected I shall commit myself to in the case of properties concerning which information as to progress and results is withheld from me by those in charge.

Perhaps the Mother Lode management may yet exclaim, “Save us from our friends,” when said friends lack accuracy in their published statements.

E. JACOBS.

Victoria, B.C., August 23, 1912.

PERSONAL AND GENERAL

Mr. F. P. Jones, general manager of the Cement Corporation, has left for the West on the company's affairs.

We are glad to note that Prof. F. H. Sexton, director of the Technical College at Halifax, who has been seriously ill, is now convalescent.

Mr. A. J. McMillan, formerly general manager of the Le Roi mine, at Rossland, has returned to British Columbia from Scotland.

Dr. J. M. Bell, formerly director of the New Zealand Geological Survey, but now engaged in consulting practice in London, purposes visiting Canada shortly at the request of a syndicate interested in gold properties in the Porcupine District.

The many Canadian friends of Mr. Walter Johnson, who, it will be remembered represented the Iron and Steel Institute on the occasion of the Canadian Mining Institute's transcontinental excursion in 1908, will regret to learn of his misfortune in the loss by fire of his beautiful residence at North Allerton, in Yorkshire. The house was an exceptionally fine example of early eighteenth century architecture and the interior decorations had been designed and executed by Adams.

Mr. H. P. De Pencier, consulting mining engineer of Montreal, has been ill with pneumonia, but is now convalescent.

Mr. D. J. Arthur Rees, of Porcupine, has been offered a permanent post in the British civil service.

Mr. H. C. C. Bellinger, well known to our Western readers by reason of his association first with the Northport and later with the Crofton smelter, has been elected president of the Australasian Institute of Mining Engineers. Mr. Bellinger, who has been in Australia for three and a half years, was first in charge of smelting operations at, and is now general manager of the Great Cobar mines, which, he stated had since they were first worked produced 3,000,000 tons of ore, and given the world 100,000 tons of copper worth approximately \$35,000,000. He believed that the Great Cobar would produce 10,000 tons of copper a year, 50,000 ounces of gold, and nearly 250,000 ounces of silver.

Mr. George E. Drummond has returned to Montreal from abroad.

Dr. A. E. Barlow, president of the Canadian Mining Institute, left Montreal for British Columbia on August 18th. His intention is to visit a number of the mining centres in West Kootenay and elsewhere before proceeding to the Coast. He will preside at the Western meeting of the Institute in Victoria on September 18th and 19th, and also at a meeting to be held at Frank, Alta., on September 30th.

Mr. W. L. Coulson, general manager of the Canadian Collieries, Ltd., when in Vancouver recently, stated in an interview that important improvements in connection with the development and equipment of the col-

lieries at Comox are now in progress. It is expected that early next year power will be delivered from the plant now being installed at Pundlege River, and thus enable the company to double its present output. A new colliery, known as No. 8 is being opened near Cumberland, borings having determined the seams at a depth of 900 feet. The present demand for Vancouver Island coal is exceptionally heavy.

Mr. J. M. Mackie, managing director of the Hillcrest Collieries, states that excellent progress is being made in the installation of new equipment at the mines. Meanwhile an output of between 600 and 700 tons a day is being maintained, and prices are higher and the demand for coal greater than at any previous time.

Mr. T. J. Drummond, president of the Lake Superior Corporation, in announcing the appointment of Mr. Samuel Hale to the general managership of the Algoma Steel Corporation, has issued the following statement: "In pursuance of its policy and the separate financing and operating of its chief subsidiary companies, the executive of the Lake Superior Corporation has decided to place an independent general manager over the plant and operations of the Algoma Steel Corporation, of Sault Ste. Marie. The Steel Corporation was recently organized combining several of the subsidiary companies of the Lake Superior Corporation, including the Algoma Steel Company, the Lake Superior Iron & Steel Company, the Lake Superior Power Company, etc."

Mr. W. Bennett is superintendent at the McAllister mine, Slovan District, B.C., at which work was resumed lately after inactivity for several months.

Mr. J. C. Buchanan, general manager of the Hobson Silver-Lead Company, Ltd., has returned to Ymir, B.C., from a visit to Fort Worth, Texas.

Mr. Chas. Camsell, of the Geological Survey, Ottawa, has been in Victoria, B.C., obtaining information for use when the delegates to the International Geological Congress shall visit British Columbia next year.

Mr. Howells Frechette, of the Mines Branch, Canada Department of Mines, was in the coast cities of British Columbia last month.

Mr. Thos. French, of Glasgow, Scotland, son of Mr. A. Gordon French, is at Nelson, B.C., investigating the matter of the occurrence of metals of the platinum group in ore and dike material at the Granite-Poorman mines of the Kootenay Gold Mines, Ltd., which occurrence his father claims to have discovered.

Mr. A. H. Gracey has returned to Nelson, B.C., from a visit to the Rose Marie mine, on the west coast of Vancouver Island, where about a dozen years ago a quartz vein mineralized with iron pyrites containing fair value in gold, was opened, and a small stamp mill and concentrating plant put in.

Mr. C. Hanckel, formerly with the Zinc Corporation, Ltd., at Broken Hill, New South Wales, Australia, is now in Silverton camp, near Slovan Lake, B.C., engaged in preparing plans for a concentrating mill for the Silverton Mines, Limited, which owns the Hewitt-Lorna Doone group silver-lead-zinc mine, in connection with the concentration of the ores of which it is intended to use a flotation process for the recovery of part of the silver-zinc contents of the ore following the extraction of silver-lead by ordinary water concentration.

Mr. Leslie Hill, who for about 20 years has been directing the development of mining properties in British Columbia and Southwest Alberta, is giving up his mining engineering work, and removing from Nel-

son to Vernon, Okanagan district, British Columbia, where he has a ranch that will in future engage his attention.

Mr. Lionel Hill, of Rossland, B.C., assistant to the manager of the Le Roi No. 2, Ltd., is spending a couple of months' holiday vacation in the Province of Quebec.

Capt. Harry Johns, one of the British Columbia Copper Company's mine superintendents, has returned to Greenwood, B.C., from examining a mining property in Montana for that company. During the first part of August he visited the L. H. mine in Slovan Lake District, B.C., being developed by the B. C. Copper Company under option of purchase.

Mr. Anthony J. McMillan, liquidator of the Le Roi Mining Company, after having spent several weeks in British Columbia, is returning to England.

Mr. C. K. Milbourne, of London, Eng., a director of the British Columbia (Phoenix) Syndicate, has been visiting several mining properties in British Columbia his company is interested in.

Mr. R. Roberts, manager of the Jewel mine and stamp mill, in Boundary District, has been burned on the hand and foot as a result of going too close to the high voltage electric power apparatus in the substation at the mill. While in the Greenwood hospital, he is not very seriously injured.

Mr. W. Hittell Sherzer, geologist of Ypsilanti, Mich., U. S., has been spending several weeks on the Soho group of mineral claims, in Slovan District, B.C.

Mr. Clyde B. White, son of Mr. Oscar V. White, superintendent of the Slovan Star mine, near Sandon, Slovan, B.C., has been engaged for the past few months in mining engineering work in Slovan district, after having been for several years with the Arizona Copper Company, Arizona, U.S.A.

Mr. Byron White, of Spokane, Washington, for many years actively associated with mining operations in Slovan district, British Columbia, recently went up to Whitehorse copper camp, in Southern Yukon, where he has copper mining property.

Mr. John E. Hooson, for years mining recorder at Rossland, B.C., received a valedictory address and presentation on his leaving Rossland for Fort Fraser, in the central part of British Columbia, where he will be Provincial Government agent.

Mr. Jos. Keele, of the Geological Survey of Canada, is now investigating the clay deposits in the Province of Quebec and is now in the field.

Mr. P. L. Naismith, formerly of Lethbridge, Alta., has joined the staff of the Canadian Pacific Department of Natural Resources at Calgary.

