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Editor:

J. C. MURRAY, B.A., B.Sc.

Business Manager:

J. J. HARPELL, B.A.

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CIRCULATION.

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

SPECIAL CONTRIBUTORS.

GEOLOGY: Dr. Frank D. Adams, McGill University; Dr. A. E. Barlow, late of Geological Survey of Canada; Professor Willett G. Miller, Provincial Geologist of Ontario; Dr. J. E. Woodman, Dalhousie University, Halifax, N.S.

CHEMISTRY: Dr. W. L. Goodwin, Director School of Mining, Kingston, Ontario; Milton Hersey, M.Sc., Official Analyst Province of Quebec.

MINERALOGY: Professor W. Nicol, School of Mining, Kingston, Ontario.

MINING: S. S. Fowler, M.E., Nelson, B. C.; Frederick Keffer, M.E., Anaconda, B.C.; A. B. Willmott, M.E., Sault Ste. Marie, Ont.; J. C. Gwillim, M.E., School of Mining, Kingston, Ont.; J. Obalski, Inspector of Mines, Quebec; J. Bon-sall Porter, M.E., McGill University; H. Mortimer-Lamb, Sec. Can. Min. Inst.; John E. Hardman, M.E., Montreal; Fritz Cirkel, M.E., Montreal; George W. Stuart, M.E., Truro, N.S.

METALLURGY: Hiram W. Hixon, M.E., Mond Nickel Company, Victoria Mines, Ontario; Stafford F. Kirkpatrick, School of Mining, Kingston, Ontario; A. P. Scott, Dominion Iron & Steel Company, Cape Breton.

COAL: Hon. Robert Drummond, Stellarton, N.S.

NATURAL OIL AND GAS: Eugene Coste, M.E., Toronto, Ont.

CEMENT: Manley Baker, M.A., School of Mining, Kingston, Ont.

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THE DATA OF GEOCHEMISTRY.

T. Sterry Hunt, whose monumental labors on the chemistry of geologic phenomena were the foundation of modern geochemistry, was a daring and brilliant adventurer in the realms of science. Posepny's monographs changed the current of geological thought in the last decade of the nineteenth century. The able and tireless Van Heiss added the fruit of his careful work early in this century. Meanwhile geologists, chemists and mineralogists on this continent and in Europe have published the results of special research in official bulletins, scientific periodicals, or in other forms.

Thus a vast bulk of geochemical data has appeared in papers, magazines, and pamphlets, over a considerable period of time. It is not incorrect, however, to state that since 1900 a far greater amount of accurate work has been reported than in any preceding corresponding period.

So important are many of the recent contributions to our knowledge of geochemistry, and so easy is it for excellent work to be crowded out of the field of our attention, that we are impelled to make prompt acknowledgment of the value of a monograph just published by the United States Geological Survey. Under the title "The Data of Geochemistry," Dr. F. W. Clarke has gathered and correlated an astonishing amount of well-sifted, sound, information.

No mere compiler could have attempted this work. No mere academician could have made it a coherent whole. Dr. Clarke has drawn upon every available source. His foot-notes constitute in themselves a copious bibliography. The scope of the monograph is splendidly wide. Its details are full and accurate.

The sequence of subjects treated in Dr. Clarke's monograph is, roughly, this:

The Nature and Distribution of the Elements.
The Atmosphere.
Lakes and Rivers.
The Ocean.
Waters of Closed Basins.
Mineral Wells and Springs.
Volcanic Gases and Sublimates.
The Molten Magma.
Rock-forming Minerals.
Igneous Rocks.
Decomposition of Rocks.
Sedimentary and Detrital Rocks.
Metamorphic Rocks.
Metallic Ores.

The Natural Hydrocarbons.

Coal.

In that the volume before us has made existing data available to the reader, it has fully justified its preparation. More than this, whilst its author expressly disclaims any attempt at presenting an exhaustive monograph upon geochemistry, he has done something much more desirable. He has given us a readable book that is at once a complete work of reference, and a sufficient resume of the best modern thought upon a subject that hitherto has been beset with discouraging difficulties.

ST. LAWRENCE COAL TRADE.

Late in April five of the Dominion Coal Company's fleet of colliers suffered delay in Quebec harbor. Coal would have been delivered at Quebec to supply the local market had the Louise Basin not been blocked with ice. The local authorities apparently made no attempt to facilitate matters for the large colliers, although it is obviously their duty to aid in every possible way.

The Dominion Coal Company is making an earnest attempt to take advantage of the early opening of navigation. Throughout the past winter an enormous quantity of coal has been banked at Glace Bay. Sixteen colliers are in their employ, and in the third week of April coal to the amount of 60,000 tons was on its way up the St. Lawrence. It is hoped that 1,300,000 tons will be carried to Montreal before navigation closes. Much depends upon an early start. Last year's shortage should not occur again.

It is quite evident that the Nova Scotian collieries are anxious and willing to rush deliveries. In this they should be assisted.

ROSSLAND.

News from Rossland gives continued hope that mining in the South Belt will develop into a substantial mining camp. Much of the ore so far encountered is rich. The auriferous lead-silver ore, of which light shipments have been made from several prospects, is reported to range from \$30 to \$70 per ton. Prospectors are actively taking up areas and many properties are being worked on lease.

It were mischievous to speculate as to the results of development. But the facts themselves are sufficiently encouraging.

ZINC.

The opening of the Canada Zinc Company's smelter at Nelson, B.C., will have a doubly beneficial effect upon the Slocan lead mines. Heretofore the lead smelters have penalized the zinc contents of ore. Now the zinc ores of the district will be provided with a ready market and zinc contents of the lead ores will no longer be considered detrimental.

COBALT—PRESENT AND FUTURE.

A year ago the atmosphere of Cobalt was filled with the fever (and ague) of perilous promotions. To-day Cobalt is a strenuous mining camp, working out its own salvation with quiet confidence.

By the great majority of those directly interested in Cobalt a boom in stocks is not desired. The recent brisk movements, excited by several spectacular discoveries, may or may not assume boom dimensions. If they do, then Cobalt will have another load added to a sufficiently sizable burden of capitalization. We sincerely hope that neither by manipulation nor by the ungoverned enthusiasm of a gambling public, Cobalt stocks will move heavenward. They are now resting on much solid ground than ever before. Artificial inflation means catastrophic collapse.

Public attention has been caught and held by recent rich discoveries. These are phenomena that will probably recur from time to time. There are and always will be persons anxious to take advantage of the excitement of the moment to unload worthless paper. The Canadian public should need no warning. But there is another aspect of Cobalt. A few weeks ago a meeting of the Cobalt Branch of the Canadian Mining Institute was held. About fifty mine managers, engineers, mill men and other practical workers attended and took part in the proceedings. The object of the meeting was to discuss concentration methods. In itself this is a significant fact. It marks the strongly progressive tone of the camp. Superintendents, who not many months ago were in charge of one or two holes in the ground, must now attack the knotty questions of ore-dressing. Amongst these operators the most general topics of conversation are not the merits of stocks, but the comparative efficiency of different makes of air drills, crushers, rolls, concentrating tables and all matters pertaining to the mining and treatment of ore.

The skill and care of the mine managers of Cobalt have imparted real value to shares in many of the older companies. The list of shipping mines is constantly being added to, and Cobalt is giving us performance in place of promise.

The future of Cobalt lies largely in the hands of technical men. The camp is assured a fair lifetime, even from present developments. But the intelligent application of technical experience in the selection of suitable mining and concentrating equipment, and in the economical generation of power, will prolong indefinitely the productive future of the district.

It is imperative that mine managers should keep thoroughly informed concerning improvements and changes in methods and machinery. The insufficiently posted manager is painfully apt to develop costly fads. To a few, complicated machinery appeals because it is complicated. Often the personal predilections of a member of the directorate carry more weight than the

recommendations of the superintendent. But the competent manager, upon whose shoulders falls the whole responsibility of failure, must be allowed to choose his own supplies, both of men and machinery.

One feature of life in Cobalt that obtrudes itself unpleasantly upon the visitor is the prevalence of the "blind pig." A moderate estimate places the number of these illicit liquor shops at thirty-five. In open defiance of the law the vilest liquor is sold day and night. As a consequence the proprietor of the "blind pig" usually a "fence" for the "high grader."

There may be difference of opinion as to extent to which "high grading" obtains in Cobalt. Those who have studied the question claim that large amounts of silver are daily disposed of. Whether the total is large or small is not our present theme; but it is certain that "high grading" would be practically eliminated if the "blind pig" did not exist.

The onus of these conditions cannot be thrust upon the Government. It behooves the citizens of Cobalt to do a little house-cleaning.

No reference to mining in Cobalt would be complete without mention of the excellent topographical and geographical map issued and distributed by the Ontario Bureau of Mines. It was compiled by Dr. W. G. Miller and Mr. C. W. Knight, and it has afforded untold help in development and prospecting.

MINING FLOTATIONS AND THE PRESS.

The general report of the Grand Jury, which last December returned a true bill against Frank Law, refers in the following terms to the newspaper practice of printing any and all mining advertisements that are offered:

"We have heard sufficient evidence to convince us that the public have been swindled out of large sums of money in the flotation of mining companies. The prospectuses issued by many of these companies are not only intentionally misleading, but oftentimes false and fraudulent in the statements contained in them. The mining industry is destined to assume large proportions in Canada and in Ontario, and it is very much in the public interest, as well as in the interest of private individuals, that it should be conducted honestly and in such a way as to inspire confidence at home and abroad.

"The flotation of wild-cat propositions depends largely for their success on advertising in the daily press, and it is a regrettable fact that the newspapers do not caution the public in regard to ventures many of which are illusory and fraudulent on their very face. If the newspapers cannot be held responsible for aiding and abetting this kind of fraud, the Govern-

ment should at least see to it that the laws are made wide enough to include fraud of all kinds perpetrated by the officers of the companies, and the brokers concerned, and furthermore that such laws are rigorously enforced."

SUMMER EXCURSION OF THE CANADIAN MINING INSTITUTE.

Plans for the visit of representatives of British technical and scientific societies are being perfected. Delegates have been invited from the Iron and Steel Institute, the Institute of Mining and Metallurgy, the North of England Institute, the South Wales Institute of Engineers, the Institute of Scotland, and the Manchester Geological Society.

Already a number of these representatives have signified their intention of coming over to Canada in August. Fifty provisional acceptances have been received by the secretary of the Canadian Mining Institute.

The proposed itinerary of the trip is printed on another page of this issue. It is, of course, open to change and has been suggested merely as a working basis. Indeed, the itinerary is now printed in the hope that those interested will give their opinions as to necessary modifications.

THE FRANK LAW CASE.

Anxious enquiries have reached us at divers times regard the progress of the case of Rex. vs. Frank Law. Rumors have been circulated that the case has been settled or dropped. These are utterly unfounded. County Crown Attorney Drayton consented to traversing the case until the June Sessions in the hope that Russell, Law's partner, would be extradited before that time.

The case is now "sub judice" and comment is out of order. The public may rest assured, however, that proceedings have not been and will not be dropped.

The finding of the Grand Jury reads thus: "That Frank Law, at the City of Toronto, in the County of York, in the year of our Lord one thousand nine hundred and seven, did unlawfully, fraudulently, and deceitfully combine, conspire, confederate, and agree with William Lockard Russell and with other persons to your jurors unknown to defraud the public market price of price and shares publicly sold, and did thereby commit an indictable offence, contrary to the provisions of the Criminal Code."

Contributors who send us photographs will do well to remember that a dull finish is difficult to reproduce. Good half-tones can only be secured from a "burnished" photo.

MINERAL LOCATIONS ON MORESBY ISLAND—ONE OF THE QUEEN CHARLOTTE ISLANDS.

(Abstract of Bulletin No. 1, issued by the British Columbia Bureau of Mines.)

The Queen Charlotte group of islands lies between the 52 and 54th degrees of north latitude and about 85 miles westward of the mainland, at the mouth of the Skeena river. The distance from these islands to the nearest of those islands lying adjacent to the coast of the mainland is from 60 to 70 miles across an open stretch of water—Hecate straits—sufficiently open to the Pacific ocean to share its waves and winds. This has proved enough of a barrier to prevent much intercourse by small boats between these islands and the mainland, while, until within the past year, communication by steamer was only to be had once a month. These islands, so commandingly situated off the main coast, have therefore remained sufficiently terra incognita to stimulate the imagination and create much interest.

The outline of the west coast of the islands, as shown on the Admiralty charts, is from a rough survey made by Vancouver in 1793, while cruising along the coast in a sailing ship. The east coast line is a little more accurately marked, as this was investigated in 1878 by the late Dr. G. M. Dawson, of the Geological Survey, who made a rough reconnaissance survey, the comparative accuracy of which, though a tribute to that wonderful explorer, still leaves much to be desired.

Historical.

The early voyages of discovery to the vicinity of the Queen Charlotte Islands, and in fact the entire northern Pacific coast, were all in search of a supposed northern passage for vessels from the Atlantic to the Pacific Ocean—in other words, a short waterway from Europe to China.

As early as 1592 the Spanish Viceroy of Mexico fitted out an expedition for this purpose under Juan de Fuca, who sailed as far north as Vancouver Island, although it is not known that he ever reached the Queen Charlotte Islands.

In 1639 the Court of Spain appointed Bartholemew de Fonte to command a squadron, fitted out in Peru, which sailed in 1640. In June, 1640, he records entering an archipelago of very many islands, called by him St. Lazarus, in latitude N. 53 degrees—the latitude of the centre of the Queen Charlotte group—and that he sailed for many leagues through intricate channels between islands. These may have been the Queen Charlotte Islands, but some doubt has been entertained as to the accuracy of both these early voyagers.

In 1774, Juan Perez, in the Spanish corvette "Santiago," saw and named the north cape of Queen Charlotte Islands Cape de S. Margarita, but, finding no anchorage, did not land.

In 1775, another Spanish expedition, under Bodega and Maurelle, coasted along the shores of the islands, but did not land.

In 1787, Dixon, in the British ship "Queen Charlotte," spent over a month on the coast of the islands, tracing the west coast from the north to the south end and sailing up the east coast as far as Gumshewa Inlet, and named the group of islands after his ship. He

traded with the Indians, buying furs, etc., the real object of his voyage.

During the next few years the islands were frequently visited by fur traders in British, French, Spanish and American vessels.

In 1792, Capt. George Vancouver, in H.M.S. "Discovery," arrived on the west coast of America, and during the next three years was engaged in a series of surveys and explorations which to-day form the basis of our present charts of the west coast of these islands.

Attention seems to have been withdrawn from the islands with the abandonment of the search for the "Northwest Passage," until 1852, when H.M.S. "Thetis" visited the islands on a surveying expedition, followed, in 1853, by H.M.S. "Virago," and by H.M.S. "Alert" in 1860.

"In 1852, the Hudson Bay Company despatched a party of men in the brig 'Una,' Captain Mitchell, to discover the locality from which several specimens of gold had been brought by the Indians. This was found to be on Gold Harbor, in Kuper Inlet, on the western coast of Moresby Island. The gold was found in a small irregular vein, which soon proved to 'run out' in every direction. The quantity of gold obtained by the expedition was considerable, but has been variously stated. The enterprise was soon abandoned, but the discovery for a time created quite a furore—the first gold excitement in British Columbia—and the locality was visited by a number of miners, but with no further success."

As to the amount of gold actually obtained in this first expedition, no very authentic account is obtainable; tradition makes it very large, but Major Downie, mentioned further on, who visited the locality a few years later on a similar errand, places the amount at \$5,000.

In 1859, Major William Downie, a miner, with a party of 27, in a schooner, under Capt. Robinson, went to Gold Harbor, and he records in his book "Hunting for Gold" that the party found quartz but no amount of gold. They "examined the spot where a large quantity of gold had been taken out some time before, but could not find anything worth working." Major Downie, however, reports that he found coal on Skidegate Inlet, and he is the first to have mentioned its existence on the islands. He, however, did not follow up his discovery, but soon left for the mainland.

In 1862 the "Queen Charlotte Mining Company" was formed in Victoria, and a party of men under Mr. Francis Poole—an Englishman, claiming to be a mining engineer—was sent north, landing on Skinecuttle Island in the inlet of that name, on which island and the adjoining island, Burnaby, they remained until 1864, engaged in prospecting. Their prospect shafts, etc., are still visible to-day and have been re-staked by present-day prospectors, more, it seems, on their historic fame than on the amount of mineral visible. Mr. Poole gives an account of his expedition in a book, "Queen Charlotte Islands," published in London in 1872.

As far as is known, this constitutes the sum of the recorded early prospecting ventures on the Queen Charlotte Islands. That there have been some unre-

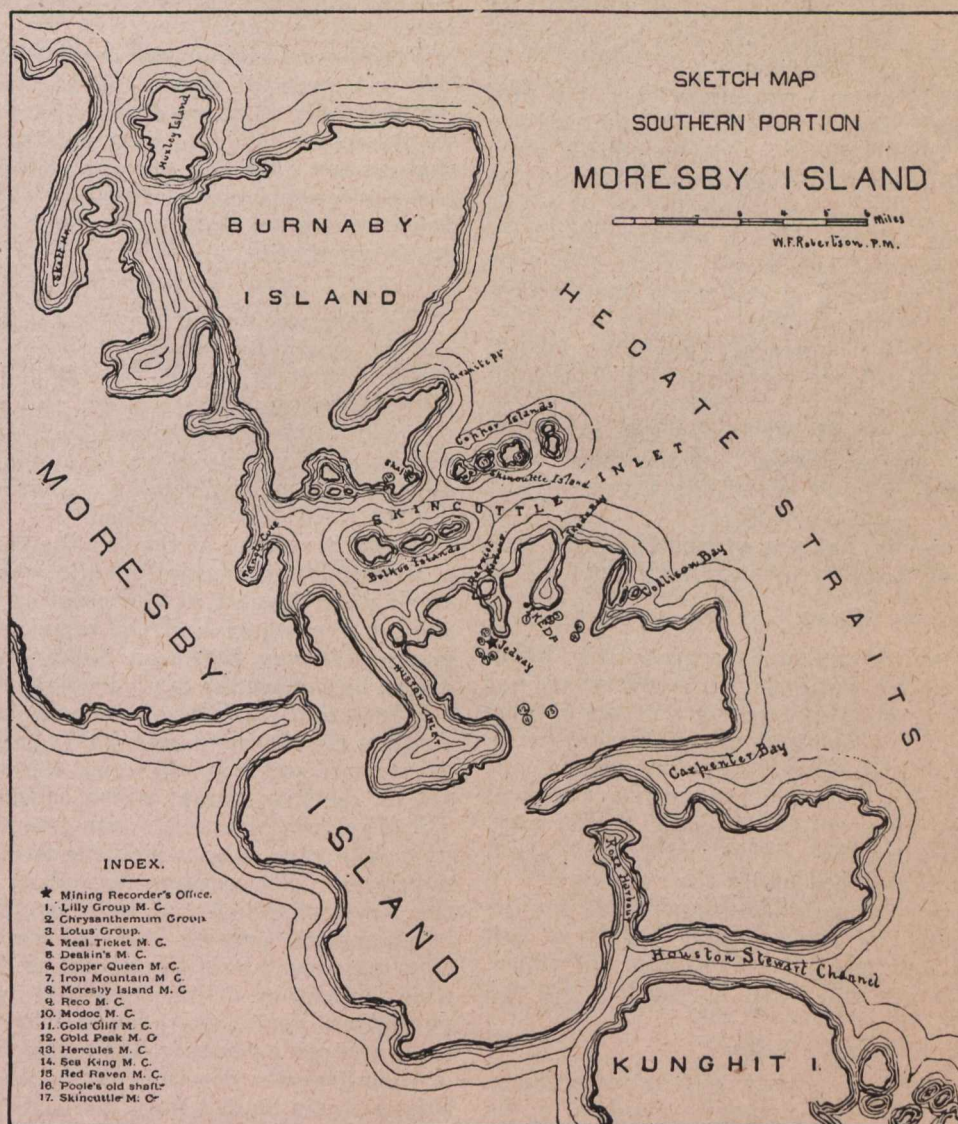
corded ventures is evidenced by the fact that at Copper Bay, some nine or ten miles south of the Sand Spit, there is the remains of an old shaft, now being unwatered and cleared out, which has been proved to be at least 100 feet deep, and of which there is no record.

