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## THE NEW FEDERAL COAL MINING REGULATIONS.

By an Order-in-Council, dated April 20th, 1910, certain significant changes are made in the Regulations for the disposal of coal-mining rights. The new Order-in-Council became effective on May 25th, 1910.

Under the new Regulations the term of lease shall be 21 years, renewable for a further term of 21 years, provided the lessee furnishes evidence, satisfactory to the Minister of the Interior, to show that he, the lessee, has complied in every respect with the conditions of the lease. As formerly the lease covered only 21 years, the change is desirable. Yet the question may fairly arise as to whether even 42 years is a sufficient period. Large investors may not think so. The surface equipment of collieries like, for instance, that of the Dominion Coal Company, represents millions of dollars. Each year sees additions to such capital expenditure. The life of a successful coal mine is long. Several of the collieries in the west possess sufficient reserves to predicate a possible life of 100 years. The Nova Scotian Government gave a 99-year lease to the Dominion Coal Company. Would it not be well for the Federal Government to follow this example? One particular aspect of this question is worth touching upon. Each lessee is permitted to acquire as much surface for mining operations as the Minister will grant him. Thus it is quite possible that a lessee, failing to obtain a renewal, may find himself at the end of 21 years in possession of surface rights and equipment but without any right to mine coal. If his surface rights cover the entry to the seams, a new lessee could obtain only the right to mine. In other words the property would be in a fair way to be tied up for all eternity.

The maximum area of a coal mining location is to be 2,560 acres, or four square miles. No person is allowed to hold more than one location. This regulation, of course, is easily evaded. The locator needs but to secure dummies. Hence the paragraph fails entirely of its object. In any case, four square miles is not an adequate area to provide for a coal mine. It would be far saner to fix the limit at from eight to twelve square miles.

The new Regulations provide that a person who has been granted a lease, and who subsequently abandons or assigns it, may, twelve months after the date of the lease, secure another location. This encourages the prospector. May it not, however, tend to restrict needlessly the activities of operating companies that wish to secure new locations?

Prospectors will appreciate the extension of time wherein applications must be filed. In cases where the location is distant more than 100 miles from the office

of a Government agent, the applicant is allowed, in addition to the regular 30 days, one day for each 10 miles, or fraction thereof, in excess of 100 miles. This will meet with warm approval.

One other paragraph calls for comment. Paragraph 13 provides that bona fide settlers shall be entitled to buy at the pit's mouth whatever coal they may require, but not for barter or sale, at a price not to exceed \$1.75 per ton. Whilst the intention here is commendable, the wording is too vague. As the law does not specify the grade of coal to be supplied to settlers, the operator is permitted to palm off any kind of slack or culm. Moreover, fixing a definite price per ton is dangerous. Operating expenses are constantly increasing. The cost of coal at the pit's mouth may before long exceed \$1.75. We would suggest that as all Dominion agents have free access to the books and accounts of coal mining companies, some effort be made to leave the adjusting of prices in their hands. In fairness to the operators it would be necessary to provide means of appeal and arbitration. It would also be essential to fix the price, not for an indefinite time, but for certain stated periods. We believe, however, that paternalism of this kind, it matters not how laudable the intention, is superfluous. The laws of supply and demand, and the rigours of competition, are the final adjusters of values. To set a fair price cumbersome machinery must be created and kept in motion. To fix an arbitrary price is unjust. Why, then, touch the matter at all!

Incidentally, we would like to have some light thrown upon the question as to what does or does not constitute a bona fide settler. We shall not be surprised if some difficulty is encountered in framing a satisfactory definition.

### INDUSTRIAL FEDERATION.

The recently elected President of the Iron and Steel Institute in his opening address departed from precedent. Instead of touching upon matters scientific and technical, he reviewed the social and economic conditions that have obtained in Great Britain since the founding of the Institute, the year 1869.

The president, at the beginning of his paper, points out that while economics have become the recognized basis of politics, yet as the Institute is concerned solely with facts and not with inferences, he had no fear of trespassing upon the political field. His field is, therefore, confined to industrial and social aspects, to the entire exclusion of matters political. But whilst he draws comparisons between the industrial development of Great Britain and that of foreign countries, he makes no such comparison of social conditions, confining himself merely to marking the contrast in Great Britain itself as between the year 1869 and the present day.

On succeeding pages of the address it is shown that, although in the year 1869, Great Britain had an enormous lead over all other nations in the production of iron, steel, and coal, yet this superior position could

not be maintained. "The output of coal, iron, and steel, the foundation of the national industry, cannot, in the nature of things, depend solely on the energy of the workers and the ability of administrators. However rich in natural resources the soil may be, the element of area must always be a great factor in the case." Obvious as is the truth of this statement, it is equally apparent that part at least of Germany's progress is due to something more than mere extent of territory. And that something is what Great Britain has always lacked.

Forty years ago Great Britain was easily first in the production of pig-iron, coal, and steel. Now both the United States and Germany are far ahead of her. Whilst Great Britain's position is still strong, a point has been reached where purely physical conditions indicate the future limits of industrial expansion. Expansion there will be for years yet; but not at anything like the rate that is observable in larger countries. Comparisons with Germany and the United States are unfair. "We can only regain the position of supremacy that we occupied in 1869 by reckoning in with the United Kingdom our great dominions overseas." This, we take it, is a constructive plea for imperial industrial federation.

Touching the amelioration of social conditions in Great Britain since 1869, the broad statement is made that since that year there has been a general advance in money wages and a general decline in the prices of commodities. The wage-earner receives to-day 38 shillings, where, in 1869, he received 20 shillings. To-day, also, the worker is better housed, better fed, better clad, and in all respects has a better chance in life.

The Presidential address makes cheerful reading. The generalizations alluded to above are substantiated by means of statistics.

After reading it carefully, the impression is strong upon us that the British workman has surprisingly little to complain of.

### THE LAST MINE MYTH.

Innumerable are the platitudes that have been written concerning the credulity of man. More convincing than all the platitudes are the amazing instances from real life. The latest and best test of blind belief is a project born in Boston.

Mr. J. Burpee Neily, not unknown to the inhabitants of Eastern Canada, is the president of the Viboras Mining Corporation, capital stock, \$3,000,000; par value of shares, \$5. Mr. C. P. Bowker is manager of the Viboras mine, which mine is situate eight miles from Hostotipaquillo, Mexico. But the Viboras is no ordinary mine. True, there is reported to be shipping ore running from \$500 to \$17,000 per ton. This, however, is so insignificant that Mr. Neily suggests counting upon only \$100 per ton. And well can he afford this discount, for, within the mine lie 45 tons of silver and 29 tons of gold, hidden treasure that once belonged to

a Spanish viceroy. So, at least, Mr. Charles P. Bowker believes. The foundations of Bowker's faith are suggested in the following paragraph—one gem in a scintillating mass:—

"July 2.—Maximino has told me that there are some nine treasures in the Viboras, and I believe I have located them all with the twig, amounting to 45 tons of silver and 29 tons of gold, belonging to the last Spanish Viceroy and his family. . . ."

Would we could quote more! We shall pause but to explain that Maximino is a horrid person who takes it upon himself to be wise after the event. Whenever Bowker becomes discouraged, Maximino multiplies the treasure by two or three and assures Bowker that it is just a wee bit farther ahead. Hence Bowker is ever and again on the point of striking the Spanish bullion. He misses, and Maximino shows him where he has been wrong. Bowker has twigged the silver and gold. Far better would it be for him to use that twig on Maximino.

To those who appreciate the curious in literature we recommend this charming little study. Mr. Neily and Mr. Bowker, with the assistance of Senor Maximino, have Edgar Allen Poe skinned to death, frazzled to a finish, or even more so.

#### COMMENDATION.

The Mines Branch, it is announced, will presently take up two urgent lines of work. It will investigate and attempt to regulate the use of explosives. It will also interest itself in the introduction of breathing apparatus for rescue work in coal mines.

Many months ago the CANADIAN MINING JOURNAL urged that the Mines Branch be directed to attack the problem of life salvage in coal mines. The matter was brought up in the House of Commons by Mr. Claude Macdonell, one of the members for Toronto. The reply of the Hon. Mr. Templeman, though vague, indicated that steps were to be taken at an early date.

The question of regulating the manufacture, storage, and use of explosives was brought forcibly before the public through the recent disaster at Hull. But the matter was, some time ago, placed before the Mines Branch.

In both directions the Mines Branch should be capable of accomplishing work for which the whole nation will be grateful. We have always had serious misgivings as to the advisability of Government officials undertaking research work of a more or less academic nature. One obvious objection is that such investigations, important as they may be in the opinion of many, take up time, money, and energy that should properly be devoted to just such problems as those mentioned above.

The Mines Branch will win and will deserve our open and hearty support if it gets down to business in regulating the use of explosives and in encouraging the introduction of rescue apparatus.

As illustrating the present position of affairs, we may instance the fact that after the recent explosion at Nanaimo, B.C., an officer of the United States Geological Survey had to be called on to instruct the men in the use of the Draeger apparatus. This should surely be unnecessary.

#### PREVENTABLE ACCIDENTS.

One of the most dangerous practices in mining is the habit of drilling or picking into old bottoms of drill-holes. These old bottoms, or "bootlegs," as they are labelled in the west, are due to the hole not breaking to bottom when it is blasted. Miners frequently take advantage of these old holes to start a new hole. If a residue of dynamite happens to remain in the "bootleg" there is a funeral. This fact, however, does not appear to discourage other searchers after short cuts to the future world.

During the session of 1909, the Ontario Government passed an amendment to the Mining Act forbidding drilling or the insertion of any metal tool into a hole that has been blasted. This, naturally, does not restrain the careless miner. But it furnishes to the mine manager the means of controlling and punishing his men. In fact, the Government can do no more than it has done. Upon mine managers devolves the duty of impressing upon their employees the criminality of taking foolish chances.

Incidentally, it must always be remembered that the "bootlegs" are evidence of bad mining.

#### EDITORIAL NOTES.

The peat producer-gas plant of the Department of Mines is now in daily operation. Visitors are invited to inspect the establishment.

It is satisfactory to learn that Cobalt ore shipments for the first four months of the year, notwithstanding the light shipments during January and part of February, are considerably larger than those reported for the corresponding period of 1909.

In the explosion in the Wellington colliery, White Haven, England, one hundred and thirty-seven miners lost their lives. Apparently the official warning, published all over Great Britain, to the effect that abnormally high barometric conditions rendered such explosions highly probable, was entirely disregarded. It seems that catastrophes are the only effective teachers.

Canada is to have a tungsten mining industry. The discovery of scheelite at Moose River, Nova Scotia, first described in these columns two years ago, is to be worked this summer. The ore is richer than most of the deposits worked at present. Many veins are exposed. The scheelite concentrates ideally, and, except for the presence of a small percentage of mispickel, will make an exceptionally clean shipping product.

# THE CANADIAN IRON AND STEEL INDUSTRY.

By Watson Griffin.

## III.

In previous articles I have outlined the difficulties that had to be surmounted in establishing the Canadian iron and steel industry, and described the plants at present in existence.

In considering the future prospects of iron and steel manufacture in Canada, the first factors to be taken into account are the character and extent of the raw materials, iron ore, limestone and fuel, their distance from each other and the means of transportation.

For purposes of comparison it may be well to outline the conditions that exist in the United States and the United Kingdom.

The first furnaces in the Pittsburg district were started on local ores, but now almost the entire supply comes from the mines in the vicinity of Lake Superior. James M. Swank, manager of the American Iron and Steel Association, says: "From the iron ore mines of Michigan and Minnesota to the coal of Pennsylvania the distance is 1,000 miles. Connellsville coke is taken 600 miles to the blast furnaces of Chicago and 750 miles to the blast furnaces of St. Louis. The average distance over which all the domestic iron consumed in the blast furnaces of the United States is transported is not less than 400 miles, and the average distance over which the fuel that is used to smelt it is transported not less than 200 miles."

The iron ore used in the Pittsburg district has to be brought from the mines of Northern Michigan and Minnesota by rail to a Lake Superior port, and there loaded on vessels, after which it must be carried through Lake Superior, the Sault Canal, Lake Huron, Lake St. Clair, the tortuous channel of the Detroit River, and finally through Lake Erie to Cleveland and other lake ports, where it is transferred to railways, again to be transported to the furnaces. This makes four handlings of the ore in transportation from the mines to the furnaces. When the iron and steel is made at Pittsburg it has to go by rail to Philadelphia, 354 miles; to New York, 445 miles; to Boston, 675 miles; to Buffalo, 270 miles. The distance from Pittsburg to Montreal is 710 miles by rail as compared with the cheap water route of about 726 miles from the works at Sydney, C.B., to Montreal.

The only blast furnaces of the United States that have their raw materials close together are in the Southern States. Of these the most favorably located are those of the Birmingham district, in Alabama, where fuel and ore are very close together. However, the Alabama furnaces are far from the leading markets both of the United States and other countries, and the freight rates on the pig iron and steel must be added to the cost of production. The nearest seaport is Mobile, 276 miles by rail from Birmingham, the centre of the iron district. It is 349 miles by rail from Birmingham to New Orleans, 448 miles to Savannah, 476 miles to Charleston, 766 miles to Newport News, 804 miles to Baltimore, 855 miles to Philadelphia, and 794 miles to Pittsburg.

The British blast furnaces at one time used only local ores, but now very large quantities of ore are imported. For many years British iron makers have been drawing ore supplies from Spain. In recent years ore has been imported quite extensively from the Gellivara district of Sweden, which is considerably north of the Arctic circle. The ore is carried by rail across Sweden and

Norway to the Norwegian harbour of Ofoten, 130 miles north of the Arctic circle, where it is shipped to the British blast furnaces. The London Economist some years ago, discussing the probability of Great Britain losing supremacy in the manufacture of iron and steel, said: "It must be remarked for how long a period the mines in this country have been worked. The output of black-band ore in Scotland has been decreasing for years past and the greater portion of the pig iron now made in that district is from foreign ores. Cleveland, which has been one of the most prolific districts in the country, has now been worked nearly fifty years, and the best ore having been taken out we may soon have to fall back on the poorer, and consequently costlier kinds. It has been known for some time past that the best hematite ores in the Bilbao district in Northern Spain are fast deteriorating, and if we have to fall back on the poorer qualities, those containing a lower percentage of iron, they will be more costly, owing to the proportionately greater cost of carriage by sea."

From the standpoint of the iron-maker, Canada may be divided into four sections, the Maritime Provinces, Quebec and Ontario, the Northwest Provinces, and British Columbia. Economically Newfoundland should be included with the Canadian Maritime Provinces, Prince Edward Island, Nova Scotia and New Brunswick, but unfortunately Canadian statesmen have never realized the importance of bringing that great province into the Confederation.

Newfoundland's resources of coal and iron ore can only be guessed at, as only a very small part of the island has been explored for minerals. Very thin seams of coal have been discovered, but as yet none have been found of sufficient thickness to be of any value. In Conception Bay, about 35 miles from St. John's, there is an island about eight miles long and about two miles wide, known as Great Bell Island, on which are the extensive ore deposits belonging to the Dominion Iron & Steel Company, of Sydney, Cape Breton, and the Nova Scotia Steel & Coal Company, of Sydney Mines, Cape Breton. As shown in my last article, there is now no doubt that hundreds of millions of tons of good ore can be obtained from this source, and it can be laid down at the works at lower cost than ore can be placed at any blast furnace in Pennsylvania, while the coal and limestone are in Cape Breton within a few miles of the furnaces. It is quite probable that valuable iron ore deposits may yet be found on the Newfoundland mainland, but this is only conjecture.

Prince Edward Island is practically without mineral resource, although coal is believed to exist at a very great depth.

Nova Scotia is particularly well endowed with coal, having extensive beds on both the eastern and western coasts of Cape Breton Island, in the central county of Pictou, and in Cumberland County at the northwest of the province. There are a number of seams of great thickness.

If all the iron ore in the province were concentrated at one point there would be enough of it to supply very extensive works. There are indications of iron in almost every part of Nova Scotia, and at one time it was commonly supposed that the province had almost inexhaustible supplies of this mineral. Investigation showed that most of the deposits were merely pockets, and

the impression became general that extensive bodies of ore would never be found in Nova Scotia. However, development work carried on in Annapolis County by the Canada Iron Corporation seems to indicate that the deposits there are very extensive. The Corporation owns and controls seven square miles of iron ore lands of Torbrook. The ore is a red hematite, and independent engineers have estimated the quantity obtainable as high as 300,000,000 tons. The Corporation has installed a plant at the mine having a daily capacity of 1,000 tons, and shipping facilities have been provided at Port Wade, N.S., with a dock-loading capacity of 2,000 tons per hour.

The Londonderry iron range in Colchester County extends for many miles and, although the deposits are not very deep, the total quantity of ore is believed to be quite large. As stated in my description of the Londonderry Iron & Mining Company's properties in a previous article, there are a number of varieties of ore in this range, including hematite, limonite, ankerite, siderite, and specular ores. The blast furnace of the Londonderry Iron & Mining Company at Acadia Mines is about midway between the coal fields of Pictou County and the mines at Springhill in Cumberland County.

There is some reason to believe that there is an extensive ore bed at Arisaig, on the coast of Antigonish County, but as no development work has been done this is uncertain.

Except in the case of some small pockets the iron ores of Nova Scotia are too high in phosphorus to make Bessemer pig iron. They are usually low in sulphur, but Nova Scotia coal is commonly somewhat high in sulphur.

Mr. J. E. Woodman, a mining engineer who has prepared a very interesting report on the iron ores of Nova Scotia for the Dominion Department of Mines, expresses the opinion that there are scattered throughout Nova Scotia in close proximity to transportation facilities by rail or water a large number of deposits which, while not individually extensive enough to justify the erection of local smelters, could be economically mined for transportation to smelting centres. He says: "It is even an open question whether it would pay existing smelting companies to buy them up. But if, instead, the individual owners were to develop them and contract for sale of the ore to the smelters, if necessary attempting an understanding with one of the smelting companies whereby the latter supplies the tools in instances in which the owner has no capital upon which to work, even under the present market conditions a number of the isolated deposits could be profitably opened up."

If the iron ore deposits at Arisaig should prove to be extensive, of good quality, and susceptible of being cheaply mined, the ore might be conveniently carried either to the coal of Pictou County or to the coal on the west coast of Cape Breton. It is possible that blast furnaces may yet be located in the vicinity of Pictou Harbour, using Pictou coal and drawing ore supplies from Pictou County, Arisaig and perhaps New Brunswick and Newfoundland.

Mr. J. E. Woodman suggests that Parrsboro, a port on the Basin of Minas, would be a favourable location for an iron and steel plant of large size. He says that ores could be conveniently brought to Parrsboro from the whole western Cobequid. Ore from the Torbrook and Clementsport mines in Annapolis County could be shipped by water to Parrsboro, while Londonderry ores could be brought there by a short rail haul. Brookfield, he says, is but eight miles from Truro, and with

a Truro-Parrsboro railway the iron ore there would be within as easy reach of Parrsboro as of Acadia mines (Londonderry) to-day. The Hants County ores also could be taken to Parrsboro as easily as to Acadia mines. For flux limestone could be obtained from the vicinity of Windsor and anchorite could be brought from the Londonderry range. "Fuel," he says, "would come chiefly from Springhill, along the road over which most of the tonnage now goes, giving a short down-grade haul and avoiding the costly and roundabout freighting across the Cobequid Mountains, now necessary on the Intercolonial Railway. The road from Springhill mines to Parrsboro crosses the mountains by a very low pass, which involves no heavy grades. Should the buried western section of the Cumberland coal field be developed there would be one or more additional sources of fuel at close range."

The distance from the Springhill coal mines to Parrsboro by the railway referred to by Mr. Woodman is 27 miles. The distance by rail from the Torbrook iron mines to Port Wade, the shipping port, is 42 1-2 miles, while Port Wade is 77 miles by water from Parrsboro. If a short railway were constructed from Parrsboro to Truro, making connection there with the Intercolonial line to Stellarton, the coal field of Pictou County would be brought within a rail distance of about one hundred miles from Parrsboro. At present the railway distance from Stellarton to Parrsboro is 132 miles via Springhill Junction.

Iron and steel produced at Parrsboro could be conveniently distributed to all parts of Nova Scotia and New Brunswick. The distance by water from Parrsboro to St. John, N.B., is 82 miles.

It has also been suggested that the Torbrook ore might be smelted at Annapolis, to which coal or coke could be brought by water. The distance from Annapolis to Parrsboro is 87 miles. Works at either Parrsboro or Annapolis would have the advantage of not being absolutely dependent upon local raw materials as iron ore, coal and limestone could be brought by water from outside points in any emergency.

