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CIRCULATION.

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WESTERN COAL.

Canada is entering upon a new phase of extension. That reciprocity in coal between the United States and the Dominion is a live question, is merely one indication of the growing strength of our country. That it has been discussed at all is due to several causes, principally to the fact that Alberta and British Columbia have practically a monopoly of high-grade coal in the west.

The rapid exploitation of our western coal areas is, therefore, a matter of national moment. And since coal-mining is not a poor man's game, a plentiful supply of capital is a pre-essential. Also, for the good of all concerned, it is desirable that initial mistakes be avoided. Coal is, more or less, a public utility. The ownership of the western deposits is vested in the Canadian public, and it is appropriate that the Canadian public should follow intelligently the steps that are being taken to open up some of the most important fields in Alberta.

The latest and perhaps the most significant happening in Albertan coalfields is the amalgamation of the interests of the German Development Company with those of the Canadian Northern Railway. This is an event that will have far-reaching effects. A glance over the railway map will be sufficient to justify the assertion that this alliance gives the Canadian Northern a most advantageous position. Possibly it brings in their hands the control of a considerable proportion of the bituminous coal supply available for railway use in Alberta.

The amalgamated interests are represented by two recently incorporated companies, "The Rocky Mountain Collieries, Limited," and "The Brazeau Collieries, Limited." The property of the first-named company is situated a few miles south of the main line of the C. P. R., where this line enters the Rockies, and where, up to now, the inadequate supply of steam coal shipped from Canmore had to be supplemented by fuel from Crow's Nest Pass. The coal lands controlled by "The Brazeau Collieries, Limited," comprise the areas belonging to the German Development Company, on the Brazeau, Bighorn, and Saskatchewan Rivers, along with the properties of Mackenzie and Mann on the Brazeau and McLeod Rivers.

Doubtless, the Brazeau lands will be worked for the particular benefit of the Canadian Northern Pacific. The coal here, according to the results of careful investigation, is a high-grade bituminous fuel. And it exists in vast quantity. The areas to be worked by "The Rocky Mountain Collieries, Limited," will become more valuable when the Mackenzie and Mann

line from Edmonton through Calgary to the Boundary country shall have been completed.

It is restful to observe that neither of the above concerns is to be put on the market as a public flotation. In both, foreign capital is heavily interested. Both, also, have been projected only after long investigation by and consultation with qualified coal-mining engineers, and geologists.

We are informed that both properties are to be opened up at once. Competent authorities have been engaged to advise upon means and methods, and early blunders, irreparable in the later life of a mine, are being sedulously avoided.

Whether success or failure attend the future history of this projects—and we have little reason to expect anything but success—they are bound to loom large in the commercial economy of the West. Especially interesting to Canadian coal mine operators will it be to watch the manner in which development proceeds.

PUBLICITY.

Canadian newspapers have much to learn as regards the meaning and value of the mining industry. The great majority of our dailies either ignore the industry completely or publish sensational clap-trap.

Yet there is a growing number of newspaper men to whom mining means more than the stock market. We have noted before the enterprise of the British Columbian dailies. Several of these publish daily columns of mining news. The statistics of ore production appear in a number, and full publicity is given to mining concerns new and old. Naturally there is a fair sprinkling of unreliable news. This, apparently, is inevitable. But the total amount of such stuff appearing in B. C. papers is creditably small. One feature that is distinctly pleasing is the annual review that comes out promptly at the end of the year in several of the more progressive western journals. And it is by no means invidious to mention here the excellent work of Mr. E. Jacobs, of Victoria, secretary of the Western Branch of the Canadian Mining Institute, and a valued contributor to the leading mining journals of the Empire and the United States. Mr. Jacobs possesses a passion for accuracy and a fearlessness that have become almost proverbial. His contributions to the press have given his Province wide advertisement, and have demonstrated not only the value of accuracy and honesty in these matters but have shown the futility of exaggeration.

But, with few exceptions, eastern newspapers give little or no space to mining. Stock-gambling is encouraged. Inspired news-notes touting mining properties are rarely refused. Generally, the reading public learns nothing of what is being done in mining and smelting from the daily papers.

We have stated that there are exceptions. These are to be found, not in the larger cities, but at or near

mining centres. In Eastern Quebec one paper devotes regularly a fair proportion of its space to recording the doings at the mines within its field. In Western Ontario three or four journals do what they can to keep public interest alive. But in the Maritime Provinces only spoadic attempts are made in this direction.

Considering this condition, it is to be regretted that the Geological Survey of Canada no longer issues press-bulletins. These could be made an invaluable medium of publicity. Moreover, the Boards of Trade in our mining towns are neglecting their opportunities. The publicity departments of our railroad organizations pay more attention to the sportsman than to the minor and prospector, although it is patent that a well-conducted campaign to advertise our untouched mineral lands, to direct and instruct the rising generation as regards the possibilities of the mining industry, would bring infinitely larger results in the long run.

We shall not cease to keep before our readers the issues touched upon above. But we must frankly deplore the indifference of the press and of the transportation corporations, and the inertness of other organized bodies. We have yet to develop a national spirit of co-operation.

A CHANGE OF HEART.

Mr. Eugene Coste's recent paper dealing with the origin of petroleum has been the subject of much comment. Mr. Coste himself has received letters from a large number of prominent geologists and others. These letters afford the clearest evidence that modern geologists no longer think it a crime to question the theory of the organic origin of petroleum. Indeed there is ample indication of a change of heart on the part of not a few.

It has been our privilege to read a number of the letters received by Mr. Coste. A few quotations will show how the "inorganic" theory is gaining ground.

One officer of the United States Geological Survey writes thus: "While I am not prepared at this time to accept the universal application of this theory, especially in the Appalachian regions, I recognize that on a number of important points it has placed the burden of proof upon believers in the organic origin." This last assertion shows certainly that Mr. Coste has made progress.

In another letter a sidelight is thrown on the subject by the operator of a quicksilver mine in Oregon. "The deposit," he writes, "has been pronounced by geologists a distinct product of solfatoric action, and the very frequent occurrences and constant association of so much carbon would seem to bear out your very reasonable and logical theory of the volcanic origin of the petroleum series of hydrocarbon compounds."

Again, in a communication from another Survey official, the intimate association of oil with igneous bodies is mentioned. In this case the writer states that

he has collected several hundred instances of the association of oil with igneous rocks.

One territorial geologist makes a suggestion to the effect that volcanoes and explosive earthquakes have a direct connection with petroleums. "The immense volume of smoke emitted at times suggests the presence of volatile hydrocarbons, fluid or gaseous. . . . Explosive mixtures of air and gas may account for many earthquakes. I am inclined to the view that volcanoes are the results rather than the cause of petroleums. . . . We cannot exclude water and steam as active agents in vulcanism; but we must admit the powerful agency of explosive mixtures of gas and air."

A distinguished Mexican geologist alludes to the immense practical importance of a clear understanding of the "inorganic" theory in developing new fields. He heartily endorses Mr. Coste's position.

After reading more than a score of letters of this kind, one is led to believe that the tendency amongst our leading geologists is to accept more fully the theory of which Mr. Coste has been so ardent a supporter. This is a matter of no little importance, in view of the fact that the industrial world is becoming every day more dependent upon petroleum and its products. It bears directly upon the exploitation of our petroleum and gas fields.

Incidentally it must be most gratifying to Mr. Coste, who for some years has played a lone hand, to find that his supporters are becoming more numerous every day.

MEXICAN INSTITUTE OF MINING AND METALLURGY.

Bulletin No. 1 of the Mexican Institute of Mining and Metallurgy (Instituto Mexicano De Minas Y Metalurgia) has just been received. It is a most commendable production.

Mexican cyanide practice has set a standard for the world. In the United States cyanidation is admittedly less advanced than in the southern republic, and, on the Rand, Mexican practice has been copied.

Hence it is with especial pleasure that we observe that two of the three papers included in Bulletin No. 1 treat of cyanidation. The first of these two, "A Proposed New System for the Cyanide Treatment of Slimes," is reprinted in this issue of the Canadian Mining Journal. The second, "Cyanidation of Concentrates," is a suggestive synopsis of a paper by A. Goothe.

The proceedings and papers are printed both in Spanish and English. This duplication of languages should be highly educative. The Canadian mining student must acquire a knowledge of Spanish if he is to become a well-rounded mining man. The Bulletin of the Mexican Institute will prove an invaluable aid in this.

The Canadian Mining Journal wishes the newly organized society a vigorous and prosperous life. Its

objects are wholesome. It has made a good start.

We may express here the hope that close relations may be established between the Canadian Mining Institute and its sister society. *Prosit!*

SILVER COINAGE.

Throughout Canada the silver coins of the United States are accepted at par. On the other hand, except in towns near the international boundary, Canadian coins are either refused in the United States or accepted at a large discount.

There is a Canadian law providing for the deportation of United States coins. Apparently this law is inoperative. Why it should be, we do not know. But it is obvious that until this is made effective, the Royal Mint at Ottawa cannot make headway. The seignorage on coining silver is large, because of the disparity between the face value of silver coins and their actual worth as silver. With a large output of silver coins, the Royal Mint would pay handsomely. There appears to be little reason why our whole demand should not be supplied from Ottawa. It is certain that with a sufficient Canadian coinage much of the United States silver now in circulation here would be displaced.

EDITORIAL NOTES.

The sixth general meeting of members of the Western branch of the Canadian Mining Institute was opened at Nelson, B.C., on September 25. The Council of the Branch, having accepted the invitation of the American Institute of Mining Engineers to adjourn to Spokane, will join that body's discussion and proceedings there.

The Sheep Creek gold camp, a few miles east of Rossland, is giving promise of wealth. The camp is yet in its infancy. But substantial working profits have been made in small stamp-mill operations, and there is sound reason to cherish the expectation that Sheep Creek will have a prosperous life. Transportation of ore will be facilitated by the construction of a Government bridge across the Columbia River at Rock Creek. It is possible, also, that electric power will be furnished within a reasonable time.

The flow of European capital to Alberta and British Columbia is heavy. Heavy investments in coal and timber lands are the order of the day. Heretofore United States capital has preponderated in new investments. Now, however, British, French, and German investors are most active. Two or three late mining transactions can be traced directly to interest aroused by the excursion of the Canadian Mining Institute last year.