Despite the fact that the early prospectors had all found enough to indicate the probability of extensive mineralization on the islands, for many years these discoveries were not followed up and little or no serious prospecting took place. It was only when attention was focussed on this northern part of the coast, by the location therein of the terminus of a transcontinental railway, that the Queen Charlotte Islands again received

began in the vicinity of the indications found many years ago, and has proceeded along the "line of least resistance," that is, in the direction from the initial point which could most easily and safely be reached by small boats.

Skincuttle Inlet was the starting point, and the majority of the claims so far staked have been in the bays or harbors opening off this inlet, viz., Huston Harbor, Harriet Harbor, Ikeda Bay and Collison Bay, with a few, and, at present, not so important localities farther south.

From Skincuttle Inlet prospecting continued north, and some important locations have been made along



ed attention from the prospector, and the more valuable discoveries that have been made have been all located within the last two years, many within the past year. The area found to contain mineral is so extensive that prospectors, having performed sufficient work on their respective claims to hold them for the year, have stopped at that and spent their time in trying to locate further mineral deposits.

As a result, it was found on examination that, with one or two exceptions, there were to be seen only surface prospects, of which no very definite future can be foretold.

As was natural, when prospecting was resumed, it

the east coast from Klunkwoi Bay to Gumshewa Inlet, in a formation quite different from that found in the vicinity of Skincuttle Inlet. As yet, all the locations have been made close to the sea shore, within distances that could be reached in a day from a boat.

The formation, which has been found copper bearing, at Klunkwoi and Gumshewa Bays, appears to continue N.W., parallel to the length of the island, and is again found on the north end of Moresby Island, an Skidegate Channel, between the Narrows, where also it is impregnated with copper, but whether the metal is here in commercial quantities has not yet been demonstrated.

Climate.

The climate of Moresby Island is particularly favorable to prospecting and to subsequent mining operations, since in summer it is never very warm, while in winter there is seldom snow or frost in the lower lands, although both are to be found on the higher mountains, the highest peaks retaining snow caps well into summer.

The west coast of the island is always dangerous to approach owing to the rocky character of its shores and the prevailing west wind, causing an ever-present ocean swell, which renders landing from a small boat very difficult except in the sheltered bays, and these bays, though quite numerous, are still uncharted and unknown save to a few prospectors, who have bought their knowledge by hard experience.

The east coast is in summer usually safe, as it is protected from the west wind by the main island, and the fringe of smaller islands along its shores affords some protection, and offers ample refuge, from all winds, the inner passage being always navigable for small boats.

The warm winds off the Pacific, striking the high mountainous backbone of the island, produce in winter a great deal of rain and in summer a mist, which, however, seldom develops into fog.

As compared with the shores of Vancouver Island, those of Moresby Island are comparatively free from troublesome underbrush.

The timber, though small for lumbering, is admirable for mining purposes, and is very plentiful, while the damp climate does away with the dangers of forest fires.

There is little soil to hamper prospecting, the surface being, however, heavily carpeted with moss.

Game.

Game on the island is unusually scarce, there being no deer, rabbits, or even squirrels, while grouse are not plentiful, which fact is strange, seeing that the natural enemies of these animals, the wolves, coyotes and foxes, are also unknown on the island. Bear are present, but not plentiful. There is no area in the province so well suited for a game reserve—the climate, topography, vegetation and position are ideal—and the island should be stocked and placed under reserve.

Nature has, however, somewhat compensated for the dearth of land game by the bounteous supply of fish found in the sea and small streams, and the clams, rock oysters, abalones and other shell-fish along the sea shore.

Skincuttle Inlet.

As already remarked, the greater amount of prospecting that has been done on Moresby Island is in the vicinity of Skincuttle Inlet, which was in 1862 the scene of early prospecting. The general geological formation of almost all Moresby Island has been placed as Triassic by Dr. Dawson, with a possibility of some Carboniferous measures. Lithologically, the formation was originally composed of limestones, shales, etc., with heavy deposits of volcanic matter from some local point of issue.

On the lower end of Moresby Island, as seen in the exposures in the various harbors bordering on Skincuttle Inlet, whatever may have been the original formation, it has been subsequently subjected to such an upheaval, with the accompanying faulting and bending, and has been so cut by innumerable feldspathic dykes that no sign of the original formation was traceable.

The dyke intrusions are so numerous and extensive as to form the greater part of the rock mass, the sedimentary rocks showing as patches, or isolated masses, without any apparent relation to the next.

The important part, however, is the existing mineral deposits rather than the geological formation, and from the number of mineral locations seen it would appear as though the whole promontory between Huston Inlet and Carpenter Bay was extensively mineralized, the locations so far made simply serving as an index to its general character. The first locations in recent years were made on the shores of Harriet Harbor, from which point prospecting extended to Ikeda Bay and Huston Inlet, and later to Collison Bay and Carpenter Bay.

The mineral claims examined in this vicinity during this trip were all within the area mentioned. Speaking generally of these claims the mineralisation is always found in the immediate vicinity of, if not in the actual contact of, limestone with one of the larger dykes and consists primarily of magnetite, with a greater or lesser amount of chalcopyrite and occasionally considerable pyrrhotite.

Ikeda Bay.

The Japanese firm of Awaya, Ikeda & Company, Vancouver, originally interested in the fishing off the Queen Charlotte Islands, has staked claims on all the hills surrounding Ikeda Bay, and this company was found to be the only concern on the island making any serious attempt at mining, employing 100 men, mostly Japanese, in mining, mining construction and prospecting the claims already staked.

At the inner end of the bay the company has erected a large and substantially built wharf, capable of receiving the largest of the coasting steamships. Connecting the wharf and the mine workings a 36 inch gauge tramway has been built, over which, on cars drawn by horses, the ore is brought down for shipment.

Lily Group.—While some development work has been done on all the company's holdings in the vicinity, the greater amount and all actual mining has been focused on the Lily group, which consists of eight claims. The development work for the group has been performed on the Lily, upon which the most available outcrop appeared. The outcrop showed up in a small creep, the water of which had washed clear an outcropping of magnetite carrying chalcopyrite. This outcrop occurs in places along the actual contact and elsewhere near the contact of limestone and an igneous rock, apparently a diorite, there being evidence of much movement and some faulting. This deposit, as is the nature of such deposits, does not assume the characteristics of a fissure vein, and is not very clearly defined, nor is it of uniform width or tenor of copper.

The development consists of what is called No. 1 tunnel, which is really an open cut in the creek bed along a contact of limestone and diorite, much altered, along which is a deposit of magnetite with copper pyrites; this has been exposed by the work done for some 30 or 40 feet, and has a width of from one to two feet. It would be difficult to estimate the copper contents of the exposed ore body, as this mineral is far from uniformly disseminated throughout the lead, occurring in bunches of quite rich ore, again scattered through the ore body, while in places the magnetite is practically barren.

Some 400 feet farther down the creek is the No. 2 tunnel, and here most of the development work has

been done, and all the mining, some 700 tons of copper ore having been shipped from this opening in 1907, assaying about 9 per cent. copper, 3.5 ounces silver, and 0.25 ounces gold to the ton. This tunnel had been driven in on the strike of and following the vein for some 160 feet in a S. 10 degrees E. direction. For the first fifty feet the ore has been stoped out up to the surface, the hanging wall, dipping at an angle of about 80 degrees, being supported by timbers, although in the tunnel proper no timber is required. The tunnel is about ten feet wide, and in places the vein-matter occupied pretty well the whole face of the drift.

In the latter part of August the face of the drift was not in ore, the vein having been temporarily lost, but when the property was again visited about two weeks later, it was found that a cross-cut had been driven to the left, towards the hanging wall, in which the vein had been again found and the main drift was being deflected to pick it up.

The ore from the tunnel is run out on cars and dumped on to an incline, at the bottom of which is a picking shed, where the ore is broken and hand sorted, the sorted ore being sacked and run down to the dock on cars drawn by horses, a distance of little over a mile, in which distance there is a drop of about 300 feet. On each car two tons of ore are carried, and one horse is required to bring back the empty car; a driver takes down two cars at a trip.

All the work about the mines is performed by Japanese. The miners working "single handed" are very efficient and compare favorably with the average white miner at this class of work, but the timbermen work very slowly.

There were employed in actual mining operations:—At No. 1 tunnel, about 14 men; at No. 2 tunnel, about 12 men; at No. 3 tunnel, about 8 men.

Chrysanthemum Group.—The same company has also staked out the Chrysanthemum group of eight claims viz.: Peony, Chrysanthemum, Rose, Violet, Cherry, Apricot, Bamboo, and Maple mineral claims. This group is located on the southwest side of Ikeda Bay, at an elevation of about 400 feet above, and about half a mile back from the sea; the approach being a gradual slant. On the Chrysanthemum mineral claim there is a large exposure of mineral, some 50 feet long and 20 feet wide and about 15 feet high, consisting of four feet of nearly solid magnetite, with a small percentage of iron sulphide, between defined walls of diorite, and dipping nearly vertical, with strike north and south.

Lying adjacent to this, and to the east, is a zone of from four to eight feet wide of magnetite of a much finer grain, but not as pure, being considerably impregnated with iron pyrites and some copper pyrites. The amount of sulphide in this latter zone is so high as to render it valueless as a commercial iron ore, whereas, as far as developed, the percentage of copper is too low to be profitably worked.

On the Rose mineral claim, of the same group, there is naturally exposed in a bluff a mass of magnetite which, on the surface, is some 20 feet high and 50 feet long. This occurs along a diorite limestone contact, the ore lying horizontal underneath the limestone. In the limestone there is a cave, which was followed in, and up, for over 50 feet, formed by the leaching of a stream of subterraneous water, and in this there is considerable hydrated iron oxide.

Speaking generally, the explorations made indicate that the group contains a great deal of mineralization,

masses of magnetite of undetermined sizes, all carrying an appreciable percentage of sulphides of iron and copper, but in no instance has copper in marketable quantity been discovered.

Lotus Group.—The Lotus group, consisting of six mineral claims and also owned by the Awaya-Ikeda Company, is located on the southeast side of Ikeda Bay, about half a mile back from the shore and at an elevation of some 500 feet above the sea. The mineral here exposed is pyrrhotite, the magnetic sulphide of iron, of which a very large body has been exposed with comparatively little work. This exposure is about 20 feet wide and is visible for a height of 20 feet, while 15 feet more depth of mineral is reported as covered by the dump made in the work done. This mass of mineral is bounded on either side by diorite country rock, the contact of which with the pyrrhotite is not sharply defined, but a gradual replacement. Included in the mineral mass are bunches of limestone, although solid limestone formation was not visible. A sample made up of fragments broken from the various large pieces of mineral on the dump assayed three quarters of one per cent. of copper, with traces of gold and silver; while an average sample broken from the exposed face assayed: Copper, 0.4 per cent., with traces of gold and silver. The work done on the group was also more of an exploratory nature than development work, and while the great mass of mineral exposed has no present economic value, it strongly emphasizes the extensive mineralization of the vicinity and encourages further exploration of the group and its surroundings.

Collison Bay.

Collison Bay lies next to Ikeda Bay to the southeast and is separated therefrom by a range of mountains forming a narrow neck of land running out into Skincuttle Inlet.

On August 26th, a gasoline launch was taken from Ikeda Bay around to Collison Bay, but, unfortunately for the writer, the prospectors interested in claims there were absent from their claims and cabins, and it was with some difficulty, and much uncertainty, that the various claims mentioned were found; therefore, it is quite possible that there may be some confusion in the names of claims seen and that some of the workings may have been overlooked.

Meal Ticket.—The Meal Ticket mineral claim and the adjoining claim, the Cash Box, are located on the north side of Collison Bay, about 280 feet elevation and about one third of a mile back from the water. The claims are reported as located by R. J. Leckie in October, 1906. On the Meal Ticket a tunnel has been driven about 33 feet, and at 21 feet in cuts obliquely a four foot lead of pyrrhotite, which continues on the left side of the tunnel to the face. The tunnel having been deflected to the right where the mineral was struck, has consequently not cut through the lead, and the thickness of the lead must be inferred from its outcrop on the surface, to the left of the tunnel mouth, at which point a fault plane is observed, along which the lead has been shifted a couple of feet north and its continuation to the east is seen in the dump in the mouth of the tunnel. A general sample of the pyrrhotite exposed was taken and assayed less than half of one per cent. copper, with traces only of gold and silver. The country rock in the vicinity of the tunnel is very much altered volcanic rock, probably originally a diabase.

(To be continued.)

COBALT—PRESENT AND FUTURE.

(EDITORIAL CORRESPONDENCE.)

Four and one-half years have come and gone since the first announcement of the discovery of valuable ore in the Cobalt district. The first authentic information, based upon letters from the Provincial Geologist, was made public in November, 1903. In the autumn of 1904 the Temiskaming and Northern Ontario Railway was running trains into Cobalt, and by the end of the year 190 tons of high grade Cobalt silver ore had been shipped to the smelters.

That the Ontario Bureau of Mines fully appreciated the importance and promise of the new camp is evident, for in the spring of 1905 swarms of prospectors were supplied with accurate geological maps of the district, along with full descriptions of the minerals and of the local conditions. Moreover, travellers were landed in the very heart of the camp in Pullman cars.

A protracted stock jobbing boom began in the summer of 1905. Within two years companies were incorporated and floated with a total capitalization of \$212,186,000. Most of these were hopeless wild-cats, schemes designed only to enrich the promoters. Nevertheless the public were bitten, badly bitten. In those days Silver Bird picked the shekels out of willing hands. Cobalt Silver Mountain blossomed and died, Big Ben boomed and "busted," and a horde of possible promoters waxed fat. Their hectic promises they exchanged for coin of the realm.

The year 1907 saw the inevitable reaction. The temporary wave of depression assisted in discrediting Cobalt with the public. The fact that steady progress was being made in the camp itself was unknown or ignored, and investors developed a thorough-going aversion to the very name of the district. However unfortunate this may have been, it was not unmixed with good. Cobalt, left to itself, settled down to work. Mine after mine was added to the shipping list, power plants and mine equipments were ordered and installed in rapid succession, and, today, Cobalt is an industrious camp.

The significance of this progress may be gauged by the following tabulated statement and by other facts adduced below.

1904. Number of shipping mines, 5; tons of ore shipped, 191; total value, \$136,217; value per ton, \$713.

1905. Number of shipping mines, 17; tons of ore shipped, 2336; total value, \$1,485,570; value per ton \$636.

1906. Number of shipping mines, 19; tons of ore shipped, 5,836; total value, \$3,573,908; value per ton, \$612.

1907. Number of shipping mines, 29; tons of ore shipped, 14,851; total value, \$5,900,000; value per ton, \$411.

For the first three months of 1908, the shipments amount to 4,490.49 tons, the estimated value of which is \$2,300,000, or an average of \$512 per ton. It will be noticed that the average value per ton shows an increase over 1907. Although much ore was shipped last year, yet it was diluted with heavy shipments of low grade ore. One factor in the enhanced value per ton during the past quarter, is the shipment of concentrates from the mills now in commission. With the addition of new concentration plants the value per ton of the year's shipments will naturally be higher. The same consideration makes the increase of tonnage

during the first quarter of the current year all the more significant.

Geological.

The most prominent minerals of commercial importance are native silver, smaltite and niccolite, all associated with a calcite gangue. The sulphides, arsenides, and antimonides of silver also occur, sometimes in considerable quantities. As a rule the veins are small, ranging in width from a fraction of an inch up to, in exceptional cases, two feet. Many of these veins, of all widths within the limits mentioned, are phenomenally rich. They are vertical or nearly so. The country rock, whether conglomerate, slate, diabase, or Keewatin-complex, is hard and compact. Only in rare cases is there any appearance of a crushed zone.

Some of the veins are associated with a fractured zone on either side. In these cases the mineral enrichment has penetrated in minute cracks and veinlets to varying distances. There are instances where the enrichment has extended from eight to ten feet from the main vein.

On all the more important properties several veins have been formed. The map prepared by Dr. W. G. Miller and Mr. C. W. Knight and issued by the Bureau of Mines shows more than 200 veins in 51 claims. Of these veins, 145 are in the conglomerate, 14 in the diabase and 15 in the Keewatin-complex. It is not well to dogmatize as to the relative importance of these formations; but, after study of their field relations, these facts are significant.

Mining.

The rock encountered in the mines of Cobalt makes hard drilling; but breaks well. Often it is "blocky." Cross-cut and drift walls stand well. No timbering is required except, of course, for shafts, chutes and floors.

In the early days the rich ore was grubbed out in any fashion from underhand surface stopes, the methods bearing as little relation to standard mining as cashing a cheque has to working for wages. Now, however, properties are being opened up in good form.

A remarkably small amount of stoping has been done in the better mines. In some cases large dividends have been paid from the proceeds of ore won in shaft-sinking and lead-stopings. This, perhaps, is the most remarkable feature of the camp.

Most of these mines are waiting for the erection or completion of their concentrating mills. The need of facilities for concentration lies primarily in the fact that many of the vein have associated with them small but visible veinlets of rich material that cannot be recovered from the broken rock by hand-sorting. Mechanical treatment is therefore a necessity. But the pay ore is not confined to the rock carrying these veinlets. Much of the country rock is enriched by microscopic veinlets and segregations. This will require fine crushing and cyaniding.

All the larger mines are working on these problems. The three mills now in operation are tentative in design—experiments on a large and practical scale. Standard designs will be the result of experience and can only be arrived at after patient investigation. But it is recognized that the whole future of the camps depends upon the successful solution of the milling prob-

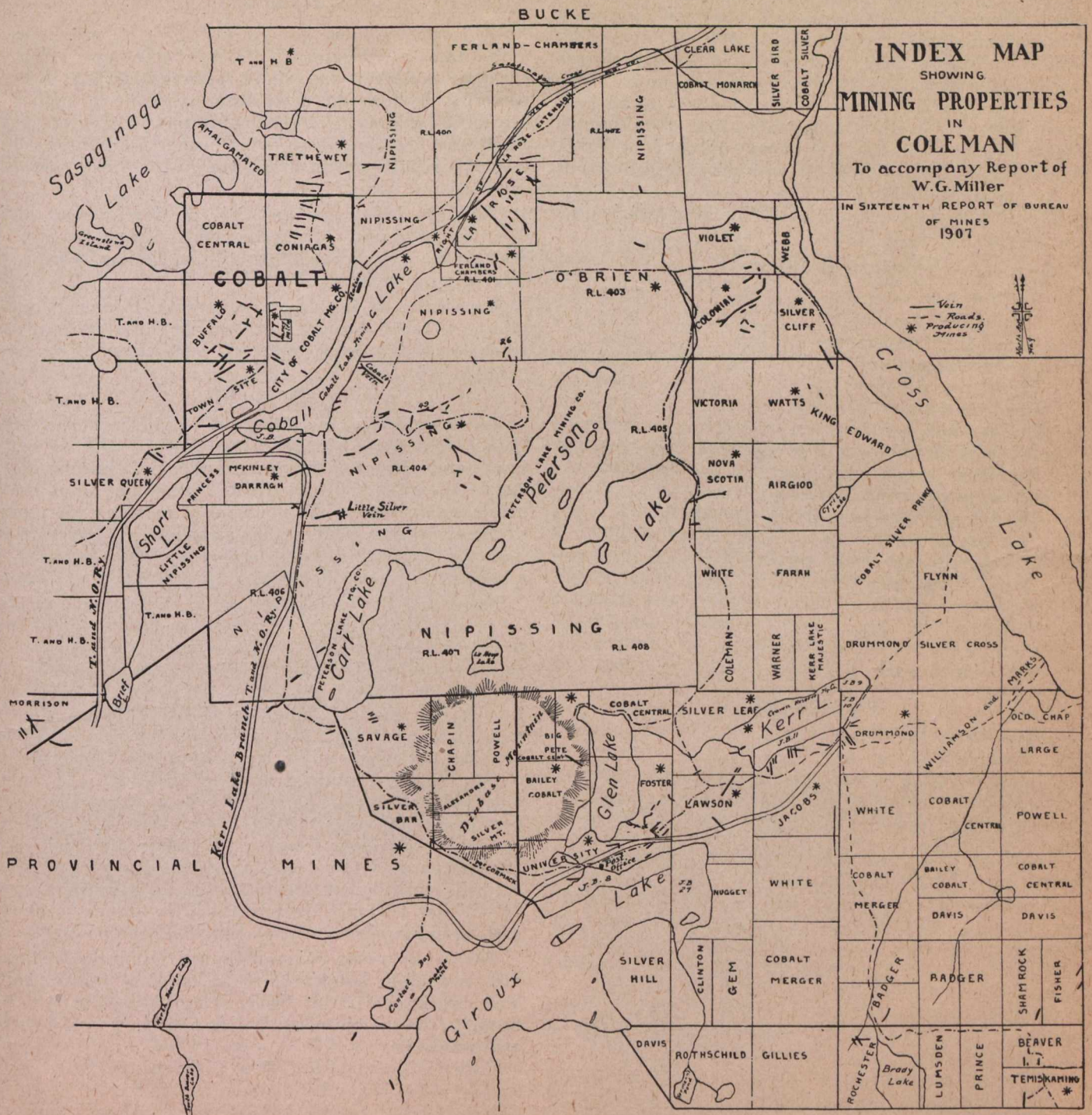
lem. Rich ore is pleasant enough when encountered; but it does not make a mine. Although Cobalt is a high-grade camp most of the high grade ore is diluted in mining with a relatively large tonnage of milling rock. So the production of the camp is increasingly dependent on its milling capacity.