The greatest obstacle to the success of a large iron and steel plant dependent upon coal supplies from Springhill is the great frequency of coal miners' strikes in that district. If some permanent basis of settlement for labour disputes could be arrived at which would prevent strikes and assure continuous operation of the mines it would do much to promote industrial development in Nova Scotia.

The coal seams of New Brunswick so far as known are not thick enough to be of much value.

There are indications of iron in many parts of New Brunswick, but the only extensive deposits so far discovered are those of the Canada Iron Corporation in the Drummond iron range near Bathurst, in Gloucester County. The Corporation owns and controls twenty-five square miles of ore lands. The ore is a magnetic hematite and already upwards of 50,000,000 tons have been proven. This is by no means the limit of the deposit, which is estimated to contain hundreds of millions of tons. Of this mine Mr. John E. Hardman, consulting mining engineer, Montreal, says: "It is the largest body of merchantable iron ore known to me to exist in the Dominion to-day."

A railway has been constructed for a distance of seventeen miles, connecting with the Intercolonial Railway, over which ore can be carried to Newcastle, N.B., where docks having a loading capacity of 3,000 tons per hour are being constructed. The distance from the mines to Newcastle is about 56 miles. From the mines

of the Drummond iron range to Parrsboro the railway distance is about 231 miles, but it would be possible to transport the ore by water during about nine months of the year to one of the ports on Northumberland Strait, from which the rail haul to Parrsboro would be short. The railway distance from the Drummond Iron Mines via Newcastle and Oxford Junction to Pictou, N.S., is about 281 miles. During the months that Northumberland Strait is open the water route would be shorter. It might be found advantageous to smelt Drummond iron ore in the vicinity of Pictou Harbour. From the centre of the coal field to Pictou Harbour the rail haul of coal would be between thirteen and fourteen miles. Works located in Pictou County would have the advantage of being somewhat nearer to Montreal than those in Cape Breton are. The railway distance from Pictou to Montreal is about 797 1-2 miles via Oxford Junction and about 829 1-2 miles via Truro, while Sydney is about 985 miles from Montreal via Oxford Junction and about 988 1-2 miles via Truro. During the season of St. Lawrence navigation the deep water route is considerably shorter than the rail route, and of course much cheaper, the distance from Sydney to Montreal being about 726 miles, while from Pictou to Montreal the distance is about the same.

Iron and steel works located in Nova Scotia have the disadvantage of being at a great distance from the central markets of Canada. On the other hand, Nova Scotia has a wonderfully good geographical situation as regards the markets of the world at large. It is nearer to Europe than any other part of the mainland of America and, strange to say, it is nearer to the leading countries of South America and South Africa than the Southern States are.

With reference to the remarkable geographical position of Cape Breton, I may quote from one of a series of articles entitled "At the Front Door of Canada," which I wrote for the "Montreal Star" some years ago. The harbours of Sydney and Louisburg are the front doors of Canada. They might be called magic doors, for they open wonderfully into short passages to the leading markets of the world. It is an extraordinary fact that Sydney and Louisburg, while more than 2,200 miles nearer to Liverpool than New Orleans and Mobile, are at the same time nearly 600 miles nearer to Pernambuco, Rio Janeiro and Buenos Ayres, and nearly 900 miles nearer to Cape Town, South Africa. This is because ham-shaped South America lies far to the east of North America, while New Orleans, Mobile and other ports on the Gulf of Mexico, are a long distance west of the Atlantic Ocean. Moreover, ships from southern ports of the United States cannot take a direct route, because they have to steer clear of the West India Islands. Cape Breton, jutting far eastward into the Atlantic, is much nearer to a direct line drawn north from the east coast of South America. And the Gulf ports are not the only ones over which the Cape Breton ports have an advantage. The whole Atlantic coast of the United States slopes away to the southwest, and Savannah, Charleston, Baltimore, Philadelphia and New York are so far to the west of the direct routes from Sydney and Louisburg that the Cape Breton ports, although farther north, are much nearer to the chief ports of South America and Africa.

The most eastern point of South America is Pernambuco. All vessels going south of that point to Rio Janeiro, Buenos Ayres or other South American ports must pass it. The following table of distances in nautical miles will show the wonderful advantage that Sydney has over all American ports for trading with Great Bri-

tain and other countries of Europe, South America, Africa and Asia.

#### TO LIVERPOOL.

	Miles.
Sydney Harbour to Liverpool	2,282
(via N. Ireland)	2,307
(via S. Ireland)	4,553
New Orleans to Liverpool	4,506
Mobile to Liverpool	3,571
Savannah to Liverpool	3,500
Charleston to Liverpool	3,157
Newport News to Liverpool	3,324
Baltimore to Liverpool	3,160
Philadelphia to Liverpool	3,110
New York to Liverpool	

#### TO PERNAMBUCO.

Sydney Harbour to Pernambuco	3,567
New Orleans to Pernambuco	4,146
Mobile to Pernambuco	4,133
Savannah to Pernambuco	3,660
Charleston to Pernambuco	3,631
Newport News to Pernambuco	3,591
Baltimore to Pernambuco	3,758
Philadelphia to Pernambuco	3,746
New York to Pernambuco	3,696

#### TO CAPE TOWN.

Sydney Harbour to Cape Town	6,467
New Orleans to Cape Town	7,355
Mobile, Ala. to Cape Town	7,309
Savannah to Cape Town	6,867
Charleston to Cape Town	6,831
Newport News to Cape Town	6,736
Baltimore to Cape Town	6,903
Philadelphia to Cape Town	6,870
New York to Cape Town	6,787

The distances from Sydney to the various points were furnished to the writer by the late Captain W. H. Smith, R. N. R., Chairman Board of Examiners of Masters and Mates, Marine Department, Halifax, while the distances from various American ports were compiled by the United States Commissioner of Navigation. Louisburg is not given in the above tables, but the distances from Sydney and Louisburg are practically the same. Only points on the east coast of South America and the west coast of Africa are given for comparison, but it will be evident to all who examine the map that Sydney must have the same advantage of distance in trading with the west coast of South America and east coast of Africa. It applies also to the whole Pacific coast of North America, to Asia and Australia. It seems strange, but it is a fact that Sydney is nearer to San Francisco than any Atlantic or Gulf port of the United States. The distances given are for routes for full powered steamships.

There are a number of harbours in Nova Scotia open all the year which, although not quite so near to the outside markets as Sydney and Louisburg, are better located in this regard than any port in the United States.

It should be noted, however, that unless regular steamship lines are established to the leading ports of the world the natural advantage of geographical situation will count for little except in the case of a large order for which it might pay to charter a ship to make a special voyage.

St. John, N.B., would possess some advantages as a location for a large iron and steel plant. The harbour is open throughout the year. It is one of the terminals of the Intercolonial Railway; it is the winter port of the Canadian Pacific Railway, and it is probable that both

the Grand Trunk Pacific Railway and the Canadian Northern Railway will have terminals there. It is nearer by rail to Montreal than any other important port in the Maritime Provinces. The railways taking grain and other farm products from central and Western Canada to St. John for export will be anxious to have return freights and would no doubt concede very low rates on finished products to an iron and steel company at St. John. St. John is the commercial metropolis of New Brunswick and is also well located for the distribution of its products throughout the greater part of Nova Scotia. With reference to the markets of the world, it is nearly 400 miles nearer to Liverpool than New York, and it is remarkably well situated for trade with Mexico, South America and South Africa. While not quite so near to world markets as Sydney, C.B., is, it has the advantage of having more established steamship lines. There is little doubt that it will in the near future have first class winter steamship services to Mexico, the West Indies, South America, and South Africa, as well as to England. It is not probable that the summer service will ever be equally good on account of Montreal competition.

It is almost certain that a large steel shipbuilding plant will be established in St. John in the near future and some of the ships of the Canadian Navy may be built there. In the days of wooden sailing vessels it was one of the greatest shipbuilding centres in the world, and in ownership of ships ranked fourth among the cities of the British Empire.

Limestone could be obtained near St. John; coal or coke could be brought by water from the Cumberland, Pictou and Cape Breton coal fields; iron ore might be

obtained from Torbrook, Londonderry, Arisaig and perhaps Newfoundland, as well as from the Drummond range near Bathurst in New Brunswick, and possibly some nearer point in New Brunswick. As already stated, Parrsboro, the port from which Springhill coal is shipped, is 82 miles from St. John, while the rail haul from the coal mines is 27 miles, and if Pictou coal were brought to St. John via Parrsboro the rail haul would be 132 miles, but this might be shortened by connecting Parrsboro and Truro. The water route from Pictou harbour to St. John is about 485 miles. The water route from Sydney, C.B., to St. John is about five hundred miles. The coal mines on the west coast of Cape Breton are somewhat nearer to St. John. Port Wade, N.S., from which the Torbrook ore is shipped, is about 40 miles from St. John. From the Drummond iron mines, near Bathurst, in Gloucester County, N.B., the rail haul to St. John via Moncton would be about 224 miles. The ore could be transported by rail to Fredericton, a distance of about 170 miles from the mines, and there transferred to boats running down the St. John River.

It has been suggested that blast furnaces might be constructed in the vicinity of the Bathurst mines or at Newcastle, getting coal from Cape Breton, Pictou County, or the Cumberland field. This would be a case of carrying coals to Newcastle in a new sense.

When other advantages are equal, it is more economical to carry iron ore to coal than coal to iron ore, for the coal is much more bulky and more difficult to handle. By converting the coal into coke the bulk is greatly reduced, but the coke requires much more careful handling in transportation than coal.

(To be continued.)

## SUMMER ROUTE TO THE PORCUPINE.

(Written for the CANADIAN MINING JOURNAL by Hamlin Brooks Hatch.\*)

At the present time, the question of the most feasible route into the new Porcupine gold fields is one of moment to mining men and investors who have interests in the new field. In other years in which any new mining country has been opened up in the winter months, men have been able to figure with some degree of certainty as to the time of the winter break-up. The spring of 1910 has been remarkable in Ontario, owing to the fact that the streams and lakes opened at least four weeks in advance of the time expected. Interested people who placed their faith in records of the break-ups of other years, and who therefore failed to get their supplies in over the good winter roads, are at present forced to devise a good freight route for the conveyance of all mining necessities. So the question of a good summer route into this new country is one of greater importance than it would at first appear.

There are at present four possible routes, two of which are being used now. It is the purpose of the writer to take up each separate route in turn, giving its advantages and disadvantages from both the passenger and the freight standpoint. The writer is himself familiar with two of the routes that will be discussed. The other two have been taken from the Government map of the district and are at present simply possibilities for the future.

### Route from 228½ Mile Post.

The first route to be considered will be that starting from the 228½ mile post of the T. & N. O. Railway.

This can be termed the all-water route. The station name is Holland. There is one train a day arriving between 7 and 9 p.m., going north, and at 9 a.m., going south. There is a good clean stopping place at this point.

From the steel there is a three-quarter mile portage to Small Lake, at the head of Slim Creek. This portage is good travelling, it being part of an old lumber road. Just before reaching the lake there is a steep down grade. Coming out, the lumber road may be taken, which winds up over the grade, lessening the incline considerably. From this lake it is a short paddle to the mouth of Slime Creek. This creek, which is 10 miles long, is narrow and quite fast. The first six miles from the lake the stream is more or less choked with dead trees and debris, which necessitates the careful handling of the canoe. The last four miles is open and good. The time of going in through Slim Creek to the Frederickhouse River is two hours. Coming out it takes four hours. Slim Creek empties into the Frederickhouse River 1 1-2 miles below the Frederickhouse Lake. Here the current is very fast, and it is necessary to pull the canoe from the shore. It is possible to paddle some of the distance, but the last quarter of a mile runs like a mill-race and no one has as yet been able to negotiate it without resorting to tracking. The west shore is sandy and furnishes a good foothold for this work.

From Frederickhouse Lake it is possible to use

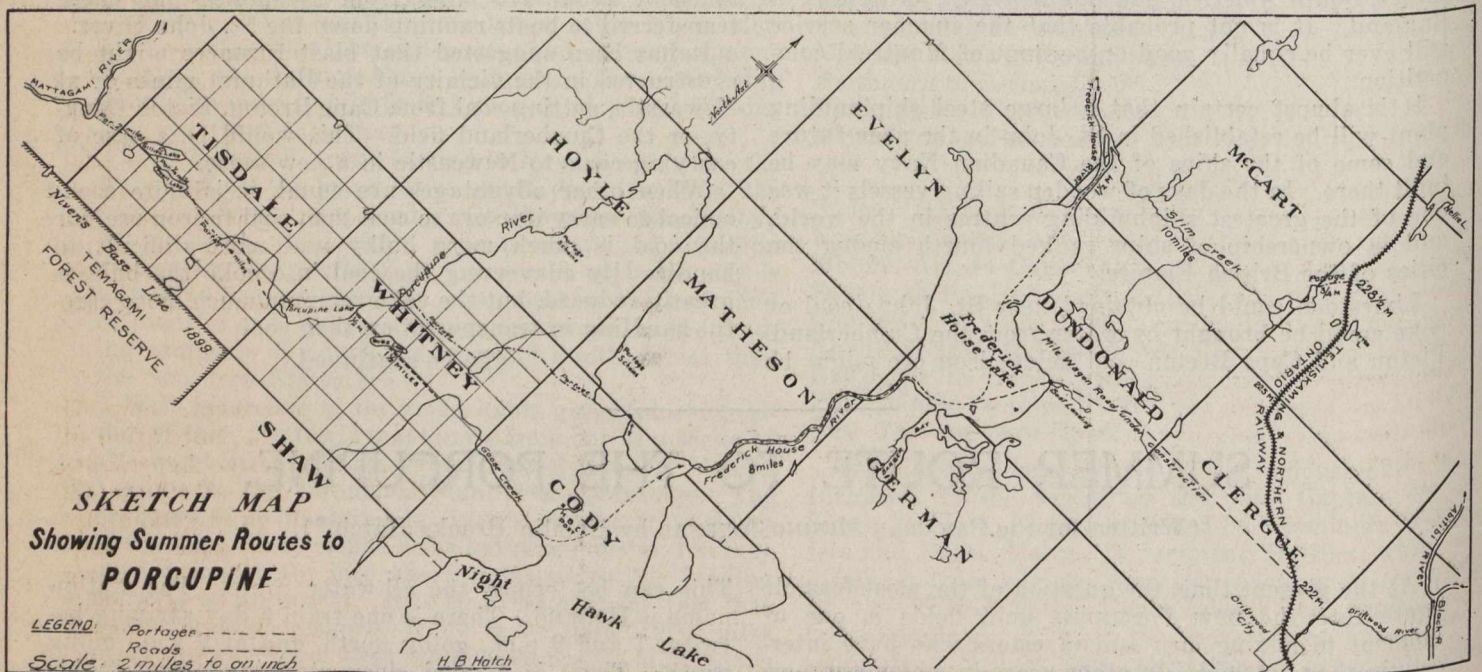
launches all the way into Porcupine Lake. The launches which are to be used are the regular flat-bottomed pointers fitted with engines.

From the head of Frederickhouse Lake the route continues over the five miles separating Nighthawk Lake from Frederickhouse. From the head of Nighthawk it is a short distance to the Porcupine River. This river empties into Porcupine Lake. It is a good wide stream, and throughout its whole length there are only two portages, and both are short, being only five chains. The route ends at Porcupine Lake.

The advantages and disadvantages of this route are about equal. The greatest point in its favour is that with the establishment of launches and the building of good tote roads over the two short portages on the Porcupine, heavy loads of freight can be taken in with scarcely any re-handling. From a passenger standpoint, the route is not advantageous. Time consumed making the trip is the most important objection. Go-

Lake. The route will continue into Goose Creek, which empties into Nighthawk, just south of the Hudson Bay Post. Leaving Goose Creek, there is a 1 1-2 mile portage into Bob's Lake. From Bob's Lake there is a one-half mile portage into Porcupine. It is intended to build good summer roads over these last two portages. There should be no difficulty in making the distance either way in one day.

To the writer's mind, with the completion of the summer roads, this route furnishes the logical way into the gold fields. Especially is this so from the passenger's standpoint. Travellers can easily save 24 hours on the trip by this route. The writer understands that the building of these tote roads at present is being done by mining men interested in the country. It would seem that the Government should at least do its share in opening up this new gold field by financial help in the building. It is impossible to say at the present time whether or no this route will be best for freight or



ing in the sixty-mile canoe journey takes 2 1-2 days, and coming out 14 hours. Of course, with the running of the launches the time will be considerably reduced. It may be said that the writer believes Slim Creek would be at slight expense made safe for the running of light draught launches and that this would make the route practically an all-launch one. The one great objection to this route is that a thirty-mile distance as the crow flies is more than doubled.

**The Route from 222 Mile Post.**

It will be remembered that mile post 222 was the jumping-off place from which the old winter road started for the Porcupine. Parts of this old winter road are at present being changed so as to be passable during the coming summer. The streams and lakes along the route are used wherever possible.

The route starts from 222, from which a seven mile wagon road will lead due west to Frederickhouse Lake. This wagon road at present is completed for three miles. The four miles remaining will be ready for use shortly. As proposed now, probably only a half mile of this distance will have to be corduroyed. At the Frederickhouse, launches will meet the wagons, and from there the 228 1-2 mile route will be followed with Nighthawk

otherwise. Whether it will be cheaper to re-handle the stuff a number of times than to carry it over the all-water route over twice the distance, with practically no re-handling, will have to be determined by experiment.

The present prices of freight from 222 to the Frederickhouse are \$4 for 100 pounds. This is exorbitant, but is partly justified at the present time by the state of the roads. There is no regular passenger service is use yet on this route. It may be said, however, that this route seems to solve the transportation question as well as it can be solved under the circumstances.

One point which, in regard to both of the above routes renders them disadvantageous, is the low water at present prevailing in Frederickhouse Lake and River. This low water is directly due to the blowing out of High Falls by Father Paradis. At present at the southern end of Frederickhouse Lake there is from three-eighths to one-half mile of sandbar covered by only six inches to a foot and a half of water. It is necessary to pack goods over this distance, as it is impossible to paddle it without running aground. There are, to the writer's mind, two ways to remedy this. Either dam up High Falls or blast out a channel in the



lake. It is the opinion of interested people that the Ontario Government should take this matter up at once and provide the necessary money to do either of these things. Time is a matter of importance and there should be no delay. The rendering of Frederickhouse Lake of sufficient depth for launches will solve as well as possible the difficulties of transportation which at present cause trouble.

#### Other Possible Routes.

There are two other possible routes into the Porcupine country. The writer is not familiar with them, and the data concerning them were obtained from the Government map. Both of these routes have as their main road the Mattagami River.

The more logical of the two starts from Bisco on the Canadian Pacific Railway, from where a trip of 140 miles is taken to Niven's base line. There are numerous portages along this route. A portage of three miles along Niven's base line into Gillies Lake marks the end of the route. Gillies Lake is in the western part of Tisdale Township. The other route necessitates the taking of a construction train west from Cochrane station on the Transcontinental, to the Mattagami River; from there, canoes or launches, 60 miles up the Mattagami to Tisdale Township. There are a number of portages and the going is all against the current. The chief disadvantage of both these routes is their length.

In conclusion, the writer wishes to say that there is no question that with the completion of wagon roads over the different portages, and the installation of launches on the lakes and streams, together with a lowering of the rates now being asked for transportation, both on freight and passengers, to a fair price, the route as proposed from 222 mile post will solve this question of access to the Porcupine gold district as well as it can be solved under the prevailing conditions.

\*Mining Geologist, Cobalt, Ont.

#### AUSTRIAN NOBEL DYNAMITE.

The accounts of the Nobel Dynamite Company, of Vienna, for 1909, show net profits from the four factories of 1,566,000 crowns, as compared with 1,734,000 crowns in the preceding year, and it is proposed to pay a dividend of 25 per cent., being the same rate as in 1908. According to the directors' report the decrease in the financial results was due to the smaller consumption of dynamite owing to the completion of the great mountain railways and the decline in the general situation of trade, whilst the orders for war ammunition were not up to expectations. With regard to the prospects for the current year, the report states that the quite extraordinary increase in the price of glycerine has to be taken into consideration, and existing competition will not permit of a corresponding advance in sale prices. A works was established in Hungary in the past year for the manufacture of nitrate of ammonia explosives, and in view of this fact the Nobel Company proposes to undertake shortly the production of similar and also first-class explosives which have answered the purpose in every way abroad.

The total value of New Brunswick's mineral production for 1908 as computed by Mr. John McLeish, of the Mines Branch, Ottawa, was \$579,816. This was only 0.68 per cent. of the total value of the Dominion production.