A PROPOSED NEW SYSTEM FOR THE CYANIDE TREATMENT OF SLIMES.

By Ferdinand McCann, Mexico, D.F.

(From the bulletin of the Mexican Institute of Mining and Metallurgy.)

(July Meeting, 1909.)

Having lately visited various cyanide plants in the Republic while gathering data for the book which I have just published on the subject, I was greatly interested by the almost perfect settlement of slimes performed by the Dorr Continuous Slime Thickener installed at the San Rafael Mill in Pachuca, and it occurred to me that by extending the field in which this apparatus is at present employed, an entirely new system of cyanide treatment of slimes might be devised.

The elaboration of this idea has resulted in the following proposal of a system which I will call be Dilution System, in contra-distinction to the Decantation System of Slime treatment. This system consists in the establishment of a series of slime thickeners, following the agitation tanks, with a dilution of the thickened pulp as it enters each successive thickener.

The apparatus which I would recommend for the purpose is the Dorr Continuous Slime Thickener, or any apparatus acting on the same principle, not only on account of its marked superiority over cones and spitzkasten as a settler, but also on account of the fact that the tanks and agitating apparatus used in the present installations of mechanical agitation in flat bottom tanks, could by very slight modifications be used as thickener tanks, so that the cost of the conversion of a decantation plant into a Dilution plant would be small.

The advantages which I believe may be obtained by this new treatment over the decantation treatment are:

A. Less cost of installation, as less tanks are required.

B. Less time required in the treatment, with a consequent increased capacity for a plant already installed.

C. Less labor, as the manipulation of the decantation pipes is entirely eliminated.

D. Less values in the solution that is discharged with the tailings, with consequent increased extraction.

E. The same bulk of solution to be precipitated.

The advantages which may be obtained by this installation in connection with a plant, practising mechanical agitation in flat bottom tanks, with semi-decantation and filtering, comprise those mentioned under headings A, B, C and D, and in addition, there would be:

F. Greater capacity and efficiency for the filtering plant.

The disadvantages in such a plant would be that:

G. A greater bulk of solution would have to be precipitated.

The advantages and disadvantages with plants using "Pachuca" tanks would be those mentioned under headings D, F and G.

Method of Working the Dilution System.

In order to explain the working of this system let us assume that we have an ore assaying 500 grams of silver per ton, which has been slimed in the ordinary manner and introduced into an agitation tank in proportion of 50 tons dry slimes to 150 tons of solution con-

taining 0.3 per cent. KCy, and that the pulp thus formed is agitated continuously for 48 hours. We can assume, according to results obtained in Pachuca by continuous agitation, that at the end of that time, a washed and dried sample of the slimes will assay 70 grams of silver per ton, so that the 150 tons of solution will contain 21,500 grams of silver dissolved from the ore, or 143 grams per ton of solution.

By passing this pulp through a Dorr Thickener we will obtain a thickened pulp containing 55 per cent. of moisture. Therefore we will have:

(1) An overflow of 89 tons of clear solution assaying 143 grams of silver per ton, and 0.3 per cent. KCy; and

(2) 111 tons of thickened pulp, containing 61 tons of the same solution.

By mixing this thick pulp, thoroughly, with 549 tons of barren solution; i.e. 9 tons of barren solution for every ton of rich solution contained in the thickened pulp; we obtain, as a charge for the second Dorr Thickener, a dilute pulp composed of 50 tons of dry slimes, mixed with 610 tons of solution assaying 14.3 grams of silver per ton.

From this second Dorr Thickener we obtain:

(3) An overflow of 549 tons of clear solution assaying 14.3 grams of silver per ton and 0.3 per cent. KCy; and

(4) 111 tons of thickened pulp, containing 61 tons of the same solution.

By mixing this thickened pulp with 549 tons of water and passing it through a third Dorr Thickener, we have:

(5) An overflow of 549 tons of clear weak solution assaying 1.43 grams of silver per ton and 0.03 per cent. KCy; and

(6) 111 tons of thickened pulp, which as it contains but 61 tons of solution assaying 1.43 grams of silver and 0.03 per cent. KCy, may be thrown away, as it will not pay to extract the values in solution by further handling.

The preceding statements regarding the cyanide contents in the various solutions does not refer to free cyanide, as of course a certain amount will have combined with the silver, etc.

The only precaution required in this treatment is that, in each dilution, there should be a perfect mixture of the thickened pulp with the diluent, as otherwise the dilution would be imperfect, and the thick pulp, in falling to the bottom of the successive thickener tanks, might carry undiluted solution enclosed within its mass.

This mixture might be performed by a centrifugal pump, receiving both pulp and diluent, and throwing them together into a bucket or other small receptacle, which would not only act as a mixing apparatus, but also enable the diluted pulp to overflow without much current into the successive Dorr Thickener.

Treatment of the Solutions.

The solution (1) should be precipitated, while solution (3) might be partially precipitated, and partially used in the battery, collection—and agitation tanks. But as each 50 tons of ore require 549 tons of precipitated solution for dilution in the second Dorr Thickener, we can assume that we would have to precipitate 11 tons of solution per ton of ore treated. This is about the amount of solution precipitated in the decantation plants of the El Oro Mining and Railway Co., and the Dos Estrellas Company, before the installation of the filters, so that in this respect there is no difference between the two systems.

The question naturally arises as to what is to be done with the solution (5); as, if fresh water were used in each dilution, the bulk of solution in the mill would soon be too great to handle, and if the solution (5) were used over again, as a diluent to the treatment of the successive charge, it would assay 2.71 grams of silver and 0.057 per cent. KCy; after its third use it would assay 3.82 grams of silver and 0.081 per cent. KCy, etc.

This weak solution, after being used once or twice as a diluent, might be used in the battery and collecting tanks, and then its values could be precipitated before being used again as a diluent, in which way the silver values could be kept within reasonable bounds but the cyanide values creep up until equal to those of the strongest solution in use in the mill, which, with a 0.3 per cent. solution, would mean that with each ton of tailings discharged there would be a loss of 1.22 tons of solution containing 3.66 kilos of cyanide, thus making the cost of treatment rather high.

However by using a weak solution of cyanide throughout the mill, say 0.05 per cent. KCy, as is at present done in mills using the decantation process with filter attachment, the loss by this dilution treatment would be within commercial bounds, and would be much less than that sustained under the decantation treatment.

In case this practice were followed, the precipitated barren solution should only be used in dilution of the thick pulp entering into the second Dorr Thickener and the direction of pulp entering into the second Dorr thickener should be performed by adding solution (5) which overflows from the third thickener, so that the quantity of solution to be precipitated would remain more or less constant, in the quantity of 11 tons of solution per ton of ore treated.

Application of the Process in Connection With a Filter Plant.

When the dilution system is installed in connection with a filter plant the third Dorr Thickener could be dispensed with, and the thickened pulp (4) from the second Dorr could be run direct to the filters, where, after filtering, it could be washed with the small quantity of water required to replace that discharged with the tailings, so to keep the bulk of the mill solution constant, as is at present done in practice.

The advantages of installing this system in connection with a filter plant would be that, on account of the pulp being thick, the cake would be formed on the filter leaves in less time, consequently increasing the capacity of the present filter plant installation; and also, that the values in the solution accompanying the pulp to the filter would be much less than those ordinarily contained, so that the losses which might occur through imperfect washing of the cake would be diminished.

This latter feature is of especial importance in installations where the ore is treated in "Pachuca" tanks, as in such installations the solutions which are filtered assay from 100 to 300 grams of silver per ton, according to the value of the ore treated, and consequently it is customary to wash the cake on the filter, first with barren solution, and afterwards with water; but even with this double washing the displacement of the rich solution is not perfect, as is evidenced by the fact that the tailings discharged from the filter sometimes carry solution assaying from 8 to 20 grams of silver per ton; so that at present the practice of collecting the wash water in dams, and reprecipitating is giving good results.

By the application of the diluting system, before filtering, the solution which is contained in the pulp delivered to the filter would be of such a low grade that the wash with barren solution in the filter might be unnecessary, as a simple water wash would probably extract all of the values in solution, so that the time occupied in filtering could be reduced one-third, with a resulting increase in the capacity of the present filter installation.

Plant Required.

It is customary, in the decantation treatment of slimes, to consider that a tank 30 feet in diameter and 10 feet high is necessary for treating 50 tons of ore with 150 tons of solution, as if the pulp is thicker than 1 to 3 there will be very little settling and decantation, so that in modern installations for slime treatment by partial decantation and filtering counting on 4 days' treatment in the tanks, there are required from 24 to 27 tanks of this size for treating 300 tons of ore per day.

By the dilution system, as there is no decanting in the treatment tank, there would be no reason to prevent charging 100 tons of slimed ore with 140 tons of solution to each tank. Furthermore as the same extraction is obtained in 48 hours by continuous agitation as in 96 hours by the decanting and settling treatment, the tank capacity for a plant treating 300 tons of ore per day by the dilution system would be as follows:

3 Dorr Thickeners, or agitating tanks used as settlers to dewater the pulp from the batteries.

7 Agitating tanks, being one extra for the time lost in filling and emptying.

3 Dorr Thickeners for the first dilution.

3 Dorr Thickeners for the second dilution.

Making a total of 16 tanks, as against 24 to 27 for the same purpose in the partial decantation and filtering plant of the same capacity.

In the older decantation plants, which have no filters, the tank equipment required is much greater than that of the partial decantation and filtering plants above mentioned, as in addition to the agitation plant therein described, there is generally a system of final settling tanks, where the slimes remain for another, three or four days, so that there may be required from 20 to 30 more tanks of the same size for that purpose.

These settling tanks would be entirely replaced in the dilution system, by the installation of 3 Dorr Thickeners, for the third dilution, as the capacity of a 30 foot Dorr Thickener is about 100 tons of ore, contained in 222 tons of thickened slimes, and about 1,000 tons of clear solution overflow per day.

Regulating the Quantity of Diluent.

It may appear that the regulation of the exact amount of diluent to be supplied to each thickener

would be a matter requiring extreme care and attention, but I believe that this would not be the case, as the only result of a slight variation would be that the solutions in the successive thickeners would carry more or less values, which could be regulated by the daily assays.

The Dorr Thickener works automatically, with very little attention, and would handle sudden changes without any trouble.