What the term "high-grade" means can be understood when it is explained that ore assaying less than

ial that leaves but a narrow margin of profit, after freight and smelter charges have been paid. This last consideration illustrates the immediate need of more concentrating mills.

Market.

There are now at least eight buyers of the high grade ores produced in Cobalt. Two of these have treatment works in Canada—the Orford Copper Company at Cop-



1,500 ounces of silver per ton is known as second grade ore. Shipments averaging more than 1,500 ounces per ton have been made. Single car loads have netted the shippers as much as \$150,000 and there are pay shoots in the camp that will net \$800 per cubic foot. These, however, are by no means the rule. One has but to refer to the annual average value per ton of ore shipped to see that the rich shipments are offset by much mater-

per Cliffe, and the Deloro Smelting and Reduction Company, at Deloro, Ont. A third Canadian plant, that of the Coniagas Smelter Company, situated at Thorold, Ont., will soon be in running order. In the early days payment was made only for the silver contents, but now arsenic and sometimes cobalt are paid for. For special cobalt and arsenic ores a limited demand exists in Europe and this market is being slowly opened.

Labor.

There is this spring an overplus of workmen. Unskilled laborers predominate. Trained miners are all too scarce. The superintendents and foremen, consequently, have to do much teaching. Naturally this is a condition that time will remedy. Inefficient and untrustworthy men are being weeded out. The camp is gradually attracting skilled miners and as these settle down the mining population of Cobalt will improve. The mine employees number about 2,500. Many nationalities are represented. Before the strike there were many of the best class of Nova Scotian miners. There are fewer now but almost every day the number is being increased. British Columbia and the Western States have contributed their quota. Finlanders, Poles, Austrians, Russians, Italians, and other lesser breeds make up the polyglot total.

The official wage scale of the Mine Managers' Association runs thus:—

Surface Labor.

Surface boss, per day	\$3.25
Carpenters, per day	3.25
Carpenters' helpers, per day	2.50
Mechanics, per day	3.25
Pipefitters, per day	3.00
Head blacksmith, per day	3.75
Blacksmiths, per day	3.25
Blacksmiths' helpers, per day \$2.50 or	2.75
Engineers, per hour,30
Firemen, per hour25
Head ore sorters one only at each shaft or ore house, per day	2.75
Ore sorters or cobbers, per day	2.50
Hand miners, per day	2.75
Teamsters, per day	2.50
Hoistmen, per day	2.75
Cage or bucket tenders, per day	2.25
Other surface labor, per day	2.25

Underground.

Timbermen, per day	3.25
Machine men, per day	3.25
Machine helpers, per day	2.75
Cage or bucket tenders, per day	2.50
Other underground labor, per day	2.50

Board will be charged at the rate of \$4.20 per week or 60 cents for every day.

Working days shall consist of 10 hour shifts except on Saturday, when the total time shall be 16 hours, 9-hour day shift and 7-hour night shift.

Twenty-five cents per day extra to be paid machine men and helpers sinking in a wet shaft.

At a meeting of the Mine Managers' Association held on December 17th, 1907, the following amendments to the rules of the Association were passed:

"That the scale at present in force be adopted as a maximum scale until further notice, for adults over 21 years of age, and that contracts and bonuses be allowed, and that the rate for blacksmith helpers be \$2.50 or \$2.75 per day optional with the employer."

The mines are exceptionally dry and generally well ventilated. The pay is good, far better than obtains east of British Columbia. There is no general work on Sunday. Board as a rule is excellent and accommodation comfortable. In some cases the managements offer special inducements to married men in the way of assistance in building cabins and houses.

Places of worship there are in abundance. In the two schools there are 450 pupils registered. The average attendance is 350.

Briefly, Cobalt is, from the workman's point of view a desirable camp. It is improving. It requires only the abolition of the "blind pig" to render it a model of decency and decorum.

Equipment.

Steam plants have been installed in 80 properties, with a total boiler capacity of 8,408 horse power. There are two producer gas plants aggregating 425 horse power. Fifty-four air compressors capable of delivering in the aggregate 36,400 cubic feet of free air per minute are in commission on 44 properties. Three concentrating mills are in operation and two are nearing completion.

Plans are being matured for the development and distribution of power from Ragged Chutes on the Montreal river. By means of this or a similar scheme a large saving could be effected.

A majority of the mines co-operate in matters pertaining to labor through a central Employment Bureau, where record is kept of every man engaged or discharged.

General.

Topographically the situation of the mines of the Cobalt district is singularly beautiful. Dotted over knolls and hills, or on the margin of one of the numerous small lakes, the shaft houses and other buildings have commanding views. The custom of painting the name of the operating company on many an office or power house in letters large and legible has been followed—a boon of no small dimensions to the uninitiated visitor.

The actual producing area of the district is comprised in a rectangle measuring roughly 4 by 2 miles. The town of Cobalt, on Cobalt Lake, marks the centre of this rectangle. In many respects the townsite is excellent. The hill on which the town is built slopes gently towards the northwest side of the lake and affords good drainage. But the exigencies of hasty birth and rapid growth have militated against a due regard for certain of the conveniences of civilization. The noxious incinerator and the malodorous garbage pile make pestilential appeal to the public nose whenever the thermometer rises above freezing. However, Cobalt is now an incorporated town with an enterprising mayor and council, clothed with the power of issuing debentures. It will not be long, therefore, before unseemly smells and offensive sights will be things of the past.

For the accommodation of the travelling public there are two fair hotels. Three Canadian banks have branches in the town. There is no licensed saloon, although (the saloon being the least of three evils) there well might be.

Both Haileybury and New Liskeard, respectively 5 and 10 miles beyond Cobalt on the T. and N. O. R. R. are residential towns. Many men whose business hours are spent in Cobalt take advantage of the excellent train service to have their homes in the two northerly towns. Toronto is only 330 miles away—a night's run on through Pullman sleepers.

Where two or three are gathered it is even betting that the unsurveyed district south of Lorrain is a point under discussion. It may therefore be well to conclude this hasty summary with a few words bearing in this new field.

The district, for which no distinctive and comprehensive name has yet been evolved, lies sixteen miles southeast of the town of Cobalt and from two to three miles west of lake Temiskaming.

Late in March of this year the district was visited by a contributor to the "Canadian Mining Journal," who looked over two properties upon which the bulk of the work had been performed. The Keeley (H. R. 19) is one of these and the Haileybury Silver Mining Company (H. R. 16) is the other.

The Keeley vein, two to six inches wide, is opened near the northwest corner of the forty acre lot. The vein has been worked by open cut to a length of forty feet and a maximum depth of fourteen feet. The strike of the vein is E. 28 degrees S. Massive smaltite and,

possibly cobaltite are present. Of wire silver, contrasting with the leaf-silver of Cobalt, there is a good showing. Quartz occurs in the gangue. About two hundred and twenty six bags of ore were ready for transportation.

On the property of the Haileybury Silver Mining Company the vein strikes S. 20 deg. E., dipping 70 degrees east, and is opened near the northeast corner. At the bottom of the forty foot shaft massive smaltite, associated with niccolite and a little native bismuth was found. Calcite, a chlorite, and pink feldspar make up the gangue. In places the vein is five to six inches wide.

Deep snow made close inspection of the district impossible. It is assumed, however, that the country rock of both veins belongs to the Keewatin series.

THE MECHANICAL EQUIPMENT OF THE OTTAWA MINT.

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

(Continued from May 1 Issue.)

Annealing.—The blank annealing furnace is heated in the same manner as the one used for annealing the fillets; but the arrangements for passing the work through is different. The blanks are fed into the machine through

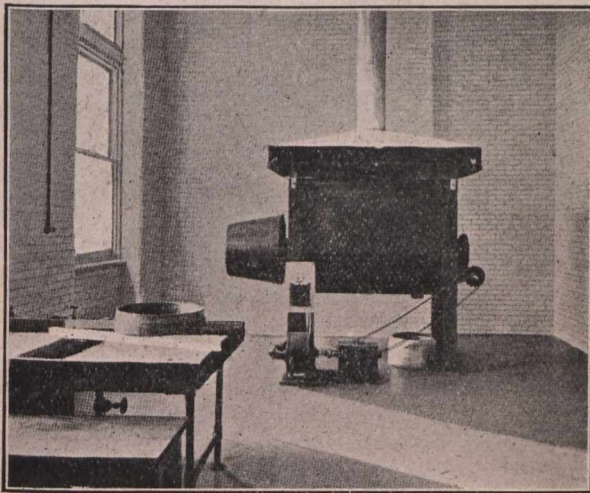


Fig. 15.—Rotary blank-annealing furnace and sawdust-drying plate.

a sheet iron hopper. This hopper is attached to, and revolves with a cast iron hollow cylinder, on the internal surface of which is cast a hollow thread of very coarse pitch. The blanks follow this thread, moving forward slowly as the cylinder revolves, until they fall through an opening which communicates with a chute leading into a vessel containing water. The flame surrounds the cylinder, which is kept at a red heat during the process of annealing. The time taken by the blanks in their passage through the furnace is regulated in the same manner as in the fillet annealing furnace. The blanks are cooled before they come into contact with the air, and oxidation is thus prevented.

Blanching and Cleaning.—After having been annealed, the blanks are cleaned in a weak solution of sulphuric acid; washed and dried; they are then ready to

receive the impression from the dies. The solution of sulphuric acid is contained in a copper tumbling barrel, which revolves at about 40 revolutions per minute, and is so designed that it can be tilted for filling and emptying. After treatment by the acid, the blanks are washed in tanks containing hot and cold water, and are then placed in the drying drum with beechwood saw dust. Beechwood is used for this purpose because it contains resin, or other ingredient likely to discolor the blanks or make them adhere to one another. The drying drum is hexagonal in section, the sides made of hard wood, and the ends and attachments of brass. This drum revolves at about 25 revolutions per minute, and the blanks and saw dust remain in it for about ten minutes. They are then tipped into a circular sieve, and shaken

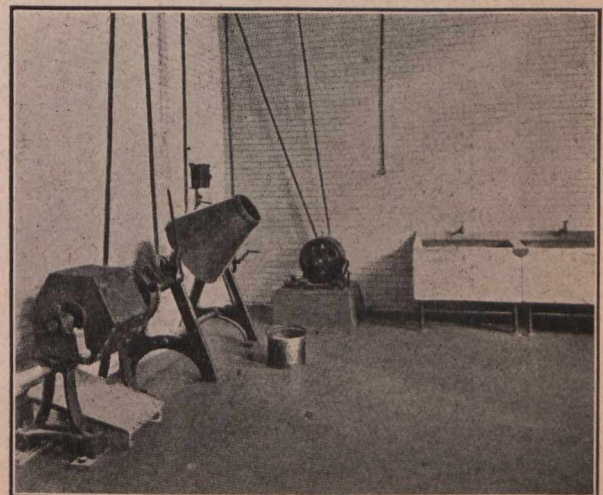


Fig. 16.—Tumbling barrel, drying drum, and washing tanks in Annealing Room.

over the hot plate. The mesh of the sieve is large enough to allow the saw dust to pass freely through the bottom, but small enough to retain the blanks. The hot plate consists of a flat sheet iron pan about 6 feet long,

4 feet wide, and with sides 6 inches high. It is supported on four iron legs, and stands about 3 feet 6 inches from the ground. Beneath the pan, and in close contact with it, is a steam coil, by means of which the saw dust is dried, and may be used over again.

Coining.—The coining presses, of which there are three, are of the type in which the pressure is given to

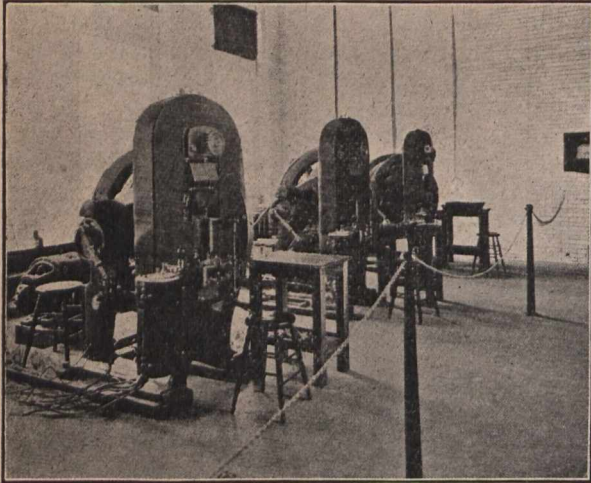


Fig. 18.—Coining presses.

the coins through levers and toggle joints. The hard steel knuckles of the toggle joints are of exceptionally large dimensions, so that coins can be struck at the rate of 100 per minute without any danger of them becoming overheated. Each press is driven by its own motor, and arranged so that the drive can be made either through a belt or gearing. The number of blows struck per

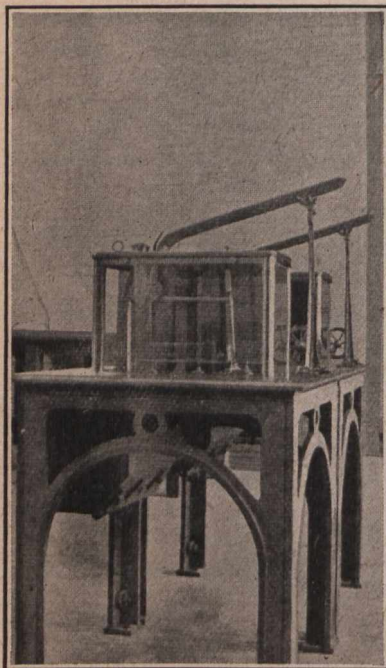


Fig. 15.—Automatic Weighing Machines,

minute can be varied from 30 to 100 by means of a 5-step controller.

The top and bottom dies move up and down, the collar plate remaining stationary. The blanks are placed. They are fed to the dies, automatically, by steel feeding fingers, which take one blank at a time from the feed

tube, and drop it into the collar, at the same time pushing the previously struck piece into the delivery tube. in the feed tube by the operator, in piles of about 30.

Hitherto, when coining, it has frequently been the case that, for some reason or other, a blank has not been placed between the dies at the proper moment. This may occur through the feed tube being empty, or through a bent blank sticking in the tube. In every case the dies have come together "clashed," and have been rendered useless. It has been known in a large mint for as many as 12 dies to be "clashed" in one day; representing a cost of not less than \$22.00, over and above the time taken in changing the dies. As a general rule a pair should be capable of striking about 80,000 pieces before becoming unfit for further use. In order to prevent the possibility of "clashed" dies, a device has been adopted in these presses, by means of which the dies do not come together unless a blank has been placed between them. This device consists of a special clutch between the fly wheel and the main shaft, which is actuated by an arrangement of levers connected with the feeding fingers. In the event of a blank not being fed to the dies, the clutch is released, and the column holding

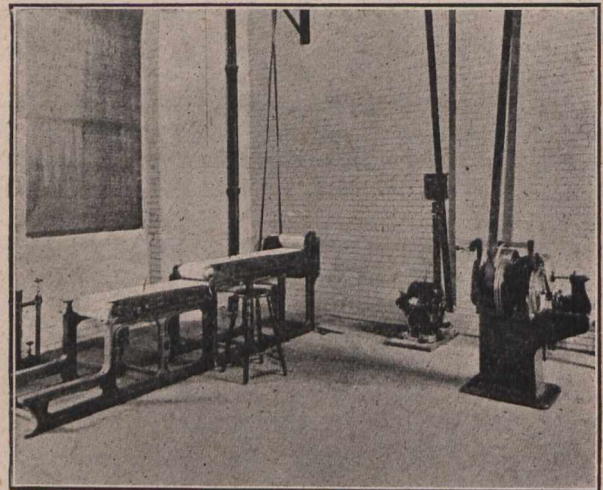


Fig. 19.—Overlooking and defacing machines in Weighing and Examining Room.

the top die is stopped instantly, at its highest point; the fly wheel continuing to run idle on the main shaft. This attachment takes up no extra floor space, and is exceedingly neat and effective. By its means also, single strokes can be made by the press; a very convenient arrangement, when setting a new pair of dies.

the delivery tube and delivered to a bowl placed in the front of the press. The finished coins are forwarded to the examining department, where they are subjected to various tests before they are issued.

Testing.—In the case of gold coins and 50 cent and 25 cent pieces, each one is weighed separately on an automatic weighing machine. The 10 cent and 5 cent pieces are weighed in groups, in a hand scale, against a standard dollar weight; while the 1 cent pieces are weighed, in a hand scale, against an avoirdupois pound, which should contain exactly eighty of them.

The automatic weighing machines are very delicate instruments, the weighing being so accurate that the beam, when fully loaded, will turn with .01 of a grain. Each machine will weigh 20 coins per minute. The coins are fed into a hopper by the attendant. One coin is then pushed automatically on to a flat pan attached

ta one end of the beam; where it remains for 3 seconds; after which it is pushed off by the succeeding coin. During the time it is resting on the pan its weight determines which one of the three shutes it shall drop into when it is pushed off. These shutes lead to three boxes; one for those coins that are too light, a second for those that are too heavy; while a third receives those that are of the correct weight. The latter are taken to the overlooking machine, where they are spread on a travelling band, and carefully examined. Any that are found to be discolored or otherwise imperfect are picked out. The band travels over rollers, and, on reaching one end of the machine, the blanks are turned over automatically, so that the other side of the coins may be examined.

All the gold coins, and the 50 cent and 25 cent pieces that have successively passed through the foregoing tests, are then rung, singly, on an iron block, to find if they have the correct ring, and are not "dumb."

Those coins which have been found to be light, or heavy, or "dumb," or discolored, or in any way imperfect, are destroyed in the defacing machine, and re-melted. The defacing machine is of similar design to the marking machine, but whereas the groove in the disc of the latter is a plain one, that in the defacing machine is divided into a series of notches, so that the edges of the defective coins are notched all the way round.

The good coins are delivered to the office, where they are counted into bags by the telling machine. This machine automatically counts, and delivers into a bag, any number of coins, as required. When the desired number has been delivered, the machine stops, until the trigger is again pulled for the next bag. Any number of coins may be counted on this machine, from 100 to 2,000; and any size of coin, from 50 cents to 5 cents.

In addition to the machinery mentioned above, there are several auxiliary machines, for various purposes, throughout the coining department. Weigh bridges, for weighing truck loads of raw material; bullion balances, of various capacities, for weighing the metal during the processes of coining; automatic and hand trying cutter, etc.

For the storing of bullion the Mint is equipped with three strong rooms; one in the Mint Office, one in the Melting House, and one in the Rolling and Cutting Department. These strong rooms are fire and burglar proof, and are fitted with doors, each of which has four combination locks, controlled by triple time clocks, and arranged so that no door may be opened without the presence of at least two officials.

A refinery will shortly be erected in connection with the Mint, in which gold will be treated by the electrolytic process.

MANGANESE IN DEEP-SEA DEPOSITS.