#### WESTERN BRANCH MINING INSTITUTE.

The eighth general meeting of members of the western branch of the Canadian Mining Institute will be opened at Grand Forks, on Thursday afternoon, May 26, when routine business will be transacted and several papers having particular reference to the Boundary read and discussed. The director of the Geological Survey of Canada (R. W. Brock) has courteously given permission to Messrs. C. E. Le Roy and L. Reinicke, staff geologists, to take part in the proceedings, and the former will contribute some notes on the geology of Phoenix camp, while the latter will take the West Fork of Kettle River as his subject. Other papers expected are, respectively, on the early history of mining in the Boundary, the electric power transmission system of the district, and probably some notes concerning local transportation facilities. The chairman of the branch, W. Fleet Robertson, Provincial Mineralogist, will endeavour to attend the meeting, arrangements for holding which are being made by the branch secretary, E. Jacobs, of Victoria. Incidentally, it may here be mentioned that as a result of action taken by the branch upon a resolution submitted at the meeting held in Vancouver on February 25, by A. G. Langely, having for its object the provision of facilities for telegraphic communication with Stewart, at the head of Portland Canal, the sum of \$16,000 for this purpose has been included in the Dominion supplementary estimates and it is stated that an effort will be made to establish telegraphic communication with Stewart during the current year.

In a recently published tabular statement, compiled by Mr. C. O. Schmitt, a member of the Institution of Mining and Metallurgy, some instructive figures are given as to the relative weights and sizes of stamp-mill parts. Five separate stamp-mills, all on the Rand, are used for illustration. The weights of stamps range from 1,250 pounds to 2,000 pounds. In the former stamp the different parts bear a relation to each other quite different from that obtaining in the heavier stamp. For instance, in the 1,250-pound stamps used on the Simmer & Jack mines, the stem weighs 580 pounds, and constitutes 46.4 per cent. of the total weight; whilst in the 2,000-pound stamps used in the City Deep, the stem weighs only 556 pounds, and constitutes but 27.8 per cent. of the total. In the former stamp the dimensions of the stem are 3 1-2 inches by 18 feet; in the heavier stamp the dimensions are 4 inches by 13 feet. "The head," says Mr. Schmidt, "is a vital part of the stamp and its importance has been more fully realized since the introduction of the heavy stamp. It is evidently that part of the stamp which must mainly serve to increase the weight of the latter, for the reason that its weight does not decrease as does that of the shoe, and also because its weight acts immediately upon the rocks to be crushed. With an increased size of stem the head also had to be increased so as to give the required strength, but as there is a limit in this direction imposed by the distance from centre to centre of stamps, the additional weight required is generally obtained by increasing the length until, at the present time, the length has in some cases reached 4 feet.

The production of nickel from the ores of the Sudbury district in Ontario was more than doubled between 1904 and 1906.

# MINING ENGINEERING IN CONNECTION WITH FORT WILLIAM'S WATER SUPPLY.

(Notes from paper read before the Canadian Society of Civil Engineers, by H. Sydney Hancock, Jr.)

[EDITOR'S NOTE.—The following extract from Mr. Hancock's paper throws a valuable sidelight on a phase of civil engineering that overlaps the realm of mining. Our readers will note the arrangement of drill holes on the headings. From the progress made and the large consumption of explosives, it seems probable that an experienced mining engineer could have effected a considerable saving, particularly in the item of time. We request our technical readers to comment upon the practice here outlined. But whatever fair criticism may be made of Mr. Hancock's mining, it is but just to commend highly the care and thought that marked all his work.]

**POWER.**—Steam was practically out of the question for this purpose. Coal must first come from Pennsylvania, and then be hauled seven miles over a road that took many months to get into passable condition, and had some hills with 15 and 20 per cent. grades. The local supply of wood was limited, and although used only for heating purposes, had to be hauled more than three miles before the close of the work. Gasoline figured out at over \$100.00 per h.p. Electric power at \$25.00 per h.p. was available on the north side of the river, and it was decided to build a power line, although, unfortunately, the price of copper was at the time abnormally high. The current used was supplied by the Kaministiquia Power Company from their hydraulic plant at Kakabeka Falls—at 2,200 volts, three phase, 60 cycles alternating current. Poles, 35 feet in length, were secured from the surrounding country, and spaced 150 feet apart. Two four-pin cross arms were used on each pole, the lower arm carrying telephone lines. The wire was No. 6 solid weather-proof copper, running 112 pounds per thousand feet. The river was crossed by a lead-covered submarine cable of No. 6 copper, laid just within the trench dredged for the west pipe crossing. This cable remained undisturbed for nearly two years, after which it was a constant source of trouble. The first break, early in November, 1908, was caused by a dragging ship's anchor, and nearly five weeks elapsed before a new cable could be secured. The cable was so buried that only 100 feet could be salvaged, after three days' work with scow and diver. The following temporary expedient was adopted to replace it. Three lines of ordinary W. P. stranded copper wire, heavily taped, were bound together. The cable thus formed, was passed through eight lengths of 2 1-2 inch fire hose, and lowered to the bottom with fish plates, lead pipe, and other weighty debris. This worked well for two weeks, when another boat hooked the hose and punctured the rubber. It was taken up and dried, and again laid for a further run of five days. This performance continued until the arrival of the new cable, shortly before the close of navigation. On opening of navigation during the present year (1909), the water level of Lake Superior and the Kaministiquia River was about two feet below normal, and the first boat down the river scraped the cable so that it had to be raised and dried. About two weeks later one wire went dead, and it was thought inadvisable to attempt to dry it again; consequently, one of the taped wires previously used in the fire house was

strung through a one-inch lead pipe and connected at the shore ends. No further trouble has been experienced.

The cost per mile of the transmission line, excluding telephone, was as follows:

3 miles, 1770 lbs. No. 6 Wire, at 28c.	\$495.60
35 Poles in place, at \$5.00	175.00
35 4-pin Cross Arms, at 41c.	14.35
105 Birch Pins, at 2 1-2 cents	2.62
35 Cross Braces, at 8c.	2.80
105 Double Petticoat Insulators, at 4c	4.10
Freight, at \$1.20 per 100 lbs.	24.00
Labour Stringing Wire	30.00

Total per mile ..... \$748.47

The total expenditure on the line was as follows:

7 miles completed Line, at \$748.47	\$5,239.29
Cable and Work at River	358.20
Alterations and Repairs	317.00
Repairs and Renewals on Cable	580.00

\$6,394.49

The alterations were due to the necessity of three times changing the four-pole construction crossing the C. P. R. property to accommodate increased trackage, and of moving the line from the vicinity of a particularly heavy rock cut in the second pressure main.

**PLANT.**—A class E straight-line belt-driven Rand air compressor, capable of compressing 282 cubic feet of free air per minute to a pressure of 100 pounds per square inch, was erected at the main camp. This compressor was operated by a 50 horse-power Westinghouse induction motor, through three 15 kw. 2,200 volts to 550 volts, transformers. A 4-inch air pipe, fed by a 36 inch by 8 feet receiver erected in the compressor house. From this air receiver 3-inch wrought iron pipes, with a union joint every 200 feet, led to the shaft and north portal. At these points were placed 24 inch by 6 feet air receivers, from which 2-inch pipes served the various headings. The 3-inch pipe was carried on the surface of the ground, blocked up where necessary to secure a continuously falling grade. Serious trouble from frost not being anticipated, the expense of excavation in a rocky country was avoided. During continuously cold weather, with temperatures near the zero mark, no trouble occurred, but, at almost every mild spell, work was temporarily stopped by frozen air pipes, a cold night, after a comparatively warm day, being the chief cause. It was not feasible to cover the whole line with snow, owing to its height above the ground when crossing small ravines. To overcome this difficulty, drip cocks, threaded to take a small pressure gauge, were placed every 300 feet along the line, and a supply of wood and coal oil kept at numerous points. When a block occurred, a gauge inspection revealed the 300-foot strip affected, and an hour's work or less usually sufficed to thaw it out.

The drills used were No. 43 Rand "Little Giant" drills, with 3-inch cylinders, mounted on 6-foot double screw mining columns, and fed through 50 feet of 1-inch Monarch hose.

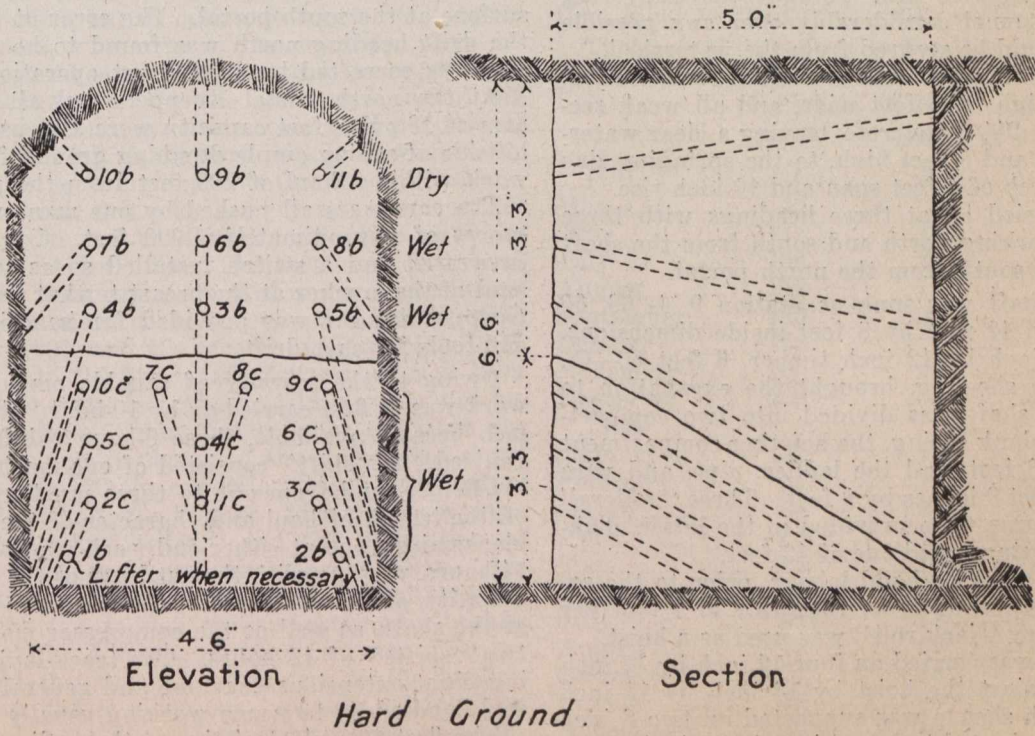
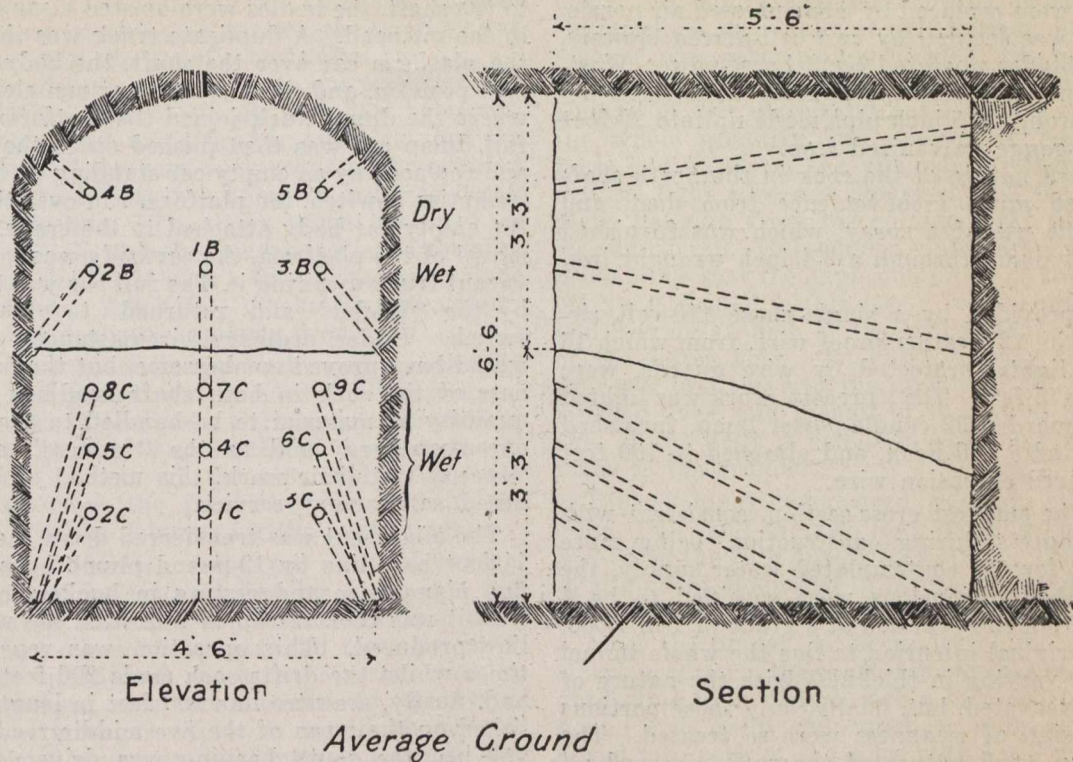
Black Diamond steel, with regular cruciform bits,

was employed at the commencement of the work in the comparatively soft rock, but the change to the hard black basalt necessitated the use of the best grade drill steel, manufactured by the Jessop and Edgar Allen Companies.

The track was of 50 c.m. gauge, 12-pound rails, 15 feet long, laid on 4-inch by 6-inch by 30-inch ties,

spaced 30 inches C.—C. The curves and switches were made of Koepfel portable track on steel ties.

The four cars at the north portal heading were Koepfel all-round dump cars of 18 cubic feet capacity, and at the shaft headings eight detachable body-side dump roller-bearing Koepfel cars of similar capacity were used.



SKETCH SHOWING ARRANGEMENT OF DRILL HOLES

A 5-inch double cylinder Jenckes hoist, operated by compressed air, with a 6-inch by 24-inch drum winding a half-inch steel wire rope, was erected at the shaft.

The shaft sump was drained by a Cameron pump, with a 3-inch suction and 2-inch discharge, rated at 100 imperial gallons per minute and operated by compressed air.

Buffalo forges were used at each end, but the centrifugal blowers were replaced by a compressed air nozzle.

Ventilation was secured by two belt-driven blowers, with 12-inch blades operated by 2 horse-power Westinghouse motors, fed from the lighting circuit and delivering air through a 5-inch pipe made up into 20-foot lengths of 24-gauge galvanized iron.

The dry, hard nature of the rock in the north shaft heading caused much inconvenience from dust, and necessitated the use of a spray, which was furnished from the shaft pump through a 3-4 inch wrought iron pipe.

Light was provided by a single-phase 110-volt circuit, through No. 12 weather-proof wire, from which 16 candle-power lights, protected by wire guards, were dropped every 75 feet. The "breast" work was lighted by a heavily guarded 32 candle-power lamp, furnished with socket handle and hook, and attached to 100 feet of rubber-covered extension wire.

**TUNNEL.**—The smallest cross-section, consistent with reasonable progress during construction, being more than sufficient for the contemplated water supply, the minimum finished dimensions were specified to be 4 feet by 5 feet 10 inches, carried at a grade of 1 in 1,000.

It was the original intention to line the whole tunnel with concrete, varying in thickness with the nature of the material excavated, but, finally, only those portions showing any sign of weakness were so treated. The generally close, hard nature of the rock removed all fear of seepage or erosion, and the use of a very high co-efficient of roughness still brought the delivering capacity of the tunnel considerably over any possible discharge that could be secured from the watershed.

The rock was excavated on a minimum cross-section, 6 feet 6 inches high by 5 feet wide, and all weak sections lined with 1:2½:5 concrete, leaving a clear waterway, 4 feet wide and 5 feet high, to the springing line of a segmental arch of 4 feet span and 10 inch rise.

Work was carried on at three headings with three machines, two working north and south from the shaft and one working south from the north portal.

**SHAFT.**—The shaft was sunk at Station 9 + 68, 60 feet in depth and 12 feet by 8 feet inside dimensions. Four sets of 12 inch by 12 inch timber, 6 feet C.—C., backed by 3-inch sheeting, brought the excavation to solid rock. The shaft was divided into two compartments by 2-inch plank casing, the hoisting compartment being 8 feet by 8 feet, and the ladder, pipe, and wire compartment 3 feet 9 inches by 8 feet. Three "rollers" or landing platforms were provided in the latter, making three 16-foot stages and one of 12 feet.

The shaft was sunk by hand labour, prior to the arrival of the machines, at an average rate of 1 foot per shift. An ordinary "jack roll" was used as a hoist.

The head gear was carried on four 12 inch by 12 inch posts, braced against the hoist by 12 inch by 12 inch struts. A 24-inch sheave was supported on two 8 inch by 8 inch timbers, bolted to four 4 inch by 12 inch cross-timbers, which were again supported by four 4 inch by 12 inch timbers, secured to the posts by 3-4 inch bolts, and a shaft house of 1-inch lumber covered the erection at the collar of the shaft. 12 inch by 12 inch

stringers, to each of which was spiked a 40-pound rail, formed a track of 6 feet 9 inches gauge, on which ran a platform car fitted with a section of track 19 5-8 inch gauge of 12-pound rail.

The cars used in the shaft drifts were the Koeppel steel side roller-bearing dump cars with detachable bodies. To the hook of the gin block was attached the Koeppel crane attachment. When the cars were brought to the shaft, the bodies were hoisted clear of the trucks to the pit head. A duplicate truck was then run in on the platform car over the shaft, the body car lowered into position, and the platform car run clear to a point where the dump track joined the platform track. The full dump car was then pushed on to the dump track and replaced by an empty car standing on the adjoining "empties" switch, the platform run over the shaft, and the empty car body attached to the crane. On the removal of the platform, the car body was lowered to the vacant truck awaiting it. The full car was then dumped by the "lander" and returned to the "empties" switch. Under ordinary circumstances, this method would have proved cumbersome, but the uniform hardness of the rock in both shaft headings reduced the quantity of material to be handled to the capacity of one "mucker," and as the "landers" soon became "speedy" at their work, this method of hoisting rendered satisfactory service.

The alignment was transferred down the shaft on an 11-foot base line by 12-pound plumb bobs attached to fine piano wire and resting in buckets of water. A transit was then set up in line with the wires and the line produced. This operation was repeated several times whilst the drifts each made 200 feet of progress, and, finally, a centre line 300 feet in length was established on the mean of the five middle readings.

When the south heading was driven through, the alignment was checked by setting up on a hub near the shaft the back sighting 700 feet to a hub set from the surface at the south portal. The error at the breast of the drift heading north was found to be 1 1-4 inches, and was corrected by subsequent operations.

At the north portal Koeppel steel all-round dump cars of 18 cubic feet capacity were also used, the steep hillside affording ample dumping ground for the whole work within a haul of 200 feet from the portal.

The cars were all pushed by one man, and over distances of approximately 1,000 feet. Bye-passes were excavated and a switch installed so as to reduce the haul of the mucker at the breast to that limit. A small Koeppel flat car was provided for handling machines and tools for each drift.

Owing to the scarcity of capable machine men, the work was at first carried on by 10-hour "shifts," but as men became available, three 8-hour "shifts" were organized. A "shift" consisted of one machine man and his helper, and from one to three muckers, depending on the length of haul and character of the work. Two blacksmiths, one at either end, each worked from 10 to 14 hours, varying with the hardness of the rock and the quantity of outside work. The hoistmen and landers at the shaft, as well as the compressor men, worked in two "shifts" of 12 hours. The track-laying, pipe-laying, light extensions, machine and general repair work was handled by two men working usually 10 hours.

The first 1,200 feet of the north heading consisted of a compact blue volcanic ash slate that drilled and broke well, and through which good progress was made. The remainder of the tunnel was through a tough, hard trap, containing numerous diorite dykes of phenomenal

hardness, the specific gravity of which frequently reached 3.4.

Progress through the latter rock was painfully slow, although air was delivered to the machines at from 80 to 85 pounds pressure. Bits of the best steel, tempered to a pitch that would notch a file, were worn smooth and useless without a crack or flaw after drilling less than three inches. It frequently took over three hours to drill a 5 feet 6 inches dry back hole.

The machines were mounted on standard vertical mining columns with two jack screws, the small size of the drift preventing the use of a horizontal bar.

The average advance made by each cut was four feet six inches. In the slate rock eight five foot holes sufficed, the whole breast being fired in one blast, but the tenacious nature of the hard rock sections necessitated from seventeen to twenty-two holes, in order to break the full cross-section. The holes were arranged as shown in the sketch, and the lower nine holes forming the "cut" were fired first with a fuse, timed to explode in the order shown. After the "muck" had been cleared, the "back" holes were similarly fired.