The engagement is announced of Dr. Herman Wupperman, of Pineberg, Germany, to Fraulein Erna Witzel, of Dusseldorf. Dr. Wupperman, it will be remembered, was one of the German representatives on the occasion of the Canadian Mining Institute's transcontinental excursion in 1908, and was an extremely popular member of the party.

Mr. C. K. Milbourne, of London, formerly connected with the Ymir and other important British directed mining undertakings in British Columbia, is again in Canada and proposes spending some weeks in British Columbia before proceeding to Mexico.

Mr. Alexander Foulds, of Vancouver, B.C., has left for Grahame Island, where he will remain for the next two months.

Mr. Victor A. Hills, formerly of Moose River Gold Mines, Nova Scotia, is now established at Denver, Col. He is at present in the Yukon on professional business.

Mr. Thomas Russell has resigned from the position of superintendent of Extension mines at Ladysmith, B.C., and has been succeeded by Mr. J. H. Cunningham, resident engineer of the mines for the past two years.

Mr. R. B. Lamb has returned to Toronto after an absence of some five weeks in London and Paris.

Mr. A. J. McMillan, of Rossland, sailed last week for Europe.

Mr. H. McCarther has resigned the management of the Minudie Colliery, N.S., to accept a managerial appointment in Western Canada.

Mr. Frank C. Loring, of Toronto, was in London recently.

Mr. Charles Fergie has returned to Montreal from Halifax.

Mr. W. H. Trewartha-James has sailed for Nigeria.

Mr. C. P. Hill has returned to Montreal from Europe where he spent the last three months.

Mr. B. A. C. Craig has returned from the Pacific Coast and is about to visit Winnipegosis.

Mr. William Smith, manager of the Bell Asbestos mines, at Thetford, Que., leaves this week to assume new duties with the same company at Ambler. On the 30th ultimo Mr. Smith was entertained at a farewell dinner by the Eastern Townships branch of the Canadian Mining Institute, of which he has been the secretary since its organization some two years ago.

Mr. Thos. Hale has been appointed mine manager of the Drummond Colliery.

Mr. G. W. Evans, mining engineer, of Seattle, Wash., is making an examination in the Ground Hog coal field, in northern British Columbia.

Mr. Samuel Hale, formerly vice-president and general manager of the Wisconsin Steel Company, has been appointed general manager of the Algoma Steel Corporation, Limited. Mr. Hale has been associated with the steel industry since 1893. He was first employed by the Illinois Steel Company, serving in various capacities until 1899, when he was appointed assistant general superintendent; while for the past ten years he has been associated with the International Harvester Company, whose steel works were organized as the Wisconsin Steel Company.

Mr. E. P. Earle, president of the Nipissing Mines Co., has been elected a director of the Tri-Bullion Smelting and Development Co.

Mr. C. H. Poirier, who recently resigned as engineer and manager of the Porcupine Gold Mines (Vipond) Co., will return to the headquarters of his firm, Poillon & Poirier, in New York. It is understood that Mr. Poirier will continue to give his services to the Vipond Company, as consulting engineer.

Mr. W. A. Begg is assistant City Engineer in Regina. He was well-known in Cobalt and Porcupine during the early days.

Mr. G. S. Scott has returned from a trip of inspection in eastern Ontario.

Mr. C. L. Bryden, mining engineer, 1015 Myrtle Street, Scranton, is organizing an American Association of Old Freibergers. Those who have not been notified are requested to send in their addresses to him.

Sir Charles Hunter, the Earl of Stanhope, and the Earl of Winterton, together with about 20 other British financiers interested in the Lake Superior Corporation, will arrive at Montreal on August 23rd for a trip to the

Sault and Western Canada. The Canadian Agency, Limited, of London, is conducting the excursion.

The Canadian Mining Journal has been fortunate indeed in securing for its Special Cobalt Issue an article by Dr. W. G. Miller. The leading article in the first number of the Journal, published on March 1st, 1907, was from the same pen and dealt with the same subject. At that time the Canadian Mining Review had just been absorbed by this publication. Cobalt had not attained fame. It had achieved notoriety. Dr. Miller's article was a sane and guarded presentation of facts. Nothing could be more instinctive than to compare that article with Dr. Miller's present contribution to our columns.

The right use of English is receiving more and more attention in our mining schools. The argot of the mining camp is a strange mixture of colloquialisms, localisms, and slang. Not a few illegitimate phrases are crisp and apt; and these are likely to survive, to become legitimized, and to be incorporated in the language. Many mining phrases, however, are shockingly uncouth, inexact, and redundant. They do not deserve to live. The student must be taught to discriminate. He must also be taught to express himself in sound, clear English. At the Colorado School of Mines,

Dr. Victor C. Alderson is striving to impress this upon his pupils. With this object in view he has compiled a series of notes giving the correct and the incorrect uses of many words that are troublesome to the beginner. A few of these are reproduced on another page of this issue.

In the Alaska-Treadwell mill, one pound of chrome steel in the shoes crushed, on the average, 2.73 tons of ore in a year; while one pound of iron and steel in the dies crushed 4.19 tons.

As an instance of the conservation of fuel by the use of gas producers, it is stated that the United States Steel Corporation by the installation of blast-furnace gas engines to displace the former equipment, saves approximately 1,000,000 tons of coal per annum. The great saving in fuel obtained through the gas producer has led to the installation within the last decade of several hundred of such power plants throughout the United States. Again as a smoke preventer, the gas producer is one of the most efficient devices on the market. It reduces the fuel consumption not 10 or 15 per cent., the limit of the ordinary smoke-preventing device used in steam plants, but from 50 to 60 per cent.

The dividends distributed by seventeen Canadian metal mines during the first six months, ending July 31st, of the present year, aggregate the very respectable sum of \$5,981,877. The mines in question have paid since incorporation \$38,230,113, or a return equivalent to 69 per cent. on their outstanding capital.

Discussing the relation and value of geology to mining, Mr. W. H. Weed very fittingly points out that "the use of geologic work to commercial ends is not, as many geologists formerly held, a prostitution of science to commercialism, but a successful proof of the usefulness of the science." He adds: It is a well recognized fact that governmental surveys of mining districts are made because an investigation by a well trained expert is not only useful to the local mining operators, but of general value to the mining fraternity throughout the world. He does not agree with those who expect the

government geologist to outline new development work or to predict "strikes" in any particular area, maintaining that the function of the official investigator should be confined to indicating the value of surface evidences, and by careful consideration of the facts, structural and mineralogical, to diagnose conditions, "even as a consulting physician called in by the ordinary practitioner in a difficult case, carefully considers the symptoms, and gives an opinion." In Canada, geology has proved of incalculable aid to mining, and of late, in particular, the services of geologists in consulting practice have been in great demand, but as an eminent member of the profession recently observed: "The trouble too frequently is that the doctor is called in too late, and in quite a majority of cases he finds that instead of being required to assist at a birth, his duty is to sit on a corpse."

The Republic district, in Ferry County, in the State of Washington, in the mines of which much Canadian capital was at one time invested and lost, has not ceased to be productive and appears, in fact, to be going through a process of rehabilitation. Thus in 1911 it produced gold and silver to the value of \$869,108, or over 82 per cent. of the total value of the metal output of the State of Washington for that year. The difficulty heretofore in Republic has been in the character rather than in any lack as regards the quantity or quality of the ore; and if the problem of treatment has been successfully solved there is no reason why the camp should not yield importantly for some years to come.

With the dividend recently declared by the Coniagas mines, at Cobalt, the aggregate distribution to shareholders represents 95 per cent. of the company's capital. Several of the Cobalt mines have now returned their capital to shareholders, and it may be confidently asserted that for the number of profit-earning mines within a limited area there is no other mining camp in the world comparable with the Cobalt district.

The Scandinavian correspondent of the "Mining Journal" states that a Spanish consortium of financiers has recently inspected the nitrate works at Notodden, Norway, with a view to the adoption of Norwegian synthetic methods in works it is proposed to establish in Barcelona and in Montreal, and a Spanish and Canadian company will be organized with this object in view.