An easy way for the workman to judge whether the proper quantity of diluent were being added, would be for him to have two cans of different sizes, which he could place under the streams of thickened pulp and diluent passing into the centrifugal pump, to observe whether the cans were filled in the same time, and if not he could so regulate the valve of the diluent pipe that the time required to fill each can would be the same.

Assuming the specific gravity of the ore to be 2.7, that of the diluent to be 1.03 and the thickened pulp to contain 55 per cent. of moisture, the relative size of the cans required for a dilution of 9 of diluent to 1 of solution contained in the thickened pulp would be in the proportion of 6.87 to 1.

Intermittent Working of the System.

By the ordinary working of the dilution system, as soon as the assays have shown the extraction in any

tank to be satisfactory the pulp contained in that tank could be transferred to the first Dorr Thickener, by means of a centrifugal pump, leaving the tank to be emptied ready for the next charge.

But should it be desired, the plant might be arranged for the

Continuous Working of the System.

This arrangement like that of the "Boss" continuous amalgamation process, might have some advantages, and may be worth investigating. However it would probably need some special arrangement for transferring the pulp uniformly throughout the agitation tanks.

Conclusion.

I wish to state that my interest in the Dorr Thickener is purely a scientific one, and I would further state that I do not propose this system as one which has been proven, nor would I advise its installation without having proven it by a preliminary trial on a small scale.

I merely offer it as a suggestion to the various metallurgists practising cyanide treatment, in the hope that the application of the principles herein proposed may be of benefit to them in their work, and that I may be instrumental, to a slight extent, in the improvement of the present metallurgical practice.

IRON ORE DEPOSITS OF NOVA SCOTIA.

Notes from Reports by Dr. J. E. Woodman, issued by the Mines Branch,
Department of Mines Ottawa.

(Continued from issue of August 15th.)

Magnetite, hematite, limonite (or brown hematite), ankerite, and siderite are found in Nova Scotia, as are also the less common iron-bearing minerals, turgite, goethite, and sideroplesite.

Magnetite.—The Triassic trap magnetites of the province vary in iron contents from 68.33 per cent. to 35.25 per cent., an average of ten samples giving 55.13 per cent. They often contain some specular hematite. The altered hematites of the Nictaux-Torbrook and Clementsport basins, while highly magnetic, usually have a brownish or reddish streak. They should be classed for the most part with the Clinton red hematites; but such as have been sufficiently metamorphosed, like those of South Mountain, are true magnetites. An average of these western occurrences shows 42.32 per cent. iron. The pre-Cambrian magnetites of Cape Breton vary widely.

Magnetite in the Triassic trap is at times well crystallized in gas and gash cavities, and in most of the deposits it is coarsely granular to massive.

Hematite.—In Nova Scotia no high-grade specular deposits have yet been sufficiently explored to prove that they are of workable size. Such analyses as can be given are sample assays from veins only, or are from districts outside the scope of this report. The chief exception is the Barachois specular ore, small lots of which run to 66.66 per cent. The specular ores of Londonderry are in a class by themselves, in that they have a highly micaceous structure, but most often show a brown to brownish red streak, due to the percentage of

moisture. So far as can be determined, these ores contain, on an average, 67.44 per cent. iron.

The Clinton red ores in Nova Scotia are, next to the mixed ores of Londonderry, the most important. The typical Clinton ore in New York averages 44 per cent. The Leckie ore at Torbrook averaged 49.20 per cent. for a number of years. As delivered to the Londonderry furnace, the shell ore at the Wheelock mine, Torbrook, ran 42.74 per cent. as an average for 1906, and 44.05 for the first four months of 1907.

The somewhat similar ore at Arisaig varies much, largely owing to the percentage of silica. Some extensive beds are too low in iron and too high in silica to work at all, while others are fair, especially in the west. A general average of 54 samples of the eastern two-thirds of the district, by various analysts, gives 40.05 per cent. iron.

Limonite.—The limonites of the United States, as worked, range from 40 per cent. to 50 per cent. iron. A fair average is 47.90 per cent.

The important limonite deposits in Nova Scotia belong to two groups—the Londonderry series and contact pockets.

At Londonderry and Brookfield, the two localities considered, the iron contents vary within wide limits, depending not only upon the amount of impurity, but also upon the type of ore and degree of hydration. An average of many furnace runs at Londonderry gives 43.36 per cent. iron.

The Brookfield limonite, averaging thirty-seven

analyses of shipments to Londonderry, gave 46.62 per cent. At the Ferrona furnace the average was said to be 47.5 per cent.

Siderite.—Siderite, iron carbonate, the "white ore" of Londonderry, is an important constituent of the deposits of that locality. It is mixed with ankerite and limonite. Theoretically it carries 48.27 per cent. of iron. As mined it averages 35.06 per cent. The Londonderry siderite belongs to the magnesian sub-species sideroplesite.

Ankerite.—The formula for this mineral calls for 50 per cent. calcium carbonate, 21 per cent. magnesium carbonate, and 29 per cent. iron carbonate, or 14 per cent. metallic iron. It is usually mixed with varying amounts of siderite, sideroplesite, specular ore and massive limonite.

This variety is uncommon, and nowhere else than in the Cobequid Mountains is it of great importance in

carry an average exceeding 10 per cent. The limonites range from a low figure up to 23.02 per cent. silica. The Arisaig hematites are highly siliceous.

Alumina is rarely present in important quantity. Most often it is negligible.

Manganese is most irregularly distributed. The Torbrook ores carry only minute quantities. The Londonderry ores run from nothing to 2 per cent., a general average of all ores being about 0.506 per cent.

Titanium is practically absent. Analyses reporting its presence require checking.

Phosphorus is uniformly high in the bedded Clinton ores of the Silurian; sometimes high and sometimes low in the Triassic trap iron ores. The ores of South Mountain, Torbrook, give an average of 1,995 phosphorus. The average for the massive red hematite of the Leckie veins is about 0.992 per cent.; for the magnetic shell ore, 1.110 per cent.

GENERAL INDEX OF SYMBOLS.

T. TRIASSIC SEDIMENTS	Or. CAMBRO-SILURIAN (OR DOVICIAN)	Gr. GRANITE
Cs. MILLSTONE GRIT	C. CAMBRIAN.	□ LIMESTONE (PLATE 1)
L C2. LOWER CARBONIFEROUS LIMESTONE.	M. MEGUMA (GOLD BEARING SERIES)	△ DOLOMITE (PLATE 1)
L C1. CARBONIFEROUS CONGLOMERATE.	PC1. GEORGE RIVER SERIES	○ IRON (PLATE 1)
D. DEVONIAN.	PC. UNCLASSIFIED PRE-CAMBRIAN	■ PITS AND SHAFTS.
S. SILURIAN.	Tr. FINE TEXTURED INTRUSIVES	• IRON OCCURRENCES.

smelting iron. Hence a brief description of its appearance and fluxing qualities may not be out of place here.

When pure it closely resembles white siderite. It crystallizes in rhombohedrons, and in coarse specimens the surface of the rock is made up of numbers of intersecting rhombohedral faces. Weathered faces show cross-hatched lines, and are brown in colour. Since it contains iron, lime, and magnesia, it is useful as a flux, and at the same time contributes to the iron content of the furnace charge. At Londonderry it renders possible the use of limonite of lower iron value than would otherwise be serviceable; but it requires a larger proportion of ankerite than would be used if an ordinary limestone were employed, because of the low percentage of calcium carbonate.

Impurities.—Many of the Nova Scotian ores are high in silica. The magnetites of the Triassic trap

The contact deposits of limonite are everywhere low. The Londonderry ores, both brown and white, are practically free from it. The magnetites of Barachois give 0.03 per cent., and are thus of Bessemer grade. The Arisaig ores are uniformly high, an average of 36 analyses from the eastern two-thirds of the district giving 0.572 per cent.

Sulphur.—Of this deleterious substance there is little in most of the Nova Scotian deposits, while some ores run high locally.

Pre-Cambrian.—The pre-Cambrian mountain proxis of Cape Breton, upon which the whole structure of the island is built, is not sufficiently well known to be subdivided accurately. In the survey of Robb and Fletcher which culminated in the series of one-mile-to-the-inch geological sheets issued by the Geological Survey in various years up to 1885, parts of this complex

are differentiated as upper pre-Cambrian, or the George River limestone series, the characteristic feature of which is a light coloured dolomitic limestone. So far as known, the iron ore of the pre-Cambrian occurs in these rocks. But a large part of the area occupied by the old mountain cores has never been surveyed or prospected in detail; and not only is it possible that the George River series may be far more extensive than is now supposed, but there may be bodies of ore in other subdivisions of the pre-Cambrian. Much geological work remains to be done in middle and northern Cape Breton, especially along the line of exploration for various useful minerals.

The iron ore of the George River series is in part hematite, sometimes apparently bedded, and in part magnetite. The latter is in places distributed in granules through dolomite, being here and there segregated in sufficient amount to form pockets, of no great promise in any so far discovered. In other localities are larger irregular accumulations, partly replacements of limestone, partly occupying fissures. These are massive ores.

The gold-bearing (Meguma) series, which occupies so large a part of the mainland of the province, contains no workable ores. A few deposits of small size are connected with isolated patches of lower carboniferous which overlie the older rocks. The known Cambrian, as indicated by fossil contents, is restricted to small portions of eastern and southern Cape Breton, and, so far as known, holds no ore, except in one place. In upturned limestones and slates near Barachois, Cape Breton, are specular and massive red hematite and siderite, roughly conformable with the stratification, and lying on both sides of a contact with lower carboniferous strata. They have not been sufficiently explored to indicate great size.

Ordovician.—This series, called Cambro-Silurian in earlier studies, occupies large and irregular areas in the northeastern portion of the mainland, in Antigonish County.

The ores now known are chiefly in the vicinity of Arisaig, and are bedded hematites. They are less regular than the bedded ores of the Silurian in size, composition, distribution and relation to the country rock.

Silurian.—In Antigonish County a large basin of Silurian at Arisaig holds a few beds of hematite parallel with the strata. In Pictou County are many veins, partly hematite, partly siderite, which will be considered in Volume 2.

The greatest development is in the west, in Annapolis County, and includes the most promising deposit in the province so far opened. This is the bedded hematite series of Nietaux and Torbrook, and a small but perhaps important area at Clementsvale, of similar character. The former contains the only ore which has been proved to any considerable depth, having been cut with calyx drills at 620 feet on the Lean Hematite vein, and worked to approximately 340 feet on the Leckie vein, most of it below sea-level.