The upper five holes in the back were practically "dry" holes, and proved a very hard drilling proposition in this rock. Two lifters were sometimes used at the bottom of the face to serve the double purpose of striking to the bottom of the cut, and lifting the "muck" away from the face, thus facilitating the speedy erection of the columns for the next attack.

Work commenced with sixty per cent. dynamite, manufactured by the Ontario Powder Company, but the fumes proved too much for the miners, who were constantly being overcome by gas, and forty per cent. dynamite was substituted with satisfactory results. When the very hard rock was encountered, the writer believed that a stronger explosive would be advantageous, and Nobel's seventy-five fumeless gelignite was adopted. After some trouble in getting it properly thawed, and the holes intelligently loaded, the results secured were good, but its odour, to which the "copper country" miners, who were in the majority, were unaccustomed, caused much vomiting and the experiment had to be abandoned. In the slate rock, about six pounds of 40 per cent. dynamite were used per foot of completed tunnel, but in the hard rock it was necessary to use from twelve to eighteen for the same distance.

In the slate rock firing by battery was more or less successful, but in the hard rock, time fuse gave infinitely better results. The "Bennett" fuse was used throughout the work and proved of uniform excellence.

Two accidents marred the success of the work. One on June 21st, 1907, and the second on June 21st, 1908. On the first date the two shaft drifts had each been driven less than forty feet, the ventilating fans not being then in position. Immediately after the midnight blast the two miners in charge of the shifts went down to recharge a missed hole, expecting to get away before becoming affected by the fumes. The air hoses were coiled on the lower "soller," and the precaution of blowing out with compressed air was not taken. Apparently both men were overcome immediately on reaching the bottom ladder, as one sustained a broken arm from the fall. A rescue party of two men from the surface placed the unconscious miners in the bucket, and then attempted to climb out, but both collapsed on the lower "soller." The casing had not been completed in the ladder compartment, so they were hoisted to surface by the bucket. One man, and he the most active of the rescue party, was already dead from the

effect of the fumes and the effort of carrying a collapsed comrade up the first ladder. His name was Jos. Chichester, the son of Colonel Chichester, a distinguished British veteran of the Indian Mutiny.

Within a few minutes of one year later, a mucker in the north heading, whilst cleaning up in preparation for the blast, turned up a small piece of dynamite eight feet from the face. On being advised, the man left his machine and began to search with a pick for further fragments, thereby immediately causing an explosion. Both the machine man and his helper were killed and one mucker was permanently blinded, the other standing beside his car, six feet away, was uninjured. The amount of dirt moved did not exceed a cubic foot, but the whole quantity was apparently received in the faces and chests of the victims. Neither the air hose nor the light wire was damaged, and the incandescent globe hanging from the column, only five feet away, was uninjured. Subsequent examination pointed to the probability that the explosion of No. 3 cut hole had cut off No. 6, drilled in this case a few inches below grade, and leaving an inch or two of dynamite in the bottom of the latter hole. An extraordinary feature of the case was that this was the third time the hole had been mucked over, and as half of it showed plainly on the side of the drift it had been examined two days previous to the accident.

The machines commenced work on the 4th day of June, 1907, and the two long headings met at Station 27+56 on the 24th day of May, 1909. The closing error in alignment amounted to three-eighths of an inch, and the difference in elevation was 0.05 feet.

After the tunnel had been cleared out and concreted where necessary, the shaft was covered eight feet above grade line by a 24-inch slab reinforced by old twelve-pound steel rails, supported on walls four feet apart keyed into rock at the sides with 1 1-8 inch drill steel. At the sump, the wall was made three feet wide on top, battering on the outside at 1 in 6. The whole shaft was then filled to the surface with earth.

The monthly progress in the three drifts was as follows:

	N. Portal. Drift.	N. Shaft. Drift.	S. Shaft. Drift.	Total feet.
1907.	ft.	ft.	ft.	ft.
May . . . . .	49	..	..	48
June . . . . .	141	43	47	231
July . . . . .	138	85	98	321
August . . . . .	142	72	85	299
September . . . . .	130	105	80	315
October . . . . .	162	111	64	337
November . . . . .	160	82	75	317
December . . . . .	209	103	77	389
1908.				
January . . . . .	137	97	72	306
February . . . . .	37*	75	51	163
March . . . . .	68	81	80	229
April . . . . .	65	70	37	172
May . . . . .	73	76		149
June . . . . .	62	66		128
July . . . . .	69	71		140
August . . . . .	73	69		142
September . . . . .	71	63		134
October . . . . .	76	80		156
November . . . . .	30**	45**		75
December . . . . .	51	66		117
1909.				
January . . . . .	50	58		108

February . . . . .	64	60	124
March . . . . .	70	70	140
April . . . . .	76	74	150
May . . . . .	53	76	129
Totals . . . . .	2255	1798	766
			4819

The wages paid on the tunnel were as follows:

Tunnel Superintendent . . . . .	\$150	per month.
Machine men . . . . .	\$3.50 to \$4.00	per shift.
Helpers . . . . .	3.00 to 3.50	per shift.
Muckers . . . . .	2.50 to 2.75	per shift.
Landers . . . . .	2.50	per shift.
Hoistmen . . . . .	.25	per hour.
Blacksmiths . . . . .	.35 to .40	per hour.
Blacksmiths' helpers . . . . .	.25	per hour.
Compressor men . . . . .	.25	per hour.
First mechanic . . . . .	.40	per hour.
Mechanic's helper . . . . .	.30	per hour.

\*Labour and machine troubles.

\*\*Half month lost by power cable troubles.

### OXYGEN BREATHING APPARATUS IN PACIFIC COAST COAL MINES.

By E. JACOBS.

One of the results of the efforts of the United States Geological Survey to make its important exhibit at the Alaska-Yukon-Pacific Exposition, held last year at Seattle, Washington, U.S.A., of practical usefulness to the mining industry is now manifest in the increasing interest being taken in the matter of providing the coal mines of the West with oxygen breathing apparatus for use in cases of need, primarily for life-saving purposes, and next for use in cases of underground fires or other emergencies. The United States Survey exhibit at that Exposition was a comprehensive one, and it included two Draeger helmets with the usual accessories to make this rescue apparatus complete, and in order the better to impress coal miners and others with the serviceableness of the apparatus, which few visitors to the Exposition had ever seen before, a demonstration was made every week day afternoon in a specially constructed room filled with noxious fumes. In this room, which was fitted with large glass windows, the two demonstrators could be seen at work climbing over obstacles, lifting heavy timbers, carrying dummy bodies, etc. In addition to the object lesson thus given, the official in charge of the demonstration work showed the apparatus to all wishing to closely examine it, explained its uses, fitted it on those who desired him to do this, and in every way possible endeavoured to impress enquirers and onlookers with the great value of the apparatus for the purposes designed. Shortly before the close of the Exposition an urgent call came from Roslyn, Washington, for the loan of the apparatus for use in a real emergency, a disaster having occurred in a coal mine there, unfortunately with distressingly fatal results.

The need for the provision of similar apparatus and training in its use having been thus demonstrated, some of the mines in the State were shortly afterwards equipped with the Draeger apparatus, and within four months of the closing of the Exposition a Mine Rescue Training Station was established at Seattle, with an official of the Technological Branch of the United States Geological Survey in charge. Dr. J. A. Holmes, of Washington, D.C., is head of this branch of the Survey, and he placed Mr. H. M. Wolfiin in charge of the training station at Seattle. Quarters for the station were found in the building erected in connection with the A. Y. P. Exposit-

tion for the Philippine Islands exhibit, which building was one of those left on the campus of the University at Washington in accordance with the understanding reached (when the use of the campus for Exposition purposes was granted) concerning the leaving of certain buildings for university use after the close of the Exposition. The proximity of this building to the main university buildings was an advantage in another respect, namely, its nearness made it convenient for some of the university professors to give lectures in connection with the work of training in progress at the station.

In the mine rescue training work Mr. Wolfiin has an assistant. The training course is taken chiefly in a suitable room or compartment strewn with obstacles such as would be met with in actual rescue work in a coal mine. The atmosphere of this room is made as foul with fumes as that of a mine in which rescue work would have to be undertaken. In addition to instruction in the use of the Draeger oxygen breathing apparatus and the actual wearing of the helmet in the room filled with noxious fumes, those taking the training course are required to attend from five to ten lectures delivered by members of the faculty of the University of Washington. In order to break what might otherwise be the monotony of taking the training course, suitable literature is provided in a reading room. Much interest has already been, and is being, evinced in the work of this training station by coal mine superintendents, foremen, fire bosses, and ordinary miners, and already advantage has been taken of the opportunity to become familiar with the mine rescue work, under conditions less dangerous than when there is no such provision made to save life, by a number of those directly concerned. It is gratifying to find that the training station at Seattle is making a record of men duly qualified and certificated during the first six months of its operation. It was opened on February 12 of the current year, and by the end of April certificates had been issued to thirteen men who, after taking the prescribed course of training, had proved themselves entitled to them. A station at Pittsburg, Pennsylvania, also operated under the auspices of the United States Geological Survey, after having been two years in active existence, has during that period issued only 25 certificates; one at Urbana, Illinois, during eighteen months has issued two, and one at Knoxville, Tennessee, four, after having been operated six months. It is evident, therefore, that advantage is being taken by western coal mining men of the opportunity afforded them by the opening of the station at Seattle in larger degree than by others elsewhere for whose benefit similar facilities for mine rescue training have been provided.

It is worthy of mention that the instructions given by the United States Geological Survey to Mr. Wolfiin were so wide that when a recent emergency arose at Nanaimo, Vancouver Island, B.C., he was at liberty to respond immediately to a request that he render assistance. Fire had broken out underground in one of the coal mines of the Western Fuel Company. Mr. Thomas R. Stockett, manager of this company, had already taken the lead in the province in procuring Draeger apparatus, which had been supplied more quickly than the selling agent had expected it would be, consequently the agent had not yet reached the mine in order to give the requisite instruction in the use of the helmets. However, Mr. Wolfiin's services were immediately available, and he proceeded from Seattle to Nanaimo and there instructed a number of men how the apparatus could be used underground, so that the measures necessary for

extinguishing the fire could safely be undertaken. In this way a restoration of safe working conditions was expedited and the usefulness of the new addition to the equipment of the mine was demonstrated in a practical way.

Since the occurrence just mentioned Mr. Stockett has been invited by Mr. Wolflin, acting in his official capacity as mining engineer in charge of the station, to send some of his men to Seattle, there to take the mine rescue station training course, for which there would not be any charge made. The expenses of maintenance of this station are at present borne by the coal mine operators of the State of Washington, and Mr. Anderson, president of their association, has stated that operators of coal mines in British Columbia will be heartily welcome to send in some of their men to take the training course without charge. However, while it is probable some men from the province may avail themselves of this opportunity to obtain the requisite training, it is not likely British Columbia mine owners will take advantage of the generosity of their neighbours across the international boundary line to the extent of allowing their men to be trained without charge. The cost of giving a man the course of training, which lasts about two weeks, is approximately \$30. The cash receipts on this account are all dealt with by Mr. D. C. Botting, Inspector of Coal Mines for the State of Washington, who attends to the proper disbursement of all money received. This arrangement frees the official representative of the United States Geological Survey from any connection with the financial affairs of the training station.

The great importance of this subject of mine rescue work is becoming generally recognized by coal mine operators. Now that the Western Fuel Company has shown itself alive to the necessity for adopting modern safety measures there is reason to conclude that other mining companies operating in Western Canada will speedily follow so good an example.

The Western Branch of the Canadian Mining Institute, at its meeting held in Vancouver, B.C., on February 25 last, passed a resolution requesting the Dominion Government to arrange for the admission duty free of oxygen breathing apparatus for mine rescue work. This request was forwarded to the Hon. Wm. Templeman, Dominion Minister of Mines, but it is not known whether or not the Government took any action thereon. It was stated at the Institute meeting that the United States Government had exempted such apparatus from duty on its being brought into that country, which was an important consideration in the equipment of mines with such apparatus. Another point urged in connection with the use of oxygen breathing apparatus was the great desirability of having it uniform in character, so that the equipment of one mine might be interchangeable with that of another. The distinct advantage of having the equipments of several mines, together with men trained in the use of it, rushed to the scene of any serious disaster was urged, and the hope expressed that mine owners generally will recognize the especial need for uniformity, so that in times of great emergency there may be readily available ample rescue equipment and many men trained in its use.

Quartz, occurring with feldspar, is shipped from the Richardson mine, Bedford Township, Ont., to the electric furnaces of the Electro Metals Company, Limited., Welland Ont. This company operates four furnaces, of from 1,000 to 1,500 h.p. each. Ferro-silicon is here manufactured.

### THE CHIBOUGAMAU COMMISSION.

The Chibougamau region lies about 200 miles north-east of Lake St. John, and 5 miles to the south of Lake Mistassini. Excepting the early explorations made in 1674 by the Jesuit Father Albel, the first report of importance was that by James Richardson, who examined the district geologically in 1870. Richardson mentions the existence of a zone of chloritic schists, diorite, serpentine, conglomerates, and granite; strongly mineralized in places with iron and copper pyrites, magnetite, etc.

These observations were subsequently confirmed by Mr. A. P. Low, who was in the region in 1885 and who also called attention to the similarity of the rocks to those of the Sudbury district. He states in his report that there are important indications of economic minerals.

In 1897, Mr. H. O'Sullivan, in a report on the country between the Lake St. John and James Bay, mentions that on the portage between Lake Chibougamau and Lake Wacounipi he noticed a compass variation of 166 degrees, caused by some deposit of magnetic iron in the neighbourhood.

Mr. Peter MacKenzie, in 1903, undertook an exploration of the region, from which he brought back good specimens of asbestos and of copper ores.

This was followed in 1904, 1905, 1906, 1907 by further explorations by Messrs. Obalski, Low, MacKenzie, Machin, and Dulieux, with further confirmation of the presence of areas of Huronian rocks and of indications of strong mineralization.

Owing, however, to the lack of transportation, the development of the mineral deposits is handicapped, and the Quebec Government has been strongly urged to take steps to remedy this, either by building a railway into the region, or by granting subsidies towards the construction. But the information that we possess about the region is far from specific. It is the result of explorations on broad lines, and it is not sufficiently detailed to answer such a question as: "Would the Government of the Province of Quebec be justified to either build or subsidize the building of a railroad to develop and work the mineral resources of the Chibougamau region?" The building of such a road would involve several million dollars, and before taking any action in the matter, the Quebec Government has decided to send a commission of geologists and engineers to report on the possibilities and probabilities of the region from a mineral standpoint.

Three commissioners have been appointed: Dr. A. E. Barlow, Mr. J. C. Gwillim, and Mr. E. R. Faribault. The high standing of these three men is a guarantee that the report of the commission will be as authoritative and unprejudiced as possible. Their instructions are to choose their own staff of technical assistants and of miners and labourers, to enquire into the mineral resources of the Chibougamau region, and to advise as to whether or not the Government of the Province of Quebec would be justified in taking steps towards the building of a railway from Lake St. John to Lake Chibougamau.

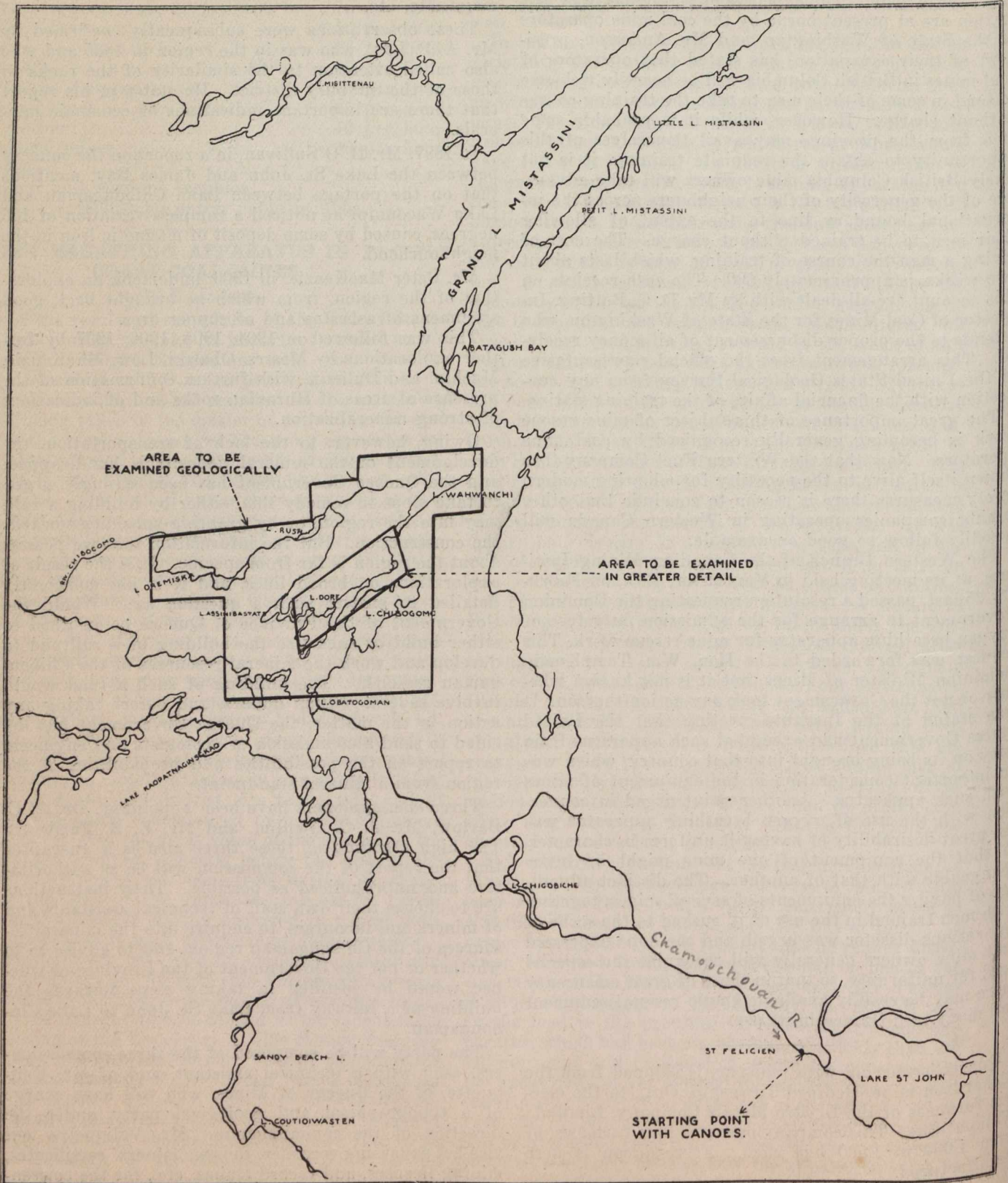
The party will be composed of the three commissioners, each with a technical assistant, and of Mr. Valiquette, of the Bureau of Mines, who will have charge of a topographical and geological party under the direction of the commissioners. Mr. Valiquette will also act as mining recorder, to issue miners' certificates, mining licenses, and record claims, etc., for the conven-

ience of the prospectors in the region. There will, moreover, be ten or twelve men to do the stripping, drilling, and blasting work.

The party will leave Roberval, on Lake St. John, as soon as the state of the rivers will allow, probably at the beginning of June. They will proceed by the usual route by wagon to Portage à L'Ourse, 25 miles; then by water along the Chamouchouan and Chigoubich Rivers, Chigoubich Lake, Nikoban River and Lake, chain of

streams and lakes over the height of land, Obatogoman Lake and Lake Chibougamau, a total of 184 miles. They will remain in the field as late as possible.

Irrespective of what may be the findings of the commission, the Government of Quebec is certainly to be commended for this action. It is a wise policy to spend a few thousand dollars to obtain as much information as possible before rushing into an undertaking which will involve four or five million dollars.