THE C. M. J. STUDENTS' PRIZE.

Soon the mining students will be returning to the fold for the autumn and winter sessions. We beg to remind them that the Canadian Mining Journal offers a substantial prize (see our issue of April 1st.) for the best paper, dealing with any mining, engineering, or metallurgical subject. The sooner these papers are submitted the better.

COMPANY NOTES

NIPISSING MINES CO.—The seventh annual report of the Nipissing Mines Company for the past year is eminently gratifying. Thus during the 12 months 29,146 tons of ore was shipped, assaying from 273 to 2,393 oz. silver per ton, yielding a total of 4,678,074 oz., worth \$2,506,608. The average price received per ounce was 53.58c. For 2,356 lb. of cobalt

sold, \$589 was realized. Freight, treatment, and smelter deductions totaled \$125,484, which left a net value received of \$2,381,712. The total cost of producing silver, based on an output of 5,197,042 oz., which was contained in the shipments and ore on hand amounted to 13.95c. per ounce. There was on hand at the end of 1910 ore amounting to 185 tons, and at the end of 1911, 268 tons; so with the shipments during the latter year, the mine production totaled 2,992.39 tons, containing 5,197,042 oz. silver, with a gross value of \$2,820,257. The total profit on production was \$2,095,241. The shipments from 1904 to the end of 1911 amounted to 24,475 tons, valued at \$12,939,395. Dividends for the year were \$1,838,430, making \$7,850,930 in all. Twelve veins contributed to the past year's output, No. 7, 80, and yielding 3,142,198 oz. A new hydraulic equipment, for surface prospecting, was fitted up. A force of 25 men completed 13.7 miles of trenches 2.7 feet deep. In the diabase, east of the lake, No. 149 vein was found to contain high-grade ore. Of the 846 acres held, 576 are partly prospected, and 270 unprospected. A total of 8,781 feet of development, and 13,841 cu. yards of stoping was done. The year's work on vein No. 73 has been most favourable, and on the 247-ft. level it has been opened for 200 ft., the average width being 4 inches. A fault disturbed veins 80 and 100, between the 70 and 189-ft. levels, but they have been picked up again. Vein 64 is the strongest on the property, and has been developed on five levels to 344 ft. deep and 900 ft. long. Vein 122 did not realize expectations; but 63, 108, and 148 produced heavily, although the high-grade ore in them is nearly exhausted. The reserves consist of 7 veins containing 3,454 tons of ore with 6,126,838 oz., and 80,036 tons on the dump, with 1,756,954 oz. silver.

ALASKA TREADWELL.—The report of this company just issued covers a period of 19 months to December 31st, and during this period 15,533 ft. of development was done on eight levels, making a total of 122,563 ft. for the past 18 years. During the nineteen months 1,349,264 tons of ore was extracted from the 750, 1050, 1250, 1450 ft. level stopes, and development on 750, 900, 1050, 1250, 1450, 1600 and 1750 ft. levels. The ore reserves totaled 7,613,087 tons, made up of 6,344,749 tons in place, and 1,268,338 tons broken in stopes. The average of 6,193 samples from the mine was \$3.32 per ton. The 240-stamp mill crushed 633,976 tons, with a duty of 4.64 tons per stamp, and the 300-stamp mill 715,288 tons, equal to 5.44 tons each. Both mills produced 24,952 tons of concentrate, of which 17,751 tons was treated at the mine by cyanide. The total yield from 1,349,264 tons milled and concentrate treated was \$3,259,446. Dividends paid amounted to \$800,000. The yield per ton milled was \$2.41, and costs totaled \$1.43 per ton. The report, which covers 74 pages, and several mine plans, is a creditable production and leaves nothing to be desired.

THE SOUTH BELT AT ROSSLAND, B.C.

Mr. J. L. Warner, in an article published in the Nelson Daily News, writes interestingly on the changes that have taken place in the Rossland district since he first knew it in 1893. The camp then, he remarks, had few champions except the prospector. The Columbia River steamer stopped at Trail, and Rossland was only accessible by wagon-road. The nearest smelters were at Butte, Montana and Tacoma. The difficulties of accurate sampling, since there were no facilities for test-

ing large lots, were necessarily great and the results were so varied that capital was slow to interest itself in the district. The old smelting rate was \$23.50 per ton as compared with the present charge of \$4 for freight and treatment. The progress that has been made is largely attributable to the operations of the Consolidated Mining and Smelting Company, at whose smelter at Trail all the ore produced in the camp is now treated. At many of the mines depths of nearly half a mile have been attained, while there are fifty miles of underground workings. Among other changes, the almost universal adoption of diamond drilling as a means of exploration is noted, as also the fact that electric power has almost displaced steam except for

hoisting purposes. Meanwhile the camp has produced gold and copper to the value of over fifty-two million dollars. Mr. Warner believes that the chances of developing new mines in the South Belt are very favourable, and states that he is convinced from results attending recent exploratory work in which he was engaged, that the formations are identical in character with those on Red Mountain. The same dikes cross the series of parallel veins in both belts, but the greater depth of decomposed surface rocks makes exploration of veins on the surface more difficult in the South Belt. There is evidence that the prevailing galena ores in the surface exposures will give place to copper-gold ores at depth.

SLOCAN CITY MINING DIVISION

Written for The Canadian Mining Journal by E. Jacobs.

There appears to be a gradual increase in activity in mining in Slocan City mining division, although there are still comparatively few of the properties being worked.

LILY B.—The most notable operations at present being carried on are those at the Lily B. mine, situated in the vicinity of Springer Creek. The shaft, now down about 198 feet, has been sunk on the vein which inclines at 60 to 65 degrees. A level is being opened at 190 feet depth, preparatory to drifting on the vein, which is about 12 feet in width. A cross-cut of 8 feet to the hanging wall makes a small station giving room to turn an ore car and dump into the skip. The ore is described as being generally a "dry" ore, though occasionally as much as 65 per cent. lead ore is found. The gangue is an altered granite filling with some quartz, the latter varying up to 4 feet in thickness. Next to the hanging wall there is a paystreak of high grade ore containing gold, argentite, and native silver; this had been 12 in. wide, and then it pinched. Recently, though, it has come in again, and at the time the information was obtained there was 6 in. of this ore in the face of the drift. There is another paystreak towards the footwall, but this has not yet been mined. Drifting was commenced on August 11, so there has not yet been time to get out much ore. That taken out is good-looking ore, and profitable returns from the smeltery are expected after shipment shall have been made. A Sullivan large-size machine drill has lately been put in, this is being operated by steam, it takes the place of a smaller drill previously used for some time.

The Lily B. group includes four claims, namely, the Lily B., Portland, Rainbow, and Rainbow fraction, located by G. D. Long, N. S. Tucker and partners. Mr. Long is superintendent for the Lily B. Mines Company, Ltd., of Spokane, of which company R. Mabry is president. The vein runs through all four claims, it has been opened near the surface in cuts, prospect shafts and tunnels at intervals along a distance of about 2,000 feet. Ore shows in a number of these openings. The mine buildings include a cookhouse about 20x40 feet, substantially built of logs, and a really good structure; an old bunkhouse, about 20 ft.

square; and an engine house, about 30x40 ft., in which are a hoisting engine and other plant, blacksmith forge and tools, etc. It is intended to shortly erect a new bunkhouse, and office building, and to provide other necessary accommodation. The number of men employed on the property recently was twelve.

The Provincial Government is making a road from the hotel on the old Arlington road to the Lily B. mine, a distance of about 6,000 feet, and eighteen men are engaged in this work. This will save a mile in distance, giving a direct road and better hauling than at present. The company will build an orehouse near the new road as soon as the latter shall have been completed.