Manganese, as oxide or hydroxide, exists in all deep-sea deposits, sometimes as grains in the ooze, sometimes as a coating upon pumice, coral, shells, and often in the form of nodular concretions with some other substance as a nucleus. The origin of these nodules is doubtful. Their derivation from the subaqueous decomposition of volcanic debris is the basis of the best substantiated theory. The nodules occur in close association with altered volcanic materials, and most abundantly in connection with red clay of similar origin. In composition the nodules vary widely, ranging from 4.16 to 63.23 per cent of manganese oxide.

STRIKE OF GOLD MINERS AT GOLDBROOK, N.S.

On December 18, 1907, the Great Bras d'Or Gold Mining Company, operating at Goldbrook, N. S., posted up the following notice at its mines:

On January 1st, 1908, the following scale of wages will go into effect at our mines at Goldbrook, N. S.:

Miners	\$1.75
Muckers.....	1.50
Laborers....	1.25
Engineers, 12 hours..	2.00
Amalgamators, 12 hours.....	2.25

Board can be had at the company's cook house at \$3.00 per week.

The company had been paying the miners \$2.00 per day, but decided to reduce the wages upon being informed that this rate was 25 cents per day more than the other gold mining companies of Nova Scotia were paying. On January 1st, the miners told the manager that they would not work for \$1.75 per day, and it was agreed to continue to pay \$2.00 a day to the men who had worked as miners up to that date, but miners who were employed as such after January 1st, would be paid the new scale of wages. On February 20th, when the men received their monthly wages, one miner objected to being paid at the rate of only \$1.75 per day. The company claimed that not having worked as a miner before January 1st, having been employed previously as a mucker or helper, he was not entitled to any more. On February 21, the employees made a written demand that the following schedule of wages go into effect at once.

Miners	\$2.00
Helpers..	1.75
Muckers ..	1.50

On being told by the manager that this request could not be granted, the men to the number of 22, left the camp, and were paid off the next day. Work was resumed at the mines on March 2nd, some of the old employees having returned at the \$1.75 rate, while the places of others were filled.

PRUSSIAN GOVERNMENT COLLIERIES.

The Saarbrucken Collieries, operated by the Prussian Government, produce annually 10,000,000 tone of coal. The system of working is almost entirely the filling-up or stowing method. The introduction of this method has lessened the number of accidents from falls of roof and side materially. Within ten years accidents of this kind have been reduced from 1.54 per 1,000 to 0.61 per 1,000.

The washeries waste, boiler clinker, and other waste materials are flushed into the mine by a current of water in steel and cast-iron pipes. Along with this practice, the longwall system of working is being more extensively used. Timber is saved and the danger of mine fires is largely removed. In spite of this, the following equipment of rescue apparatus is held ready for use: 41 "Draeger" apparatus, 28 "Giersburg," 29 "Walcher-Gaertner," 12 "Neupert" pneumatophores, and 36 smoke masks of various types, together with 170 electric accumulator lamps.

The number of working days for the years 1905-6 was 299.9, the daily output per man, 0.778 ton. The colliery coal consumption was 1,390,747 tons, or 12.9 per cent. of the output.

NOTES ON FUEL ECONOMY AND ITS APPLICATION TO NOVA SCOTIA.

By A. A. HAYWARD, Halifax.

(Continued from last issue.)

It is only within a few years that large types of gas engines have been on the market. To-day the modern gas engine is the cheapest and most efficient power known. By the Mond producer process, about 15,000 feet of gas can be generated from one ton of coal, or 15 times more than by ordinary methods. This gas would have calorific value of 22,500,000 B.T.U. and a heating power of 26,400,000 B.T.U. Of this thermal heat an ordinary steam engine only succeeds in turning into useful energy about 6 1-2 per cent. or 1,616,000 B.T.U.; while a gas plant having a combined efficiency of 25 per cent. and a mechanical efficiency of 85 per cent. multiplied by 25 per cent. would secure in useful energy 21.25 per cent. at the engine shaft, thus showing an efficiency of nearly 300 per cent. over the ordinary steam engine. Mr. Byron Donkin says it has now been proved by experience that a good gas engine turns about double as much heat into work as a good steam engine.

In operating a modern gas producing plant of large unit, less than one pound of coal is required to produce one B.H.P.H., while to obtain the same results by a steam plant would require from 2 to 6 pounds, depending largely upon the size and kind of plant.

A series of tests made of gas producers and engines using 1 1-4 pounds of coal per H.P.H. show the yearly cost of operation a gas plant to be as follows:—

Coal at \$3.50 per ton, cost of one horse-power..	\$5.83
Coal at \$4.00 per ton, cost of one horse-power..	6.67
Coal at \$5.00 per ton, cost of one horse-power..	8.33

A further illustration of fuel economy is shown by a 500 horse-power plant used for generating electricity:—

500 horse-power unit.	
Fuel cost, per ton	\$2.36
Consumption indicated horse-power, lbs.	.78
Consumption per kilowatt hour, lbs...	1.40
Cost of fuel per indicated horse-power hour04
Cost of fuel per brake horse-power hour	.055

Result of a test made by the United States Geological Survey of No. 2 Wyoming lignite:—

Hours of duration	30
Average power required to drive auxiliary machinery	16.4
Equivalent in pounds in dry coal per hour	51.2
Total dry coal used in producer during the test	10,968
Total refuse in coal	2,509
Total coal consumed	8,449
Dry coal consumed per hour in producer	365.3
Equivalent to dry coal used by the producing plant	416.5
B.T.U. from pound of dry coal	10,656
B.T.U. from dry coal as fired per hour	3,892,600
Total gas produced at 62 degrees and 14.7 pounds pressure	447,700

Total gas produced per hour	14,923
Total cubic feet gas per pound dry coal consumed in producer	40.9
Per pound equivalent dry coal used by producer plant	35.8
Average electrical horse-power available for outside work	184.8
Average electrical H.P. at switchboard	201.2
Brake H.P. developed at engine	236.8
Efficiency—	
Of conversion and cleaning gas58
Of producer plant50
Dry Coal Per H.P. Hour—	
Pounds consumed in producer per electrical horse-power available	1.98
Pounds consumed in producer per electrical horse-power at switchboard....	1.82
Pounds consumed in producer per break horse-power at engine	1.54
Pounds equivalent used by producer plant per electrical horse-power	2.25
Pounds equivalent used by producer plant per switchboard	2.07
Pounds equivalent used by producer plant per break H.P. at engine	1.76
Composition of Coal—	
Moisture	9.44
Volatile matter	35.02
Fixed carbon	34.82
Ash	20.72
Sulphur	3.91

The remarkable results obtained at the fuel testing plant of the United States Geological Survey at St. Louis supply abundant material for serious thought. While the report may be understood by engineers and those accustomed to technical detail, these details are somewhat confusing and obscure to the ordinary layman. The accompanying scale of comparisons will assist in making the results fully understood (paper by Mr. Marius R. Campbell).

Seventy-two tests were made under practical conditions, and made from samples of coal ranging in quantity and moisture from the lignites of North Dakota to the best coal of Virginia and Pennsylvania. Among the noticeable features of these tests was the absence of smoke. The sulphur contents varied from 1 to 7.36, and the ash was as high as 23.44. Notwithstanding these high percentages, satisfactory results were obtained. In fact, coal carrying a much higher percentage of ash and sulphur could have been used, providing the coal was not so fine as to pack in the producer. Lump coal gave no better results than fine, while under a steam boiler the size of the coal was of much importance.

The table shows the results obtained by the producer and steam plant, the first block in the diagram being the standard representing one electrical horse-power per hour. The block in the left-hand column shows the frac-

tion of an electrical horse-power that was produced by one pound of coal as fired under the boiler. The second column represents the fraction of an electrical horse-power per hour, generated by one pound of coal as fired in the producer; while the relative efficiency of the coal used in the producer plant, as compared with that used under the boiler, is shown by the size of the blocks and the ratio in the central column.

It will be seen that by each test one pound of coal used in the producer developed more power than the same coal fired under a steam boiler, and in some cases more than three times as much, the ratio running from .96 to 3.34.

Another striking feature of the test is the result obtained from peat fuel. More power was generated in the producer with peat than from the best Virginia coal used under a boiler. The peat gave values of .299, .308, .355, .388, .330; while by the best coal only .287 of an electrical horse-power was obtained under the boiler.

The report admits that, had the steam been compounded and condensed, much better results would have been obtained. But improvements could have been made in the producer plant. As the tests were made with a producer using forced draft, the tar was not consumed, but saved as a by-product. It must thus be seen that this style of producer was not the best for soft coal, as one consuming the tar would generate a larger volume of gas, and would recover as a by-product a large percentage of sulphate of ammonia.

A test at St. Louis of Ohio coal demonstrated that this coal, when gasified and burned in an internal combustion engine, producer 286 times as much energy as when the same coal was consumed under a boiler.

An average of fourteen separate tests made from thirteen different grades of coal shows that to generate one electrical horse-power by gasified fuel and internal combustion required 1.70 pound of dry coal per hour, while to create the same energy by external combustion, it required 4.29 pounds per hour; showing an actual waste, by the use of steam, of 2.59 pounds of coal per hour electrical horse-power. These results are remarkable when we consider the quality of coal used.

During the same year the coal mines in the State of Ohio produced 6,597,600 tons of coal. Of this amount 4,880,740 tons were used for power purposes, and excepting the efficiency of gasified fuel and internal combustion over external combustion to be but 50 per cent., the saving by the former method would equal 2,449,370 tons. This, at \$1.60 per ton at the mine, would mean an annual saving to the State of Ohio of \$3,904,592. How strongly this result reminds me of the situation in Nova Scotia!

At a test made of the Mond gas producer plant at Heyshan, using one producer and running two engines at full load, the I.H.P. was 509, the B.H.P. 432, and the full consumption 2,213 pounds; equal to 1.09 pounds per I.H.P. per hour and 1.28 pounds per B.H.P. The fuel used was small bituminous coal.

These tests are of much value, as their results, together with other valuable data that are being supplied from many different sections, point strongly to gasified fuel and the internal combustion engine as our future heat and power.

So near do the conditions in Ohio approach those existing in Nova Scotia that we are justified in accepting the economic results as final, and can apply the same line of determinations to our own situation. During the same year the mines of this province produced 5,

800,000 tons of coal, which had an average value of \$2 per ton at the mines, or a gross value of \$11,600,000. To this sum an additional \$2 per ton, or \$11,600,000, should be added to cover costs of transportation, handling, commissions and middlemen's profits, making a grand total of \$23,200,000, the sum actually paid by the consumer for 5,800,000 tons of coal. Of the 5,800,000 tons produced, 60 per cent., or 3,480,000 tons, were used for power purposes, the balance, 40 per cent., is represented by 2,320,000 tons consumed for domestic purposes. Of the 3,480,000 tons used for power purposes, about 9 per cent. of the actual thermal energy of the coal was utilized, while from the 2,320,000 tons of domestic coal the thermal heat utilized did not exceed 5 per cent.

If the amount of coal required for power had been converted into Mond gas and burned in an internal combustion engine (one having a combined efficiency of 20 per cent), 1,555,000 tons would have been sufficient to accomplish the same results as was secured from the 3,480,000 tons, while a large amount of economy would have resulted in our domestic requirements, as 1,150,000 tons would have been sufficient to accomplish the same results as we obtained from the burning of 2,230,000 tons, thus showing that by the use of gasified fuel, 2,705,000 tons of coal would have been sufficient to accomplish the same results as those secured from the 5,800,000 tons, our annual output. This would have resulted in a saving to the Province of Nova Scotia of 3,095,000 tons of coal, having a cash value at the mine of \$6,190,000.

Continuing our economic policy, if we should add to our gasification plant one for the recovery of the sulphate of ammonia contained in the coal, the yield of which would have been about 80 pounds per ton, the total recovery at the present market price would have resulted in a net profit of \$2,900,000. This sum deducted from our coal bill would leave a balance of \$3,290,000, the net cost of our annual bill for heat, light and power, delivered in the gas holder at the mine and ready for delivery, as against \$11,600,000, the present cost.

That we are approaching a period of economic transition, no one familiar with our national aspirations will question, and no subject should receive more serious consideration than the generation and distribution of the heat and power contained in our fuel deposits. The scientific investigator, capitalist and consumer are all beginning to recognize their individual responsibility. The latter expects the former to utilize a far larger percentage of the constituents combined in the raw material, and to do so on a scale of efficiency that will enable the finished product to be delivered at his door by the most direct means and at the lowest possible cost.

When these principles have been fully recognized and firmly established as a basis of our industrial life we shall apply them directly to our fuel deposits by establishing large central plants at collieries for the gasification of coal, and the recovery of the valuable by-products they contain. We shall construct transmission pipe lines to all points of large consumption. We shall further extend our economic principles by individual distribution of gas fuel for all domestic purposes, while by the adoption of gas engines we shall generate and distribute electricity for power and light. We shall then avoid paying tribute to transportation companies, teamsters, coal handlers, middlemen and the various other sources of expense we have now to contend with, all of which increase the cost of our fuel beyond its original cost of production; and above all, we shall escape paying a proportionate part of these various profits on

ashes and stone from which we now receive no benefit. We shall then receive a far larger equivalent in heat for the money expended. Power will be supplied in large units at prices that would defy the competition of Niagara. The smoke and dirt nuisance would be entirely eliminated, while our morning slumbers (for under such ideal conditions they would be peaceful and prolonged) would not be disturbed by harrowing dreams of neg-

lected duty due the furnace, or the discordant cry of "coal, coal" by the hawker.

When the morning is bright with realizations of such ideal conditions, Halifax will be in a position to offer the manufacturing and industrial world advantages unequalled on the Atlantic seaboard, receiving as she will, heat, light and power from the mines of Pictou County at prices that will defy competition.

COLLAR AT No. 1 ALLAN SHAFT.

By H. E. COLL, Stellarton, N.S.

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

When sinking was commenced at No. 1 Allan Shaft in April, 1904, it was found that a considerable thickness of water-bearing sand, overtopped with clay, had to be penetrated before reaching rock. It was decided to use temporary timbering and continue sinking, leaving the permanent work to be put in when the sinking was finished. Consequently the first of June, 1906, we were ready to commence work on the following proposition:—

The original shaft opening, 12 feet by 24 feet, had been timbered with 10 inch by 10 inch hemlock, having 4 foot 10 inch centres, for a distance of 23 feet. At this point the walls had given way and the remaining distance of rock had been skin timbered and piled laterally. The shaft opening had twisted and was out of line, the south and east sides being closed in over 18 inches. On the surface the ground was broken back for a distance of 20 feet on the east side, the west side being fairly good. Two 14 inch by 30 inch timbers had been placed across the shaft, and the weight of the headframe rested on these. This headframe was 40 feet high and built heavy enough to hoist two tons weight.

The shaft was making an average of 30 gallons of water per minute, and this had to be handled daily, so that it was necessary to carry this headframe independent of the shaft timbering and collar work, and until the top section would be placed, the guides and shaft timber could not be moved. Commencing 300 feet from the south end of the shaft an incline was driven towards the shaft, so as to tap the shaft opening 20 feet below the surface. The material was handled by a horse and dump car, having a capacity of one cubic yard of material. This incline was cut from the surface and securely timbered. When the south end shaft timbering was reached, a turning sheet was put in and the material was taken out to that depth all around the shaft for a width of 5 feet 4 inches. This was done by benching, and as soon as sufficient space was gotten all around the shaft, a set of round sticks was placed, "log cabin fashion," the ends projecting 2 feet 6 inches, and drift bolts being driven at the corners and centres, on both sides and ends. As fast as space was made another set was entered from the bottom and packed into place. Braces were then placed on the corners and centres between the logs and the square shaft timbers. In this manner we reached the bottom of the incline, or 20 feet from the surface, but the ground on both east and west sides had broken and we were carrying the weight of the walls on our timber. The shaft timbers were then taken out, and as the 28 foot span was too much for our side logs to carry, we placed cross sticks on the shaft centre line, in

such manner as not to interfere with permanent timbering coming up. The next 20 feet was a sandy mud that, if given an opening, would run like water. After two attempts we abandoned further sinking until we could get piles driven, as the surface had begun to break back a distance of 30 feet. In preparation for such an emergency, we had a pile driver and piles on the ground, and work was immediately commenced on the northeast corner by driving a pile between the projecting ends of the logs. Then a row was driven down the side around the south end and so on to the northeast corner again. The piles were yellow pine creosoted, 40 feet to 50 feet in length, and were pointed with steel shoes, made of one-quarter inch plate. All told, one hundred and twenty-four piles were driven around the shaft, and it was decided these should be sufficient to enable us to continue sinking. In order to take the weight of the "log cabin" timbering, we put in concrete "dead men" 50 feet back from the shaft corners and anchored the timbering by 1 inch wire rope. A tension of about eight tons was put on the four ropes. Before excavating below this timber 3 inch by 6 inch by 5 foot piles were driven at an angle of 10 degrees from the vertical, thus bringing the lower ends against the piles. We then took out sufficient muck to get in a set of timbers. In this way we secured ten more feet. But at this point we found that nearly half the piles that were driven had sheared and the upper end had then driven down inside the timber line. By this time the ground was broken on both east and west sides for a distance of 30 feet. As fast as the cracks opened up they were grouted full, but a rain at any time during these 24 hours would have probably caused serious trouble.

Fourteen inch round timbers were hastily swung into place, and braced across the shaft. These, of course, had to be kept clear of the No. 1 compartment, and the vibration of the headframe when water was being hoisted required them to be watched and tightened almost hourly. After placing ten braces we again began excavating. We had to cut out the misplaced piles, drive plank piling and place the round timbers as closely following one another as possible, and in fact the different jobs overlapped each other. Most of this work was done below the surface of the muck, in order to prevent it draining out from behind the walls. The last nine sets of wall timbers had to be spliced, as the plates were too long to swing between the bracing, and this required centre bracing for each splice. These were placed in thirty-six hours, at the end of which time the shaft was squared up on rock at a depth of 52 feet. It was recognized that no time was to be lost, as the timbering was showing

grave signs of strain. The inch ropes were buried out of sight in the wood, and three of the cross braces were split. Fortunately everything and everybody was ready, and before all the muck was out of one corner the concrete was pouring into the other. As soon as a foot deep layer was on, three sets of yellow pine shaft timber were placed and braced at the corners and centres against the wall timbers. On top of this foot of concrete, and each succeeding foot, four 56 pound steel rails were placed one foot from the shaft plates and ends. These rails were 16 and 22 feet long, the shorter ones being placed at the ends and overlapping the longer ones. We found that the removing of cross braces, placing of shaft sets and rails gave sufficient time for the concrete to set.

The following means were used in handling the material:—

For hoisting water the main sinking engines were used, and when not utilized for water a muck bucket was hung and so used for mucking out for the timbering. The most of this, however, was done by the original sinking engines: a pair of 10 inch by 12 inch second motion Lidgerwoods. The rope led from the drum to the foot of a 30 foot derrick, which would swing one hundred and eighty degrees. A shackle and pin fastened to either a muck bucket or a hitch chain, depending on what was being handled. All the timber and rails were handled directly to place by this rope. The water was carried by troughs to inside the shaft line, until the stream would be overtopped by the concrete. At all times the concrete was kept thin enough to penetrate any crevices or open place behind the log cabin timbers, and "men" constantly rammed in to ensure compact setting.

The concrete for this work was of the following proportions:—

- One barrel cement (350 pounds).
- Three barrels sand.
- Two barrels broken sandstone.
- Two barrels slag.

This is equal to about one cubic yard of concrete rammed in place. The capacity of the mixer was five yards per hour, but owing to timbering, placing of rails, and other interruptions, the average was about half this amount. The crushed rock and slag were hauled and dumped on one side of the machine and the sand on the other. Each batch took a half barrel of cement, and all the material was loaded by hand and dumped into the mixer. From the machine it was conveyed by separate delivery chutes made of 10 inch galvanized tubes. One connecting piece was used as a switch to throw the concrete to any point desired.

The top section of the collar was widened out to include the foundations for the bankhead and headframe, as shown by the accompanying plan, and is, of course, counted in the cost of the shaft collar.

The weight of the various materials used in concretizing are as follows:—

	Tons.
Cement	296
Stone	708
Slag	266
Sand	705
Steel	16
Total	1,991

The shaft sets required 36,400 feet of yellow pine, and in piling, staging and timbering 30,450 feet of spruce timber was made use of. One hundred and eight logs were used in the log cabin sets, and 124 piles were driven.