**Cost of Operating Boarding House and Camp.**

Supplies .....	\$3,937.38
Labour .....	1,440.00
	\$5,377.38

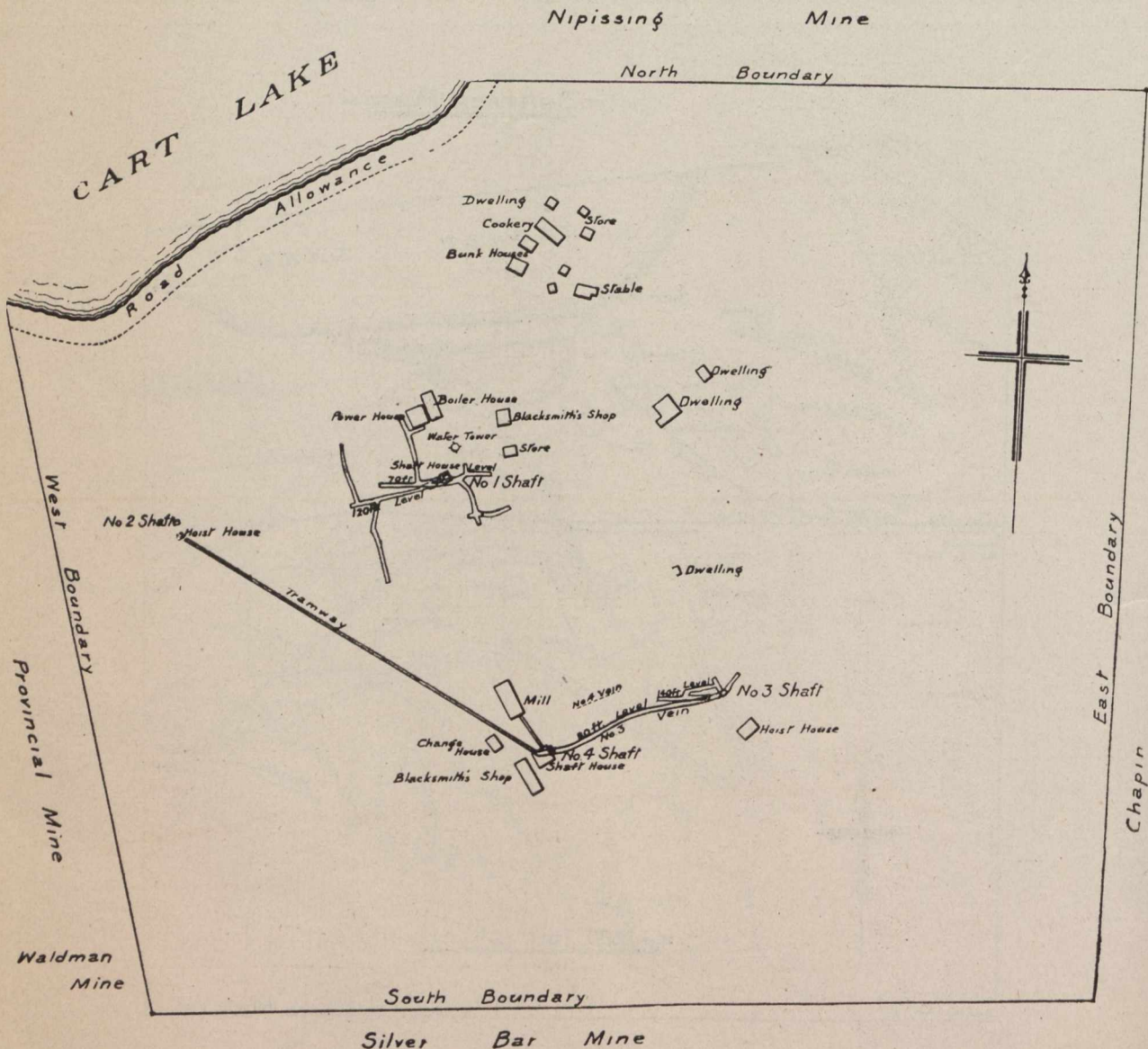
Men have been charged 60 cents per day for bed and board, deductions from pay roll on this account

Returns from McKinley-Darragh having provided funds for dividends, plant extensions and operations, we have been able to proceed slowly, and therefore economically, in developing the Savage.

The entire year has been spent in converting this property from a "prospect" into a developed mine, and although the costs have been charged into "oper-

**— SAVAGE MINE —**

**— Plan of Workings —**



amounting to \$4,969.25, which shows a deficit of \$408.13, and which latter amount has been charged to labour.

The average number of men employed upon operations has been 33.

It is rather a misnomer to speak of work upon the Savage as Operations, as nothing but exploration and development has been done.

ations" they might better be considered as "equipment."

During the past year the importance of the claim as a valuable asset, has developed steadily.

With payable ore in No. 2 Shaft from 40 feet down to 112 feet; No. 3 Vein proven to carry rich values over a distance of several hundred feet; the discovery on the surface of No. 4 Vein carrying nuggets, and

several other promising veins carrying cobalt, it has gradually become evident that the Savage is worthy of serious consideration as a mine.

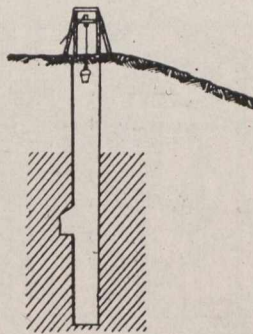
The power plant at present existing upon the property is entirely inadequate for our work, and far

greater progress would have been made during the last four months of 1909 if we had had sufficient power available to meet the increased demands made by pumps, drills and hoists.

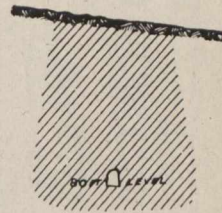
In fact, during the last three months so great has

— SAVAGE MINE —  
— Cobalt, Ontario, Canada —

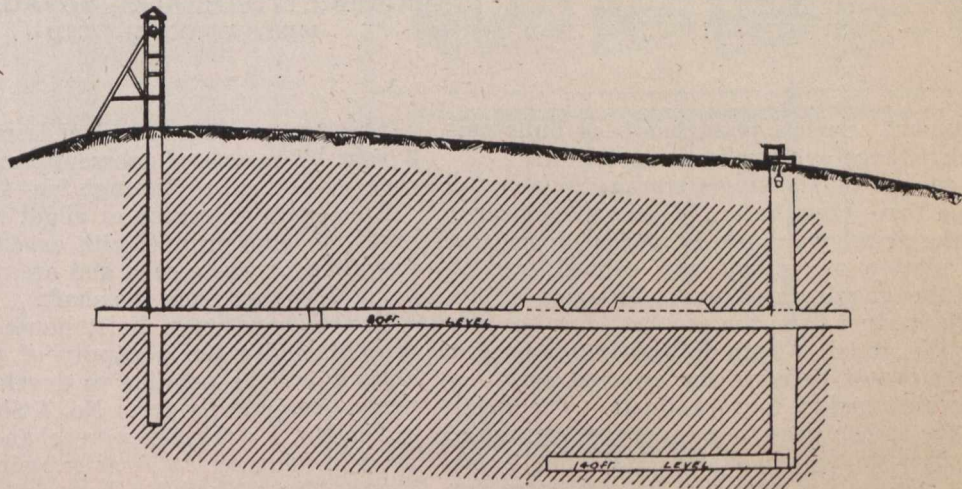
~ Vertical Section on No 2 Vein ~



~ Vertical Section on No 4 Vein ~



~ Vertical Section on No 3 Vein ~



*Payable Ore shown Hatched*

been the demand for pumping, that we have been able to operate but one drill.

We have been misled by those companies which propose to supply compressed air and electricity to the camp, as their repeated assurances led us to believe that an abundance of cheap power for all purposes would be available in October and November. With this power supply constantly expected, it has not seemed advisable to spend anything in supplementing our present plant, and the consequence is that we are still struggling along with insufficient power to enable us to push the development of the Savage as it merits. The power supply companies are working steadily upon the installation of their plants and it is probable that there will be a supply of power available in the near future.

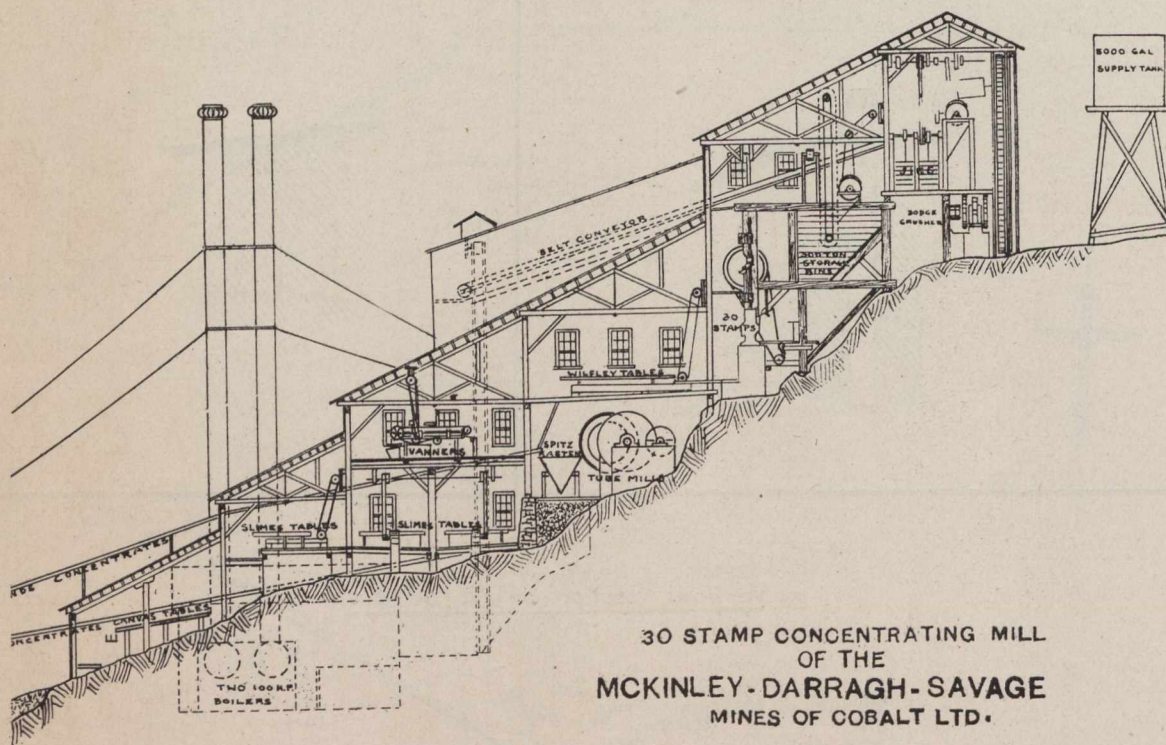
With the opening out of the Savage, it became evident that we would be warranted in putting in a somewhat elaborate ore-sorting plant, so that the ore from the various workings could be brought to a central

be possible to treat it further in our McKinley-Darragh mill.

The process is illustrated by the "flow sheet," and the details of the ore-sorting plant are shown by the drawings accompanying this report, while the appearance of the plant is shown in the several accompanying photographs.

Our work upon the Savage has demonstrated the fact that only in rare instances do the silver values show upon the surface, and for this reason it is intended to prove up known veins by crosscutting rather than by sinking separate shafts upon each of them.

About six thousand feet of trenches have been dug this year, and altogether about two miles of this work has been done. The result has been the exposure of four veins (one of which carries nuggets at the surface) lying between and extending parallel to veins 2 and 3. Also to the east of No. 3 Shaft a network of cobalt-bearing veins has been exposed.



30 STAMP CONCENTRATING MILL  
OF THE  
MCKINLEY-DARRAGH-SAVAGE  
MINES OF COBALT LTD.

point for treatment. Such a plant has been built and is about completed, the system being as follows

Ore is dumped into bins having a storage capacity of 100 tons. From these bins the ore is drawn out over a grizzly. On the grizzly the ore is washed down and the rich vein matter sorted out and cobbled free of waste. From the grizzly the ore is fed into a jaw crusher and the product from the crusher joins the fine material from the grizzly, both falling into a bucket elevator. The elevator delivers the crushed ore to a sizing screen which makes four products. The finest product from the screen goes to a concentrating table, the next two sizes go to two Hartz jigs. The hutch product from the jigs is elevated to the concentrating table referred to above.

The waste tails from the jigs and from the concentrating table flow out to a dump.

The oversize from the sizing screen is discharged onto a bumping table and is hand picked, the reject going to a dump, there to remain until such time as it will

These veins can be reached from the workings on No. 3 vein by means of crosscuts, and all ore and waste rock will be raised through No. 4 Shaft.

This shaft is located at about the centre of the property, on high ground with excellent opportunities for disposing of waste rock and ore, the new sorting plant being fifty feet from the shaft.

A new head gear, hoist house and shop have been erected, and when a supply of power becomes available, it will be possible to develop and mine the property economically from No. 4 Shaft.

The No. 1 workings were abandoned and allowed to flood in January, 1909, as explained in my last annual report. No. 2 Shaft has been pumped out and timbered to a depth of 100 feet, the shaft bottom being 112 feet. A concrete water ring has been installed and a pumping station established at 70 feet, for the purpose of catching up and getting rid of as much water as possible, thereby improving the working conditions in the shaft.

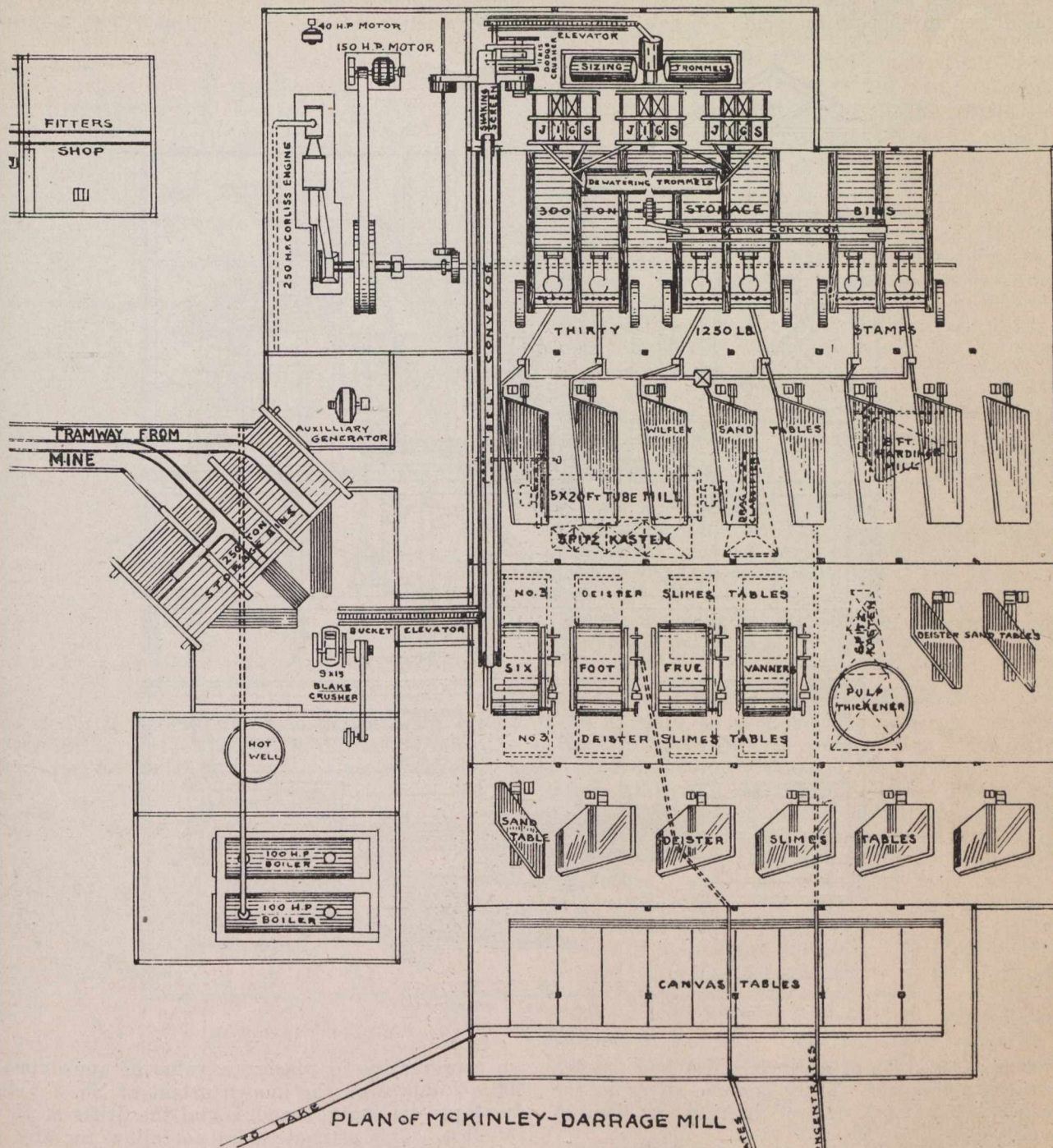
During the summer the Provincial Mine, by means of a diamond drill, proved the continuance of this vein to a depth of 165 feet, and it is my purpose to sink to 200 feet if the ore holds good that far.

Allowing a distance of twenty feet on either side of the shaft and a vertical depth of 75 feet, I estimate that No. 2 Shaft has developed a reserve which will

has been constructed to connect No. 2 with the new sorting plant at No. 4.

The most important ore body at present known upon the claim is No. 3 Vein.

Sinking No. 3 Shaft, ore was encountered at 20 feet, and for about nine feet the vein was one and one-half inches wide, and carried from 8,000 to 10,000 ounces



yield approximately 60,000 ounces, but owing to a lack of knowledge concerning this vein it is not possible to form any accurate conclusions; it is probable that the ore developed will considerably exceed the above estimate.

Pending the completion of the new sorting plant, and the delivery of power, the sinking of No. 2 Shaft has been deferred, and work at present is limited to keeping the shaft pumped out. Meanwhile a trestle

per ton. From 30 to 75 feet the vein averaged about two and one-half inches in width and carried from 1,700 to 2,500 ounces per ton.

Drifting on the 75-foot level showed ore ten feet to the east of the shaft, at which point the vein ran into an open fissure. No attempt has been made underground to locate the extension of the vein beyond this fissure, but upon the surface it has been located. To the west of No. 3 Shaft the 75-foot level drift has been

connected through to No. 4 Shaft, a distance of 265 feet, and the drift has been carried 20 feet beyond No. 4.

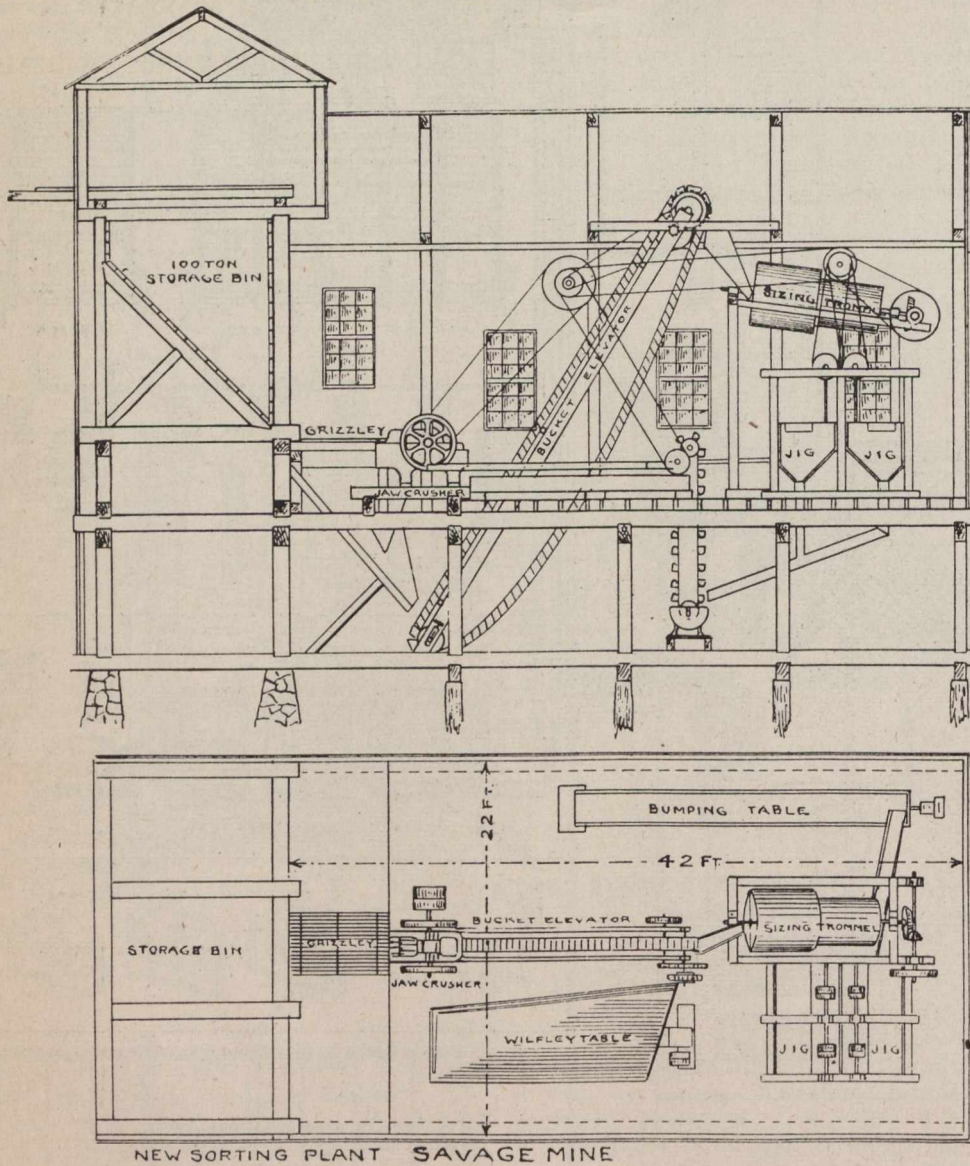
Between No. 3 and No. 4 the vein averages 2 inches in width, and carries approximately 1,800 ounces per ton.