METEOR.—The Meteor is under lease and bond to Chas. E. Barber, who has two partners. The lease has about another year to run. Six men are working on the property, from which one car of high-grade ore was shipped about the end of last year, and another a few weeks ago, while some 20 tons is now ready for the packers to take down to Slocan City. The first-mentioned car is stated to have contained about 20 tons of ore from which a net return of about \$7,000 was received from the smeltery, while the second lot, of about 28 tons, is said to have brought the company between \$9,000 and \$10,000. More ore is in sight, and the lessee is busy making the most of the unexpired time of his lease. Some beautiful specimens of Meteor ore were seen at the Madden House, Slocan City, these containing much free gold and native silver.

OTHER PROPERTIES.—Of the numerous other well-known properties in the Springer Creek section of Slocan City division, but few are being worked. Included in the list of inactive ones are the Ottawa and Arlington, but it is thought probable some work will shortly be done in the latter, although nothing definite in this connection could be learned.

On Zimmerman's claim near the Ottawa, the owner is working alone, and in July he sent out a few tons of ore. Two men have been working on the Black Prince for about two years, during which period between 800 and 900 feet of tunnel has been driven. A later report was to the effect that a little ore was showing in the face, so that the outlook is regarded as promising. The Hampton is the property from which M. Cameron last year shipped 2,100 lbs. of ore that re-

turned \$365 net. This is one of the mines in which the late N. S. McNaught was interested; it is known that there is more ore in it, but considerable development work will have to be done before much can be extracted.

ABOUT LEMON CREEK.—This is another of the N. S. McNaught properties; it is now under lease and bond to Mr. Sostedt, who is stated to be working four men. The information obtained in Slovan City—not from the lessee, though—is that it is intended to treat the ore at the old Chapleau mill, from which to the Kilo, a distance of about two miles, the government is making a wagon road. Some 20 to 25 men have been working on this road and in repairing the old road from the mill to the Slovan-Nelson railway, for about six weeks, and it is expected it will be completed this fall, so as to allow of ore being hauled over it from mine to mill.

Particulars of the Kilo property were not obtainable other than the following taken from an official report dated 1899: "The Kilo group, consisting of 22 claims, is being opened by driving tunnels on the ledge, and very encouraging results have been obtained. The character of the ore is quartz containing iron pyrites, the value being in gold."

The Rose Marie Mine.

Last month Mr. A. H. Gracey, mining engineer, of Nelson, made a trip up the west coast of Vancouver Island to the Rose Marie mine, in Clayoquot mining division, which mine he examined and sampled. The following information relative to this property has been taken from a report made in 1899 by Mr. Herbert Carmichael, provincial assayer:

"The Rose Marie group consists of the Rose Marie, Nos. 1, 2, 3, 4, and 5, and is owned by the Rose Marie Mines, Limited; head office, Vancouver; Mr. Barclay Bontrone, manager. The property is situated on the eastern slope of Elk River, some little distance above the point where that river flows into Kennedy Lake, which, in turn empties itself by Kennedy River into Tofino Inlet on the southeast side.

"Deep draught vessels can safely enter the mouth of Kennedy River, but can proceed no further, as a series of rapids, extending for some 500 yards and having a total fall of nine feet at high water, renders it difficult, even with the highest tide to pole a canoe up-stream against the current.

"Kennedy River, from these rapids up to the lake, a distance of some four miles, is comparatively deep and tranquil, and is navigable for boats carrying freight, as also is Kennedy Lake for its full length of 14 miles. The width of the latter is five miles.

"Elk River, which flows into the arm at the head of Kennedy Lake, is navigable, for canoes only, as far up as the Rose Marie group.

"The mountain, upon the side of which the property is situated, rises abruptly above the water for some 1,000 feet, and, about half-way up this slope, there occurs a quartz vein, of from 15 to 36 in. in width, exhibiting a banded structure, and having well-defined walls standing out clearly and distinctly against the bluff. This vein has been traced up the side of the hill and, for a distance of more than 100 feet, across the more level summit.

"Such development as had taken place, at the time of my visit, was confined to surface stoning and open cuts, no underground work having been done.

"The quartz in the lode is mineralized with iron pyrites, occurring in streaks or bands parallel with the walls of the vein. This pyrite contains fair value in gold, about \$12 to the ton of ore. It is the intention of the owners to concentrate the ore, experiments having shown that the 12 tons will yield about one ton of concentrate. This concentrate will then be shipped in flat boats down the river and lake to Tofino Inlet, and thence by steamer to a smeltery.

"A concentrator building had been erected on the river bank, and, at the time of my visit, the machinery was being placed in position. This consists of a 7x12 Dodge crusher, two Tremain steam stamps (small size) and one Wilfley table. It was also intended to put in a second Wilfley table and a classifier.

"The motive power will be supplied by a small engine, while a 50-h.p. boiler, now on the ground, and which will be followed later by a second, will provide steam for the stamps and pumps, and also for a two-drill Rand compressor."

PANAMA AND OTHERS.—High up the mountain on the opposite side of Bear Lake to the Lucky Jim are situated the Silver Glance, Empress, London Hill, Panama, and other mineral claims, some of which have been worked intermittently in the past. Of these, the London Hill and Panama—each had a few men on them in August. From Mr. Miller, who is interested with Mr. H. Giegerich, of Kaslo, in the latter, and who was met at the Lucky Jim Company's office, it was ascertained that at the London Hill Major von Moerkerke has been getting out ore lately, with three men employed, but the quantity extracted is small. The Panama had been under bond to some Spokane and Vancouver men, but they relinquished possession last June and Mr. Miller had lately been taking out ore, of which some 600 to 700 sacks had been packed down to Bear Lake, and a similar quantity was at the mine waiting for the packers to take it down to the railway. As soon as enough shall have been accumulated near the railway, a carload will be shipped to the smelter at Trail. Across the divide from the before-mentioned claims, on the slope drained by the north fork of Carpenter Creek, is situated the Jo Jo, from which a small quantity of very high grade ore was taken some time ago; the chief value of that ore was in gold, as compared with high silver value from the Silver Glance and others in its vicinity.

RAMBLER-CARIBOO.—From the Lucky Jim the route mapped out for the trip was by an old trail up the mountain to the Rambler-Cariboo mine, situated well up in McGuigan Basin, at an altitude of about 6,000 feet. In the Annual Report of the Minister of Mines for 1911 may be found an account of this property, prepared by the provincial mineralogist, from which part of the following information has been taken.

This mine is now held by the Rambler-Cariboo Mines, Ltd., a company with an authorized capital of \$1,750,000, and having its head office at Kaslo, B.C. Mr. A. F. McLaine, of Spokane, Washington, is president, and Mr. W. E. Zwicky, of Kaslo, general manager. The Rambler-Cariboo group has, under various ownerships, been one of the largest ore-shippers in the district. The following is a rough estimate of the total shipments, including crude ore and concentrates, made from the mine up to the end of 1910: Shipments since 1893 have been about 23,384 tons, containing 2,216,800 ounces of silver and 13,676,885 lbs. of lead. These figures show the average recovered contents of the ore shipped to

have been about 95 oz. of silver to the ton and 30 per cent. lead. In addition the ore contains from 10 to 14 per cent. zinc.

The rock formation of the district is slate, through which a great boss of granite has been forced up, the whole being much cut by porphyry dikes. A well-defined quartz vein cuts through both the slate and the granite, crossing the contact, and this has been traced on the surface for a long distance, in a northeast-by-north direction, with a dip to the south, or into the hill.

The mine was originally opened by three cross-cut tunnels, connecting with levels about 100 feet apart. No. 3 was the main working tunnel; it had a cross-cut 510 feet long to the vein, and drifts to the extent of more than 1,200 feet. Above this level all the ore, except a few small bunches, was extracted some years ago. From this No. 3 level a shaft was sunk 500 feet, with levels Nos. 4, 5, 6, 7 and 8 at intervals of 100 feet, and there much productive mining was done, and some very good ore obtained. The expense of hoisting from this shaft to a higher level, together with the cost of keeping it unwatered, added so much to the cost of mining that the company decided to abandon the workings temporarily, and to drive a long cross-cut adit into the vein at the 1,400-foot level, and to put up a raise to connect with the shaft, and thus reach the known ore body from below.