Devonian.—By far the most widespread ores are those of the Devonian, being found from eastern Cape Breton westward through the southern part of that island, through Guysborough and Pictou Counties and into Colchester and Hants Counties, the one north of Cobequid Bay, the other south. Indeed the westernmost occurrences are far into Cumberland County, along the south side of the Cobequid Mountains.

These ores are varied in their character. In parts, especially in Guysborough County, they are high-grade

specular hematites, but apparently in small detached bodies. In Colchester County are the Brookfield deposit and the Londonderry range. The former is an irregular lode of limonite, occupying the Devonian slates immediately below their contact with the lower carboniferous; but instead of lying along this contact the lens stands on edge, as it were, extending directly downward into the slates. The Londonderry zone of ankerite (lime-magnesium-iron carbonate) and limonite has been a centre of interest for many years, in part because of its almost unique character. The iron ore is an alteration from carbonates, the complete series being (1) limestone and calcareous quartzite, (2) siderite (iron carbonate), (3) ankerite, (4) hematite and limonite, the last itself passing through several stages. The location of the ore is a series of easily replaceable beds that have felt especially severely the mountain-building which has given the Cobequids their present character.

Lower Carboniferous and Triassic.—Iron ore deposits in the limestone (Windsor series) are not abundant, but the contact-deposits of Bridgeville and Sunnybrae, Pictou County, are replacements of limestone at the contact with older rocks, the ore going only to a moderate depth. The contact presents an irregular, broken or zig-zag line, and the iron ore pockets, which are crescent-shaped in surface plan, occupy the apices of the limestone scallops.

Part of the deposit at Barachois, Cape Breton, is in lower Carboniferous conglomerate; and here and there, as north of Whyecomagh, small amounts of hematite occur in the so-called metamorphic series.

The Triassic has many small and isolated magnetite and hematite bodies in the trap, but few are of economic value, because of their limited tonnage.

Thus it will be seen that the iron minerals of Nova Scotia have a distribution as wide geologically as it is geographically. There is, in the province as a whole, a great amount of iron oxides, but only a small portion of the total number of occurrences will probably prove workable at any time on a scale which should command the attention of capital.

Mining Policy.

Cost of Labour.—A cost sheet supplied by a large worker in iron ore in Nova Scotia gives the present wages for mining and quarrying as follows:—

Quarryman or underground miner, per day.	\$1.40—\$1.50
Drillman	1.75
Ordinary fireman, per day	2.00
Foreman, per month	65.00
Expert engine man and mechanic, per month	75.00

This may be compared with Wabana—\$1.10 per day for unskilled labour, and \$1.50 for drillmen, up to May, 1907; at that time wages rose materially.

All these costs seem extremely low to a westerner, yet they are 25 per cent. higher than a few years ago. But while they may mean no less in annual savings to the labourer, owing to differences in cost of living, these low wages do make an item in favour of a low total cost of production of the ore in the province.

As against this item, however, must be set off several others. One is the small size and uncertainty of many of the deposits. Where they are large and permanent they may be uncertain, as at Londonderry; low in iron and high in silica, as at Arisaig; or moderately expensive to work, because of attitude and depth, as at Torbrook. Still, while costs as low as at Wabana or in the Lake Superior region cannot be expected, it should

nevertheless be possible to mine ore in a number of parts of the province not now producing, at an expense which meets market conditions; and the author believes that this will be found to be the case.

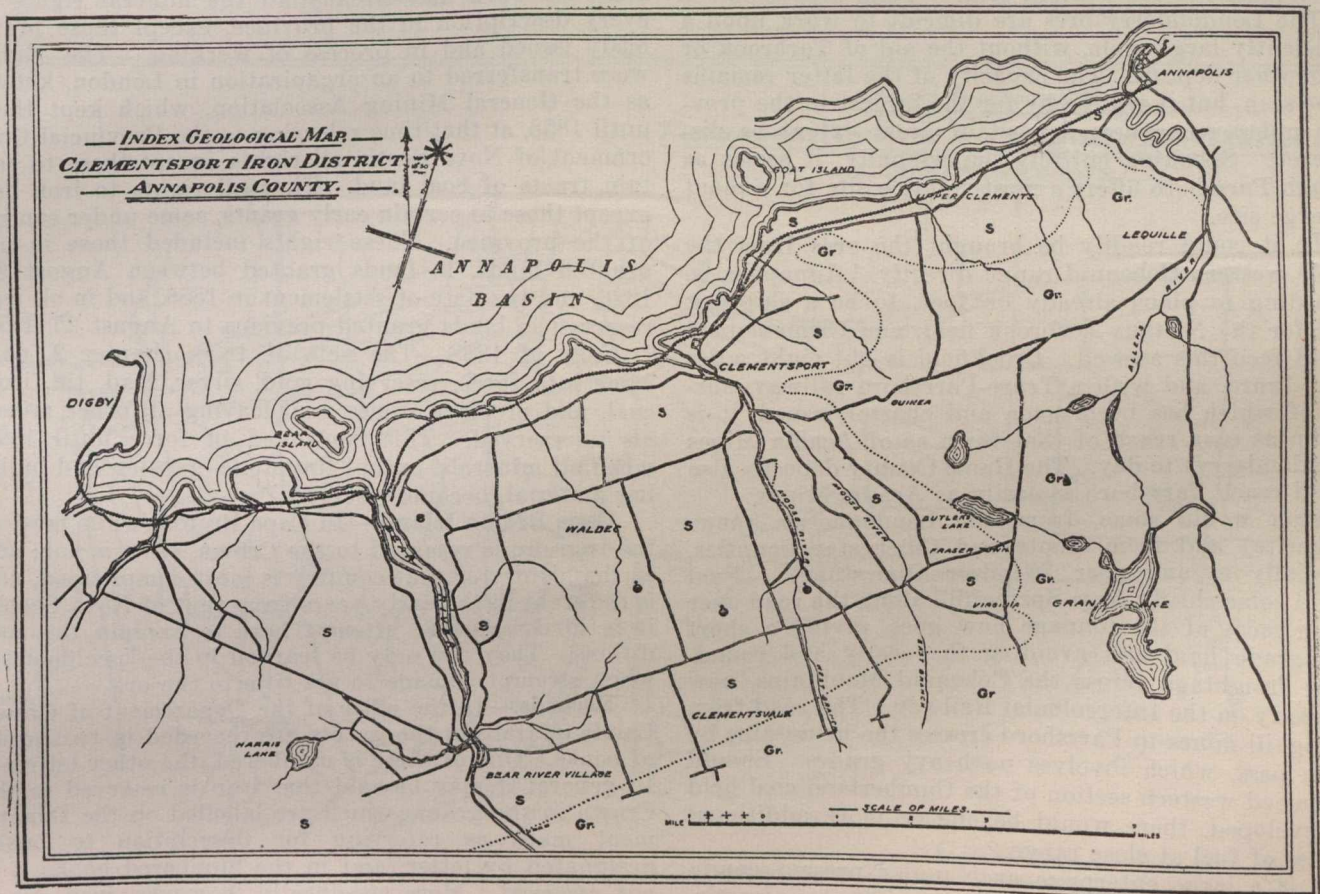
Some of the labour is unionized, much of it is not. It is difficult to secure or to keep a good quality of miners in this industry in sufficient numbers to meet even the present need. Metal mining of all sorts has been for some years conducted on so small a scale as to turn out few men who thoroughly understand the work. Imported labour has thus far proved more or less unsatisfactory. Indeed, of all the immigrants arriving at the port of Halifax every year, but a handful remain in the province of Nova Scotia.

Capitalization.—One of the most serious drawbacks to any success which might otherwise come to the iron industry of the country is the financial method em-

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. This plan is known to be feasible, because it is in practice to-day.

The wisest method for working the small deposits, then, is individual ownership and tonnage contract with the smelters. This is now employed by one of the companies for a considerable amount of ore each year.

Smelting Centres.—Mention has been made of natural geographic divisions into which the iron ore regions of Nova Scotia group themselves. Of these the eastern section requires little comment. There is no



ployed in certain instances by the owners of the land, holders of iron ore leases, middlemen, self-styled financiers and all concerned in the movement to boom a tract of iron ground.

Time and again have owners of land on which the iron ore was not reserved to the Crown held out for most exorbitant prices for territory not even properly explored, much less developed. If, instead of attempting to market these properties at unapproachable figures, serious effort were made to work them individually and to get what profit is possible while the ore lasts, more prosperity would result.

A large number of the iron ore deposits of the province are such, in extent and quality, that no ethical sanction can be gained for the practice of large capitalization. It is even an open question whether it would pay existing smelting companies to buy them up. But

immediate probability of any Cape Breton deposits developing to such size as to require or permit local reduction.

The east central division requires further study before much can be written about it. Some years ago a smelter was erected at Ferrona, in Pictou County, and the steel mills at Trenton, north of New Glasgow, later came to handle its pig. This furnace used Pictou County and Brookfield ores, which have proved to be local and limited; and on account partly of the development of its Bell Island deposits in Newfoundland, the Ferrona works were dismantled, and the large smelters at Sydney Mines erected by the Nova Scotia Steel and Coal Company. How much iron ore could be depended upon within the field outlined on the map as properly feeding this centre it is impossible to state without study subsequent to the preparation of this

volume. At present the only large deposit known is that of Arisaig, part of which would not pay to work under the present conditions of market and metallurgy. But the possibility must be kept in mind that in the future it may be feasible again to erect a plant in the vicinity of New Glasgow, where fuel and flux can be assembled with the iron ore at a minimum expense.

There remains consideration of the west-central and western regions. At present the former is drawing upon three sources—the Londonderry range, Torbrook, and, to a small extent, Brookfield. If the Clementsport ores should be found of sufficient grade upon proper exploration—which, by the way, they have never had—they are as suitable as Torbrook ore for the furnace, and of the same variety and characteristics. They are nearer Annapolis than is Torbrook, and they naturally become a part of any large proposition looking to the development of the western ores.