The cost of the completed shaft collar is as follows:—

Cost of labor—

Excavating	\$1,826.66
Piling	677.21
Concreting	1,929.80
Timbering	496.85
Total	\$4,930.52

Cost of Stores—

Piling	\$1,225.63
Timbering	1,396.90
Rails	931.25
Sand	595.80
Rock	693.75
Cement	2,756.25
Total	\$7,599.58

Total	\$12,530.10
Cost per foot, depth of collar	\$245.69

Cost per cubic yard of concrete—

Labor	1.14
Stores	2.39
	\$3.53

The work in the shaft was done by three eight-hour crews of eight men each, having two 12-hour foremen. The surface men worked two shifts of 10 hours each. Fourteen men were required in delivering and mixing the material for concrete. The work itself would not have been so difficult were it not for the several propositions which arose.

I will mention one trouble which caused us considerable anxiety: We had no ventilation in the shaft, and as a result a low barometer would bring the gas up the shaft in considerable quantities. All night work was done by electric reflectors, placed in the open air, and safety lamps were used in the bottom. The greatest precaution had to be taken to keep visitors from lighting matches or smoking in the vicinity of the shaft.

The hoisting of water was another matter that gave considerable trouble. A bucket holding 200 gallons and having a wing valve in the bottom was used, and each time this was landed on the bull chain it shook the ground all around the shaft and kept the mud constantly moving. The water was carried away in a large trough, and try as we might we could not present a little leakage when a bucket was dumped.

Another time the rope broke just as a bucket of water reached the top and it dropped the 1,500 feet to the sump without touching a timber on the way down. We lost five hours fishing that bucket up.

When finished we had the satisfaction of knowing that a big job had been well done, for not a drop of water showed on the face of the shaft timbering, and to-day that collar is bearing the weight of a steel headframe 110 feet high without showing a sign of any strain.

Mr. J. E. McEvoy, who has resigned from the staff of the Crow's Nest Pass Coal Company, Fernie, B.C., was presented with a handsome travelling bag, fitted with a gold pendant set with pearls and diamonds, and Miss McEvoy a solid gold bracelet. Presentations also were made to Mr. McEvoy by the directors of the company, by the Fernie Club and by the Kootenay Rifles.

A Partial Bibliography of Publications Referring to the Geology and Mineral Resources of Alberta, British Columbia and the Yukon.*

By J. C. Gwillim, Kingston, Ont.

The following classification of literature dealing with the exploration, geology and mining of these regions, is not complete. It has been compiled chiefly from three relatively accessible sources, namely, from the reports of the Geological Survey of Canada, and the Provincial Bureau of Mines, and the Canadian Mining Institute transactions.

The inclusion of some purely geological reports of the more remote districts seemed advisable, as offering first aid to those who go into them with the purpose of mining.

The reports of the Geological Survey provide our chief source of information in respect to the economic geology of these areas; and it may be stated that Alberta, British Columbia, and the Yukon, have received a great service from the Canadian Geological Survey, from the days of Richardson and Dawson, to the present summer, when eight field parties were working in these provinces. The publications of the Geological Survey are, in most cases, free, and will be sent on application by the Library of the Department at Ottawa.

The Annual Reports of the Provincial Mineralogists contain much statistical information relating to production and progress, together with reports or summaries of the conditions in the respective mining divisions. There are also incorporated in these volumes special reports upon mineral or coal areas, by the Provincial Mineralogist, the Provincial Assayer, and others competent to investigate them. The British Columbia reports, and also various bulletins on, and maps of, the mining districts of the Province can be obtained free, or for a small sum, on application to the Provincial Bureau of Mines at Victoria.

The transactions of the Canadian Mining Institute appear to round out our field of information, by giving detailed studies of mines, mining geology and mining operations. This is a source of information which is likely to increase as the provinces develop. Volume V. is especially valuable in papers relating to operations in British Columbia. It would make this paper too cumbersome if one ventured into a description of the material within the titles cited. Attention, however, may be called to those having an asterisk, as affording much detail information concerning the area or areas to which they refer. The work of Dr. G. M. Dawson is always valuable, and his observations cover a large portion of the country here considered.

Concerning the selection of papers and authors in this compilation, I am largely indebted to the Geological Indices of D. B. Dowling and F. J. Nicholas, also to the index of "The Canadian Mining Journal," up to Volume VI. Any important omissions may be added. The list is lengthy, but it is a tolerably available one.

The abbreviations used, are:

G. S. D.—Geological Survey Department, Ottawa.

M. M.—Report of the Minister of Mines, Victoria.

C. M. I.—Journal of the Canadian Mining Institute, Montreal.

Western Alberta.

- Cairnes, D. D.—Foothills south of the main line of the C. P. R. G. S. D. Summary, 19-5.
- *Dawson, G. M.—Preliminary Report upon the Bow and Belly River region, with special reference to coal deposits. G. S. D. 1880-1-1, or No. 167 and Map No. 177.
Report upon the Rocky Mountains between the International Boundary and Lat. 51' 30". G. S. D. 1886.
- Dowling, D. B.—Coal fields of the foothills from Old Man River to the Athabasca. G. S. D. Summaries 1903-04-05-06, and maps of Sheep Creek, Cascade and Costigan coal basins.
Stratigraphy of the Cascade Coal basin, Vol. VIII., C. M. I.
- Henrett, C. M.—Bankhead Coal Mines, Vol. VIII., C. M. I.
- Gwillim, J. C.—Notes on the life history of coal seams, Vol. VIII., C. M. I.
- Leach, W. W.—The Blairmore-Frank coal fields, with map. G. S. D. Summary 1902.
- *McEvoy, Jas.—The Yellowhead Pass Route, with map, from Edmonton to Tete Jaune Cache. G. S. D. Summary 1898, or No. 703 separate.
- Stockett, Lewis, and Warden, B. R.—The Anthracite Breaker of the Pacific Coal Company, at Bankhead, with plans. Vol. IX., C. M. I.
- Smith, F. B.—Coal Mining in the Northwest, and its probable future. Vol. V., C. M. I.
- Tyrrell, J. B.—Northern Alberta, with map. G. S. D. 1886.
- Whiteside, O. E. S.—Across the Pitch versus up the Pitch. Vols. II. and IV., C. M. I.

East Kootenay.

- Blakemore, Wm.—Pioneer work in the Crow's Nest Areas. Vol. IV., C. M. I.
Future of the coal and coke supply of B.C. Vol. VI., C. M. I.
Iron deposits near Kitchener. Vol. V., C. M. I.
Bull River iron deposits. M. M. 1900.
- Carlyle, W. A.—Report on E. Kootenay. M. M. 1896.
- Corless, C. V.—The Coal Creek colliery of the Crow's Nest Coal Company. Vol. IV., C. M. I.
Notes on the geology and a few ore deposits of Southeastern B.C. Vol. V., C. M. I.
- Daly, Dr. R. A.—Geology of the International Boundary. G. S. D. Summary 1904.
- *Dawson, Dr. G. M.—Report and Map upon the Rocky Mountains. G. S. D. 1886.
- Dowling, D. B.—Northern extension of Elk River coal fields. G. S. D. Summary 1905.
- Leach, W. W.—Crow's Nest and Elk River coal fields. G. S. D. Summary, 1901.
- McEvoy, Jams.—East Kootenay map sheet. G. S. D. Summary, 1899.

* Read before the Canadian Mining Institute, Ottawa Meeting, 1908.

- Crow's Nest coal field and map. G. S. D. Summary 1900.
Notes on the special features of coal mining in the Crow's Nest Pass. Col. VII., C. M. I.
- Robertson, W. F.—Reports on East Kootenay. M. M. 1898.
Reports, including observations of McEvoy, Selwyn and Leckie and Baker, M. M. 1901; Bulletin and map of Flathead oil fields.
Reports on Windermere and Fort Steel. M. M. 1903.
Report on the Fernie Coal Mines Explosion (separate), 1902.
- Selwyn, A. R. C.—Oil fields of Southwestern Alberta and Southeastern B. C. G. S. D. Summary 1891.

West Kootenay.

- Brock, R. W.—Reports on West Kootenay. G. S. D. Summaries 1898-99-1900.
Geological Map of West Kootenay. G. S. D. No. 792.
Report and sketch map on Lardeau district. G. S. D. Summary 1903-04.
Report (Preliminary) upon Rossland. G. S. D. No. 939.
Report upon Rossland. G. S. D. Summary 1906.
Poplar Creek and other Camps. Vol. VII., C. M. I.
West Kootenay ore bodies. Vol. 2, C. M. I.
West Kootenay Notes. Vol. 3, C. M. I.
- Carlyle, W. A.—Bulletin No. 2, Trail Creek. M. M. 1896.
Bulletin No. 3, Slocan, Ainsworth and Nelson Mining divisions. M. M. 1896.
- Campbell, C. M.—Mining in Rossland District. Vol. V., C. M. I.
- Campbell-Johnston, R. C.—Dry ores of the Slocan. Vol. V., C. M. I.
- Cole, L. Heber.—Mine Surveying as carried on at the Centre Star Mine, Rossland. Vol. VIII., C. M. I.
- Dawson, G. M.—Report on West Kootenay with map No. 303. G. S. D. No. 294.
- Fell, E. Nelson.—Notes to accompany sections of the Athabasca Mine. Vol. V., C. M. I.
Gold milling practice at the Athabasca Mine, Nelson. Vol. V., C. M. I.
- Fowler, S. S.—Notes on the Ymir mine and its mill practice. Vol. III., C. M. I.
Coarse concentration in the Slocan district. Vol. VI., C. M. I.
- Garde, A. C.—Notes on the B. C. zinc problem. Vol. VII., C. M. I.
- Gwillim, J. C.—West Kootenay ore bodies. Vol. III., Fed. C. M. I.
- *Ingalls, W. R.—Zinc Resources of B. C. Dept. of Mines, Ottawa.
- Ingall, E. D.—Silver mines of the West Kootenay. Journal Mining Society of Nova Scotia, Vol. III.
- Hardman, J. E.—Notes on some mining districts in B. C. Vol. II., C. M. I.
- Hall, Oliver.—The Le Roi Mine. Vol. V., C. M. I.
- Hedley, R. R.—The possibilities for smelting in B. C. Fed. C. M. I., Vol. III.
- Kirby, E. B.—Ore deposits of Rossland. Vol. VII., C. M. I.
- McConnell, R. G.—On West Kootenay in G. S. D. Summaries 1894-95-96-97.
- McDonald, Bernard.—Hoisting and Haulage (description of Le Roi plant). Vol. V., C. M. I.

- Mining possibilities of the Canadian Rockies. Vol. VI., C. M. I.
- Mine signalling by compressed air. Vol. VI., C. M. I.
- Mine timbering by square sett system at Rossland. Vol. VI., C. M. I.
- Parlee, Norman W.—Rock drilling and blasting. Vol. VI., C. M. I.
- Robertson, W. F.—Report on Nelson district. M. M. 1900.
Lardeau, Fish Creek, Poplar Creek, etc. M. M. 1903.
Ainsworth, Slocan, and Slocan City Division. M. M. 1904.
- Thompson, Wm.—Comparison of costs of compressing air with steam and electricity at Rossland. Vol. VI., C. M. I.

(To be continued)

THE NEW PREMISES OF THE IRON AND STEEL INSTITUTE.

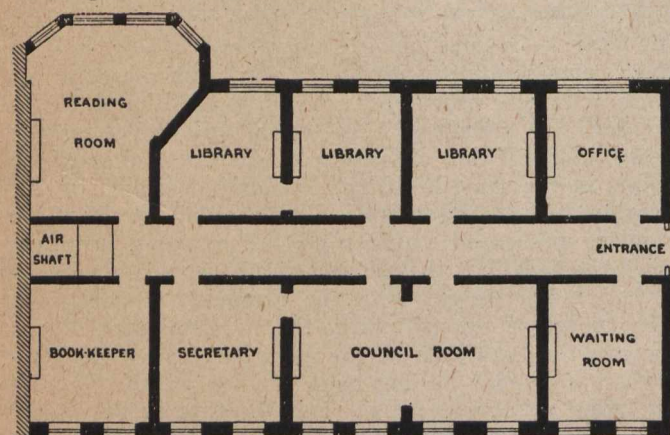
Owing to the steady growth of the membership of the Iron and Steel Institute, with the increasing clerical work thereby entailed, and to the expansion of the Institute library, which now contains several thousands of volumes, the Council decided, early in the current year, to secure more commodious offices, and to effect certain improvements in the internal arrangements with the object of providing additional facilities for the members. An opportunity fortunately presented itself for obtaining a lease of the spacious offices, in the same building, formerly occupied by Sir Douglas Fox & Partners. The acquisition of these premises presented numerous advantages, amongst which the fact that the address would remain unchanged, had much weight with the Council. Negotiations were therefore opened with the Westminster Trust, who are the landlords of the premises, and a satisfactory arrangement having been arrived at, the Council concluded an agreement at their meeting in February.

The new premises consist of a suite of ten rooms, on the first floor of No. 28 Victoria street, having precisely the same outlook as the recently vacated offices, and access being obtained from the same main entrance and staircase. The Council have also obtained the use of a storeroom, conveniently situated in the same building, on the sixth floor.

A plan of the new offices is shown in the figure herewith. The entrance is immediately opposite that of the old premises, and affords access to a spacious hall nearly 70 feet in length. The rooms have been decorated throughout in white enamel, with distempered walls of pale straw-yellow color, which ensures the maximum radiation of light, and enables an effective display to be made of the extensive collection of portraits and paintings possessed by the Institute.

To the left, on entering the hall, is a suite of five rooms overlooking Victoria street. The first room is fitted as a waiting room, and its most interesting feature is the large showcase containing the collection of early specimens of Bessemer steel presented to the Institute by Sir Henry Bessemer. Amongst other objects of interest on view in this case are short pieces of a 100 pounder gun tube made of Bessemer steel, a 74 pounder steel projectile formed in a hydraulic rolling mill of novel construction, designed and worked by Sir Henry Bessemer, part of a Bessemer steel rail rolled

at the works of the London & Northwestern Railway Company, and a portion of a steel rail twisted into a complete spiral, from end to end, without producing fracture. Two interesting specimens are pieces cut from the two first rails of Bessemer metal ever rolled, the metal having been made from Blaenavon grey foundry pig at Sir Henry Bessemer's experimental works at Baxter House, London, in 1856. A sample consisting of the earliest experimental example of metal converted by the Bessemer process is also shown, the resulting ingot having been rolled at the Royal Arsenal at Woolwich into a flat bar. This bar was made in about the month of June, 1856, and was among the samples of Bessemer metal exhibited at the meeting of the British Association at Cheltenham on the 13th August, 1856. With the exception of this bar, all the other samples shown on that occasion have been lost. There is also a small model gun forged from one of the first Bessemer ingots which were made at the works of Messrs. Bessemer & Company at Sheffield. An analysis of the metal of which this gun is made was conducted by Mr. Edward Riley, when it was found that it yielded 99.787 per cent. of pure iron, and was therefore equal in quality to some of the highest brands of Swedish bar iron. Another showcase contains a collection of medals and of the badges which have been issued at the various meetings of the Institute.



Plan of the new Iron and Steel Institute.

Suspended around the walls of the waiting room are portraits of Henry Cort (the inventor of puddling and of grooved rolls), George Thomas Clark (one of the trustees of the Institute, 1880-1898), Alexander Thielien (vice-president 1896), and Benjamin Walker (member of Council, 1889-1890), together with diplomas gained by the Institute at various exhibitions in which it has participated, including those of Paris, St. Louis and Milan.

The two adjoining rooms have been thrown into one, and form a spacious Council room. In a prominent position of this room stands a life-sized painting in oils, by H. T. Wells, R.A., of the seventh Duke of Devonshire, the first president of the Institute. At one end of the room is suspended a large oil painting, by Rudolph Lehmann, of Sir Henry Bessemer (president, 1872), at the period of his invention of the Bessemer process. At the other end hangs the portrait, in oils, of Edward Williams (president, 1879-81), presented to the Institute by William Jenkins of Consett. The Council room also contains the portraits of the past-presidents of the Iron and Steel Institute, viz.: Sir Lowthian Bell, Bart. (1873-75); William Menelaus (1875-77); Sir C. William Siemens (1877-79); Edward Williams (1879-81); Josiah Timmis Smith (1881-83); Sir

Bernhard Samuelson, Bart. (1883-85); John Percy (1887-89); Lord Airedale of Gledhow (1889-91); Sir Frederick Augustus Abel, Bart. (1891-93); Edward Windsor Richards (1893-95); Sir David Dale, Bart. (1895-97); Edward Pritchard Martin (1897-99); Sir William Chandler Roberts-Austen (1899-1901); William Whitwell (1901-1903); Andrew Carnegie (1903-1905); Robert Abbott Hadfield (1905-1907). The Council room also contains a portrait of Mr. W. H. Bleckly, hon. treasurer, and albums containing a collection of photographs of members of the Institute.

A door of communication from the Council room affords access to the secretary's room, while the last room on this side of the hall is used as an office for the Institute's accounts and correspondence. On the western side of the hall is a large reading room and lounge, in which members may consult current periodicals, conduct correspondence, and meet each other for conversation or consultation. Smoking is allowed, and comfortable lounge seats have been provided, the Council being desirous of encouraging members to use the room as a meeting place. On the walls of the reading room are displayed portraits of the Bessemer medalists of the Institute, including Robert Forester Mushet, Peter Ritter von Tunner, Peter Cooper, Sir Joseph Whitworth, Bart., Alexander Lyman Holley, George James Snelus, Sidney Gilchrist Thomas, Richard Akerman, James Akerman, James Riley, John Devonshire Ellis, Henri Schneider, William Daniel Allen, Hon. Abram S. Hewitt, Lord Armstrong, C.B., Arthur Cooper, John Fritz, John Gjers, Henry Marion Howe, Hermann Wedding, Richard Price-Williams, Henri de Wendel, John Edward Stead, Friedrich Alfred Krupp, John Oliver Arnold, Floris Osmond, Johan August Brinell.

In this room also stands a handsome marble pedestal, surmounted by a marble bust of F. Krupp (hon. member of the Institute), bequeathed by Mr. Alfred Longden, and a bust of the late Sidney Gilchrist Thomas. Over the mantelpiece is a small bust in cast iron of Professor A. Ledebur (hon. member of the Institute).

The three adjoining rooms on this side are devoted to the library of the Institute. In the last of the three provision is made for special research for the purpose of enabling members desirous of consulting works of reference, or the files of mining and metallurgical periodicals, to do so in quietness and privacy. In this room a card catalogue to the library is available, and the current files of some hundred and fifty technical journals are placed in boxes easy of access.

The last room of this suite (the first on the right, on entering) is the general office for inquiries, etc. In the new premises effective ventilating apparatus is provided, and the hall and rooms are lighted by Osram electric lights. There is telephonic communication between the various rooms. In case of fire there is an iron door to shut off the premises from the rest of the building, and fire-extinction apparatus is provided.

It will be seen from the foregoing that the new premises are considerably larger than those just vacated, and it is hoped that not only will the increased facilities thus provided attract the London members of the Institute who may have occasion to avail themselves of them, but that the members resident in the country and abroad may find them increasingly useful when they visit the metropolis, and thus realize the objects which the Council have had in view in planning and carrying out the necessary alterations.

EXCHANGES.

Mines and Minerals, April 1908.—Cyaniding Cripple Creek ores is the subject of a paper by F. L. Barker in this number of Mines and Minerals for April.

The rates for ore treatment offered by the Golden Cycle Mining Company in their independent custom mill aer as follows:

Golden Cycle Rates.	Per ton.
Up to \$8 inclusive	\$4.00
\$8 to \$10	4.50
\$10 to \$15	5.25
\$15 to \$20	6.00
\$10 to \$25	6.50
\$25 to \$30	7.00
\$30 to \$40	7.50
\$40 to \$60	9.00
\$60 to \$100	9.00
\$100 to \$150.....	12.00
\$150 to \$200	13.00
\$200 to \$300	13.50
Over \$300	13.50*

*Plus 1 per cent. assay value.

The competitive rates of the United States Reduction and Refining Company have been made slightly lower than these. The result of this rivalry has been highly beneficial to the camp.