Below the 75-foot level, No. 3 Shaft was sunk to a depth of 130 feet from surface, and a crosscut of 18 feet was driven to pick up the vein. On this level the

time being, until sufficient power is available to meet the increased demands for power for pumping.

STOPING.—Sixty cubic yards, stoped from the roof of the 75-foot level drift, represents the only inroad made upon ore reserves during the year.

ORE RESERVES.—The values of the ore reserve in No. 3 Vein can not be accurately estimated, owing to the great variations in the values per ton at different points. From sampling in the shafts and drifts, checked by smelter returns on ore shipped, I believe that I



vein is small (about 3/4 of an inch wide) and patchy, though rich in nuggets. There is some silver in the wall rock. A total of 98 feet of drifting was done at this level.

On the night of August 6th, the No. 3 Shaft house caught fire, being completely destroyed, and the burning debris falling down the shaft caused the shaft timbers to burn out above the 75-foot level. After this accident, work on the 130-foot level was suspended, as it was decided not to rebuild the burned structure, but to push the sinking of No. 4 Shaft, making the latter the main hoisting shaft for the workings.

No. 4 has been carried down to a depth of 125 feet, at which level a strata of water-bearing sandstone was cut, and sinking operations were discontinued for the

am conservative in placing a value of approximately 600,000 ounces on the known extent of No. 3 Vein as developed by shafts 3 and 4, and the drifts at 75 and 130 feet. This estimate does not allow for any persistence of values beyond our present workings.

Since the first of the year we have driven a crosscut north from the 75-foot level of No. 3 vein to prove No. 4 vein. At a distance of 44 feet No. 4 vein has been cut. It is 2 1/2 inches wide, calcite and smaltite, carrying 1,000 ounces in silver values.

Allowing 80 feet of backs and a lateral extent of 60 feet will give a reserve of something over 90,000 ounces for this vein. Continuing the above crosscut to the north, at a distance of 26 feet beyond No. 4 Vein, we have also cut No. 5 Vein. It is 1 1/4 inches wide, smal-

tite, and is very rich in silver. No allowance has been made for this in estimating reserves.

**Recapitulation of Estimated Reserves.**

No. 2 Vein.....	60,000 ounces.
No. 3 Vein.....	600,000 ounces.
No. 4 Vein.....	90,000 ounces.
	750,000 ounces.

considerable distance, but has only been prospected at one point underground.

Several other veins, fully as promising in surface showings as were either No. 2 or No. 3, have also been disclosed in trenching.

With these facts in view, one is justified in placing the possible yield of the Savage at a figure greatly in excess of the 750,000 ounces estimated above, and while not venturing any definite figures, I feel that the Savage is destined to become a factor of far greater importance than it is at present.

**THE COBALT PROVINCIAL MINE.**

(Special Correspondence.)

Many of the readers of the CANADIAN MINING JOURNAL will be interested to know that the Provincial mine, now being operated by a private company, is showing up very well. The principal shaft, near the boundary that marches with the Savage claims, is down 130 feet. Under Government regime this has been sunk 70 feet. At 84 feet a high grade 6-inch vein was encountered. At 100 feet the vein dipped out of the south side of the shaft. Within 50 feet of the No. 2 shaft a rich vein was cut by diamond drill at a depth of 125 feet. This has not yet been cut by the workings. Four veins in all were encountered by the drill. But the best showing was the big calcite vein cut at 125 feet, which showed silver in the core. The shaft was sunk so that this vein could later be cross-cut. The other discoveries were pleasant surprises.

The indications are that the conglomerate here is deeper than in most parts of Cobalt camp. The diamond drill has demonstrated it to be at least 200 feet deep.

Power is now being furnished by the Cobalt Hydraulic. Two Mack drills are in commission.

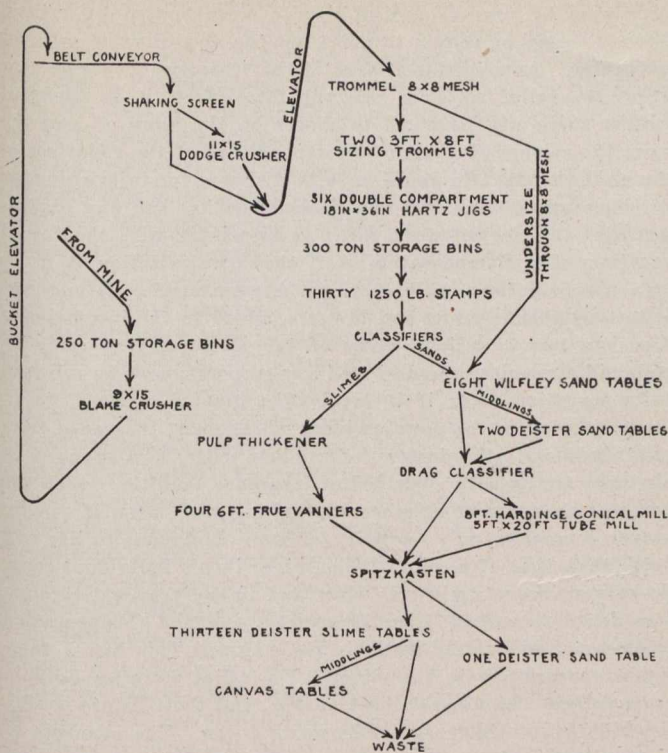
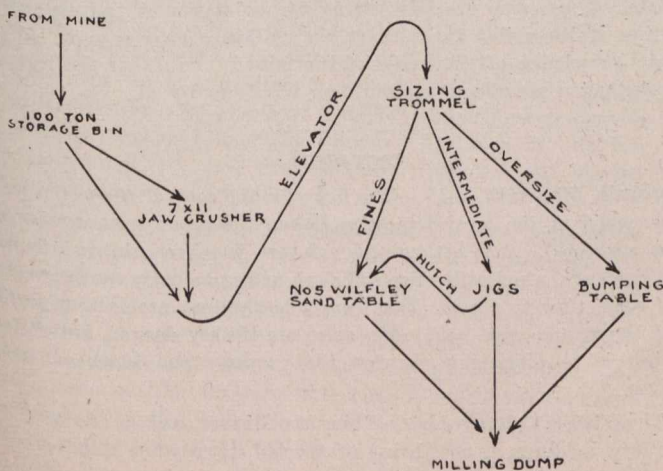


DIAGRAM ILLUSTRATING FLOW OF ORE THROUGH MILL

This is not to be considered as the full measure of the possibilities of the Savage, it represents only the value of that ore which has been fairly well developed.



—FLOW SHEET-SAVAGE SORTING PLANT—

No. 2 Vein is known to continue to a depth of 50 per cent. deeper than that included in the estimates of ore reserves.

No. 3 Vein has been traced upon the surface for almost twice the length developed underground.

No. 4 Vein has been traced upon the surface for a

**PERSONAL AND GENERAL.**

H. Koppers, by-product coke oven constructor, with offices at Joliet, Ill., has contracted to build 60 by-product ovens for the Woodward Iron Company, at Woodward, Alabama, near Birmingham. The by-product plant will include Koppers' direct ammonia recovery process, and will be built with a capacity to handle the by-products from the plant enlarged to 120 ovens in the future. The coke production from the 60 ovens will be 655 tons per 24 hours. In addition there will be 4,700,000 cubic feet of gas, 4,700 gallons of tar and 9.4 tons of sulphate of ammonia. This is the same type of oven being built so extensively by the United States Steel Corporation. The rapid growth enjoyed by the Koppers' coke oven is evidenced by the following:— Number of Koppers' ovens built and under construction in America, from opening of American office in 1907 to date, 1,376. Total number of Koppers' ovens built and under construction in America and abroad since this type of oven was introduced in 1903, 5,609.

Mr. R. B. Lamb, of the C. L. Constant Company, has retired from that organization to become associated with the Proprietary Mines Company of America, offices at 15 Broad Street, New York City.

Mr. J. B. Comstock, for six years with the Westinghouse Electric & Manufacturing Company at its East Pittsburg Works, and for four years manager of its publication department and printing plant, severed his connection with that company in April to accept a similar position with the P. & F. Corbin Company, of New Britain, Conn.

## SPECIAL CORRESPONDENCE

### NOVA SCOTIA.

**Glace Bay, May 17th, 1910.**—Since the U. M. W. A. strikers returned to work at Glace Bay, the outputs of the Dominion Coal Company's collieries have increased about one-third, but they are not yet up to the summer maximum. The total production for May will be about 280,000 tons, comparing with 316,000 tons in May of last year. It is anticipated that the June figures will be large, as there is an unusually plentiful supply of labour. The strikers have not all found work at the time of writing, but they are being placed as rapidly as it is possible. Several of the collieries have been placed on double-shift, and the new winnings which the company is undertaking in the Morien and Lingan fields are being vigorously prosecuted. There is every prospect that this summer's coal production in Cape Breton will be larger than ever before, as all the companies are well supplied with men. This state of affairs is rather novel in Cape Breton, and is, of course, due to the importations of men that were made during the U. M. W. troubles.

The mining rates have been fixed at Dominion No. 12 Colliery by agreement between the P. W. A. and the company, and from now on this colliery will rank as an important producer. The surface works on No. 14 will be finished this summer, and No. 15 is now producing about 100 tons per day from development work. No. 16 slopes are being sunk, and other mines are in contemplation. Before long a district where the industries were farming and fishing will become one of the busiest and most prosperous places in the Island.

Owing to the extensive developments which are being undertaken by the three leading industrial concerns in Cape Breton, namely the Dominion Steel and Coal Companies and the Nova Scotia Steel & Coal Company, there has been a marked restoration of business confidence. The coal-steel "merger" has put an end to the protracted friction between these two mutually dependent enterprises, and now that the U. M. W. trouble is past, there seems every reason for optimism for the future of the coal and steel industries of Cape Breton.

**The Colliery Relief Societies.**—The Nova Scotia Government has just enacted a Workmen's Compensation Act, but they have excepted from its provisions those coal companies at whose works relief societies are established, on the understanding that the scope and usefulness of these societies are to be enlarged. The president of the Dominion Coal Company, together with the general manager, lately met a deputation representative of all the relief societies at the mines of the Dominion Coal Company and explained to them the desire of the company to give effect in the very fullest manner, to the evident wish of the Government, that adequate provision shall be made for the victims of industry throughout the province. The president expressed his desire to see a scheme of benefits arranged which should be second to none in Canada, and announced that the company would contribute equally with its workmen to the cost of any scheme which should be decided upon. No definite plan was presented, as the meeting was purely of a preliminary character, advantage being taken of Mr. Plummer's presence in Cape Breton to enable him to meet for the first time a committee of the workmen at the mines. Mr. Plummer and Mr. Butler both emphasized the necessity of commencing properly and with an adequate scale of contributions. It has been suggested that the sole desire of the Coal Company, in advocating an extension of the relief societies, is to enable them to escape the cost which a Workmen's Compensation Act would bring upon them, and one newspaper irresponsibly stated that the cost to the Dominion Coal Company alone under such an Act would be \$200,000 per annum. This newspaper has absolutely no grounds for such a statement. The yearly cost for death claims, under the scale proposed by the Nova Scotia Act, would not exceed \$25,000 to \$30,000 at the highest computation. This would leave

say \$175,000, as the cost of non-fatal accidents. The average maximum of the Coal Company's employees is about 7,500 men. The Act provides for weekly payments as compensation for injury, which amount to about half of the wages which would be earned at work. A little calculation will show that in order to incur such an enormous bill for compensation, would mean that every employee of the company would lose one month out of every year by reason of disability to work caused by injury. There is surely no reason to point out the absurdity of such an assumption. As a matter of fact, if the tentative proposals now before the relief societies are put into effect, it is doubtful whether there will be much to choose on the score of cost between the company's share of the expenditure of the relief societies, or the amount it would have to disburse for injuries under a Compensation Act. But any person who has had any experience with the clerical work which is associated with the actual operation of a Compensation Act, the dissatisfaction it occasions, the litigation and bickerings between employers and employees, between doctors and lawyers, added to the insufficiency of such a law to relieve many of the most pressing cases of need, will appreciate the desire of any corporation to be relieved of its operation, even if it involved a greater expenditure in money. Owing to the peculiar ideas which many insurance companies hold as to the dangers of a miner's life, men engaged in this trade are unjustly deprived of insurance facilities which are open to men engaged in other trades, many of them, if the insurance companies only knew it, far more dangerous to life and health than that of a miner. The miner in his individual capacity cannot insure against accident and sickness, except through some form of mutual friendly society, and the Compensation Act does not adequately meet his needs alone. This fact is thoroughly appreciated by the miner. The relief societies have in the past been the miners' sheet anchor, and their future usefulness bids fair to increase as the years go on. The interests of the employer and the workman are identical in these societies, malingering is checked, provision is made for sickness and accident also, the extent of the relief disbursed increases automatically with the extent of the family that is dependent, the less onerous demands of the single man help out the needs of the married man, the provision for widow and children is disbursed in small sums, which is often a preventative of misuse and waste. Those who are advocating the enlargement and consolidation of the relief societies at the collieries have a more intimate knowledge of the needs of the miner than either the legislature or the press, and are building wisely and well.

### ONTARIO.

**Cobalt, May 18th, 1910.**—The fight for the control of the Beaver was ended at the annual meeting, when the present management was sustained. Another car of rich ore has been shipped from the property, which will raise sufficient money to carry on the work for some time to come. The veins underground are looking well and the management could ship more ore if they desired, but their object is to thoroughly develop the property and block out reserves.

The Fisher Eplet, which adjoins the Beaver, and is one of the La Rose holdings, is now being prospected, twenty-five men having started trenching. No work has been done on this section of the La Rose holdings for over two years, but the good ore being found on the Beaver has encouraged the management to continue their prospecting.

The official figures for the production of the Cobalt camp for the year 1909, published by the Bureau of Mines, Toronto, show a total output of 25,835,983 ounces of silver. The estimated production was only 24,000,000 ounces, so that the returns much exceeded expectations. The production from South Lorraine amount-



ed to 144,953 ounces shipped from the Keeley and Wettlaufer, the latter company having been the largest contributor.

On the Yorke-O'Brien lot in the Gillies Limit, the vein was cut in a crosscut from the 100-foot level. It shows several inches of calcite with native silver, and will probably assay in the neighbourhood of 500 ounces per ton. The shaft has been continued a depth of 150 feet, and a crosscut from this level will be run to intercept the vein. Work has been stopped until air from the power companies can be obtained, as the property is equipped with only a small steam plant. The vein recently cut is a continuation of the one worked on the Red Jacket. The latter company, however, closed down shortly after its discovery and no work has been done since. Trouble among the owners is said to be the reason and a few days ago, the supplies of all sorts were sold to satisfy a debt due one of the banks.

Toronto men who are interested in the Bartlett property in Gowganda are endeavouring to get things running again. It is stated that McLaughlin and McIntyre, the original owners, have contributed 350,000 shares, to be placed in the treasury and sold for 25 cents. A considerable sum of ready money has also been raised, in order to commence work as soon as possible. The property is equipped with a splendid plant, including a twelve-drill compressor and a complete machine shop. It is understood that the whole thing cost in the neighbourhood of \$125,000 by the time it was installed. Only a small section of the company's holdings has been prospected and it controls a large acreage in the richest section of the district. One shaft was put down about 100 feet with a small amount of crosscutting accomplished, when the company had to close down for lack of funds. The shipments from Gowganda last winter proved the district to be worthy of serious consideration, and are largely responsible for the increased public confidence. The Millerett was the heaviest shipper, and it already has another carload on hand. The development work now being accomplished is proving up the ore bodies in a satisfactory manner. At the Reeves Dobie, there is a considerable body of ore blocked out above the 80-foot level, and next winter will probably show a material increase in its shipments. The shaft is down 160 feet and will be continued to the 250-foot level. At this point a crosscut will be run to cut the vein. The crosscut from the bottom of the shaft of the Miller Lake-O'Brien has cut the vein which shows good ore. Last winter an English syndicate took an option on the Morrison property, which has one of the most sensational surface showings in the whole district. They agreed to spend \$100,000 in proving the claim, but owing to the early break-up, it was unable to get its machinery in. On this account the option has been extended for a further period of six months.

For the past week or so bush fires have been causing considerable uneasiness, and the plants of some of the outlying properties had a narrow escape from being burned. The lack of rain has made everything very dry, and the fires were probably started through carelessness.

The best ore in the history of the Rochester is now being taken out of that property from the vein opened up a short time ago. It is believed that only the apex of the ore shoot has been cut, as the ore is much better in the bottom of the level. The vein varies up to five inches in width and is exceedingly rich. The shaft will be sunk an additional 75 feet to the 150-foot level, and from that point a crosscut will be run to cut the vein. A considerable amount of ore has been bagged, and it is probable that a shipment may be made in the near future.

The Nipissing Central Railway, the electric road between Cobalt and Haileybury, has now been running for some time, and has proved a great boon to these two places. As an outcome of the road, several quite important settlements have sprung up along the right of way, and these are growing rapidly. As an evidence of the business done it may be stated that during the first nine days the cars were running, they carried 30,000 people. It is probable that this summer the road will be extended to Liskeard.

Conditions at the Cobalt Lake Mine continue to be very satis-

factory, and in the drift from the bottom of the winze there are thirteen stringers of ore across the face. A crosscut is being run to intercept the Pellatt and Morrison veins and should these have good values at this depth, the mine will have a very considerable ore reserve. Two or three cars of screenings are now ready for shipment and will be sent out shortly.

A car of ore has recently been shipped from the Provincial Mine for the Ontario Government. This ore was lying in the ore house at the time the property was sold, and was taken out when operations were carried on by the Government. A short time ago the new owners of the property found a high-grade vein near the boundary of the Savage Mine.

Two new veins have already been found on the Nipissing by the gangs employed trenching. They have been stripped for about twenty feet, and although narrow, contain high grade ore.

Several parties of Government geologists have started for the different districts of Northern Ontario, where they will thoroughly explore and map the country. Professor Miller, with his assistants, will work out the geology of the Porcupine district, while another party will examine the lignite deposits near the Mattagami River. An engineer recently returned from there, states that the lignite is of inferior quality, but suitable for domestic purposes. The deposits, however, cannot be utilized commercially, until railroad transportation is available. Other parties from the Provincial Department, are being sent to the Sturgeon Lake, Port Arthur and Rainy River districts.

The Temiscaming and Hudson Bay has declared another dividend of 300 per cent., or \$3.00 per share. This will be payable on May 25th and makes a total of \$12 per share already paid for 1910.

The condition of the La Rose is steadily improving, and the latest favourable development is the opening up of a new ore body on the No. 11 vein of the Lawson. This vein was cut on the fifty-foot level and shows altogether about ten inches of high-grade ore. This vein was discovered last year on the surface, and has been traced for nearly 1,000 feet. This makes the second vein on the Lawson giving high values at any depth.

The O'Brien is now shipping silver bullion, more or less regularly, to the Bank of England. The last shipment amounted to 17,116 ounces, bringing their total shipments of bullion up to 85,366 ounces.

The new concentrator at the Nova Scotia has commenced running, although it is not yet operating to its full capacity. The Silver Cliff mill has been running for some time and has made its first shipment of concentrates amounting to 20 tons. The Trethewey concentrator is also ready, and part of the machinery has been running. When these new mills are operating their output of silver will show a material increase.

The question of compressed air power is still unsettled, as at the present time neither of the two companies is in a position to make deliveries. The Mines Power started some time ago, but so far its air service has not been satisfactory, due to frequent interruptions. Such power as was delivered was very good, the air being clean and dry and maintained at a constant pressure of about 105 pounds. The company, however, has had all its generators at the Matabitchouan plant burned out, and although it is running sufficient to supply electric energy to its customers, it is still unable to run its compressors. The management expects to be in a position to turn on the air again on May 22nd, and should then be able to proceed without any more serious interruptions.