The Londonderry ores are difficult to work upon a sufficiently large scale, without the aid of Torbrook or some other deposit. The capacity of the latter remains to be seen, but it will be by far the largest in the province unless some new deposit of great extent be discovered. Speaking entirely impersonally, it seems as though Parrsboro offers a most suitable site for a plant of large size.

To it could readily be brought the ores from the whole western Cobequid range directly. Annapolis is, according to plans already on foot, to be a shipping port for the Nietaux-Torbrook field, and Clementsport would feed this as well. Brookfield is but eight miles from Truro, and with a Truro-Parrsboro railway, survey of which has been made and charter issued, it is within as easy reach of that town as of Acadia Mines (Londonderry) to-day. The Hants County deposits also would reach Parrsboro as easily as Acadia Mines.

Flux would come from the Londonderry range (ankerite) and from Hants and Colchester Counties, especially at and near Windsor (limestone). Fuel would come chiefly from Springhill, along the road over which most of the tonnage now goes, giving a short downgrade haul and avoiding the costly and round-about freighting across the Cobequid Mountains, now necessary on the Intercolonial Railway. The road from Springhill mines to Parrsboro crosses the mountains by a 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.

It is a large enterprise even under present conditions; but it appears as though it might be possible, and is worth investigating by capitalists. It is the only case of its kind in the province that would not require long and costly exploration of iron fields before being regarded seriously.

Titles to Iron Ore—Systems of Holdings.

Two Systems.—In Nova Scotia two systems obtain, under which iron ore is held as property. The situation, which is almost hopelessly involved in some localities, has been explained as clearly as is possible by the late Dr. E. Gilpin, Jr., Deputy Commissioner of Works and Mines of Nova Scotia (Mineral and Crown Land Grants in Nova Scotia; Trans. Roy. Soc., Can., vol. IX., 1903, pp. 123-134).

In some parts of the province title to the iron ore remains vested in the land; in others the iron is reserved to the Crown, and in certain districts both systems obtain, to the great confusion of titles. The exact condi-

tion depends upon the date of the original grant of land and the nature of the clause contained in it reserving certain minerals.

Earlier Grants.—In grants up to the year 1808 no reservation of iron ore was made by the Crown, but from that year onward reservation was a feature of the grants. "It follows, therefore, that, in many of the older township grants issued between 1759 and 1785, the Crown does not profit by the mining of this ore. This is notably the case in the grants of Guysboro, Londonderry, Nietaux and Clementsport, and in numerous large blocks of land granted to the Loyalists and early Scotch settlers in Antigonish, Pietou and Colchester Counties." In all of these, title to ore is vested in the land, and no royalty is paid to the Provincial Government on the ore.

In 1826 a royal grant was issued conveying to the Duke of York and Albany all the mineral rights of every description in the province, except those previously issued and in process of working. The rights were transferred to an organization in London, known as the General Mining Association, which kept them until 1858, at that time releasing to the Provincial Government of Nova Scotia all rights except those to certain tracts of coal land. Thus all rights to iron ore, except those to certain early grants, came under control of the province. These rights included those in ungranted lands, in lands granted between August 25, 1826, and the date of settlement in 1858, and in all iron reserved in lands granted previous to August 25, 1826.

Acts of 1858.—The acts of 1858, chapter 2, next came into force, reserving gold, silver, lead, tin, iron, coal, and precious stones, and leaving all other minerals unreserved. This continued in force until 1892, when all minerals, except limestone, gypsum and building material, became reserved.

Cape Breton Island.—In Cape Breton, while most of the iron ore is reserved to the Crown, some is not; and as the history of that country is most complicated, and is different in the early years from that of Nova Scotia, it is inadvisable to attempt here to explain the conditions. They can only be learned in the specific cases when attempt is made to get title to the ore.

Records.—In the office of the Department of Crown Lands in Halifax the grants are recorded in two series of books. One of these is numbered, the other lettered. In general it may be said that iron is reserved to the Crown in the grants which are labelled on the Department maps as referring for description to books designated by letter, and in the numbered books it is not reserved. More specifically, however, iron ore is reserved in those grants recorded on the maps as of books A to Z, except part of book R, and books 12 to 64.

The Crown Lands Office has maps and records only of the original grants. For all information regarding present ownership search has to be made in the various county registry offices, a slow and uncertain process. The system is by no means perfect. It is often difficult to discover the present ownership, or to find accurate maps or descriptions from which one can do his own surveying.

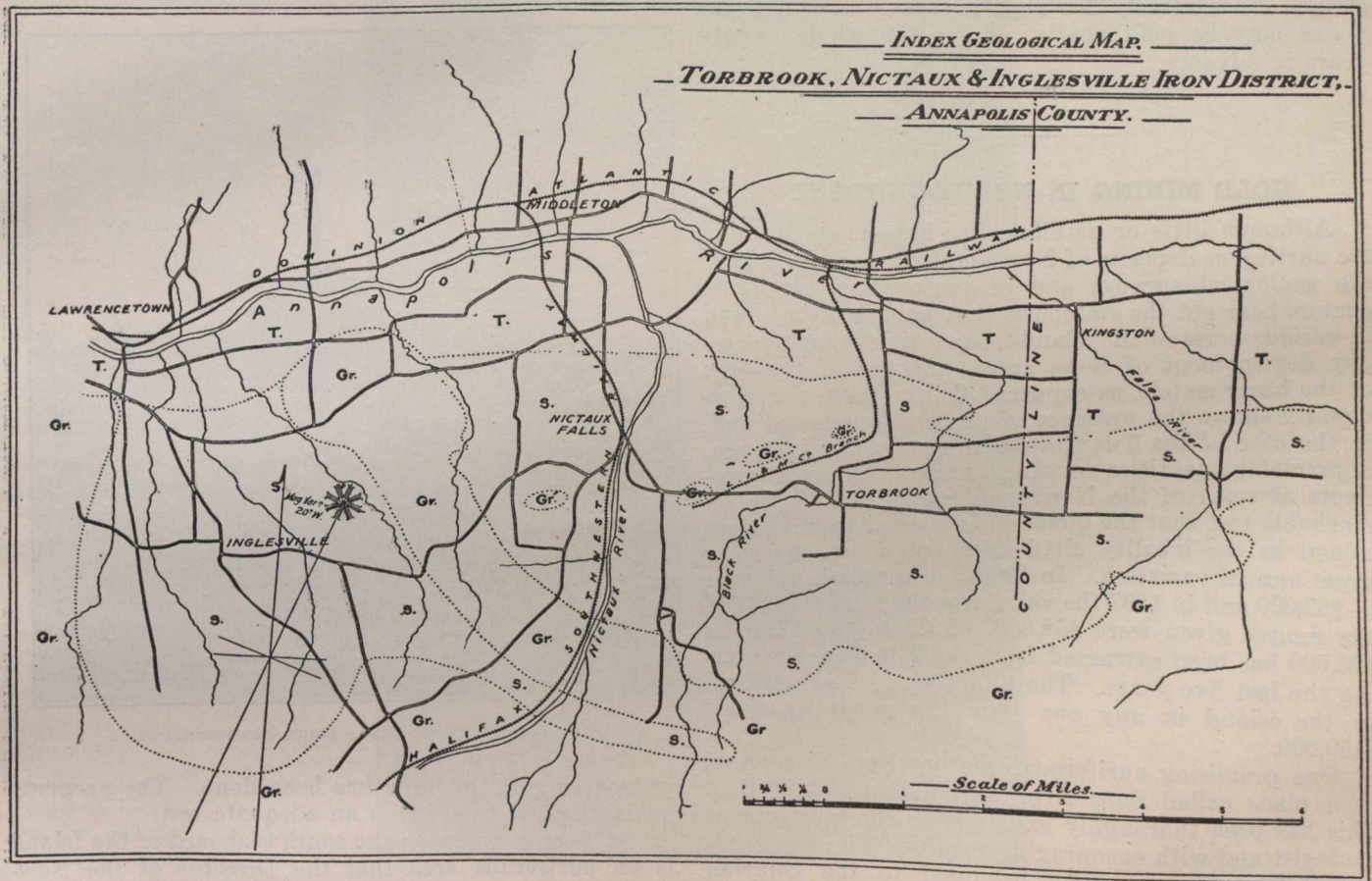
Ownership and promotion.—Taking advantage of the condition of ownership of such iron ore as goes with the land, a common method among promoters, in order to secure such title as will enable them to work off a sale at their own convenience, is to procure from the owners of the land an option, paying a small deposit, \$50 to \$100, the option binding the owner to sell at a

specified price but neglecting to bind the purchaser to buy within a specified time. The balance of the payment is to be made when the promoter closes his mining deal. Cases are not uncommon, if reports be true, in which the owners, after waiting a considerable time for the first bonders to put this deal through and make payment, have yielded to the persuasion of a newcomer, rebonding the property indefinitely and receiving another small advance payment therefor. Meanwhile, because of the wording of the option, the first bonder's legal hold on the property continues. Thus the difficulty of a final purchaser, ignorant it may be of the earlier history of the case, is very great in securing a clear title. The involved condition may easily discourage an investor and result in a failure to buy.

Unfortunately, it is much to the interest of any promoter to get an option upon mining properties that

ment will locate areas upon application. For any number of these areas licenses to search may be taken out at the Mines Office. For all purposes of license and lease, every area is composed of five unit rights, each containing one square mile, and the applicant receives one, two, three, four or five rights to search, according to his application. Should he apply for but one right, and no one is before him, he is given a first right; should he apply for two, they are first and second rights, and so on through the five. Should he not apply for all the possible rights, anyone else is at liberty to make application for and to receive any or all of the remainder.

Conversion to leases.— On or before the expiration of eighteen months the licensee must exchange the license of his first or otherwise earliest right for a lease of one square mile.



shall omit any time limit. The only gain which the owner would seem to derive from such a bargain is the opportunity to secure a second small initial payment, should a new adventurer arise. But this gain would appear to be slight, contrasted with the probable failure to consummate any final sale to which the dishonest practice described above leads.

Leasing From the Crown.

As the information contained in this report is in part for those outside the Province of Nova Scotia, the following general description is given of the procedure in acquiring rights to iron ore reserved to the Crown.