The costs of mining, including stoping, developing and sorting are nowhere less than \$8 per ton, and in many cases are higher. Millions of tons of low grade ore are slowly becoming available, as heretofore no ore running less than \$20 has been shipped. Cyanidation is believed to be the key to the problem.

An analysis of the Golden Cycle ore may be quoted here:

Silica, per cent.	55.98
Alumina, per cent.	17.09
Iron, per cent.	3.44
Magnesia, per cent.....	0.47
Lime, per cent.....	0.71
Sulphur, per cent.....	1.77
Gold per ton, oz.	0.98
Silver per ton, oz.....	0.62

The principal primary miners are calaverite, tetrahedrite, sylvanite, barite, quartz, pyrite, fluorite, calcite, dolomite. The secondary minerals are gold, gypsum, psilomelane, limonite, alunite, and epsomite.

These secondary minerals occur in the oxidized zone and are amenable to cyanidation. But the ores containing the tellurides of gold and silver have to undergo preliminary treatment, since compounds of tellurium are not soluble in cyanide solutions. Roasting is resorted to for this. Bromo-cyanide has not met with much success.

The Isabella cyanide mill, working low grade dump ore, gives a four-day leach. The tank capacity is to be increased so as to permit of a six-day leach. A 9 inch by 15 inch Blake crusher, fed by gravity, takes the ore from the bin. At the crusher, lime is added at a rate of about 5 pounds to the ton of ore. The ore then goes to a 16 inch by 36 inch Davis roll and thence to two 14 inch by 27 inch Davis rolls. It is then passed over a 1/4 inch mesh bumper screen, the oversize from which is returned to the last set of rolls, the undersize going by a belt-conveyor to a storage bin of 200 tons capacity.

Six leaching tanks, 5 feet deep, 30 feet diameter, holding 125 tons and arranged in a single row are filled in 4 hours. The four end tanks are filled by the belt conveyor, the two middle tanks direct from the storage bin, which is placed just above them.

Strong solution, 4 pounds of cyanide to the ton of water, is added first, followed by a 3 pound, and then a 2 pound solution, and finally by a wash of water. As the solutions are drawn off they pass through a battery of nine zinc boxes to a sump below. The leached sands are shovelled through manholes in the tank bottom on to a belt conveyor and thrown on the tailings dump. Two men empty one tank in 8 hours. Water is scarce and this method is unavoidable.

The gold-zinc slimes are washed and the wash water is passed through a filter consisting of a 7 foot wooden tank with perforated bottom, over which is placed first burlap, then a cheap cotton blanket, and last a muslin bag. They are then dipped out of the boxes and thrown into a lead-lined tank, and, as they are being put in, full-strength sulphuric acid is added slowly. When all the slimes are in, the portion caught in the filter is added and the whole is diluted by one-fourth its bulk of water. Live steam is turned in and the contents are boiled until solution of the zinc is complete. This takes from 8 to 10 hours. The tank is now filled with water, allowed to settle and the solution is decanted on the same filter as before used. The dried muslin bag is then placed on top of the gold precipitate and burned. The gold is drawn off from the bottom of the tank and dried. Equal parts of gold and flux are mixed in a No. 80 crucible and melted. The flux is:

	Parts by weight.
Borax	10
Bicarb. of soda	10
Potassium nitrate	1/4
Silica	3

From this melt a matte and gold button result. The gold button is put in a crucible with a charge of potassium nitrate and a soft iron rod and given a second melt. A pure bar results.

The average costs of treatment of ore per ton are:

Tramming ore to mill	\$0.22
Disposal of tailings	0.09
Repairs	0.02
Milling	0.14
Cyaniding	0.38
Acid treatment, fluxing and melting	0.02
Total	\$0.87

Tailings run 67 to 80 cents. Therefore ore running over \$1.67 can be treated.

The Iron and Coal Trades Review, April 17th, 1908—

The evolution of the coal mine explosion is traced by Mr. E. J. Deason in the Iron and Coal Trades Review. After much experimenting Nobel, in 1867, found that he could control nitro-glycerine by blending it with Kieselguhr. Dynamite, or Nobel's Safety Powder, was patented on May 7th, 1867. Nobel had previously patented the detonator in July, 1864.

For some years the formula, 75 per cent. nitro-glycerine and 25 per cent. Kieselguhr, was used. This af-

terwards was known as "Dynamite No. 1." "Dynamite No. 2" was made to meet the demand for an explosive for use on coal and rocks of varying hardness. Its proportions were: 18 per cent. nitro-glycerine, 71 per cent. nitrate of potash, 10 per cent. charcoal and 1 per cent. paraffin. In 1875 Nobel made the advance of including gun cotton in the list of ingredients. Other nitro-glycerine explosives were brought out by Nobel. But meanwhile, although Nobel monopolized the manufacture of this class of explosives, much attention was being paid by other investigators to the "Nitrate Class" of compounds, which class now includes the greater proportion of the powders used for coal getting.

The Explosives Act of 1875 did much to reduce accidents in the use and manufacture of explosives. But at the commencement of the last decade of the nineteenth century it became increasingly evident that further legislation was needed as regards the use of explosives in coal mines.

A new Act in 1896 brought into existence a "Permitted List." Explosives to be used in coal mines had to pass certain tests at Woolwich. The effect of the constant addition of stringent revised tests to the Act has been the elimination of all powders carrying high percentages of nitro-glycerine. The list is practically made up of the ammonium nitrate class.

Eight explosives, whose composition is given below, make up 77 per cent. of the total explosives used.

Bellite—Per cent. of total explosives used, 4.7; its rate of ammonium, 87; other constituents, per cent., 16 D. N. benzol.

Monobel—Percent. of total explosives used, 4.9; nitrate of ammonium, 80; other constituents, per cent., 10 guncotton, 10 woodmeal.

Westfalite—Per cent. of total explosives used, 5.7; nitrate of ammonium, 93; other constituents, per cent., 6 resin.

Roburite—Per cent. of total explosives used, 8.3; nitrate of ammonium, 88; other constituents, per cent., 11 D. N. benzol.

Ammonite—Per cent. of total explosives used, 8.8; nitrate of ammonium, 88; other constituents, per cent., 12 D. N. naphthaline.

Carbonite—Per cent. of total explosives used, 12.4; nitrate of potassium, 33; nitro-glycerine, 26; other constituents, per cent., 40 woodmeal.

Saxonite—Per cent. of total explosives used, 14.6; nitrate of potassium, 22; nitro-glycerine, 52; other constituents, per cent., 18 ammonium oxalate.

Bobbinite—Per cent. of total explosives used, 17.6; nitrate of potassium, 64; other constituents, per cent., 19 charcoal, 15 saltpetre.

It may thus be seen that modern practice in coal getting is reverting to the old sulphur, charcoal and saltpetre compound. Probably, however, the safest and best method of winning coal will prove to be by the use of mechanical means.

Mining and Scientific Press, April 18th, 1908.—Mining costs in the Joplin district are written of by Doss Brittain. The low prices of spelter have reacted upon mining in this district and costs are being carefully overhauled.

Royalty, in all cases calculated on the gross sale of ore, ranges from 7 to 30 per cent. If the operator is fee-owner there is no royalty.

Workmen are paid as follows:

Engineer	\$2.25 to \$4.25
Fireman	3.00
Hoistman	\$2.50 to 2.75
Machine men	2.75
Helpers	2.25
Shovellers	\$3.00 to 3.50
Powder men	3.25 to 3.50
Jig man	4.00 to 5.00
Blacksmith	2.50 to 2.75
Boss (day)	5.00
Boss (night)	3.00

The superintendent is usually paid \$150 per month.

Steam, gas, and electricity are the forms of power used. The cost of one horse-power hour using steam is 1.75 cets, running non-condensing. Steam power with gas, non-condensing, costs about 0.75 cent per horse-power hour, while with gas condensing the cost is reduced to 0.5 cent. Gas power runs as cheap as 0.25 cent. Electricity costs 1.25 cents per horse-power hour.

The cost of explosives per ton of material broken should not exceed 10 to 12 cents.

Mills are insured at a rate of \$2.50 to \$5 per \$100 valuation.

The actual cost of placing a ton of zinc concentrate in the bin is variously estimated from 50 cents to \$1.50, the latter including all necessary expenses involved in a year's work, pumping, exploring, timbering, construction work, and general expense.

The operation of mining crude ore includes:

Breaking ground	\$0.41
Shoveling	0.21
Hoisting	0.14
Pumping	0.10
Exploring	0.10
Timbering	0.01
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Total cost of mining	\$0.97
Milling	0.25
General expense	0.25
Construction	0.14.
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	\$1.48

Mines and Mining, April 17th, 1908.—In an editorial on the market value of copper, Mines and Mining reaches the conclusion "that in the next couple of years the selling price of copper will be from twelve to fourteen cents, and that any increase will be but temporary, due to universal causes. This is a condition we cannot avoid, since nearly all of our large producers can mine, smelt, and refine the metal at a cost of ten cents, or less, and in many cases the gold and silver contents more than pay all charges."

The Mining World, April 18th, 1908.—In this number Ralph Stokes' article on "Record Shaft Sinking on the Rand Gold Field" will appeal to the managers of metalliferous mines in Canada. Mr. Stokes speaks in high praise of "the time-honored combination of white supervision and Kaffir muscle."

Deep shaft sinking in the Rand has few drawbacks. Water troubles are almost nil and at a depth of more than 3,000 feet a full 8 hour shift can be performed without the aid of artificial ventilation, so slight is the increase of temperature with depth.

PERSONAL AND GENERAL.

Dr. A. M. Campbell, of Ottawa, was in Toronto recently.

Mr. Leon C. Jones has retired from the management of the Canada West mine, near Taber, Alberta.

Mr. J. R. Cowans, general manager of the Cumberland Coal & Railway Company, has returned to Springhill, N. S., after a visit to Quebec and Ontario.

Mr. W. J. Prisk, late of the Dominion Antimony Company, West Gore, N.S., is directing the development work of the Eagle Mining Company's property at Renfrew, N.S.

Mr. J. Dix Fraser, late works manager of the Dominion Iron & Steel Company, Sydney, N.S., has accepted the position of general manager of the Atikokan Iron Company, Port Arthur, Ont.

Mr. F. N. Flynn, for the past year manager of La Rose, Lawson, University and other mines of the Timmons-McMartin corporation at Cobalt, has resigned and will shortly return to the States.

Mr. H. Mortimer-Lamb, secretary of the Canadian Mining Institute, met the Toronto members of the Council at the King Edward Hotel on May 6th. Plans for the reception of British delegates next summer were discussed.

On April 22nd Mr. A. J. McNab, metallurgist of the Consolidated Mining & Smelting Company, Trail, B.C., was united in marriage to Miss A. Bingay at Yarmouth, N.S. Mr. and Mrs. McNab are expected to return to Trail before the end of May.

The Senate of Queen's University at the annual convocation held in Kingston, Ont., on April 29th, conferred upon Mr. Milton L. Hersey, of Montreal, the honorary degree of L.L.D. In the Senate's letter of notification the reason for granting this honor is given as being "in consideration of your position as the leading man in Canada in your chosen profession of consulting chemist and chemical engineer." Dr. Hersey, whose career was outlined in these columns recently, is now chairman-elect of the Canadian Section of the Society of Chemical Industry.

One of the first official acts of the Earl of Crewe, the newly-appointed Secretary of State for the Colonies, was to cable to Mr. Herbert C. Burchell, of Sydney, N.S., offering him the important position of Director of Public Works for Jamaica and a seat on the Executive Council there. Mr. Burchell is the vice-president and managing director of the Sydney Cement Company. He is a graduate of McGill University of long standing. He was formerly Government Engineer in New Foundland, and has made valuable reports to the Colonial Office on the resources of British Honduras. It is not often that the authorities go outside the ranks of the permanent services to find men for official positions in the Crown colonies. The offer indicates a high appreciation of Mr. Burchell's standing as a Canadian civil engineer.

LAND MADE GOOD BY ITS PEAT.

In the work of reclaiming the 25,000 acres in the great peat bogs of Konigsmoor and Marcardsmoor in the Leer District, East Friesland, the land will be drained by a network of 25 miles of canals, and a station for generating electricity will be established at the junction of the main canal with the high road from Leer to Wittmund. Current from this station will be distributed over an area 30 miles in diameter. The

peat will serve as fuel, the plows and other machinery used in fitting the land for cultivation being driven by power from the bog products, which will also give light and power to many surrounding towns.

OUTLINE OF PROPOSED SUMMER EXCURSION OF THE CANADIAN MINING INSTITUTE.

The outline given below is provisional. It is subject to modification in all its details. The date of the arrival of British delegates at Quebec is, however, understood to be fixed as August 24th. The itinerary is as follows:

Stage I.—Nova Scotia and Quebec Excursion—Quebec to Sydney, including, in Nova Scotia, visits to the Pictou and Glace Bay coal mines, to the Dominion Iron and Steel Works, and the Nova Scotia Steel and Coal plant. In Quebec, the asbestos and copper regions of the Eastern Townships will be visited, Quebec to Montreal. Time required, approximately 9 days. Approximate cost, \$150.

Stage II.—Ontario Excursion—Montreal to Toronto. Niagara Falls, Cobalt and Sudbury will be visited, probably also the Atikokan Iron Company's Works at Port Arthur. Time, 6 days. Cost, \$100.

Stage III.—Western Excursion—North Bay to Victoria, B.C., and return, including visits to the Fernie and Bankhead coal mines, the St. Eugene silver-lead mines at Moyie, the copper-gold mines and metallurgical works of Rossland and Boundary, the Bonnington Falls power plant, etc., etc. Time required, 25 days. Approximate cost, \$250.

It is roughly estimated that the cost of the whole excursion will not exceed \$500, and it is hoped that these costs may be somewhat reduced if arrangements, now being negotiated, are satisfactory completed.

CORRESPONDENCE.

To the Editor,

"The Canadian Mining Journal."

Dear Sir,

In your last issue the reviewer of Mr. Low's "Technical Methods of Ore Analysis" makes an error in crediting me alone with the design of the new form of electrolytic apparatus referred to. This apparatus was designed by Mr. George A. Guess and myself after much joint experimenting.

In connection with this I would like to draw attention to the difference between Guess' method and the ordinary electrolytic method for copper. According to Low the preparation of the solution by the ordinary method calls for at least 15 separate time and attention requiring operations such as heating, filtering, and washing, and 13 additions of reagents. Guess' method, which, by the way, is entirely independent of the style of apparatus used, calls only for boiling with nitric acid, the addition of the special nitro compound and dilution with water. The subsequent electrolysis requires a much shorter time, as stronger current densities are used. The results are as accurate as by the older method.

Guess' work in the electrolytic assaying of copper and of lead is the most important contribution to the art of assaying since the introduction of gasolene furnaces.

Yours faithfully,

H. E. T. HAULTAIN.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

Glace Bay.

The Sydney Daily Post is offering a weekly insult to the intelligence of its readers in the shape of letters signed "Shotlighter," the object of which appears to be to discredit the present Grand Officers of the P. W. A., presumably for political motives, and to herald the golden and Saturnian age of U. M. W. A. reign, as now exemplified in the States. This gentleman begins one of his mendacious epistles as follows: "When there is lack of matter for argument it is always safe to appeal to prejudice" and thereupon proceeds to make a dreadful example of himself by writing in a strain that we venture to assert is redolent with the savour of prejudice added to an evident and abysmal ignorance of mining that at once suggests a nigger in the woodpile.

We have nothing to do with P. W. A. or U. M. W. A., and we leave the internal arrangements of trades unionism in Cape Breton to those whom it concerns, but we do object to an attempt to upset the pleasant relations that now exist between the Dominion Coal Company and their men, and to the utterly useless and inflammatory letters which the Post is now publishing, much to its own detriment and discredit among the mining towns.

A few quotations may serve to justify our language and to show the unprejudiced wisdom of our Glace Bay Solon. Referring to the late three years' contract, he writes: "The safety lamp was introduced without any rise in wages, although by using it the miners' earning power is lessened by 'fully ten per cent.'" The single quotes are ours. This statement needs no analysis, and it has not even the garment of plausibility to cover its indecent nakedness. If "Shotlighter" had ever seen the last sad journey of the victims of a mine explosion he would not use such mischievous and dangerous arguments. Maybe, seeing that he so loves the ways of U. M. W. A., he could view with equanimity the sight of such processions as have recently wended their doleful course in that favored land where the U. M. W. A. has its main stamping ground. The man who will appeal to the ignorant prejudice of the few and attempt to inflame the minds of men against so necessary a precaution as safety lamps is incontinently condemned out of his own mouth, and no further utterances of his are worth our attention.

However, the average man has so pathetic a faith in the truth of the printed page that we think it is necessary to point out a few more of the unbiased statement of this ingenious prevaricator.

He states that the U. M. W. A. have already secured an equitable Compensation Act and an eight hours day for miners in Western Canada "whose wages are 100 per cent. higher than ours." If this is so there are exceedingly fortunate men in Western Canada, but we saw a letter the other day from Fernie, B.C., stating that soup kitchens had been opened there to relieve the distress, and the writer (a Cape Bretonian) said he wished he were back where Canadians manage their own business, namely, in his own country. It is a little naive to say that the U. M. W. A. had obtained the two legislative measures above referred to. We presume they were passed by a Canadian legislature, and we are under the impression that they are measures not of American origin, and we have never heard that the U.M.W.A. ever obtained such measures in their own land. We admire the gall of the man who will try to tell us that we can learn anything in the way of legislation relating to mining from the United States or any labor organization from that country. We will undertake to say that we have good mining legislation in Nova Scotia, and it is enforced

also, which is more than can be said of the district controlled by the U. M. W. A. politics.

"Shotlighter" states that "wages earned are from various causes falling." We admit it, everywhere but in Cape Breton. We may say that the pay roll of the Dominion Coal Company in March was the largest in its history, and further that the average wage earned per man employed was the highest on record also.

The Post writer criticises some remarks of "Rambler" in the Mining Record, and refers to this well-known person as a "wiseacre." Incidentally it occurs to us that "Rambler" has in all probability forgotten more about mining matters than "Shotlighter" ever knew, although we apologize to the former for the comparison. To quote: "According to this wiseacre we would simply be put out of business, while cheap American coals would flood Canadian markets," and other like absurdities. This reads more like an appeal to prejudice than an argument, and no attempt is made to disprove the statement referred to. Suppose P. W. A. passed, and U. M. W. A. became the order of the day, and it were thought well in the interests of 400,000 miners in the States that they should have a larger share in Canadian coal markets, would they then be so solicitous for Cape Breton? This reminds us that a writer from Springhill in criticizing some former remarks of ours in this column fell foul of the opinion expressed that Canadian should keep themselves free from the imbroglio of U. M. W. A. politics, that "wonderful game," as it is described by the Coal Trade Journal. He asked why international and artificial boundaries should be allowed to stand between the brotherhood of man, and why such boundaries were ignored in religious matters, finishing by the remark that we were living out of harmony with the designs of our Creator. This may be, but the cold and naked truth is that Canadians can not afford sentiment when dealing with the United States in matters of business. Here we are a lone seven million against seventy million on the other side of the line. Despite the Free Coal League and the altruistic balderdash that is talked by some fervid trades unionists, anything approaching reciprocity either in trade or in organizations must be impossible between two such unequal forces. If Canada is going to play a lone hand let her play it. And may we be preserved from the Pinkerton van, the picric acid bomb, the Gatling and the revolver, the illegal trial and the red flag of anarchy that are amongst the choice flowers of American trades unionism. We can dispense with these little amenities in Cape Breton.

Perhaps we have labored this matter too much, and have made a molehill out of a mountain. At any rate there is a very well defined feeling down here that there is no real enthusiasm behind this amalgamation talk, and that the efforts of the Post and its henchmen are directed against the personal prestige of the present leaders of the P. W. A.

To return to "Shotlighter"—he states that the workmen of the Dominion Coal Company, in accepting the recent award of the Board of Conciliation, have been "hoodwinked," that the advances given are "mythical" and that the men have been the "dupe" of their employers. We take it this is a serious reflection on the members of the recent board. Dr. Kendall and Prof. Shortt satisfied themselves that the award given meant a net gain the men of about \$70,000 per annum. Did our Münchhausen ever read of the person who threw mud at the "shining one" in the Pilgrim's Progress? It would be just as well if he mixed a little truth with his statement, but we notice that whenever by chance there is a modicum of truth in "Shotlighter's" letters it is that half truth which is "ever the worst of lies."