The Hydraulic Company has the plant at Ragged Chutes nearly completed, and should be able to deliver power in a short time.

**Porcupine.**—Due to poor transportation facilities, very little is being heard of this district, but the reports that do come are very satisfactory. The Miller Company has obtained assays from the big vein that run as high as \$238.00 per ton. These samples were taken across the vein, but doubtless in the richest portions. The Timmins are stated to be putting up a test plant of 15 tons capacity, to treat some of the ore produced in development work.

The treatment will consist of amalgamation and cyaniding, and the plant will give the owners a much better knowledge of the value of the ore than would be possible by sampling. At the Hollinger, the plant is now running and a force of 90 men is employed. In the crosscut from the No. 2 shaft at the 60-foot level, assays of \$347.00 per ton were obtained. Free gold has been found in the south of Shaw Township, and a few days ago three claims in that vicinity were sold for \$20,000. It is possible that before the season is over, several of the camps may run short of supplies, as the number of men employed is greater than was anticipated.

**Kenora, Ont.**—At a meeting of the Prospectors' and Mine Owners' Association of the Kenora Mining Division, held May 11th, Mr. A. L. Parsons, lecturer in Mineralogy of the Toronto University, addressed the members and gave them a very interesting little lecture upon the methods which should be employed by the ordinary prospector in his search for mineral wealth, exemplifying by means of one or two incidents from his own experience the necessity for the prospector not to confine his energy to the examination of the rocks for one thing only, but rather to be in a position to recognize any ore of commercial value with which he might come in contact. At the close of his lecture a hearty vote of thanks was tendered to Mr. Parsons for his courtesy in meeting the members of the Association.

This district is at present becoming somewhat excited over the reported finds of tin in the boundary country, some thirty miles west of Kenora. The main deposits from which it is claimed this tin is obtained varies in width from 300 to 1,200 feet, and has been staked for a distance of 8,000 feet. This ore which appears to be very heavily mineralized, carries a larger percentage of sulphur and requires thoroughly roasting before any results can be obtained by fire assay, but under this treatment from the results obtained so far, it seems to promise very well. The West Hawk Lake district comes to the front this time with some samples of pyrrhotite which has been located on the contact. The vein is eight feet wide on the surface, and has been traced and staked for a distance of two miles. No direct analysis of this ore, giving its percentage of nickel, has come to hand; but the parties interested are making arrangements to have this ore thoroughly tested so as to be in a position to place their holdings upon the market. The Star Lake properties are still being developed and the holders of these properties are expecting very shortly to announce the closing of a deal with the syndicate, who will operate the whole group of claims.

The work is still progressing of opening up the Alley Island copper property, whose discovery was reported some months ago. This is one of the few properties in which copper occurs native in any quantity. The action of the Government in sending up a geologist to correct several inaccuracies in the existing geological maps of this district, and to make a further report on the geology shows that they are at least becoming awakened to the importance and the large possibilities of this territory.

#### BRITISH COLUMBIA.

Available information relative to the progress of mining in the province during the four expired months of the current year indicates that ore production has been on a larger scale than for the corresponding period of any previous year. Complete returns are not obtainable before the close of each year, but for the chief ore-producing districts the statistics published weekly by the Nelson "Daily News," afford a general idea of the situation. These show that production for the year to the end of April, was as follows: For Boundary district, 636,191 tons; Rossland, 85,441 tons; Sloean-Kootenay, 111,431 tons; total, 833,063 tons. The corresponding figures for 1909, were: Boundary, 491,489 tons; Rossland, 80,346 tons; Sloean-Kootenay, 60,815 tons; total, 632,650 tons. This comparison shows an increase in the tonnage of the district named of nearly one-third. Of the 200,000 tons increase, 145,000 was from

Boundary district mines, 5,000 tons from those of Rossland, and 50,000 from those included under the head of Sloean-Kootenay. The increase in tonnage of ore reduced at the several operating smelters of the districts under notice, is evident from the next following figures:

At Smelter of	Smelted during First Four Months of	
	1909.	1910.
Granby Company .....	313,223 tons.	427,263 tons.
B. C. Copper Company .....	140,505 tons.	144,960 tons.
Total for Boundary .....	453,728 tons.	572,233 tons.
Consolidated M. & S. Co. ....	117,502 tons.	169,622 tons.
Total .....	571,230 tons.	741,845 tons.

Of the increase of 170,000 tons smelted, 114,000 was credited to the Granby Company, 4,000 to the B. C. Copper Company, and 52,000 to the Consolidated Company. The tonnage of ore milled during the same periods was, in found figures, 61,000 tons in 1909, and 91,000 in 1910, the latter showing an increase of nearly 50 per cent.

Beside the increased production of lode mines, there is good reason to look for an equally satisfactory increase from both placer gold and coal mining, operations in connection with both of these being on a larger scale than in 1909. It would appear, therefore, that if nothing occurs to check progress and interfere with production at present rate, the output of minerals should this year prove to be the largest in the history of mining in British Columbia.

#### CARIBOO.

**Barkerville.**—Placer gold mining for the season has been fairly commenced. Mr. John Hopp's hydraulic mines, the Mucho Oro on Stout's gulch, the Forest Rose on the east Branch of Williams Creek, and those on Lowhee and Mosquito Creeks, are being worked; provision having been made for an increased supply of water for gravel-washing, and the prospects for the season being favourable, there should be a larger quantity of gold recovered from these mines than in previous seasons. Other hydraulic mines are being operated, though not on so large a scale as those of Mr. Hopp.

**Quesnel Forks.**—In Quesnel division the most important work in progress is that of dam and ditch construction for the Philadelphia company, represented by Mr. Howard W. DuBois. Between 200 and 300 men and a number of horse teams have been employed in connection with the preparations for the development of a large hydraulic mine at Twenty-Mile Creek, on Quesnel River, about 20 miles below Quesnel Forks. Construction of a ditch and flume to carry 6,000 to 7,000 miner's inches of water from Swift River to Twenty-Mile Creek, is being expeditiously proceeded with. The undertaking is a big one, the whole enterprise involving an expenditure stated to be estimated at about \$1,500,000. Mr. John B. Hobson intends to hydraulic gravel on some of his placer-gold leases and looks for profitable returns from the season's operations.

#### EAST KOOTENAY.

**Placer Gold.**—On Wild Horse Creek the Invicta and Nip and Tuck properties are again being hydraulicked. On Perry Creek operations have been commenced with one large hydraulic plant, and it is intended to again use the steam shovel, put in here several years ago, to handle the gravel. On upper Moyie River and on several other streams in Fort Steele mining division, small hydraulic plants are at work.

**Lead-Silver.**—The St. Eugene is regularly maintaining an output of lead-silver concentrates and shipping same to the Consolidated Mining & Smelting Company's smelter at Trail. The same company is working the Sullivan group, near Marysville, and has this year shipped to Trail about 4,000 tons of ore from that mine. The Aurora, situated across Moyie Lake from the St. Eugene Mine, will send ore to the Alice Mine concentrator near Creston; it is expected that by this arrangement it will be found practicable to make a marketable product at a cost which will leave a margin of

profit to the mine-owners. Preparations are being made to ship ore from the Society Girl, on which ore has been cut by a long crosscut tunnel.

*Coal.*—The Crow's Nest Pass Coal Company looks for conditions being favourable for larger production at its mines henceforth. An adequate supply of railway cars for hauling the coal away has been promised, and arrangements have been made with the Great Northern to take about all the coal the company shall find it practicable to supply that railway with. The C. P. R. Mine at Hosmer, and the mine at Corbin, owned by a Spokane company, are both being regularly worked; the prospects for these comparatively new mines are that their output will be larger this year than last.

#### WEST KOOTENAY.

*Ainsworth.*—In Ainsworth camp proper there is not much being done at present, but those directly interested are endeavouring to arrange for an early resumption of work at both the Highland-United and Krao properties. The Blue Bell, across Kootenay Lake from Ainsworth, is not now being worked; the manager, Mr. S. S. Fowler, has gone to Europe with the stated purpose of meeting the larger shareholders of the French company owning the mine and informing them what plant and machinery are required to allow of the big mine being worked to advantage. There is much lead-zinc ore accessible, but hoisting and pumping machinery is required to make this available for milling. On the south fork of the Kaslo Creek the Cork Mine is to be worked again this season, besides several smaller mines also on that creek. The Whitewater group has resumed shipment of concentrates, some 10,000 tons of ore having been milled during the four expired months of the year; both lead-silver and zinc-silver concentrates are produced. The Utica and Wellington Mines will be producers again this year.

*Slocan.*—The rebuilding of several bridges, so damaged some time ago that no trains have since been run over the Kaslo and Slocan Railway beyond McGuigan, has been ordered, so transportation facilities for mines near Sandon will ere long be improved. Recent developments at the Rambler-Cariboo Mine are the most important in recent years at that property. The finding of valuable shoots of silver-lead ore on the 900 and 1,000-foot levels had added considerably to the producing capabilities of the mine. The annual meeting of the Rambler-Cariboo Mines, Limited, will be held at Kaslo in June, and it is expected the report then to be presented will be the most favourable since the mine's dividend-paying periods of years ago. Shipments from the Richmond-Eureka mines, owned by the Consolidated Mining & Smelting Company, were in excess of 1,600 tons for four months to April 30th. With the melting of the snow working conditions should be favourable to an increased output. The Slocan-Star and Ruth-Hope groups, both in the vicinity of Sandon, will contribute substantially to this year's total output. The concentrating mill at the former will probably be operated again after having been idle for several years. Above Cody Creek, the Noble Five, Surprise, Reco and Sunset, are all being worked. About Slocan Lake there is also encouraging activity. The Mollie Hughes, near New Denver; Standard, Van Roi, and Hewitt-Lorna Doone group, in Four-Mile Creek camp; Eastmont (Ellis Silver Mining Company) at Ten-Mile Creek, and Ottawa, on Springer Creek, all tributary to Slocan Lake, are also being worked, with good prospects for an appreciably large total production of ore this year.

*Nelson.*—Near the city of Nelson the Granite-Poorman group is keeping its gold stamp mill running continuously, and at the Silver King is shipping silver-copper ore to Trail. The latter has this year sent out about 1,300 tons by the end of April. The acquirement recently of the old Molly Gibson Mine by the Consolidated Mining & Smelting Company, leads to the expectation of an early resumption of production there, though it is not yet known whether the mill put in by the La Plata Mines, Limited, which worked the mine during two years, will again be used for

concentrating purposes, or all the silver-lead bearing ore mined be shipped crude to Trail. In the southern part of Nelson mining division, mining gives promise of improvement, there being work in progress in Ymir, Salmo, Sheep Creek and Erie camps. This year's shipments from the Yankee Girl, at Ymir, had, by the end of April reached a total of rather more than 2,200 tons. The Emerald, near Salmo, has shipped about 1,100 tons of lead ore in 1910. The Queen and Nugget, at Sheep Creek, are both producing steadily, the former having this year milled about 7,000 tons at its 20-stamp mill, and the latter 2,000 tons at its 4-stamp mill. Development work in the Mother Lode, another Sheep Creek mine, is stated to be resulting satisfactorily and arrangements have been made for operating power drills in this mine in place of hand drills. Gold is the chief valuable metal in Sheep Creek ores.

*Rosland.*—The War Eagle Mine, of the Consolidated Mining & Smelting Company's Centre Star group, is reported to be in a position to supply during several months a fairly large tonnage of ore containing a higher average of gold than usual. There has not been any development of importance in connection with the exploration of the Le Roi by diamond drills, no large body of ore of good grade having yet been found. Fire has destroyed the head works at the No. 1 mine of Le Roi No. 2, Limited, but as all the ore has for some time been hoisted through the company's Josie shaft, production will not be interfered with. The loss, which is partly covered by insurance, is reported to have been about \$10,000, this including head-frame and electrically-operated hoist. The year's total receipts of ores and concentrates at the Consolidated Mining & Smelting Company's works at Trail to May 7th, are stated to have been nearly 180,000 tons, as compared with 125,000 tons for the corresponding period of 1909.

*Boundary.*—The tonnage of ore shipped in 1910 to May 5th has reached a total of 660,500 tons; of this, 450,000 tons was from the Granby Company's mines, 145,500 tons from those of the B. C. Copper Company, and practically all the remainder from the Consolidated Mining & Smelting Company's Snowshoe Mine. The Granby Company's total gives an average output of a little more than 3,600 tons for each of the 125 days of that period. It is reported that the B. C. Copper Company expects to soon have enough men to admit of its mines and smelter being worked to ordinary capacity. Numbers of the men who lately refused to continue working with non-union men have left the district. Two of the three blast furnaces at this company's smelter at Greenwood, are being enlarged. New York news is to the effect that 25,000 tons of ore from the New Dominion Copper Company's mines will be smelted at Greenwood, results to be taken as a guide in making permanent arrangements between the two companies for the reduction of Dominion Company's ores.

*Similkameen.*—Further development of the Hedley Gold Mining Company's Nickel Plate Mine is in progress, and additions are being made to plant and machinery at the company's 40-stamp mill. The V. V. & E. Railway, constructed by the Great Northern, is being operated to Princeton, and the further extension into the Tulameen country is in hand. Coal from the Vermilion Forks Mining & Smelting Company's Princeton colliery has been shipped over the new railway.

*Nicola.*—Coal mining operations are gradually assuming larger dimensions in Nicola Valley district. The Nicola Valley Coal & Coke Company is steadily enlarging its output. Last year this company mined about 70,000 tons; production for the four expired months of this year must be well on to a similar total. Several other companies are preparing for a regular output.

*Coast.*—The reported sale of the Dunsmuir coal mines to Mackenzie & Mann interests, and some local excitement relative to Portland Canal mineral claims, are the chief features connected with mining in the Coast district. The Portland Canal Mining & Development Company is the only organization that has yet done much actual mining on its property in the new camp, though two or three others have also driven some tunnels.

# MINING NEWS OF THE WORLD.

## GREAT BRITAIN.

The Dolcoath's new shaft has now been completed. It is three thousand feet deep, vertical from the surface, is lined throughout its entire depth with nine inch brick, and is seventeen feet nine inches in diameter—inside measurement. It is considered to be the finest piece of work of its kind in the West of England, and numerous mining engineers and others have visited it during the progress of the work. The contractors (Messrs. Piggott) have opened up the entrance to the north and south headings at the bottom, or five hundred fathom level, and are now engaged sinking below this point in order to make a sump for this new shaft, after which they will continue to drive from the south heading to intersect the Dolcoath lode.

At the Home Office April 21st, Mr. Churchill received a deputation consisting of the Parliamentary Committee of the Trades Union Congress, the Miners' Federation, Durham and Northumberland deputies and enginemen and the Wind Enginemen's Federation, who urged him to embody in a Bill some of the recommendations suggested by the Royal Commission on Accidents in Mines.

Mr. Churchill congratulated the deputation upon the steady progress made in adapting the whole industry to the conditions of the Eight Hours Act. The Home Office would give effect to the view that pump miners' hours were not applicable to bona fide hauliers. The great bulk of the recommendations of the Royal Commission required legislation to give effect to them, and at present great delay hung over all legislation. In addition, the Commission had not completed its labours and it would be better that a Bill for regulating the work of coal mines should cover the whole ground. He thought the inspectors should be strengthened, but the difficulty of money came up. There was to be a conference with mine owners at the end of May with a view to ascertaining how best to improve and systematize rescue apparatus and working. The Treasury had sanctioned the provision of a testing station, and they were now looking for a suitable site. In conclusion, Mr. Churchill said that when the Bill came to be framed, if he was responsible for the task, he should confer not only with employers, but with representatives of the men and make sure that the measure did contain practical points.

At the special meeting of the Coal Conciliation Board of South Wales and Monmouthshire, held at Cardiff, April 8th, the clauses of the new agreement were discussed, and steps were taken to insert the terms agreed upon which the workmen have balloted. No serious difficulty arose during the discussion and the agreement was duly signed by the representatives of the owners and workmen, with the exception of Mr. C. B. Stanton, miners' agent for Aberdare, who stated he could not sign because the majority of the men in his district had voted against the acceptance of the new terms.

The result of the ballot of the miners employed in the South Wales coalfield was an overwhelming vote in favour of the signing of the new agreement. The official figures were:—

For the agreement .....	97,273
Against the agreement .....	34,963
Majority for .....	62,310

The ballot thus brings to a satisfactory and peaceful settlement the protracted negotiations which have been in progress between the representatives of the coal-owners and the men since December last. The new agreement is for a period of five years.

**Manchester, Friday, May 13th.**—One hundred and thirty-seven miners lost their lives in an explosion in the Wellington coal

mine at White Haven. Rescue parties succeeded in saving four men, but fire has broken out in the works, leaving practically no hope for those who are still entombed.

Throughout the day rescue parties made considerable progress at the mine, but their work was stopped by the collapse of the roof.

It is curious that a colliery warning was published in many of the newspapers in the mining districts of the Kingdom yesterday to the effect that an unusually high barometric condition rendered fire-damp explosions extremely probable, and that underground workers ought therefore to be on the alert. The barometer reached the highest reading in the White Haven district.

King Gorge sent a message of sympathy to the owners of the colliery.

## NORWAY.

Advice has been received from the Sulitelma Company's mines in Norway, that for the month ending April 30th, 1910, 845 tons of concentrates containing 8.18 per cent. copper, were produced by the Elmore process.

## GERMANY.

The Dynamite Company (formerly Alfred Nobel & Company), of Hamburg, states, in the report for 1909, that the less favourable situation of the coal and iron and steel industry exercised an influence upon the sales of explosives during the year, but the total turnover was very favourable as more satisfactory results were obtained in other branches of the company's activity. In order to economize freight charges and other expenses, a new factory has been erected at Saarbrücken for the manufacture of dynamite and other explosives, and it was recently set in operation. After appropriating £50,000 for depreciation in 1909, as compared with £34,500 in the preceding year, the accounts show net profits of £144,000, as against £106,000 in 1908, and it is proposed to pay a dividend of 22 per cent., as contrasted with 6½ per cent. in 1908.

## TURKEY.

Interesting developments in connection with the petroleum deposits in Turkey are pending. The existence of considerable oil deposits in the vilayets of Morkul, Bagdad and Baskorak has been known for some time past, and it is now intended to commence exploitation in these districts. Refineries are to be built and liquid fuel to be introduced on the railways, in the fleet and in private industry. Rumours are in circulation that an American company has obtained an exclusive concession from the Government for the exploitation of these lands.

## EGYPT.

**Suez.**—The third oil well at Jemshah has become a gusher. Dr. Ball and the staff of the Government Survey Department were present when the well was drilled in. One hundred and eighty tons of oil flowed in the first six hours. The flow was steadily increasing when it was shut off.

## SOUTH AFRICA.

**Johannesburg.**—Mr. W. W. Mein, consulting engineer to Messrs. Ecksteins, is contributing a paper to the Association of Mining Engineers on Rand mine returns, criticizing as unscientific the much-discussed proposal by Mr. H. F. Marriott, consulting engineer to Messrs. Wernher, Beit, to substitute per fathom for per ton in future statistics.

It has been decided to construct at once four seven-compartment shafts on the Modder State mines, two of which will be located at 2,000 feet on the line of contour and two at 3,000 feet. It is intended to dispense with temporary headgears with the view to economizing time and money.

#### AUSTRALIA.

The gold yield of New South Wales during the month of April was 15,381 ounces, valued at £52,149. The yield for the past four months was 75,301 ounces, valued at £269,544.

#### MEXICO.

**Guadalajara, Mex., May 16th.**—The Santa Domingo Mining Company, which is now controlled in Boston, has resumed development work in the Santo Domingo mines in the Hostotipaquillo district of this state. A party of twelve investors recently visited the mines, and two other parties will visit the properties during the next sixty days. The erection of a reduction plant is planned. But little work has been done in the Santo Domingo mines since the fall of 1908, but during the three years prior to that time several thousand feet of tunnels and drifts were driven. It is stated that since the resumption of development work high-grade ore has been opened in a new drift on the El Favor vein.

#### UNITED STATES.

**Butte, Mont.**—To some extent a curtailment policy was observed by the larger operating companies in Butte during the month of April and the total output, which amounted to 27,451,000 pounds of copper, was nearly 1,000,000 pounds less than for the month of March. The Butte-Ballaklava Copper Company has developed into a permanent producer and during April averaged about 72 tons of ore a day, the average mineral content being 10½ per cent., as no great quantity of second-class ore was shipped.

**Butte, Mont.**—During the month of April the Alex. Scott shaft was sunk to a total of 106 feet, making a record close to the highest record for deep-shaft sinking in the Butte camp. The shaft is now down about 1,524 feet and by June 1st it is anticipated that a depth of 1,600 feet will have been attained. At the latter depth a station will be cut and an electric pump will be installed. Also a crosscut will be run to intersect all of the veins traversing the property and the work of placing the mine in condition for heavy shipments will be pushed aggressively.