Licenses to Search.—The mining districts are divided into areas of five square miles each, in shape 2.50 by 2.00 miles. In a new district the Mines Department

This, if he is exercising a first right, he may choose from any part of the area, but its length must not be more than two and one-half times its breadth. This exchange he must continue to make at intervals of eighteen months or less, until all his rights are exhausted. If he does not possess all five rights, the rights of any later applicant are convertible in due course of time and in order, after his own have been exhausted, until in all five rights have been converted into leases. This would take seven and one-half years. Whenever a first right is converted into a lease, but four are left, and what was a second right becomes a first right. This change of numbers recurs at each conversion.

Lapsing of licenses.—There is one method that may be employed, if one does not desire the expense of a

lease at the time and is not working the property. Upon the expiration of the eighteen months the first right, if unconverted, lapses; the second becomes the first, and so on, leaving the fifth right vacant. The applicant may immediately, at 10 a.m. of the day following that in which the first right lapsed at close of business, make application for the vacant fifth right. But as some claim jumper—of whom there are not a few—may apply simultaneously, or a moment ahead, the proceeding is a dangerous one.

Costs and tenure.—The cost of a right to search is \$30, or \$150 for the whole area. This is a single charge, and the privileges which it confers last throughout the whole seven and one-half years without additional expense chargeable to the licenses themselves. The leases cost \$50 per square mile for the first year, and \$30 per square mile per year thereafter. The lease runs for twenty years, subject to three renewals, so that an operator may control iron lands from the Crown consecutively for eighty years. The fees for leases may be paid yearly, or for the whole twenty years in advance.

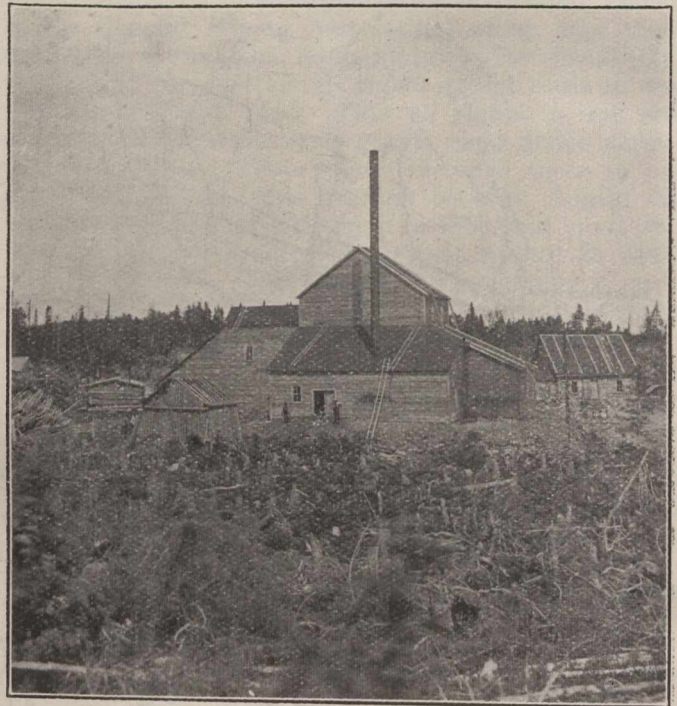
(To be continued.)

GOLD MINING IN NEWFOUNDLAND.

Although little or no effort has been made to mine the auriferous deposits of Newfoundland, the reports of the geological surveys and of various private prospectors bear out the statement that gold is to be found in various parts of the island in quantities that will repay development of these areas. Assays of the ores of the baser metals, as copper and iron, have very frequently shown the presence of the precious metal and, in the case of the Tilt Cove Copper Co., for instance, appreciable quantities are often extracted from the products of some of the Newfoundland Mines. It is remarkable too, that the quantity extracted from the ore mined in the locality cited does not show any very great annual variation. In 1896 it was worth upwards of \$62,000 and in 1897 the value was the same. In 1898 the figures given were \$58,000. Gold to the value of \$25,000 has been extracted from the Tilt Cove ore during the last five years. The total value of gold mined in the island in any one year has never exceeded \$150,000.

One promising auriferous area has been discovered at a place called Sops Arm, situated in White Bay. This has been thoroughly explored by the government geologist and with encouraging results. The most pronounced auriferous rocks belonged to the Silurian series, although the gold was not confined to these. The quartz veins were numerous, generally running in the strike of the slates and seemingly conforming with them in the dip. One shaft sunk passed through several veins and one belt was found to consist of mixed quartz and slate over thirty feet in thickness. This latter was found to contain gold in quantities ranging from a mere trace up to several ounces to the ton. The district contains all the conditions characteristic of auriferous regions. The quartz veins have an aspect that suggests the presence of the precious metal. In colour they are a dull white, are not vitreous, and contain considerable intermixture of calc and brown spar, so that they are comparatively soft and easily crushed. The gold is frequently seen in the quartz entirely independent of other metals, but it is also found in association with zinc and galena. The geologist reports that the gold is

for the most part not visible, but that some rich specimens were seen in small nuggets, and that strings of the precious metal arranged along weathered edges of the quartz were quite perceptible. Several washings were made in his presence from quartz in which gold was not previously discernible even when the lens was used. Yet nearly all these washings exhibited signs or colours of gold and some were quite rich. One in particular, made from about three ounces of crushed vein rock, yielded an average of about ten ounces to the ton. Other washings made from material taken from a shaft and a distance of about thirty feet below the surface panned out about fifteen ounces to the ton. Desultory prospecting at another place, Cinq Cerf, showed the presence of gold in quantities ranging from a mere trace to a value of \$6 or \$7 per ton. Not very alluring certainly at first sight, but it must be remembered that these results were obtained from mere scrapings of the surface and that no systematic or extensive



STAMP MILL AT MING'S BIGHT, NEWFOUNDLAND.

prospecting of this area has been done. The property has really not been given an adequate test.

At Rose Blanche on the south seaboard of the Island is an auriferous area that the Director of the Newfoundland Geological Survey regards as of some importance. He states that the gold is there distributed rather sparsely through quartz leads, but is of the opinion that if mining methods similar to those of Canadian companies were employed, it could be extracted in paying quantities.

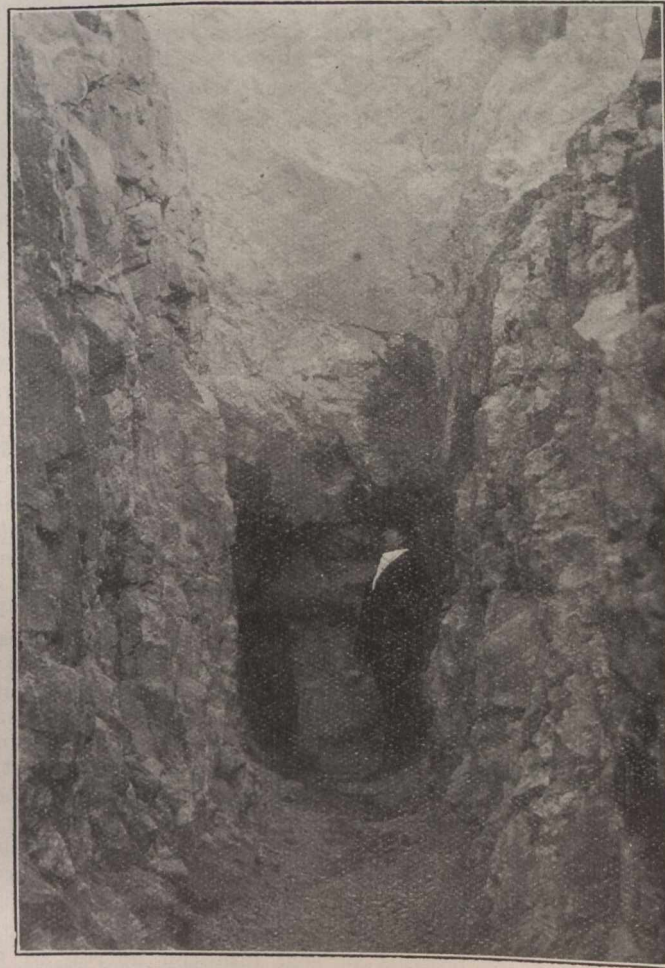
The only locality where gold mining in Newfoundland has been attempted on any considerable scale is at Mings Bight in the northern part of the island, near the entrance to White Bay. Here an outfit consisting of a ten-stamp mill and a Wilfrey concentrator has been placed on the ground and an attempt has been made to discover just what the area is worth as far as gold production is concerned. The deposit is of the bedded type and is composed of magnetite slate, quartz, and pyrite. It dips north at an angle of about 60 degrees. The auriferous lode has been traced for

fully a mile through the company's property, which is known as Goldenville, and has a width of from 5 to 13 feet. A trial shaft was first sunk 50 feet on the eastern extremity of the deposit, then a working shaft was sunk at a point half a mile further west, and continued down to a depth of 100 feet. When this shaft had attained a depth of 17 feet a shipment of about twenty tons of ore was made to the Brookfield mine, Nova Scotia, for the purpose of having a mill test. This, upon being treated by amalgamation and cyanide process, yielded 11 ounces of melted gold, valued at \$209.00, as per N. Y. Assay office certificate, which is equal to a recovery of \$9.08 per ton; in addition five tons of slimes carried a total value of \$55 which was

4. The total recovery equalled 11 oz., in melted gold at \$19 per ounce, or \$209. Value recovered per ton equalled \$9.08.

A value of \$46.20 per ton in gold was obtained as a result of a test made on concentrates, the total cost of the treatment being \$2.40 per ton.

This result was considered so satisfactory that the shaft was continued and at a point 80 feet below the surface, levels were driven east and west along the lode, in the former case for a distance of 80 feet and in the latter 51 feet. The ore taken from the shaft was continually sampled, the samples being sent on to New York. A result of some thirty assays shows an average of \$12.44 per ton, a fairly good showing.



AGALMATOLITE—PSEUDO-TALC—NEWFOUNDLAND.

See issue of September 1st, page 525.

not saved. The detailed result of this test was as follows :

1. By amalgamation, bullion recovered, 8 oz., 4 dwts. (retorted gold).

2. Treatment of tailings by cyanide process: Assay value of sands, \$3.20 per ton; slimes, \$11 per ton. The value of tailings sampled at end of plates, \$4.95 in gold and 21c in silver, a total of \$5.16.

3. Cyanide test: Number of tons treated, 217.85; average value, \$4.43; recovered in bullion, 3 oz. 9 dwts; time of treatment, 54 hours; consumption of cyanide, 3 lbs. per ton; percentage of recovery, 82.