The portal of this lower tunnel is on Dardanelles Creek, about half-way between the site of the former McGuigan station, on the Kaslo and Slocan Railway, and the old mine workings, and near the wagon road. The tunnel is 9 feet 6 inches high by 7 feet wide (7 feet by 7 feet 6 inches in the clear), and its length is about 4,500 feet. It cuts the vein at rather more than 600 feet below No. 8 level. The contract price at which the first 2,500 feet of this tunnel was driven was between \$10.50 and \$11.50 per lineal foot, this price covering everything but compressed air for operating the drills, the latter having been supplied by the company. The remaining 2,000 feet was driven by daywork. The gross cost of the entire tunnel, including management and all other expenses, was \$14.60 a lineal foot, and the rate of progress made was 7 feet 3 inches a day for 24 hours.

Where crossed on the 1,400-foot level, the vein was not recognized, and the tunnel was driven 90 feet past the place where the projection of the vein indicated it should be found; consequently, it was determined to reach the vein at the nearest point under the old shaft, so a diagonal drive was made and raising from this to the vein commenced in the country rock. When the raise was up 200 feet a cross-cut was driven to the vein, which was reached at 47 feet, and was found here to be about 8 feet in width, and to contain several streaks of clean galena. The raise was continued in the vein up to the 800-foot level. Subsequently, a second raise was put up from the 1,400 to the 1,200-foot level, so as to be in line with that from the 1,200 to the 800-foot level. Other shoots of ore than those previously known to occur have since been found on levels opened from this raise, so that practically a new mine has been developed.

Levels have been driven at 900, 1,050, 1,200 and 1,400 feet depth, and ore in considerable quantity and of good grade has been found on all but the deepest, on which last, however, while some 40 feet of ore has been passed through, not sufficient work has yet been done to reach the large orebody it is expected will be found on this, the deepest, level in the mine. Latterly, nearly

all the development work done has been on this level. Stopping has been done on other levels, but not a great deal of ore has been mined during the past year or so—only about sufficient to meet the current expenditure in operating the mine—pending the completion of provision for milling the lower-grade ore and transporting to the railway the sorted crude ore and concentrate. Up to August 1st of this year between 700 and 800 tons of sorted ore has been shipped to the smeltery. There is large dump of milling ore at the mine, probably 6,000 to 7,000 tons, and it is estimated that there will be sufficient silver, lead, and zinc recovered from this to more than pay the cost of the aerial tramway in course of construction from mine to concentrating mill, and of erecting the mill and removing the plant from the old concentrator to the new. Ore bins at the upper and lower terminals, and the tramway will probably be completed by the beginning of September, while it will be six weeks or two months later before the mill will be ready for operation. Meanwhile a spur from the railway to the mill is being put in, and this will be ready for use by the time the mill construction shall be finished. Thereafter, it is expected, production will be continuous, and the company will begin to make profits on its operations, for it has much ore of good grade opened for extraction whenever it shall be advantageous to mine and ship it.

THE PRICE OF CHROME ORE.

Chrome ore varies in price from \$10 to \$20 per ton, depending on grade of ore conditions and supply. Imported ore from New Caledonia carrying 50 per cent. chromic oxide was quoted in New York in 1910 at an average price of \$15 per long ton in carload lots, exclusive of cost of transportation. In 1909 the price averaged \$16.24 per ton. If the chromic oxide exceeds 50 per cent., the value of the ore rises in proportion; if the chromic oxide is less than 50 per cent., the value of the ore decreases at a more rapid rate. The price of the California ore is governed almost entirely by local conditions, as there is little or no competition with foreign ores. The price of chrome bricks f.o.b. Pittsburg is \$175 per thousand. American potassium bichromate was sold at 7 $\frac{3}{8}$ to 8 cents per pound and the Scotch product at 10 $\frac{3}{4}$ cents per pound in the latter part of 1910.

ESTIMATING IRON ORE RESERVES.

Estimating ore reserves requires the determination of the number of cubic feet per ton. In the case of iron ore this varies from 7 to 18, and in making estimates of Michigan ores, C. K. Leith used the following figures: Marquette hard ores, 8; Menominee and Gogebic ores, 10; soft ores of the Marquette, Crystal Falls, and Iron River districts, 12; low grade high silica ores, 14. The Oliver company uses the figures 10 cubic feet per ton throughout, on the assumption that the error in this figure is considerably less than in assumptions as to dimensions of orebodies.

VENTILATION IN PITCHING SEAMS.

A correspondent of the Coal Age, referring to the methods of ventilation in the pitching seams of the anthracite region states that the airway is often driven above the gangway and the air conducted to the cham-

bers by a short crosscut or "monkey airway;" and, after passing through the chambers, the air is then conducted back to the gangway, which is thus made the return of that section of the mine.

He notes that this system of ventilation brings all the smoke from the chambers down on to the gangway and, consequently, interferes considerably with the work of the drivers in loading the cars and hauling them out of the mine. He suggests that a better plan would be to bring the air in on the gangway and carry it up the chambers and into the airway above, thereby making that the return air course. This would not only keep the chambers clear of smoke and enable the miner to get out more coal; but it would greatly assist the work of the drivers, in gathering their trips. Such an arrangement would greatly increase the output of the mine.

As similar conditions obtain in Alberta this suggestion will no doubt be of interest to those now engaged in developing pitching seams in that Province.

THE BEHAVIOUR OF NITROGLYCERIN WHEN HEATED.

A knowledge of the action of heat upon nitroglycerin is important a contributory to the information on the stability of explosives and on the behaviour of large masses of explosives when burning, and the relation of such facts to fire in magazines and nitroglycerin factories. The subject has been recently investigated by

the U. S. Bureau of Mines, whose conclusions are summarized as follows:

Nitroglycerin begins to decompose at temperatures as low as 50 or 60 degrees C. Even at very low temperatures it tends to be somewhat volatile, while at higher temperatures both the decomposition and the evaporation of nitroglycerin increases. The decomposition of nitroglycerin is accompanied by the evolution of much heat. At temperatures between 145 and 215 C. the ebullition becomes more and more violent; and at about 218 C. nitroglycerin explodes.

BOUNTIES IN 1911.

With the expiry last year of the bounties on iron and steel, Canada paid comparatively little during the past fiscal year for the special encouragement of industries under the bounty system. Thus the total amount paid on bounty account during the year ending on March 31st, last, was \$538,529 only, as compared with \$1,591,663 paid during the preceding year. The distributions were as follows: Wire rods, \$160,750; crude petroleum, \$141,935; lead, \$179,288; Manilla fibre, used in the manufacture of binder twine, \$50,536.

Since 1896, when the bounty system was introduced, the total payments have been rather over twenty-one millions, of which amount seven millions was paid as represented bounties on pig iron, over four millions on puddled iron bars, and six millions on steel manufactured in Canada.

SPECIAL CORRESPONDENCE

ONTARIO

COBALT, SOUTH LORRAIN

GILLIES LIMIT.—The excitement in the Gillies Limit has grown far beyond all expectations and has assumed almost dangerous proportions. The Ontario Government has thrown open to staking 3,303 acres, including several claims that were not sold at the previous auctions of 2,000 acres. This means that there are about 150 acres claims to be staked of 20 acres each. Though the Order-in-Council specifies that the new acreage shall only be opened to prospecting on August 20, as a matter of fact every foot of the ground has been run over by hundreds of men, and to-day hundreds are camping upon the ground. Upon one of the claims, indeed, some ten men are working at a discovery that has been made, though they have no manner of right to the property till after it has been properly staked next Tuesday. On one claim this week fifty men, most of them in parties of threes and fours came together until there were fifty on the one bluff.