We hope we have shown the mischievous unreliability of the correspondent of the Post and we again wish to deprecate the attempt made by a local newspaper to upset the industrial peace that means so much for Cape Breton industries, every one of which is dependent on the coal mines. Everybody, merchants, workmen and operators, have taken fresh courage from the way in which the recent Conciliation Board arranged matters and promised unrestricted development for at least two years, and if the Post sees fit for the sake of pandering to the restless element and the sensational appetite that exists in all communities to act the part of the gratuitous firebrand, so much the worse for the Post. When they employ a "Shot-lighter" they should take care that his squib is not damp. We naturally conclude that he would use a squib. We don't suppose he ever heard of a detonator.

Although at the beginning of the month conditions promised well for an early opening of St. Lawrence navigation, the ice was very heavy for the last three weeks of April, and the Dominion Coal Company's steamer fleet were tied up in the St. Lawrence for quite a time. At the time of writing, however, the ice has largely passed to the southward, and shipping will begin in earnest the first week of May. The output of the mines during April was approximately 300,000 tons. The reduction in output compared with the previous month was due to idleness of the mines enforced by lack of shipping due to ice conditions. Lifting from bank will probably commence early in May, and for some months to come the Sydney and Louisburg will have all it can handle in the way of coal.

The Hub Colliery was idle during most of the month of April for the purpose of installing a modern electrical endless haulage system, which has necessitated the straightening and widening of the Main Deep. The new man hoisting engine is completed and running. The whole mine has been cleaned up and repaired after the fire and flooding, and is now in better shape than ever before. It will be working in full operation again by the end of the first week in May.

The work on the No. 12 Branch is being pushed vigorously, and a large number of men are employed on the line. The work of building dwellings is also proceeding, and there is a quite respectable bank of coal waiting for the railway.

NEW BRUNSWICK.

St. John.

From a gold strike made on a branch of the Restigouche, interested parties believe that the future gives promise of great mineral development in that country. Early last fall a number of Campbellton gentlemen became interested in the matter, and claims were staked out and preliminary work done.

For several years the question as to the possibility of gold, copper and other minerals being embedded in the rocky hills on the banks of the Restigouche has been a subject of comment. There were many stories of the finding of gold by early settlers, but nobody seemed certain as to the locality of the find. It was a recent discovery, however, that resulted in the formation of a company several months ago.

On Friday, the 17th ult., Messrs. William S. Montgomery, Dalhousie, W. A. Mott, Maxwell M. Mowatt and George G. McKenzie, members of the company, left for Charlo and from there drove to the property, which is situated on the Upsalquitch, and inspected the mine, which was being worked by a small force with a view to learning the exact extent of the vein of ore. The party returned from their trip on the following Monday, all well satisfied with the results so far obtained. The hill was being tunnelled and the ore taken out was improving considerably at every shot. It was also reported by members of the party that work was well under way on the shaft.

The company have secured rights over some five miles of country, and it is expected that "pay dirt" will be found in sufficient quantity to warrant the construction of a branch line from the mine to the Intercolonial Railway, some fifty miles distant.

It is said that several other companies have been formed and prospecting is in progress all over this section of the country. Some have been successful and further reports are looked for in the near future.

From Bathurst comes the report that T. M. Burns has received from Mr. Drummond a communication in which he speaks favorably of the Gloucester iron deposits.

In his letter, Mr. Drummond states that it is the intention of his company to open up the mines this summer.

The Provincial Government will be approached relative to certain concessions and rights to control the great water power of the Nepisquit River. Mr. Drummond adds that he considers the Gloucester iron deposits among the finest in the Dominion. It is Mr. Drummond's intention to visit Bathurst in the near future, when it will be learned just what the intention is with regard to smelting, etc.

A company was formed some three or four years ago, when a charter was obtained permitting the construction of a railroad from Bathurst to the Twin Tree mine, which received its name from a freak of nature in the form of two magnificent pine trees with but one top, and standing just behind the camp. Efforts are now being made to alter the charter in some respects, after which the company will proceed to carry out the plans for which it was organized.

ONTARIO.

"66." A correspondent, writing under date of April 18th, sends us some details concerning the new mining camp south of Lorrain. The camp is styled "66"—a name that has stuck. Its location is approximately 16 miles southeast of Cobalt, Ont., on the Ontario side of Lake Temiskaming, in the unsurveyed country south of Lorrain. The district was not thrown open to prospectors until late in 1906. The country is heavily timbered, the clay soil is deep, and there are few outcrops. Hence prospecting has been slow. In the latter part of the summer of 1907 discoveries, however, were made. The Keeley, Landon, Mayhow-Brough, Maiden, Forniri and other claims have excellent showings.

From the Keeley claim, 350 sacks of ore, reported to average 3,000 ounces of silver per ton, were taken out along the vein by three men since December, 1907. At a point six feet from the surface the vein is from 4 to 6 inches wide and is largely composed of wire silver. The Haileybury Silver Mining Company are sacking a high grade cobalt ore. Their main shaft is sunk to a depth of 40 feet on the vein. Very little development will put several other properties in a position to make small shipments of high grade ore. The veins in the Maiden and Forniri properties lies in the slate, cutting through the contact with the diabase.

The field explored for two miles south of the Keeley claims to the shores of Lake Temiskaming northeast, has shown native silver or cobalt in encouraging quantity.

The district is accessible by good trails and lumber roads. Lumber companies are still operating. Transportation by steamer on Lake Temiskaming is offered either from Mattawa or Haileybury Wharf and storage facilities are to be provided by the transportation companies, and the Ontario Government will extend aid in building a wagon road from the wharves to the mining sections.

Cobalt.

Southeast Coleman.—The discovery of a rich vein at 200 feet in the Temiskaming property, a feeder from the main vein, the increasing richness of the new vein on the Badger and the location by a diamond drill of a promising vein on the Shamrock, has resulted in increased activity in the development of properties in this section. On the Shamrock, which lies directly north of the Beaver and east of the Badger, diamond drilling was started some weeks ago. The first drill hole was put down at an angle of 45 degrees to cut the contact of the Keewatin and diabase in the southern part of this lot. At 110 feet a number of small veins were encountered, and for 20 feet the ground was much broken and cut with narrow stringers. Small silver values were obtained from every core taken out. At 120 feet a 12 inch vein of calcite showing native silver and assaying 690 ounces was cut. The drill, which is now down 170 feet, will be sunk at least 100 feet more. A shaft will be started at once on the vein. The shaft on the new vein of the Badger is down 125 feet. Drifting has been started at 106 feet. The vein is 5 to 7 inches wide and carries silver. The development work in this section of the camp has demonstrated that a depth of 75 to 100 feet must be reached before high silver values are encountered. The Beaver No. 1 shaft, now down 85 feet, will be sunk 100 feet deeper. The vein, which is now practically solid smaltite and niccolite, carries small silver values. On both the Lumsden and Coleman Development properties, shafts will be sunk 100 feet and drifting and cross-cutting done at this level. Negotiations are now under way to arrange for the resumption of work on the Rochester and the Davis properties.

Silver Queen.—The new 12 drill compressor and 100 horsepower boiler are now installed. It is announced that diamond drilling has proven values to a depth of 390 feet, and the No. 1 shaft will be sunk to a depth of 400 feet.

Chambers-Ferland.—Two shafts are being sunk here, and one is now down 16 feet and the other 32 feet. Contracts have been let for the sinking of both. Hoists will be put in at both shafts and machine drills used. Air for hoists and drills will be obtained from the Nipissing. No. 1 shaft has a vein of calcite and smaltite, and No. 2 a 4 inch vein that will run six thousand ounces.

Buffalo.—A very rich vein has been struck here. The ore is similar to that on the Crown Reserve.

Right of Way.—Cheques for the payment of a seven per cent. dividend have been sent out. In 15 months \$105,000 has been paid in dividends, making a total of 21 per cent. The original price of the property was \$50,000.

Silver Leaf.—From October 21, 1907, to April 8, 1908, the ore mined amounted to 312,144 pounds, worth \$150,000.

City of Cobalt.—On May 5 a new vein was encountered 80 feet from the shaft at the 137 foot level. The vein is from 3 to 4 inches wide and as rich as any yet found on the property.

Thethewey.—In the week ending May 2 the Trethewey shipped three cars of ore, weighing 192,800 pounds. The total output since January 1 is 679,916 pounds, making this mine fifth in the list of shippers. Reports from the mine indicate that the property is in excellent shape.

Night Hawk Lake.

On Gold Island, in Night Hawk Lake, there is a three stamp mill in operation. The ore being run through is taken out by quarrying and is showing high values. The ice on the lake is still firm.

Montreal River District.

On Monday, May 11, the Ontario Navigation Company will begin the operation of a line of steamers from Latchford to

Elk City. The gasolene boats will also start regular trips on this date. A large quantity of supplies and mine equipment which has been accumulating at Latchford, awaiting the opening of navigation, will be sent in as fast as the boats can handle the stuff. A number of engineers and representatives of Canadian, English and American capital are booked for the first boats.

ALBERTA.**Coleman.**

Trade still continues dull all over the Province, but the Coleman mines of the International Coal and Coke Company are working almost full time. The coal trade in the Crow's Nest Pass depends to a great extent on railroad consumption, and owing to the decrease of traffic the demand for coal has been small. The past mild winter has also been against the coal trade.

It is claimed that about 2,000 men are idle around the various mines.

Edmonton.

A Winnipeg and St. Paul development company have secured an extensive coal area near the Pensluna river, north of this city. These holdings were taken up last fall and the prospecting work done shows the area to be valuable. No steps will be taken at present, however, as it is impossible to do much development work without railway facilities.

Canmore.

A serious accident occurred in the mines of the H. W. McNeil Company, whereby three men were killed and three men slightly injured. The names of the killed are Mathew Sarri, gangwayman, Gus Capleson, bratticeman, and Wm. Willmot, fire boss. The cause of the accident was an explosion of gas in the Carey vein. This vein gives off a lot of gas and only safety lamps are used. It appears that some time ago owing to the gaseous nature of the coal the Mine Inspector ordered that nothing but flameless explosives be used in this vein. In complying with this order the company obtained a supply of a safety explosive known as Negro Powder and gave strict orders to their shotlighters that nothing but Negro Powder was to be used for blasting the coal.

At the inquest on the victims of the explosion it was demonstrated that the explosion followed almost immediately after a shot had been fired in the main gangway, and that the shot-hole had been charged with "Giant" instead of "Negro Powder."

It was the shotlighter's (Mr. Willmot) duty to see that only "Negro Powder" was used, but he had evidently allowed the miner to use "Giant" instead, with fatal results.

(Editor's Note.—This is an instance of the gross lack of a sense of responsibility on the part of workmen. Such cases are of more frequent occurrence than is supposed. In the above case the company had issued specific instructions that none but flameless powder should be used in the mine. The mine was known to be gaseous. Why a miner should wish to disregard orders and risk the lives of his comrades and himself, is not apparent. The lesson is a painful one. But it must not be lost. Flameless powder, and safety lamps, are absolutely necessary for the prevention of coal mine explosions. One criminally careless workman can in one moment render useless all precautionary measures instituted by a responsible management.)

SASKATCHEWAN.**Taylorlorton.**

The Board of Arbitration which has been appointed under the Lemieux Act to deal with the labor troubles of the Western

Dominion Collieries of Taylorton met in Winnipeg. The chairman of the board was Judge Myers, while Frank Sherman represented the men, and J. Hannah represented the operators.

The chief points in dispute between the Coal Company and the men are—recognition of the union, wages scale, an eight-hour bank to bank day, employment of check weighmen, price of miners' supplies, and reinstatement of local union officers who have been discharged.

BRITISH COLUMBIA.

Rossland.

Mining is still looking busy in Rossland district. At the big producers development work is being kept well advanced and new ore bodies are daily being opened up and blocked out. While some of the mines could ship more ore, average shipments only will be maintained while copper remains at its present low price, as the managers can see no good in working out the mines and not getting a good price for their product, which is reasonable.

The hills surrounding the camp are being more thoroughly prospected at the present time than they ever were in the boom days, for the simple reason that the miners staked anything in those days, as there was a sale for any kind of wild-cat, but to-day the prospectors seem to know that a barren ledge is of little value to him and the ground now being staked in the South Belt in nearly all cases has a mineral showing of some little promise. Quite a number of the old abandoned claims have been sampled and restaked and where they are still held by the mining companies if there is any promising ore in sight overtures have been or are being made to the companies with a view to their being leased by ambitious miners.

The lessees of the Mayflower are taking out ore and the men on the Nest Egg have uncovered a body of copper ore. The Red Eagle has joined the shipping list, having sent a car of hand-picked ore to the smelter at Trail. They are still working and taking out good grade ore on the Blue Bird. The ore is at present being stored in the Homestake bins and will be shipped as soon as the rails are laid on the Homestake siding, but it is the intention of the Blue Bird management to have a siding and ore bins put on Blue Bird ground before very long. L. Carter, of Spokane, president of the company, states that his company will take over the mine and push development work immediately upon the expiration of the present lease, December sixth next. The ledge still retains its strong appearance and the prospects are good for the future. Of course the rock in this vicinity is much broken up and misplaced and the Blue Bird people can expect more or less trouble with their ledge at depth, but from its present appearance it looks as though it would continue downward in good form.

The Trail smelter has entered into a contract with the Snowstorm Mining Company, of Idaho, to treat 100 tons of ore from their mine per day, and the ore is now being received at the smelter. This ore carries over four per cent. copper. Mr. W. H. Aldridge, managing director of the Consolidated Company, in commenting upon the affairs of his company, states that the Centre Star, War Eagle and St. Eugene mines are all looking well at depth and that the smelter at Trail is working successfully and is one of the company's most valuable assets. The company has 1,150 men on its pay roll at Rossland, Trail and Moyie. Good progress is being made at Hosmer, where the C. P. R. is opening up their 4,000 acres of coal land. The 20 coal seams which are being opened up by means of two 2,800 foot tunnels have six or eight first-class workable seams among them. The 240 coke ovens are being rushed along as fast as possible. The total plant and equipment will cost over \$1,500,000.

Shipments from Rossland for the week ended April 25th amounted to 5,065 tons.

Phoenix.

Work is going along nicely at the Granby mines, and while the shipments are not as heavy as they were during March, yet they are much greater than they were during the same month in either 1906 or 1907, and this despite the fact that one furnace is cold most of the time, in consequence of repairs being made. The furnaces will be connected up with the new dust chamber and gone over one at a time, so as to not restrict the output to too great an extent.

During the week ended May 2nd the Phoenix mines shipped 19,942 tons of ore down to the smelter, and that plant treated 22,005 tons. This gives 354,872 tons mined and 348,229 tons of copper-gold ore smelted during the year to above date. At the present moment No. 3 furnace is out of commission.

Diamond drill exploration has been resumed in the mines and will be continued during the life of a contract recently entered into with Boyles Bros. On the 400 foot level there is now in successful operation a method of self-dumping cars which was devised by the local manager, Mr. A. B. W. Hodges, and which is expected to reduce the cost of handling ore on that level. The cars, which are loaded by gravity in the stopes, are brought to the chutes by electric locomotives and by means of a wheel attached to the cars engaging in an incline track the big five tone cars are dumped while in motion and in a few seconds.

Work is to be resumed on the Joe Joe in the near future. The Tip Top is the only electrically equipped high grade property that is doing any work at the present moment in this district.

Nelson.

At a recent meeting of the Ymir Mines in London the hope was again advanced that the ore body now being sought at depth would be located in the due course of active development work and the directors were urged to assist all they could in the raising of funds to go ahead with this work. Diamond drilling is now in progress on the property. A rich strike is reported from the Gallagher mine in the Ainsworth district. The ore body, a soft iron carbonate, carrying gold and silver, is three feet thick. This ledge is all good sacking ore. The mine has produced considerable ore during the past six months, and there are now two carloads of ore all sacked and ready for transportation to the cars as soon as the trail will permit of hauling.

One cannot but admire the pertinacity of F. Griffiths the owner of the Westmount claim that is now shipping high grade silver ore. Mr. Griffiths, who has always had great faith in the Westmount, began its development over ten years ago. Being unable and somewhat unwilling to interest capital, he alone and unassisted drove a 1,000 foot adit and was successful in cutting the Westmount ledge where he knew it ought to show up. Often for as long as three months at a time he worked away in the wild, rugged hills without hearing the sound of a human voice or feeling the warm handclasp of a fellow-being. He is certainly made of the best material that goes into the make-up of a pioneer and deserves the reward that he is at present reaping. The last car of ore sent from the Westmount to Trail smelter averaged 405 ounces of silver per ton.

A new company has been organized to take over the affairs of the Lucky Boy, Trout Lake, and will be operated by them.

Work in the Sheep Creek district continues to show good results. On the Devlin Group, now being developed by a syndicate of Nelson men, the ore body is showing up strong. The ledge is of quartz, 6 feet in width, carrying free gold to the extent of \$15 per ton. On the hanging wall there is a particularly rich pay streak about one foot wide, which will average \$100 per ton in gold. Steady operation is the slogan of the management at the Queen mine, and they are now busy in-

stalling their new compressor, hoist and other machinery. The Kootenay Belle, Mother Lode, Nugget and other Sheep Creek properties are showing up well.

Sixty men are now employed at the Silver Cup mine in the Lardeau. Geo. Alexander is acting as manager for the English interests, which now control the property. The Cup last month

shipped 160 tons, the largest shipment in the history of the mine. The ore averaged 150 ounces silver, $\frac{3}{4}$ ounce gold and 40 per cent. lead. The 160 tons above mentioned were valued at \$18,000. The mine is to be further developed by a long tunnel, which will be started fully 400 feet lower down the hill than any existing adit.

GENERAL MINING NEWS

NOVA SCOTIA.

Londonderry.—Messrs. T. J. and J. J. Drummond and Mr. Edgar MacDougall, all of Montreal, accompanied by Sir James Heath and Mr. Hamilton Benn, of England, visited Londonderry on April 30th. Two days were spent in inspecting the property of the Londonderry Iron and Mining Company. The East and West mines were examined, and the blast furnace plant. A visit also was paid to the company's saw mill at Folly Lake.

Halifax.—Examinations for the purpose of granting certificates to managers, underground managers and overmen, under the Coal Mines Regulation Act, R. S., C. 8, S. 1, may be held somewhat earlier this year than last. The date, however, will shortly be announced. The board for the purpose of granting them certificates is made up as follows: Cape Breton District—Henry Mitchell, Dominion; A. B. McGillivray, Glace Bay; Isaac Greenwell, Sydney. Cumberland District—Joseph Moss, Springhill; Henry McArthur, River Herbert; Amos Billereau, Joggins. Pictou District—John Rigson, Stellarton; Charles J. Core, Stellarton; W. W. Gray, Westville. Inverness District—M. S. Beaton, Inverness; J. W. Johnston, Mabou; Robert D. Anderson, Halifax.

The Dartmouth Ferry Commission have accepted the offer of the Inverness Coal Company for the supply of 5,000 tons of coal of 2,240 pounds. The company offered No. 1 slack at \$2.15 per ton, to be delivered at Commissioners' wharf, delivery to commence 1st May or sooner if required; to be delivered in schooners, steamers or barges of 800 tons capacity, free over ship's rail; weight as per scales. They also offered 1,000 tons run of mine at \$3.40 per ton. This is the lowest offer for a number of years. The Gowrie Company offered coal at \$2.50 per ton. The Mabou Coal Company's offer was for \$2.65 per ton, weight to be taken as bill of lading, delivery at commence about 15th May or on opening of navigation, and completed 15 December. They also certified coal against spontaneous combustion.

Port Hood.—The miners of the Port Hood-Richmond Railway-Coal Company stopped work on May 1st. Not one word of warning was given the management. Evidently the men thought that the time was opportune. The summer's output of coal has been sold in advance, and a continued strike would embarrass the company seriously.

The miners struck for a 15 per cent. increase on the general labor pay roll and for 5 cents a ton increase on coal cutting. They gave no indication of their intention and the management was taken entirely by surprise. On May 5th the men resumed work. A conciliation board is to be appointed.

QUEBEC.