FILTERING GOLD SLIME.

The following method of filtering gold slime is given by Mr. E. Jansen, metallurgist to the Oroya Black Range Gold Mining Company:—"In small cyanide plants where a clean-up press is not provided, the filtering and washing of the gold slime after acid treatment of zinc is generally found to be a slow and tedious process, but the following arrangement can be very cheaply installed. It will save much time in the clean-up, and is, in fact, with small plants, a good substitute for a filter-press. The whole operation of washing and filtering can be done in the acid tub, and consists simply of applying the principle of vacuum filtration to the

clean-up. The appliances necessary are a filter-frame, a vacuum chamber and a vacuum pump. The frame is constructed of 3-4-inch piping, screwed together in the form of a square, with a T-piece let into one of the sides, to which pipe and hose can be fitted; the sides of the pipes toward the centre have 1-4-inch holes drilled every six inches. A filter cloth to fit the frame is made of two pieces of good canvas or cotton duck, between which are two layers of coarsely-woven cocoanut matting. The four layers are all held together by a few rows of stitching, about 3 inches apart. The cocoanut mat layers are made so as to fit easily inside the frames, the duck being left large enough so that the top and bottom layers can overlap the frame on opposite sides and can be well sewn together all round. This then forms an efficient cell for filtering solution. The frame is made of such size as to fit the bottom of the acid tub, with about 2 inches clearance all round. The vacuum chamber can be conveniently made from a sulphuric-drum, fitted with pipe connections.

After the acid treatment is finished, the tub is filled with water, and the contents well stirred, then after the precipitate has settled, the clear solution is decanted off. The remaining gold sludge is well stirred and the frame is put into the tub, and the cock to the vacuum chamber and pump are opened. The frame should lie horizontally on the bottom of the tub and remain there until all the liquid is drawn off; it can then be lifted from the bottom and placed upright against the side of the tub while sufficient water is run in for washing. The slime adhering to the frame is scraped off, and, together with the rest of the slime in the bottom of the tub, is thoroughly stirred up with the water. The frame is again laid horizontally on the bottom of the tub and the vacuum cocks are opened as before. One washing in most cases will be ample, but can easily be repeated if insufficient. After the liquid is all drawn off, the vacuum is maintained for a time so as to air-dry the slime as much as possible. The slime is then collected from the frame and from the bottom of the tub; with careful scraping very little need be left on either. What is left can, however, be collected by washing and sponging the tub and frame with about half a bucketful of water. The washings can then either be filtered through a small calico filter, or use may be made of the filter frame by laying it down flat and, with the vacuum on, slowly pouring the washings upon one side of it; when dry the slime is carefully scraped off. If the filtering is slow with only one frame, there is no reason why two or more should not be used."

NEWFOUNDLAND PETROLEUM AREAS.

For a number of years it has been known that the formation of the west coast of Newfoundland—proschists at the base of the Silurian series—is oil bearing, and the desultory prospecting that has been done has proven that petroleum areas of considerable extent do exist there. Operations were carried on for several years at a place known as Port au Port on this coast and with satisfactory results. Three or four wells were drilled and at least three of them struck oil at from 136 to 684. The shallow well is said to have produced ten barrels a day for a month. The color of the oil is dark amber, the gravity 33 deg. Baume, and it possessed good lubricating qualities. Financial difficulties are supposed to have interfered with the increased and continued development of the area.

The Parsons Pond area, situated a little farther north along the same coast, is even more promising. The best of judgment does not seem to have always been displayed in the method of exploring the area, but in spite of this good results have been obtained. All the wells first sunk showed oil in greater or less quantity, one of them yielding 18 barrels of oil after about an hour's pumping. In 1901 the developing company put down a well to a depth of 2160 feet and struck oil in large quantity, the quality being superior. The oil apparently came from a lower set of petroliferous strata than any that had been previously bored. It burned freely even in its crude state and did not generate any explosive gas. By this year the company had sunk five wells, and while the quantity yielded was not very great, not one of them was dry. A new well sunk the following year to a depth of over 1,200 feet also struck good oil in considerable quantity. Attempts made to torpedo these wells failed, yet the season after the attempt was made on the deepest well, it was found to contain 900 barrels of oil.

During the season of 1904 several new wells were sunk in this area. One, partly drilled the year previous, was sunk to a depth of 2,050 feet, oil being struck at 1,470 and 1,750 feet. The well yielded an average of two barrels per day. A two months' test of this and three of the other wells resulted in an average daily yield of six barrels. Two wells were next sunk on the north side of the pond (lake). One was drilled upwards of 1,400 feet but gave a very poor yield of oil. The other, however, was the most productive of the lot, was pumped steadily for five months, yielding 4½ barrels daily. The oil from this well differed considerably from that obtained from any of the others. It was of great body and had a pale amber appearance. The superintendent reported that it was exceptionally rich in the more valuable lubricating oils, giving excellent results when used on his engines. It also gave a rich yield of paraffin, waxes and other useful by-products. During the season of 1906 two deep wells were sunk, but operations were not carried on with any very great vigor and some of the old wells became "drowned out." The company has unfortunately been hampered by lack of capital, a difficulty that has caused the failure of attempts at developing many promising Newfoundland areas. There is every reason why this petroleum area should be carefully and systematically developed on a large scale. The desultory operations carried on there have proved the existence of oil in paying quantities, and, further, analyses of this have proven its value for many industrial purposes. Several hundred barrels of the oil was used at the gas works in St. John's to enrich the gas production, the experiment being attended with most satisfactory results.

AMERICAN MINING CONGRESS—PROVISIONAL PROGRAMME.

A partial list of the speakers who will appear on the programme for the twelfth annual session of the American Mining Congress, at Goldfield, Nevada, September 27th to October 2nd, appears below. The Programme Committee has not yet completed its work, and this list will be materially augmented before the final programme is published:—

1. "Purchasing Coal by the B. T. U. Method," by Samuel A. Taylor, E.M. and C.E., Pittsburgh, Pa.

2. "The Paralysis of Mining Districts," by E. B. Kirby, St. Louis, Mo.
3. "The Forest Reserves and Other Public Land Questions," by Senator Weldon B. Heyburn, of Idaho.
4. "The New Experimental Ore Dressing and Metallurgical Plant of the Colorado School of Mines," by Prof. F. W. Traphagen.
5. "Industrial Accidents and General Liability Laws," by David Ross, Springfield, Ill.
6. "Old Days on the Comstock," by William C. Ralston, San Francisco, Cal.
7. "State Inspection of Metal Mines," by Courtenay DeKalb, San Francisco, Cal.
8. "Some Defects in State Inspection of Mines," by Harry A. Lee, E.M., Salt Lake City, Utah.
9. "Zinc Mines in the Good Springs District," by Douglas White.
10. "Geology and Ore Deposits of the Round Mountain District," by J. P. Loftus.
11. "Some Grievances of Ore Producers Against the Smelting Combine," by James H. Fox, E.M., Seattle, Wash.
12. "The Geology of the Goldfield District," by Prof. Chas. J. Moore, Goldfield, Nevada.
13. "Some Arizona Suggestions in Mining Law Revision," by Fred. J. Elliott, Globe, Ariz.
14. "Protecting Mine Investors," by Floyd Davis, E.M., Ph.D., Denver, Col.
15. "The Florence Mine," by A. D. Parker, Vice-President C. & S. Railway, Denver, Col.
16. "The Bullfrog Mining District," by Clay Tallman, Rhyolite, Nevada.
17. "The Ely Mining District," by Hon. S. W. Belford, Ely, Nevada.
18. "The Application of Steel to Mining," by Prof. R. B. Woodworth, Pittsburgh, Pa.
19. "The Effect of Silver Values Upon American Trade with Silver-Standard Countries," by James A. Heckman, representing Merchants' and Manufacturers' Board of Trade of New York City.
20. "A Bureau of Mines," by D. W. Brunton, President American Institute of Mining Engineers, Denver, Col.

Silver Discussion.—Additional views upon the silver question will probably be offered by Sir Moreton Frewen, of London, England; James J. Hill, of St. Paul, Minn., and John Hays Hammond, of New York City. Officials of the Mexican and Canadian Governments are also expected to be present and take part in this discussion.

Other Discussions.—Special discussions will follow the committee reports upon the following questions:—"The Prevention of Mine Accidents," "A Tonnage Tax on Coal Output for Distribution Among the Victims of Mine Accidents," "The Standardization of Electrical Equipment in Mining Work," "Needed Changes in Alaskan Mining Laws," "The National Forest Service," "Vertical Side Line Law," "General Revision of Mining Laws."

Sessions will begin at 10 o'clock Monday morning, Sept. 27th, and adjournment will be on Saturday afternoon, Oct. 2nd. On Wednesday the sessions will be held in Tonopah, the citizens of that city providing a special train to convey the delegates from Goldfield early in the morning, returning in the evening.

REPORT ON CHROMITE DEPOSITS.

The Mines Branch of the Department of Mines of Canada has just issued a "Report on the Chrome Iron Ore Deposits of the Eastern Townships," by Fritz Cirkel, M.E.

In the last few years, owing to the rapid development of the iron and steel industry in Canada, more than ordinary interest has been manifested by the mining and metallurgical public in respect to the Canadian deposits of raw materials and ores, which enter into the manufacture of iron and steel products. To meet the demand for information on these subjects, the Mines Branch has undertaken to issue a series of reports on the Canadian deposits of the substances which form the basis of the iron and steel industry. Several reports on iron ores and one on tungsten ores have already been issued and the present report is another of this series.

The scope of the "Report on the Chrome Iron Ore Deposits in the Eastern Townships of the Province of Quebec" is best judged by quoting the Table of Contents, which is as follows:

Introduction. Chapter I., Historical; Chapter II., The Chrome Iron Ore Deposits of Canada; Chapter III., Mining of Chrome Iron Ore; Chapter IV., Dressing for the Market; Chapter V., Market Prices, and Status of the Canadian Industry; Chapter VI., Chrome Iron Ore Mines; Prospects in Canada; Chapter VII., Chrome Iron Ores in Foreign Countries; Chapter VIII., Origin; Chapter IX., Composition of Chrome Iron Ores; Chapter X., Statistics and Chronology; Chapter XI., Determination of the Value of Chromium; Chapter XII., Uses of Chromium; Chapter XIII., Technology of Chromium and Its Compounds; Appendix II. Experiments with Chromite at McGill University; Bibliography."