From the 500-foot level to the 1,400 the Alex. Scott has opened up a number of veins carrying copper and silver in commercial quantities. On the 1,400-foot level the main vein has been drifted upon to a considerable extent and an ore body more than 20 feet in width has been developed to the producing stage. The ore carries considerable bornite and copper glance, although in a conglomerate form, and it is believed that on the 1,600-foot level the ore will be found in a more compact form.

**Goldfield, Nev., May 10.**—The greatly extended scope of development at depth in the mines of the Goldfield Consolidated Company has rendered necessary the employment of a larger amount of electrical power and, to meet the growing requirements, the company is now preparing for the installation of a large storage battery and power equalizing plant at Jumbotown, a collection of houses a short distance from the town of Goldfield, situated near the Clermont and Laguna claims of the Consolidated.

**Houghton, Mich.**—The Michigan Copper Company in 1909 sold 1,979,305 pounds of copper at an average of 13.16 cents, yielding \$260,551. By assessments its total income was swelled to \$429,577. The annual report shows a deficit of \$8,174, against \$15,392 a year ago. President Brady considers the timber resources as of value, consisting of about 5,250,000 feet of excellent white pine, and an equal amount of hemlock and other timber. "A" shaft has been sunk to a depth of 2,133 feet and underground work tested values of the Minnesota vein, but nothing

of interest was exposed. "B" shaft openings were confined to the 14th level east on the Calico lode.

There was opened from "C" shaft 894 feet on the Calico, 471 feet on the North Amygdaloid and 209 feet on the Minnesota vein. Light copper ground was shown on the 7th level west on the Calico. Both the 8th and 11th levels east were driven through excellent copper ground. The character of the copper contents at these points was spotty and its width averaged four to four and a half feet.

**Deadwood, S.D.**—E. C. Johnson, manager of the Gertie Tin Mining Company of Hill City, has recently received patents for a rock-grinding device which promises to have a marked effect on the ore-milling industry. In point of efficiency it is claimed to be far superior to any of the machinery now in use for the purpose and the demonstrations which have been made with models of smaller size than standard machine, appear to substantiate these claims.

The invention is called the Johnson Rod Tube Mill, its chief feature of difference from other tube mills in use being that instead of pebbles or chilled steel balls the grinding is effected by the use of chilled iron rods extending from end to end of the machine. The standard machine, as it will appear when turned out of the Homestake Company's shop, where it is now being put together, will consist of a metallic cylinder six feet in length by 18 inches in diameter. The inside surface is protected by a casting of corrugated chilled iron, against which the grinding is effected. The rods which extend practically the entire length of the mill, are sufficient in number to occupy one-quarter of the interior space of the cylinder. They are made of chilled iron with a core of rough iron.

**Goldfield, Nev., May 16th.**—The detailed statement issued by Manager J. R. Findlay, outlining the operations of the Consolidated Mines Company in April, shows that in point of production the record was surpassed in but one month of the company's history and exceeded the bullion output of March last, which heretofore has ranked second. This heavy production was made in the face of most unusual obstacles. On April 8th the mill was damaged by fire to the extent of \$125,000, necessitating the complete closing down of the plant for a period of eight days, and resulting in a reduction of mill capacity since that time of 30 per cent. The great belt conveyor of 1,000 tons daily capacity, which carries the ore to the stamp bins, was destroyed, as were all stores of cyanide, zinc dust and materials employed in treatment, together with thirty of the stamps.

**Victor, Colo.**—Stratton's Independence, Limited, operating at Victor, Colo., paid on April 29th last a dividend of \$60,000, bringing up the dividends paid during the first nine months of the fiscal year to 15 per cent. per annum on the capitalization of the company.

The cyanide mill is in steady operation, treating by cyanidation and concentration nearly 7,000 tons a month of low-grade dump ore, while the mine is producing better than 2,000 tons a month or one and one-quarter ounces ore.

The combined earnings of mine and mill, as published in London, amounts to 20 per cent. per annum on the capital.

**Coalinga, Cal., May 16th.**—In another two weeks the Producers Transportation Company's pipe line system, tapping the five big oil fields of the San Joaquin Valley, will be in complete operation, and crude oil from Coalinga, mingling with that from Kern River, McKittrick, Sunset and Midway, will start from the Junction on its journey to the sea, and hence into the markets of the world.

**Globe, Ariz.**—As a conservative estimate, the first of January, 1911, is set as the date for the beginning of production of ore from the mine of the Miami Copper Company. The concensus of opinion among the members of the management is that within six months from date, or by the first part of November, the concentrating plant, including the power plant and water system, will be completely equipped for handling a daily ore production of 1,000 tons, which output will be increased shortly

afterward to 2,000 tons, the tonnage for which the plant was originally designed. Although the construction plans have been changed and a concrete foundation built for a mill of a capacity of 3,000 tons daily, the third unit will not be added until a later date. At present, most of the concrete work is completed, and the steel frame for the concentrator building is well advanced, so that the principal construction work in the future will be that of installing the various machines in the concentrator and power plant buildings. Large shipments of machinery and structural steel are received almost daily, and with a force of nearly 500 workmen, a large number of whom are skilled machinists, these shipments will be readily taken care of.

**Washington, D.C., May 17th.**—President Taft has signed the bill creating a bureau of mines, but has as yet taken no action looking to the appointment of a chief of the new branch.

The bureau was created for the purpose of making diligent investigation of the methods of mining, especially in relation to the safety of miners, and the appliances best adapted to prevent accidents, the possible improvement of conditions under which mining operations are carried on, the treatment of ores, and other mineral substances, the use of explosives and electricity; and other inquiries and technological investigations pertaining to the mining industry.

The new bureau will be a branch of the Interior Department. Work in connection with mining which is now being conducted

by the Geological Survey, a bureau of the Interior Department, will be transferred to the mines bureau. Such work includes the investigation of structural matters, the analyzing and testing of coals and the ascertaining of the causes of mine explosions.

While the act creating the new bureau was designed largely to practicalize the investigations of the Geological Survey and meet the demand for action to prevent the constantly recurring coal mine explosions throughout the country, it was drawn on broad enough lines to permit of the extension of many benefits to mines where explosions do not often occur.

The bureau of mines is to be under control of a director who will receive a salary of \$6,000 a year. J. F. Callbreath, of Denver, secretary of the Mining Congress, has joined in a petition to the president for the appointment of Dr. J. A. Holmes, of the Geological Survey, to the position.

**ALASKA.**

**Valdez, May 14th.**—The first attempt at quartz mining in this district has proved highly successful, returns received here to-day from the first eighteen days' operations of the Cliff Mining Company's claim showing an output of 860 ounces of gold, besides \$4,000 in concentrates, from 150 tons of ore.

The company was organized eight months ago to develop the quartz vein on Valdez Bay, and a thousand foot tunnel and an uprise was driven, and a three-stamp mill installed.

**COMPANY NOTES.**

**INTERNATIONAL COAL.**

The annual report of the International Coal & Coke Company, which has just been issued, shows that the net profits for the year, after paying all operating expenses at the head office and the mine, amount to \$246,271, which sum has been derived from the various departments of the company's coal and coke business.

Four quarterly dividends at the rate of one and a quarter per cent., amounting to \$145,000, were paid, the balance, \$101,271, being carried to the surplus account, which now reaches the handsome sum of \$34,595.

The president's report says that during the year development work proceeded apace, some 2,303,352 tons being in sight on December 1st, 1909, after due allowance for working and waste had been made. These figures show a net gain of 323,352 tons developed over and above the tonnage extracted.

The Hedley Gold Mining Company, which purchased the famous Nickel Plate mine and reduction works at Hedley last August, has issued a statement covering its operations during 1909.

The company took an option on the property in May of last year for \$715,000, which was exercised on August 13th, 1909. During the life of the option exploratory work was carried on and the new company received half of the profits made during that period, its share amounting to \$15,748.89. The net profits from August 13th to December 31st were \$68,812.57. The first dividend of three per cent. was paid January 4th, 1910, leaving a surplus as of December 31st, 1909, of \$79,041.46.

Mr. I. L. Merrill, president of the Hedley Gold Mining Company, in his report to stockholders last month, says: "At present we are wholly dependent on our water power. Low temperatures and drought interfere with this power and stop our mill. We have been fairly fortunate this winter, losing but little time until February 24th, when a temperature of 24 degrees below zero shut down the mill. We hope to be able to resume by or before April 1st. Our engineers are figuring on building a larger

dam, to give a water power that would be unaffected by weather conditions; or, as an alternative, adding an auxiliary steam plant to run the mill when our water power fails.

"Prior to our taking possession of the property the tailings were wasted. We are now impounding them and a substantial profit is hoped for from their retreatment. Your president, with the aid of the best experts, is conducting experiments to determine character of needed changes in reduction plant. The changes can probably be made this summer. They should increase the tonnage of ore handled and save most of the gold now going into the tailings. The additional recovery hoped for is estimated at \$1.25 per ton of ore treated.

"Your president believes that the outlay needed to enlarge and improve the reduction plant and power plant will not exceed \$100,000. The company at its inception, was provided with \$280,000 working capital, so that the cost of new plant is much more than provided for. No outlay will be made until we are satisfied that it will be quickly repaid by increased profits."

The production returns from August 12th to December 31st, 1909, were as follows:

	Tons Milled.	Assay Value.	Net Profits.
August and September...	6,092	\$11.90	\$18,190.70
October .....	3,914	11.75	16,186.68
December .....	3,392	12.80	14,556.29
November .....	3,691	12.76	17,918.01

The company has since declared its second quarterly dividend of three per cent., which was payable on April 2nd last.

The Temiskaming Mining Company has issued a statement for the first three months of the fiscal year. Profits for the quarter ending April 30th were \$96,684.05, which practically places the company out of debt. The statement of the president claims the mine is now working in good ore, and that excellent results are being obtained from the concentrating plant, although the work at the mill was retarded owing to the delay in getting sufficient electric power.

# STATISTICS AND RETURNS

Cobalt, Ont., May 10th.—For the first four months of 1910, the following ore shipments were made from the Cobalt district:

	Tons.
Nipissing .....	1,958.81
La Rose .....	2,082.81
Kerr Lake .....	1,446.00
Crown Reserve .....	962.21
McKinley-Darragh .....	483.05
Buffalo .....	356.14
Drummond .....	332.10
Right of Way .....	305.05
Coniagas .....	257.48
O'Brien .....	244.67
Temiskaming .....	208.25
City of Cobalt .....	142.83
Trethewey .....	186.73
Cobalt Central .....	127.74
Chambers-Ferland .....	112.68
Cobalt Lake .....	97.30
King Edward .....	87.98
Peterson Lake .....	85.22
Colonial .....	62.68
Hudson Bay .....	61.68
Silver Cliff .....	33.00
Waldman .....	32.00
Cobalt Townsite .....	27.25
Hargraves .....	20.90
Casey Cobalt .....	10.00

Total ..... 9,724.24

Gowganda and Elk Lake shipments, bringing the total for the northern Ontario camps up to 10,065 tons. Bullion shipments to the amount of \$96,750 have been made.

This compares favourably with 9,456.68 tons for the first four months of 1909, and 5,650.01 for 1908.

## COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending May 20th, and those from January 1st to date:

	May 20. Ore in lbs.	Since Jan. 1. Ore in lbs.
Beaver .....		120,450
Buffalo .....	66,000	825,558
City of Cobalt .....		363,835
Chambers-Ferland .....	64,260	291,060
Cobalt Central .....	46,300	293,265
Cobalt Lake .....		196,000
Cobalt Townsite .....		68,000
Colonial .....		107,260
Coniagas .....	52,400	623,795
Crown Reserve .....	84,000	2,381,295
Corkill E. P. ....		65,000
Drummond .....		664,200
Hargraves .....		41,800
Hudson Bay .....		123,695
Kerr Lake .....		3,077,991
King Edward .....		174,966
La Rose .....		4,824,003
McKinley .....	201,408	1,246,579
Nipissing .....	120,400	4,372,541
O'Brien .....	64,100	648,046
Peterson Lake .....		270,450
Right of Way .....		616,757
Silver Cliff .....	51,500	117,510
Temiskaming .....		421,830
Trethewey .....	63,700	447,650
Waldman .....		63,992

Ore shipments for the week ending May 13th were 814,068 pounds, or 407 tons.

Total shipments from January 1st to May 13th were 22,447,580 pounds or 11,223 tons.

## CONSOLIDATED MINING AND SMELTING COMPANY'S RETURNS.

Following are the production returns of the Consolidated Mining & Smelting Company of Canada for the month of March last and the eight months previous:

### Metals Produced in March.

	Quantity.	Value.
Gold .....	12,487 oz.	\$254,507
Silver .....	178,542 oz.	92,368
Copper .....	468,565 lb.	62,267
Lead .....	3,766,388 lb.	106,565

Total value ..... \$515,798

### Production During Nine Months, to March 31st.

Gold .....	101,340 oz.	\$2,074,853
Silver .....	1,548,780 oz.	808,013
Copper .....	4,500,754 lb.	590,197
Lead .....	31,851,801 lb.	896,357

Total value ..... \$4,367,420

### Percentage of Value of Production.

	March. Per cent.	Nine Months to Mar. 31. Per cent.
Gold .....	49.34	47.51
Silver .....	17.91	18.45
Copper .....	12.07	13.51
Lead .....	20.68	20.53

For purposes of comparison the following figures, being the company's production at its smeltery at Trail, for the fiscal year ended June 30th, 1909, are here given: Gold, 114,920 oz.; silver, 2,443,475 oz.; copper, 4,637,631 lbs.; total value, \$5,505,526. It should be noted that these figures are for twelve months while those given in the second table above are for only nine months.

## B. C. ORE SHIPMENTS.

(Week ending May 14th.)

### Boundary.

	Week.	Year.
Granby .....	22,509	473,130
Snowshoe .....	22,483	69,273
Other Mines .....		146,098

Total ..... 24,992 688,501

### Rossland.

Centre Star .....	3,849	73,818
Le Roi No. 2 .....	621	11,665
Le Roi (milled) .....	300	5,700
Le Roi .....	275	5,400
I-X-L .....	007	041
Other Mines .....		229

Total ..... 5,052 96,857

### Slocan-Kootenay.

St. Eugene (milled) .....	2,775	52,725
Whitewater (milled) .....	600	11,400
Van Roi (milled) .....	800	15,200
Kootenay Bell (milled) .....	70	1,330
Granite-Poorman (milled) .....	250	4,750
Queen (milled) .....	420	7,980
Nugget (milled) .....	110	2,090
Van Roi .....	122	511
St. Eugene .....	368	7,024
Rambler-Cariboo .....	021	378
Sullivan .....	129	4,033

Richmond Eureka .....	29	1,719
Ferguson .....	60	385
Yankee Girl .....	128	2,392
Other Mines .....		21,845

Total ..... 5,882 133,762

Total shipments for week, 35,926 tons, and for year to date, 919,120 tons.

**Smelter Receipts.**

	Week.	Year.
Granby, Grand Forks .....	22,509	473,250
Consolidated Co., Trail .....	8,323	188,210
B. C. Copper Co., Greenwood. ....		145,935
Total tons .....	30,832	807,395

**TORONTO MARKETS.**

**Metals.**

May 23.—(Quotations from Canada Metal Co., Toronto.)

- Spelter, 5½ cents per lb.
- Lead, 3.65 cents per lb.
- Antimony, 8 to 8½ cents per lb.
- Tin, 34.50 cents per lb.
- Copper, casting, 13.75 cents per lb.
- Electrolytic, 13.75 cents per lb.
- Ingot brass, 9 to 12½ cents per lb.

May 23.—Pig Iron (Quotations from Drummond McCall Co., Toronto.)

- Summerlee No. 1, \$23.50 to \$24.00 (f.o.b. Toronto).
- Summerlee No. 2, \$23.00 (f.o.b. Toronto).
- Midland, No. 1, off the market.
- Hamilton, No. 1, \$21.00 (f.o.b. Hamilton).
- Hamilton No. 2, \$20.50 (f.o.b. Hamilton).
- Clark's, \$21.00 (f.o.b. Toronto).
- Cleveland, \$20.50 (f.o.b. Toronto).
- Coal, anthracite, \$5.50 to \$6.75.
- Coal, bituminous, \$3.50 to \$4.50, for 1¼-inch lump.

**Coke.**

- May 20.—Connellsville coke (f.o.b. ovens).
- Furnace coke, prompt, \$1.70 per ton.
- Foundry coke, prompt, \$2.25 to \$2.35 per ton.
- May 20.—Tin (Straits), 33.35 cents.
- Copper, Prime Lake, 13.00 cents.
- Electrolytic copper, 12.75 to 12.85 cents.
- Copper wire, 14.25 cents.
- Lead, 4.40 to 4.50 cents.
- Spelter, 5.35 to 5.40 cents.
- Sheet zinc, (f.o.b. smelter), 7.50 cents.
- Antimony, Cookson's, 8.37½ cents.
- Aluminium, 23.25 to 24.00 cents.
- Nickel, 40.00 to 49.00 cents.
- Platinum, ordinary, \$29.00 to \$29.50 per ounce.
- Platinum, hard, \$34.50 per ounce.
- Bismuth, \$1.75 per lb.
- Quicksilver, \$48.00 per 75-lb. flask.

**SILVER PRICES.**

May 7.....	53¾	24½
" 9.....	53¾	24½
" 10.....	53¾	24½
" 11.....	54½	24 15/16
" 12.....	54	24¾
" 13.....	53¾	24½
" 14.....	54	24¾
" 16.....	54	Holiday
" 17.....	54	24¾
" 18.....	53¾	24½
" 19.....	53¾	24½
" 20.....	53¾	Holiday

**SHARE MARKET.**

(Courtesy of Warren Gzowski & Company.)

**Miscellaneous.—May 23rd, 1910.**

	Bid.	Ask.
Amalgamated Asbestos .....	22	22½
Dominion Coal Company .....	67½	68
Dominion Steel Company .....	67½	68
Nova Scotia Steel .....	79¼	80
Granby .....	41½	42
Consolidated Smelting .....	77	81
Crow's Nest Pass .....	85	..

**Cobalt Stocks.—May 23rd, 1910.**

Amalgamated .....	.02	.04½
Beaver Consolidated .....	.33¾	.33¾
Buffalo .....	2.20	2.60
Chambers Ferland .....	.25	.25¾
City of Cobalt .....	.27¾	.28½
Cobalt Central .....	.06½	.09
Cobalt Lake .....	.28¼	.28½
Coniagas .....	4.95	5.00
Crown Reserve .....	2.90	2.96
Gifford .....	.09	.10½
Foster .....	.16	.18
Green Meehan .....	.02½	.03½
Great Northern .....	.08¾	.09½
Hudson Bay .....	105.00	125.00
Hargraves .....	.26	.29
Kerr Lake .....	9.00	9.08
La Rose .....	4.60	4.70
Little Nipissing .....	.22½	.22½
McKinley-Darragh-Savage .....	.92	.94
Nancy Helen .....	.05	.06
Nipissing .....	11.10	11.25
Nova Scotia .....	.41	.42
Otisse .....	.05½	.06
Peterson Lake .....	.26	.26½
Right of Way .....	..	..
Rochester .....	.20	.20½
Silver Leaf .....	.07	.07¼
Silver Bar .....	.06¼	.06¾
Silver Queen .....	.10	.12
Temiskaming .....	.67½	.68
Trethewey .....	1.24	1.29
Watts .....	.10 offered	..
Ophir .....	.30	.41
Wettlaufer .....	.85	.90

**New York Curb.—May 23rd, 1910.**

Boston Copper .....	17	20
British Columbia Copper .....	6	6¼
Butte Coalition .....	20	21
Canadian Mines .....	6	7
Chino Copper .....	13¼	13½
Davis-Daly Copper .....	2	2¾
Ely Consolidated .....	½	5/8
Gila Copper .....	6¼	65/8
Giroux Mining .....	7½	7¾
Goldfield Consol .....	8 5/16	8 7/16
Green-Can.....	8¾	85/8
Harcuvar Copper .....	..	..
Inspiration Copper .....	7 3/16	7 5/16
Miami Copper .....	22	22¾
New Baltic Copper .....	6	8
Nevada Con. Copper.....	21¼	21½
Ohio Copper .....	2 15/16	3
Rawhide Coalition .....	33	34
Ray Central .....	2½	2¾
Ray Consolidated .....	19¼	19¾
Union Mines .....	1½	1¾
Yukon Gold .....	4¾	4½