Montreal.—On May 1st there were seven Dominion Coal boats in Montreal. Thirty-four thousand four hundred and sixty-four tons of coal were being unloaded. On April 30th 6,355 tons were unloaded at Quebec.

To encourage research work in the study of the structure of metals, etc., arrangements have now been made to offer a scholarship at McGill University. The particulars are as follows:

The holder shall be preferably a graduate of the metallurgical engineering course. The appointment will not necessarily be limited to one year, provided funds are available. The student will receive in the first place a salary of \$500 per year, and from \$100 to \$200 per year will be available for defraying the cost of supplies and apparatus.

The object of the research will be to ascertain the effect of the structure of metals (as revealed by the microscope) on their mechanical properties and their wearing quality; particularly in the case of steel rails, axles, tires and chilled iron wheels.

Provision will be made for enabling the holder of this scholarship to visit certain steel works and rolling mills, so as to learn the effect of mechanical treatment during the process of manufacture.

The student holding this post will be expected to assist in the laboratory teaching as far as it relates to the special work on which he is engaged.

The student would be termed Research Fellow in Metallurgical Engineering.

For the first year the necessary funds have been promised by Mr. Milton L. Hersey, M.A. Sc., who has already contributed an annual prize to students in the metallurgical course at McGill.

The work will be carried on under the direction of Dr. A. Stansfield, the professor of metallurgy, who, for a number of years, has made a special study of the heat treatment of steel and the nature of steel rails.

ONTARIO.

Belleville.—The Deloro works of the Deloro Mining and Reduction Company are operating continuously, almost up to capacity, on Cobalt ores. One hundred and fifty men are on the pay roll. Additions to the plant are proposed. Weekly shipments of bullion are now being made. In the first week of May fifty-one ingots were shipped to London. The total weight was 2,2550 pounds.

From the Henderson talc mine, near Madoc, large shipments will soon be made. A mill for grinding this superior talc is to be installed.

The Silver Leaf Mine, Cobalt, has shipped one car of high grade ore to the Deloro smelter. The arsenic plant, running in conjunction with the smelter, is producing arsenic regularly. The stamp mill is in commission on a test lot of gold-arsenic ore from the Lawson-Pearce mine, near Marmora.

Cobalt.—The discovery of a new vein on the Temiskaming 200 foot level, is creating a sensation. The vein contains 8 inches of silver. A new find on the Buffalo is also reported.

By the accidental explosion of dynamite two men were killed at La Rose mine on May 4th. The men were working on the second level. They were found about 1 o'clock. One of them, a Galician, was dead. The other, Leonard, a Frenchman, died shortly after being taken out of the mine. It is stated that both men were inexperienced.

ALBERTA.

Frank.—The Bellevue mines, belonging to the Lille Collieries, have resumed work. Thirty miners are employed.

The Frank coal mine of the C. A. C. Company was inspected on April 29th. Inspector Heathcote found it in good condition. It has been closed for three months.

BRITISH COLUMBIA.

Fernie.—On January 1st, 1909, the agreement between the C. P. R. and the Crow's Nest Pas Coal Company will expire. By the terms of this agreement the C. P. R. was prohibited from engaging in coal mining in the Crow's Nest district. Preparations are now being made at Hosmer, where the C. P. R. owns 4,000 acres of coal lands, to erect plant and houses. One million five hundred thousand dollars will be expended. Five hundred men are now employed in opening up. Two cross-cut tunnels, each 2,800 feet long, are being driven to intersect twenty seams of coal, six of which are good, workable seams. In these tunnels a system of compressed air haulage will be installed. Commenced next January shipments of coal will be increased

until an output of 3,000 tons per day is reached. During the summer 240 coke ovens will be completed. For shipping the coke a new type of steel coke car is to be introduced. Each car will have a capacity of forty tons as compared with the wooden box cars, which only hold twenty-two tons. The C. P. R. also owns forty square miles of coal lands on the Elk river, forty miles north of Michel, in the Crow's Nest district.

Mr. W. H. Aldridge, managing director of the Canadian Consolidated Mining and Smelting Company, is acting as chief consulting engineer on behalf of the railway company.

Phoenix.—The first fatal accident in many months took place on Sunday, 26th April, at the Granby Mines. Two men fell from the bench on which they were working in Stope No. 61, on the 300 foot level, on to a muck pile 25 feet below. Both men were probably killed instantly. The bodies were not discovered until some time after the accident.

Revelstoke.—For fourteen years the Silver Cup mine has produced ore steadily. It employs 50 to 75 men. Last year a new compressor, operated by water power, was installed. The Silver Cup ore averages 150 ounces of silver, $\frac{3}{4}$ ounce of gold and 40 per cent. lead per ton. In March it shipped \$18,000 worth of clean ore.

MINING NEWS OF THE WORLD.**GREAT BRITAIN.**

A Glasgow syndicate has leased nearly 300 acres of peat land in Bowness-on-Solway in North Cumberland. The peat will be subject to special treatment for manufacturing and other purposes.

The wages of coal miners in Cumberland have been reduced $2\frac{1}{2}$ per cent.

A thick seam of coal has been struck at a workable depth on Thorne Moor, Yorkshire, proving the existence of coal over a stretch of ten miles of country between Bentley and Thorne.

FRANCE.

The tin deposits at Montebrias, in the department of La Creuse, are to be developed by Anglo-French company, known as the French Mining Syndicate, capitalized at £250,000. Some of the tin occurs in a white feldspathic rock which yields as a by-product a fine quality of china clay.

PORTUGAL.

A gold mine of exceptional richness is reported to have been discovered in Northern Portugal, and a great rush to the district has set in. Auriferous quartz veins have long been known to occur in that region, especially in the Provinces of Minho and Traz-os-Montes, lying north of the Dowro.

NORWAY.

The production of iron ore in 1907 showed a large increase, the output last year being 130,000 tons, against 80,000 in 1906. Of the year's product, 90,000 tons were exported, in the form of ore, while 40,000 tons were treated by magnetic separation and briquetted.

The copper mining industry during 1907 made much progress. Existing mines largely increased their output, and a number of new enterprises were started. The Sulitelna mines were the heaviest producers, and of their output 11,900 tons of copper pyrites were treated on the spot, yielding 701 tons of nearly pure copper.

AUSTRALASIA.

The Mount Lyell Mining and Railway Company has just installed at its reduction works, Queenstown, Tasmania, two large turbo-blowing engines, which with the smaller one which has been in use for a year will make the finest blowing plant in Australasia. The practice in pyritic smelting at the works is advancing.

An official report on the Wolfram deposits near Marysville, Victoria, states that this mineral has been found over a tract of country said to be two miles square. A wide field is presented for further prospecting, as it is by no means certain that either the best alluvial or the best lode Wolfram has yet been found.

The prospects of the tin-dredging industry in Northeastern Tasmania are encouraging. The Dorset bucket dredging plant in the Ringarooma valley is handling between 12,000 and 14,000 cubic yards of ground per week and other plants are making a fair turnover.

In boring for coal at Cape Ford, Northern Australia, a depth of 1,459 feet has been reached. Several small seams of coaly matter have been cut and, indications being considered favorable, a more powerful plant is to be employed.

SOUTH AFRICA.

Several large amalgamations of mining companies have taken place or are in progress. The most important of these which is now under consideration by the companies affected, is that of the East Rand Proprietary Mines, which will absorb several other enterprises embracing a total of 2,801 claims. It is estimated that the amalgamation will effect a reduction in working costs amounting to 1 shilling per ton.

A lode has been struck in the City Deep shaft on the Rand at a depth of 2,865 feet, showing good assay values across a 42 inch working face. This result is regarded as highly encouraging in regard to the future of the Rand mining industry.

The gold production of Rhodesia for the first three months of 1908 was 147,141 crude ounces, as against 134,417 ounces for the corresponding months of last year.

UNITED STATES.

The Montana Mine Owners' Association has secured control of the smelter of the Idaho Smelting and Refining Company at Ponderay, Idaho, which has been closed since last fall, and will increase the capacity of the plant from 250 tons to 1,000 tons per day, giving employment to about 300 men. It is proposed to spend \$100,000 on improvements and the plant will be equipped for treating copper, a refinery being added. The name of the operating company will be the Montana and Idaho Smelting Company.

Oil and gas have been discovered near Colorado Springs, Colorado, and a company capitalized at \$1,000,000 has been organized to develop the field. They have secured control of about 6,500 acres.

It is proposed to substitute cement pillars for mine timbers in a number of Leadville, Col., mines. A series of experiments has been arranged for and should cement prove satisfactory it will be largely adopted.

The sum of \$195,000 has been appropriated by the American Congress to be used by the Geological Survey in studying means for lessening the number of mine accidents.

Company Reports.

INTERNATIONAL COAL COMPANY.

Dividends Paid in 1907 Aggregate 5½ Per Cent.

The annual report of the International Coal and Coke Company, Limited, operating collieries at Coleman, Alta., has just

been issued. It is signed by A. C. Flumerfelt, the president, and runs as follows:

The net profits for the year, after paying all operating expenses at head office and mine, amount to \$251,049.21 (being 8.9 per cent. on the outstanding capital), which sum has been derived from the various departments of the company's business, together with the sale of coal and coke, receipts on account of lots sold from the company's townsite and returns from water and electric light supplied by the company to the people of Coleman.

On the 1st of February, 1907, a dividend of 1 per cent. on the capital stock of the company was paid; a similar one on the 1st of May, which was increased to 1½ per cent. on the 1st of August and 2 per cent. on the 1st of November, making in all 5½ per cent., aggregating \$154,000, and as you will see by reference to the balance sheet on the opposite page, the handsome sum of \$97,049.21 was carried to surplus account for the year.

Coal produced—for the year under review—was 372,480 tons, of which 61,998 tons were sent to the company's ovens and produced 39,121 tons of coke, all of which found a ready sale, the balance being marked as coal.

The total amount of the pay roll for 1907 was \$437,723.19; average number of men employed, 465; days worked, 236; the average tonnage being 1575. During the year there were some additions made to the plant (expenditure under this head being \$45,943.57), which included coke ovens, additions to haulage plant, a Bradford breaker, snow sheds and a thoroughly well-equipped wash house for the men, all of which were deemed necessary in the company's interests and approved by the board.

STATISTICS AND RETURNS.

The output for the month of April at the collieries of the Nova Scotia Steel and Coal Company is about the same as that for the month of March. Number 4 colliery is just beginning to produce coal again, and allowing for two days of which the mines were idle the general output will be about the same as preceding month.

Following are the figures:

	Tons.
No. 1	71,612
No. 3	2,760
No. 4	576
No. 5	7,261
Total	55,212

The coal shipments of the Nova Scotia Steel Company for the three months were as follows:

	Tons.
Shipments March, 1908	23,757
Shipments March, 1907	21,854
Increase March, 1908	6,903
Shipments 3 months, 1908	117,737
Shipments 3 months, 1907	86,829
Total 3 months, 1908	30,908

The Crow's Nest Pass Coal Company, Limited, report the output of the collieries for the week ending May 8th as 17,453 tons, a daily average of 2,909 tons.

The output of the Crow's Nest Pass collieries for the week ending May 1 was 18,826 tons, or a daily average of 3,137 tons.

SMELTER RECEIPTS.

	Week.	Year.
Granby	19,905	334,530
Consolidated	4,726	88,002
Le Roi	371	24,806
Other mines	1,511
Total	371	26,317

The total receipts at the various smelters for the past week were 25,002 tons, and for the year to date 454,579 tons.

Manager Levy cabled the London office of the Le Roi Two Mining Company the following report of the operations of the Josie and Vancouver for the month of March: "Josie Mine report for last month—shipped 2,440 tons. The net receipts ore \$52,947, being payment for 3,275 tons shipped, and \$2,293, being payment for 151 tons of concentrates shipped. In all \$55,240. Vancouver mine report for last month: Shipped 50 tons. The net receipts are \$4,423, being payment for 60 tons shipped, and \$1,024, being deferred payment for 121 tons concentrates. In all \$5,447. No lead concentrates shipped."

Shipments from the Springhill Collieries of the Cumberland Railway and Coal Company amounted to 33,457 tons for the month of April.

BRITISH COLUMBIA SHIPMENTS.

Following are the shipments for the week ending April 25 and year to date:

Boundary shipments—

Mine.	Week.	Year.
Granby	19,905	334,530
Other mines		462
Total	19,905	334,992

Rossland shipments—

Centre Star	3,242	55,040
Le Roi	371	24,806
Le Roi No. 2	114	10,325
Other mines		500
Total	2,727	90,671

Slocan-Kootenay shipments—

St. Eugene	233	8,332
Whitewater	23	445
Whitewater, milled	280	4,620
Poorman, milled	250	3,350
Queen, milled	185	2,950
Second Relief, milled	145	1,520
North Star	139	1,004
Standard	86	532
Rambler-Cariboo	22	457
Ruby	43	141
Milly Mack	102	128
True Fissure	18	50
Other mines		13,352
Total	1,526	36,748

For the first four months of the year the Dominion Coal Company's output is 237,580 tons ahead of the corresponding period last year. The figures are as follows:

	1908.	1907.
	Tons.	Tons.
January	314,108	252,348
February	285,649	225,588
March	346,529	212,931
April	298,745	316,384
	1,245,031	1,007,451

DOMINION COAL OUTPUT FOR APRIL.

	Tons.
No. 1	48,000
No. 2	58,721
No. 3	32,279
No. 4	38,528
No. 5	42,757
No. 6	20,453
No. 7	713
No. 8	18,072
No. 9	27,948
No. 10	12,979
	300,450

The following report of the operations of the Le Roi mine for March was cabled to the London office of the company: "Shipped from the mine to Northport during the past month 6,700 tons, containing 2,680 ounces gold, 4,600 ounces silver, 170,000 pounds copper. Expenditure on development work during the month, \$7,250."

COBALT ORE SHIPMENTS.

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

	Week end	Since
	April 25.	Jan. 1.
Crown Reserve	40,000	40,000
Cobalt Central	10,600	107,180
La Rose	292,200	1,729,452
McKinley	61,000	1,063,000
Nipissing	101,170	1,044,600
Silver Queen	44,000	524,000
Silver Leaf	70,800	132,800

The total shipments for the week were 680,170 pounds, or 340 tons.

It will be noticed that the Crown Reserve mine has joined the list of shippers.

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

	Week end	Since
	May 2.	Jan. 1.
Buffalo		517,520
Coniagas		380,910
Cobalt Lake		180,610
Crown Reserve		40,000
Cobalt Central		107,180
City of Cobalt	110,520	338,600
Drummond		92,340
Foster		168,600
Kerr Lake		330,710
King Edward		127,240
La Rose	132,200	1,861,652
McKinley	60,900	1,123,900
Nipissing	64,030	1,108,630
Nova Scotia		120,790
Nancy Helen		140,420
O'Brien	126,980	1,635,570
Right of Way		60,120
Provincial		143,210
Standard		39,730
Silver Queen		524,200
Silver Cliff		52,000
Silver Leaf		132,800
Townsite		85,100
Temiskaming and H. B.		539,000
Temiskaming		237,250
Trethewey	192,800	679,916
Watts		114,430

The total shipments for the week were 687,430 pounds, or 343 tons. The total shipments from January 1 to date are 10,882,918 pounds, or 5441 tons.

The shipments for the month of April practically tripled those of 1907, when 533.15 tons of ore were shipped out from the camp. For April, 1908, the shipments were 49 cars and a total of 2,634,240 pounds. These shipments for the month of April are particularly notable in view of the fact that since April, 1907, several large concentrating plants have been installed

in the camp, and while the number of ounces of silver will be increased thereby, a large shipping tonnage will be cut off in consequence.

The shipments from the camp for the month ending April 30 are as follows:

	Cars.	Pounds.
Mc-Kinley-Darragh	7	366,240
Provincial	2	93,210
Nipissing	5	224,430
O'Brien	4	251,250
Buffalo	2	107,980
La Rose	15	854,200
Temiskaming and H. B.	2	121,000
Kerr Lake	1	60,330
Nova Scotia	1	40,000
Cobalt Central	2	57,480
Crown Reserve	1	40,000
Silver Queen	1	44,000
Silver Leaf	1	70,800
Trethewey	3	192,800
City of Cobalt	2	110,520
Total	49	2,634,240

The shipments for the first four months of the current year are much heavier than those of the same period for 1907.

Fifteen mines shipped 1,317.55 tons in April, 1908. The shipments for April, 1907, only amounted to 535.15 tons. Cobalt shipped nearly three times as much in April, 1908, as it did in April, 1907.

Jan.	Feb.	March.	April.	Total.
1325.89	1173.80	1832.79	1317.53	5650.01
980.11	903.71	1027.59	533.15	3444.56

Increase in tons for first four months, 2205.45.

The above increase is the more remarkable owing to the fact that many shipping mines that formerly sent second grade ore to the smelter now ship concentrates.

Another consideration is the high standing for the first four months of 1908 of the new shippers.

The Watts, Temiskaming and Hudson Bay, Temiskaming, City of Cobalt, Silver Leaf, Provincial, Nova Scotia and Nancy Helen now rank among the camp's most regular shippers.

The shipments for week ending April 25th went to the following smelters: La Rose to Denver; Nipissing to U. S. Metal and Refining Company, Carteret, N. J.; Crown Reserve, to Ledoux and Company, New York; Silver Queen to Copper Cliff; Silver Leaf to Deloro; McKinley-Darragh to Pennsylvania Smelting Company, Carnegie, Pa.; Cobalt Central to Rickett and Banks, Waverly, N. J.

The Transvaal gold output in April, as officially reported in London, was 565,832 ounces, fine, a decrease of 9,069 ounces from the output of March. The April output last year was 537,019 fine ounces; in 1906, 439,243. Value of the April output, calculated on the basis of the above estimate, compares as follows:

April, 1908	\$11,924,000
March, 1908	12,210,000
February, 1908	11,510,000
January, 1908	11,900,000
December, 1907	12,393,000
April, 1907	11,405,000
April, 1906	9,329,000
April, 1905	8,477,000
April, 1904	6,497,000
April, 1903	4,839,000

MARKET REPORTS.

Coke.

May 8th—Connellsville coke, f.o.b. ovens—

Furnace coke, prompt, \$1.55 to \$1.65.
 Foundry coke, prompt, \$2.10 to \$2.25.

Pige Iron.

May 8th, Pittsburg—

No. 2 foundry, \$15.40 to \$15.65.

Bessemer, \$16.90 to \$17.15.

Basic, \$16.15 to \$16.40.

Malleable, \$16.90 to \$17.15.

Southern No. 2, \$16.40 to \$16.90.

Other Metals.

Tin, Straits, 30.55 cents.

Copper, prime lake, 12.75 to 12.85 cents.

Lake, arsenical brands, 12.70 to 12.80 cents.

Electrolytic copper, 12.70 to 12.85 cents.

Sheet copper, 17 cents.

Copper wire, 14.75 cents.

Lead, 4.20 cents.

Spelter, 4.67½ cents.

Sheet zinc, 7.50 cents.

Antimony, Cookson's, 8.65 to 8.70 cents.

Aluminium, 33 to 35 cents.

Nickel, 45 to 47 cents.

Platinum, \$23.50 to \$26 per ton.

Bismuth, \$1.75 per pound.

Quicksilver, \$45 per 75 pound flask.

Silver Prices.

	New York. Cents.	London. Pence.
April 16	54¾	25 5-16
April 17		
April 18	54¾	25 3-16
April 20	54¾	
April 21	54¾	25 3-16
April 22	54¾	25 3-16
April 23	54¾	25 1-16
April 24	54	24¾
April 25	53½	24 11-16
April 27	53¾	24 9-16
April 28	53¾	24 11-16
April 29	53½	24 11-16
April 30	52¾	24 5-16
May 1	52¾	24 5-16
May 2	52¾	24¾
May 4	52¾	24¾
May 5	52½	24 3-16
May 6	52	24
May 7	52¾	24 3-16
May 8	52½	24¾
May 9	52¼	24 1-16

Silver.—The U. S. Mint has made no purchases of silver for the past four weeks. The consumption, at present, of the world, is far behind the production. India has not been a buyer for some time. China has been selling silver abroad. Since the first of the year England has shipped to India about 50 per cent. of the amount going out on the corresponding period of last year, or £2,310,438, against £4,409,784.