The Limit will be thrown open at one minute after midnight on August 20th. As there are dozens after the same claims it resolves itself into a contest in staking and a Marathon to the recording office at Haileybury in order to be the first in line when it opens at half past eight. In the early days the name of the Gillies Limit conjured up to every prospector the thought of it, hidden veins of Crown Reserve richness and the old glamour has drained the whole of the north country of prospectors till the Limit to-day has brought together all the old veterans of Cobalt, Larder Lake, Gowganda, South Lorrain, Elk Lake and Por-

cupine. The high price of silver and the reopening of many old silver prospects at Cobalt has all helped to inflame the popular imagination.

So far the record of the Gillies Limit has not been encouraging to further exploration. The public, chiefly of Montreal, has paid hundreds of thousands of dollars to the Ontario Government for lots, and not a cent of profit has been made out of any claim sold within its borders.

Purchasers of lots at former sales appear to have a just grievance. They have paid for their claims anything from two thousand to \$35,000, and yet they are burdened with a royalty on any future profits they make. Just as good ground is now being thrown open for the staking and no royalty is exacted.

SUCCESSFUL HYDRAULICKING.—Several finds of minor importance have been made as the result of the hydraulicking operations at the Nipissing. The latest discovery is a vein of silver ore, probably an extension of vein 128 and several smaller stringers have been uncovered. In view, of the great richness of all silver veins in this conglomerate area all of these finds, however small, on the surface, will be developed during the winter.

BAILEY COBALT.—It is understood that the Bailey Cobalt will soon make a shipment of high grade ore. This claim for the past two years has been developed by a Chicago business till lately associated with the Pullman Company. A thoroughly modern plant is installed under competent technical management. The ore is not sufficiently high grade to allow of direct shipment, but there is a considerable tonnage that would pay to concentrate on the spot, or at a neigh-

boring property. The Penn Canadian Mining Company is also doing quite as well as they expected, so the vicinity of Diabase Mountain is once more active.

FOSTER REDIVIVUS.—Mr. T. J. Flynn and the syndicate with which he is associated, is making arrangements to open up the Foster again. The success of the Lawson at the lower levels makes the salvage of the old mine a possibility. There are also deals pending for the working of the Cochrane near the Temiskaming, but for the time being negotiations for the leasing of the King Edward have fallen through.

BEAVER EXPANDS.—The Beaver Consolidated Mining Company of Cobalt has purchased the Donaldson property at Elk Lake, to date by far the most promising of the silver prospects in that section of the country. A shaft has been put down for 150 feet and mining done with the result that according to the report of a conservative engineer who has just been over the property, "it is an excellent prospect." It is also reported that the Buffalo mines have purchased some claims with a view to development. The completion of the Elk Lake branch of the T. & N. O. railway this fall will bring these properties within easy reach of the smelters.

DIVIDENDS.—Cobalt dividends continue to pile up. Next month the Crown Reserve will pay its thirty-first dividend, and will have returned to shareholders no less than 250 per cent. On par or altogether \$2,402,021. The fact that the McEaney, the Porcupine venture of the Montreal company is developing most satisfactorily, will give satisfaction to shareholders who believe that all good things must have an end some time.

In 1908 when the McKinley-Darragh was paying its second dividend, a mining engineer who had been sent to examine the property, reported to his principals that it was possible that another car of ore might be scraped together, but then the end would be nigh. On Oct. 1st the company will have paid 126 per cent. on capitalization, or \$2,830,558.

SHIPMENTS.—The shipments from the Cobalt camp in ore and bullion for the week ending Aug. 17, were: Crown Reserve, 44,966; City of Cobalt, 85,500; Cobalt Townsite, 105,000; Cobalt Lake, 63,100; La Rose, 85,800; McKinley-Darragh, 76,200; Trethewey, 82,000; Temiskaming, 63,704; Kerr Lake, 60,981. Total 667,251. Bullion, Crown Reserve, 39,660 ounces, \$26,000; Dominion Reduction Company, 24,630, \$14,778; Trethewey, 3,990 ounces, \$2,394; City of Cobalt, 2,667, \$1,267; Buffalo, 11,500, \$7,000. Total, 82,449 ounces, \$51,439.

The growth of cyanidation and amalgamation in the camp can be seen by the fact that although the Nipissing shipped no bullion at all the output was over \$50,000. In the ore shipments the 38 tons of the McKinley-Darragh contained \$142,000.

PORCUPINE AND SWASKIKA

KIRKLAND LAKE.—Another discovery in the Kirkland Lake section of the Cobalt camp is causing some interest among prospectors. This is the find made by W. Costello in Barnhardt Township, three miles north of Kirkland Lake. With the Tough, Terry, and Costello claims offering opportunities it seems probable that there will be considerable activity in this portion of the mineral belt.

REA.—Since it started operations the Rea mine at Porcupine has cost the company \$790,410 on capital account, and \$114,399 on development account, a total of \$905,470. There is cash on hand amounting to only \$660 to meet bills and other liabilities amounting to \$3,838. Though several attempts have been made no way has yet been discovered of financing the company so that development work can be resumed. There is a considerable amount of good ore above the 200 foot level, but below that the values in the vein would not pay for taking the ore out and treating it.

SWASTIKA.—Progress is being made with the construction of the mill at the Swastika mine. The concrete foundation has been completed, and the framework is now in place. The machinery is all ordered and should be on the ground in a month's time. The mill building will measure 30 feet by 86 feet, and for the present saving will be made by amalgamation alone although provision is being made in the mill for cyanide tanks. The tailings from the mill will be dammed up so that they will be available for re-treatment.

Among the few mining companies now being incorporated the Anchorite Mining Company, with the modest capitalization of \$250,000, will operate in Northern Ontario. The company has headquarters at Toronto.

STANDARD LIQUIDATES.—As the creditors of the Standard Gold Mining Company have refused to accept 40 cents on the dollar the company has gone into liquidation, and the assets will be sold by auction. The company is \$10,000 in debt. The company has 200,000 shares in the treasury, but cannot realize on them. The surface showings on the Standard were very spectacular. The property was diamond drilled, and on the strength of a very rich core that was handed round much stock was sold. The origin of the gold in that core is one of the mysteries of the camp for the body from which it was cut has never been located.

PORCUPINE LAKE EQUIPMENT.—The Porcupine Lake Mining Company has ordered a complete plant for the further development of its claims near Golden City and under Porcupine Lake. The plant includes a ten-drill compressor, boilers, and full equipment for a thorough development of the Hunter properties.

BRITISH COLUMBIA

GENERAL NEWS.—The 10-stamp mill put in some time since at the Inland Empire Mine, which is situated three and a half miles from Paulson, a stopping place on the C. P. R. line between the Columbia River and the Boundary district, has been in operation lately. It is reported to be making a good percentage of extraction, but no particulars have been received from those in charge of operations.

The aerial tramway that was for years at the Le Roi mine, Rossland, is to be used to convey ore from the No. 1 mine to the shipping wharf at the Highland concentrator, near the town of Ainsworth, Kootenay Lake. The No. 1 and Highland properties are both held by the Consolidated Mining and Smelting Company, of Canada, Limited, under option of purchase and the former, which in the early days of Ainsworth belonged to residents in the Maritime Provinces, has been for a long time an intermittent producer of ore.

The Hobson Silver-Lead Company, Ltd., of Spokane, Wash., is working the Yankee Girl group mine, near Ymir, Nelson mining division. It is stated that the company, which two or three years ago operated this property, took out ore of a total value of about \$160,000 from an orebody mined from No. 1 adit up to the surface, a distance of 400 feet. The same company commenced driving two other adits at lower levels, but got into financial difficulties before the payable orebody was reached. The Hobson Company is continuing driving adits Nos. 2 and 3, and it is expected No. 2 will soon enter the oreshoot being driven for.

The Blue Bell mine and concentrator, on the east side of Kootenay Lake, opposite Ainsworth, are again being operated, after having been inactive for between two and three years. Hoisting and pumping machinery has been put in the mine, and the treatment capacity of the mill enlarged. There is much lead ore in this mine, which is owned by the New Canadian Metal Company, of which Mr. S. S. Fowler is general manager. It is intended to continue ore production without interruption.

The Eureka mine, in Nelson mining division, has been taken under a working bond, with option of purchase, by the British Columbia Copper Co. This property, situated about 9 miles from the town of Nelson, and two and a half miles from Granite Siding on the C. P. R., line west of Nelson, is reported to have about 10,000 tons of ore in sight. Assay returns have shown from 4 to 8 per cent. copper. Some of the machinery and plant that had been used at the B. C. Copper Co.'s Wellington group mine, Boundary district, is being taken to the Eureka, at which latter development will be undertaken without delay.

Much work is being done on the Granby Consolidated M. S. and P. Co.'s Hidden Creek mine, at Granby Bay, Observation Inlet, both underground and on the surface. The improvements above ground include construction of a shipping wharf, erection of buildings, grading of the site for a 2,000 ton smeltery, construction of railway from the wharf up the mountain to meet the tramway, and thence by a switchback to the smelting site, and construction of dam and other works in connection with the establishment of a hydro-electric power generating station, to supply power for mine, smeltery, and railway. Developments in the mine continue to be satisfactory, and that to a greater extent than was looked for when purchase of this property was decided upon. What is known as the 385-foot tunnel (that is 385 feet above the sea level at Granby Bay), has cut No. 1 ore body 145 feet below the upper tunnel, known as the 530-foot tunnel, and there has now been proved a vertical depth of about 700 feet in ore. Average assay returns from the ore passed through on the 385 foot level give rather better than two per cent. copper, as compared with the earlier estimated copper content of 1.65 per cent. Much work has been done in preparation for opening stopes as soon as it shall be advantageous to take out ore.

At the Corbin Coal and Coke Co.'s colliery in Southeast Kootenay, a railway, to be about seven miles long, is being constructed from the British Columbia Eastern Railway (which connects the Corbin mine with the C.P.R. Co.'s Crow's Nest Railway at McGillivray Station, near the Loop), up to what is known as the "lower big showing" of coal, occurring on the mountain above the Corbin mine. There is here an enormous

body of coal which it is intended to work as if it were a big quarry, and the coal will be loaded from the pit that will be opened, directly on to railway cars.

Included in the information obtained during a recent trip to several of the interior mining districts of the province is that concerning a number of mines in the Slocan, which district is attracting increasing attention among mining men prepared to do much development work where there is a reasonable prospect of ore in quantity and of a profit-yielding grade, being obtained.

Some Slocan District Mines.

In the following notes no particulars will be given of mines in Ainsworth mining division, which is usually regarded as part of the Slocan district as distinguished from the Slocan and Slocan City mining divisions, for none in Ainsworth division were visited on this occasion.

Leaving New Denver, on Slocan Lake, early one morning in August, the train was taken to Three Forks, on the C. P. R. line from Nakusp to Sandon, the former being situated on upper Arrow Lake, which is an enlargement of the Columbia River, and the latter a mining town in the heart of the Slocan country. From Three Forks, so named because of the junction here of the three forks of Carpenter Creek, the way lay up the middle fork, known as Seaton Creek, to Bear Lake on the summit of the divide between Slocan and Ainsworth mining divisions. A branch of the Nakusp-Sandon railway has quite lately been constructed from a short distance on the Sandon side of Three Forks to Bear Lake, this being intended to provide transportation facilities for the Lucky Jim, Rambler-Cariboo, and other mines in the eastern part of Slocan mining division. From Three Forks to the Lucky Jim mine, which is near Bear Lake, the distance is between four and five miles.

When the disastrous forest fire of the summer of 1910 swept through this part of the Slocan it deprived the Lucky Jim, Rambler-Cariboo, and other mines of transportation, for it destroyed trestles and bridges along the old Kaslo & Slocan railway, over which ore had been taken to Kaslo during many previous years. Further, it consumed the surface works and mine buildings of the principal mines, so that they were left at a great disadvantage, and this, too, just at a time when they were about ready to ship ore in considerable quantity. The Lucky Jim lost its compressor plant, tramways from mine adits to railway, mine buildings, and all other surface improvements. Further, there was no wagon road communication to points on a railway, so that the condition was serious, and a similar state of affairs largely existed as regards the Rambler-Cariboo mine as well. However, mine owners and government immediately co-operated to put the old disused wagon road to Three Forks into some kind of shape for hauling, and a determined effort was made in part to restore conditions that would admit of development work being continued, even should the shipment of ore not be found practicable for the time. In the course of the following fall months new buildings were erected, plant got in, and work in the mines resumed. Finally, when it was found that the Kaslo & Slocan railway was not likely to be rebuilt, the C. P. R. company was induced to build a spur line from Three Forks to Bear Lake. This construction was com-

menced last year, but it was only a few weeks ago that the steel was laid and transportation facilities were again available.

LUCKY JIM MINE.—The Lucky Jim mine has long been known as the only mine in British Columbia that, up to the time of suspension of ore shipments in 1910, had shipped crude zinc ore in any considerable quantity. It has been opened at different levels, and it is stated that there is much ore available for shipment above the No. 5 level. During the last year or so No. 6 level has been driven to the lime formation in which occur large lenses of zinc ore in No. 5 and higher levels, but at the time of writing development work has not been sufficiently advanced to determine whether or not the ore continues down to No. 6, which is several hundred feet lower than No. 5, though it is believed that large shoots of shipping ore will also be found on this level.

Early in August a single car of ore was shipped from the mine, but this was ore that had been left alongside the railway track when the fire did so much damage in 1910, as above outlined. When visited recently it was ascertained that No. 6 adit had entered the lime dike at about 1045 feet from its portal, and that the drive was continued for 110 feet across the lime, the limit of which was not reached when it was decided to explore the footwall side of the dike for ore. Driving was then undertaken near the footwall, and at 83 feet some ore was found, but not the large body sought for. This drive is now in about 500 feet, and it is be-

lieved No. 2 orebody, which is large in No. 5 adit, will soon be reached. This level is at a vertical depth of about 450 feet below No. 5, and nearly 800 feet on the incline, the lime having flattened out considerably in comparison with its position in the higher levels. It is the opinion of the superintendent that a big body of ore occurs somewhere near where the adit enters the lime, and this will be prospected for later; it may be found on the hanging wall side. For the present, the intention of the management is to pay most attention to the shipment of ore from No. 5, now that the railway has been constructed to the mine, and it is planned to ship one car of ore a day from that level until such time as the output can be increased.

An aerial tramway from No. 5 down to the loading bins alongside the railway was practically completed when the mine was visited, and it was intended to give the tram a trial run the next day. The tramway is equipped with two buckets working in balance. Two ore bins have been built at the head of the tramway, each of 50 tons capacity, and a 125-ton bin at the lower terminal.

The resumption of shipment of ore in considerable quantity will give much satisfaction, not only to those directly interested in the Lucky Jim Zinc Mines, Limited, but as well to all connected with mining in the vicinity, for it will stimulate other mine owners to do development work and to prepare for making an output of ore when they shall have their work advanced to a stage that will admit of this being done.

STATISTICS AND RETURNS

NOVA SCOTIA COAL SHIPMENTS

Intercolonial Coal Company.

Shipments July, 1912	15,508
Shipments July, 1911	21,886
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Decrease July, 1912	6,378
Shipments 7 months, 1912	123,480
Shipments, 7 months, 1911	146,086
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Decrease 7 months, 1912	22,606

Dominion Coal Company, Ltd.

Output or July, 1912	409,125
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Shipments July, 1912	476,208
Shipments July 1911	375,147
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Increase July, 1912	101,061
Shipments 7 months, 1912	2,295,297
Shipments 7 months, 1911 ..	1,945,591
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Increase 7 months, 1912	349,706

Springhill.

Shipments July, 1912	24,394
Shipments July, 1911	20,815
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Increase July, 1912	3,579
Shipments 7 months, 1912	201,116
Shipments 7 months, 1911	66,708
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Increase 7 months, 1912	134,308

Inverness Railway and Coal Company.

Shipments July, 1912	20,264
Shipments July, 1911	21,130
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Decrease July, 1912	866
Shipments 7 months, 1912	152,595
Shipments 7 months, 1911	152,122
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Increase 7 months, 1912	473

Acadia Coal Company.

Shipments July, 1912	25,083
Shipments July, 1911	30,425
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Decrease July, 1912	5,342

Shipments 7 months, 1912	201,231
Shipments 7 months, 1911	218,624
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Decrease 7 months, 1912	17,393

Nova Scotia Steel and Coal Company.

Shipments July, 1912	86,080
Shipments July, 1911	71,750
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Increase July, 1912	14,330
Shipments 7 months, 1912	413,290
Shipments 7 months, 1911	340,451
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Increase 7 months, 1912	72,839

COBALT ORE SHIPMENTS.

The ore shipments for the week ending August 17 were small, there being shown a great decrease compared with the shipments of last week which were above the average. Nine mines only sent out ore, all of this being high-grade, the one car sent by the McKinley alone being worth \$142,231. The shipments for the week in pounds were as follows:

Crown Reserve	44,966
City of Cobalt	85,500
Townsite	105,000
Cobalt Lake	63,100
La Rose	85,800
McKinley	76,200
Trethewey	82,000
Temiskaming	63,704
Kerr Lake	60,981
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Total	667,251

The shipments for the year to date were as follows:

	Week.	Year to Date.
Beaver		\$219.75
Buffalo		708.44
Casey Cobalt		212.15
City of Cobalt	\$42.75	855.26
Cobalt Lake	31.55	497.76
Cobalt Townsite	52.50	1,007.31
Chambers-Ferland		257.05
Coniagas		1,351.46
Crown Reserve	22.48	324.56
Drummond		330.30
Hudson Bay		440.06
Kerr Lake	30.49	474.63
La Rose	42.90	2,229.26
Lost and Found		15.00
McKinley-Darragh	38.10	1,740.09
Nipissing		1,444.38
O'Brien		345.62
Provincial		22.22
Right of Way		180.01
Temiskaming	31.85	744.93
Trethewey	41.00	353.89
Wettlaufer		229.04
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Totals	\$333.62	\$14,033.30

a large consignment, part of which was bullion from Kerr Lake ore. The shipments for the week were as follows:

	Ounces.	Value.
Crown Reserve	39,660.26	\$26,000.00
Dom. Red. Co.	24,630.00	14,778.60
Trethewey	3,990.32	2,394.16
City of Cobalt	2,667.54	1,267.20
Buffalo	11,500.00	7,000.00
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Total	82,449.06	\$51,439.96

BRITISH COLUMBIA ORE SHIPMENTS.

(Week Ending August 10.)

Boundary.

	Week.	Year.
Surprise	235	3,025
United Copper	34	558
Granby	23,292	752,501
Mother Lode	7,920	228,316
Rawhide	7,490	133,707
Napoleon	508	4,522
Unnamed	210	7,130
Nickle Plate, milled	1,500	46,500
Other mines	19,561
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Total	41,189	1,195,820

Nelson.

Queen, milled	300	7,500
Mother Lode, milled	350	3,450
Molly Gibson, milled	300	3,300
Granite-Poorman, milled	250	8,250
Hudson Bay	39	69
Queen	31	383
Granite-Poorman	30	219
Other mines	10,108
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Total	1,300	33,279

East Kootenay.

Sullivan	469	19,436
St. Eugene	67	554
Monarch	88	687
Society Girl	21	42
Monarch, milled	425	5,275
Other mines	5,452
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Total	1,069	31,446

Slocan and Ainsworth.

Standard	184	5,347
Van Roi	92	1,665
Bluebell	94	193
Ruth	36	405
Whitewater	34	213
Jo Jo	8	8
Standard, milled	400	10,400
Bluebell, milled	175	800
Van Roi, milled	1,100	37,200
Other mines	8,314
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Total	2,323	64,575

Rossland.

Le Roi	1,038	29,174
Le Roi No. 2 milled	300	4,400

Although the Nipissing did not contribute at all to the bullion shipment of the week the amount sent out was well up to the average weekly shipments of silver from the camp. Four mines contributed to the total shipments while the Dominion Reduction Company sent out

Le Roi No. 2	60	16,217
Blue Bird	20	77
Centre Star	3,173	96,575
Inland Empire, milled	90	540
Other mines		57
Total	4,681	147,040

Granby Smelter Receipts.

Grand Forks, B.C.

Granby	23,292	752,501
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B. C. Copper Co.'s Receipts.

Grand Forks, B.C.

Mother Lode	7,920	228,316
Rawhide	7,490	133,707
Napoleon	508	4,522
Unnamed	210	7,130
Other mines		17,003
Total	16,228	389,678

Consolidated Co.'s Receipts.

Trail, B.C.

Centre Star	3,173	96,575
Le Roi	1,038	29,174
Sullivan	469	19,436
Surprise	235	3,025
Standard	184	5,347
Van Roi	92	1,665
Bluebell	94	193
Monarch	88	687
St. Eugene	67	554
Le Roi No. 2	60	16,217
Hudson Bay	39	69
Ruth	36	405
Whitewater	34	213
United Copper	34	558
Queen	31	383
Granite-Poorman	30	219
Society Girl	21	42
Blue Bird	20	77
Jo Jo	8	8
Other mines		8,536
Total	5,753	183,383

SHARE MARKET.

(Courtesy of J. P. Bickell & Co.)

New York Curb.

	Bid.	Ask.
Braden	700	712½
B. C. Copper	500	525
Giroux	562½	587½
Greene Cananea	1012½	1025
Inspiration	1900	1937½
Yukon Gold	350	375
Goldfield Con.	362½	375
Nevada Hills	200	206¼
Miami	2962½	2975
Tonopah Mining	700	712½
Ray Con.	2187½	2200
Chino	3925	3937½
United Copper	625	1875

Cobalt Stocks.

	Bid.	Ask.
Bailey	5¼	5¾
Beaver Con.	43½	44
Buffalo	145	150

Chambers Ferland	20¾	21
City of Cobalt	24	2½
Cobalt Lake	29½	30
Coniagas	740	760
Crown Reserve	310	340
Great Northern	7½	8
Gould Con.	1	1½
Gifford	2	3¼
Green Meehan	1¼	1½
Hargraves	4¾	5
Kerr Lake	290	292
La Rose	297	305
McKinley Darragh	195	197
Nipissing	840	850
Ophir	8	11
Otisse	1¼	1¾
Peterson Lake	8	8¼
Rochester	3	3¼
Right of Way	5	6¼
Silver Leaf	3	4
Silver Queen	3½	4½
Timiskaming	38	38½
Trethewey	40	45
Wettlaufer	43	46

Porcupine Stocks.

	Bid.	Ask.
Apex	2¼	2¾
Dobie	10	25
Crown Charter	7½	8
Dome Extension	10¼	10½
Eldorado	1	3
Foley-O'Brien	15	17
Hollinger	1220	1230
Jupiter	25	26
N. Ont. Exp.	200	250
Pearl Lake	17	18
Porcupine Imperial	2½	2¾
Porcupine Tisdale	..	1
Preston East Dome	3¾	3¾
Rea Mines	25	35
Standard	½	1
Swastika	8	8¼
Vipond	26¼	26¾
United	..	1¼
West Dome	..	8

Sundry.

	Bid.	Ask.
American Marconi	750	775
Canadian Marconi	512½	550
Island Smelters	2¼	2¾

SILVER PRICES.

	New York.	London.
	Cents.	Pence.
August 8	61	28 1/8
August 9	61	28 1/8
August 10	61¼	28 3/8
August 12	61½	28 1/2
August 13	61½	28 5/8
August 14	61¾	28 7/8
August 15	62¾	28¾
August 16	63	29
August 17	63¼	29 1/8
August 20	62½	28 5/8
August 21	62 5/8	28 11/8
August 22	62 3/8	28 11/8
August 23	62¼	28 5/8