The report is well illustrated by eleven plates in half tone, from photographs of mines, mills and machinery; and fifteen diagrams, maps and drawings, all illustrative of the chromite industry. The author of the report is Mr. Fritz Cirkel, mining engineer. This work was entrusted to Mr. Cirkel on account of his long connection, as consulting engineer, with the chromite and the asbestos industries; the deposits of these two substances in the Province of Quebec occur in the same region, and the origin of both is closely connected with the serpentine rocks of the Eastern Townships.

The topography of the report is good and the book will form a welcome addition to the library of the mining engineer, the metallurgist, and the capitalist interested in the iron and steel industry. Moreover, it may be pointed out that the chapters on the uses, the technology, the metallurgy of chromium, and those on the origin, the composition of chrome iron ores, as well as the bibliography, will be appreciated by all students and investigators on the subject of Chromium and Chromite.

The book is obtainable on application to Dr. Eugene Haanel, Director of Mines, Department of Mines of Canada, Ottawa.

ELECTRIC SMELTING OF IRON ORES.

As a sequence to the reports on Electric Smelting of Iron Ores published in 1904, 1906 and 1907, the Mines Branch of the Department of Mines of Canada has just issued the results of "An investigation of an Electric Shaft Furnace" in operation at Domnarfvet, Sweden. The investigation was made by Dr. Eugene Haanel in

December, 1908, on the invitation of the inventors, and the results given represent the latest developments of the electric smelting of iron ores.

The report contains 38 pages and is divided into four parts: Part 1 deals with the Domnarfvet furnace, the trials run witnessed by the writer of the report and the comparative costs of production of pig-iron by the furnace. The other three parts, which are more of the nature of appendices, describe: (1) a new electric furnace for the manufacture of steel, (2) the manufacture of electrodes, (3) methods of manufacturing wood-charcoal, this material being used to supply the carbon

which enters into the composition of pig iron manufactured by electric smelting.

Three full page plates, from photographs, and numerous drawings, illustrate clearly the descriptive matter of the book, which, taken in conjunction with the reports previously published by the Mines Branch on the subject of electric smelting, brings up to date the literature on the electro-metallurgy of iron.

The "Report on the Investigation of an Electric Shaft Furnace" at Domnarfvet, Sweden, may be obtained on application to Dr. Eugene Haanel, Director of Mines, Department of Mines of Canada, Ottawa.

THE LA ROSE DUMP.

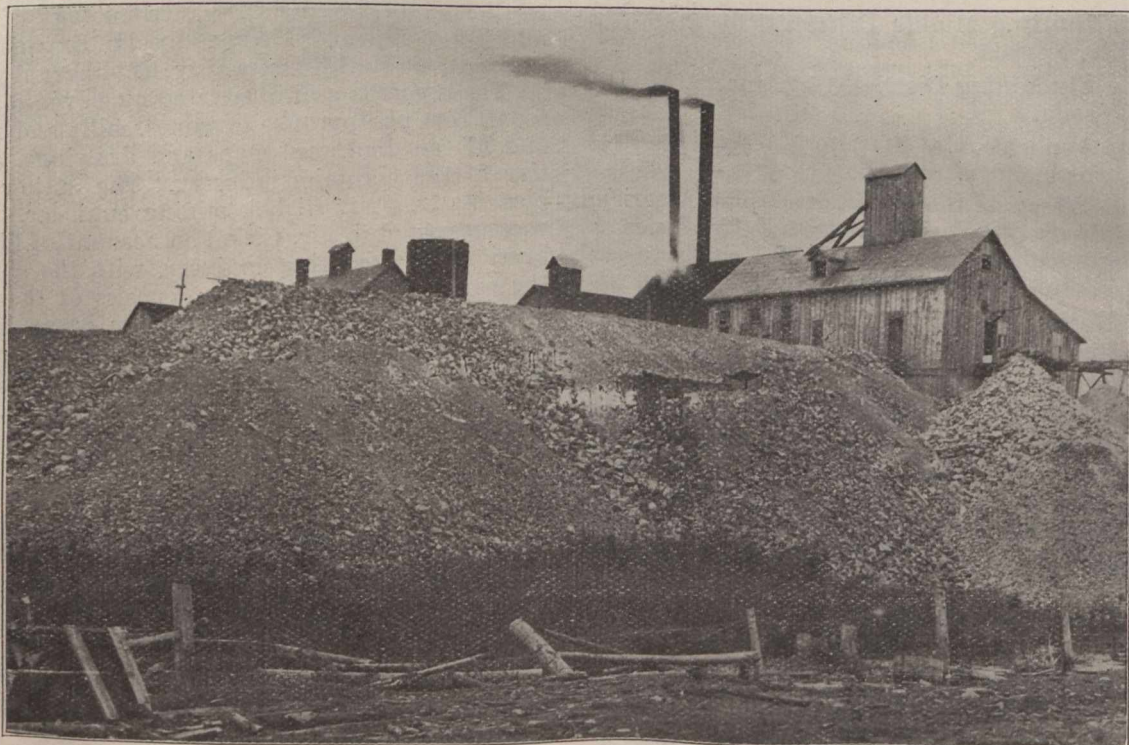
Written for the Canadian Mining Journal by H. P. Davis.

After careful sampling and mill tests it was estimated on May 1st, 1909, that the various dumps at the La Rose mine, of the La Rose Consolidated Mining Company, contained 44,340 tons of concentrating ore assaying from 15 to 40 ozs. in silver to the ton and averaging 28.16 oz. to the ton, a total of 1,248,820 ozs.

Since that date the mine has produced approximately 10,000 tons of discard from the picking tables,

of \$562,850.00; deducting from this amount 12 per cent. for marketing charges will leave \$495,000.

A contract has been entered into between the La Rose Consolidated Mining Company, Ltd., and the Northern Customs Concentrators, Ltd., for the concentration of the dumps of the La Rose mine. This contract is on the basis of a certain fixed price per ton plus a percentage of the net smelter returns.



THE LA ROSE DUMP.

which averages about 15 ozs. to the ton, or a total of 150,000 ozs.

It is conservative to estimate that in these dumps to-day there are 55,000 tons of milling rock containing 1,400,000 ozs. of silver. Figuring on the basis of 85 per cent. extraction, this would yield 1,190,000 ozs. of silver of a gross value, at the present market price,

The cost of concentrating the 55,000 tons of mill rock, above referred to, and of loading the same on cars will be approximately \$186,000, leaving a net return to the La Rose Company of \$309,000. In addition to the 55,000 tons included in the estimate, there are about 10,000 tons in the main dump of "uncertain value," and as a portion of the old dump, which has

not been tested owing to the fact that it is covered up, will yield considerably higher percentage of silver than the estimated figures given above, it is safe to estimate a net return of not less than \$325,000 from the concentration of the mill rock in the dumps of the La Rose mine.

The La Rose mine is producing from its ore-sorting tables each day:—

10 tons of 100 ozs. screenings	1,000 ozs.
5 tons of 40 ozs. screenings	200 ozs.
100 tons of 15 ozs. discards	1,500 ozs.
<hr/>	
115 tons	2,700 ozs.

The screenings have hitherto been shipped to the Denver Colorado smelter at the United States Smelting and Refining Company.

In concentrating ore averaging as high as 100 ozs. a recovery of 90 per cent. can be made. If this ore were handled by a local concentrator the daily production of screenings and discards from the ore-sorting table would yield a profit of approximately \$600 per day from the La Rose mine alone.

The Princess, University and Lawson are each producing milling ore in steadily increasing quantities. The Lawson mine will be productive of this class of material owing to the fact that, in addition to the strong and well-defined leads of high-grade ore, there are, on this property, a number of offshoots and small veins parallel to the main leads and the country rock between these offshoots and parallel leads and the main veins will make profitable concentrating ore.

Measurements taken across vein No. 11 at one point show 12 inches of bonanza ore, 5 feet of rock, 3 inches of ore, 5 feet of rock, 3 inches of ore, 2½ feet of rock and 2½ inches of ore, making a total of 20½ inches of high-grade ore in a zone of mineralization 9 feet in width.

TUNGSTEN ORES IN CANADA.

A report on the Tungsten Ores of Canada, by Prof. T. L. Walker, of Toronto University, has just been issued by the Mines Branch of the Department of Mines of Canada at Ottawa. The report covers 56 pages and includes 15 illustrations.

Amongst the rare metals which have recently become of commercial value, tungsten is an important example. One of its most recent applications is as a filament in incandescent lamps, in which it gives a much more brilliant light with greater efficiency than carbon. Its most important use, however, is in the manufacture of tungsten steel, to which it imparts great elasticity and tensile strength. The metal has, therefore, become particularly valuable to the manufacturers of special steels. The known occurrences of tungsten ores throughout the world are comparatively few, which fact lends additional interest to some discoveries of scheelite (an ore of tungsten) which have been made within the past year or two in Nova Scotia. These, together with other occurrences of tungsten ores in Canada, have been made the subject of the present report, which is designed to present to those interested all the available information on these ores.

The several occurrences of tungsten ore in Canada are described in detail, and a general statement is given on the geological occurrences of the ores, chemical tests,

concentration, the uses of the metal, producing mines in other countries, statistics of the world's production, etc., while a very useful bibliography of the literature on Canadian and United States occurrences is added.

CANADIAN PATENTS.

Below will be found a list of patents issued by the Canadian Patent Office on July 27, relating to mining and metallurgy, and furnished by Fetherstonhaugh &



OIL DERRICK AT PARSON'S POND, NEWFOUNDLAND.
See page 558.

Co., 5 Elgin Street, Ottawa, Canada. Russel S. Smart, resident:—

119547. W. Scrimgeour, Norfolk, Va., furnaces and forges, Mires Fuel Oil Equipment Co.

119576. E. A. Custer, Philadelphia, Pa., modes of casting metal structures in permanent molds having permanent cores.

119590. R. Gartenmeister, Elberfeld, Prussia, Germany, processes for making readily inflammable phosphorous compounds or kindling and priming compositions, and compositions resulting therefrom.

119592. L. F. Gilman, Spokane, Wash., coffer dams for placer mining and pier building.

119606. W. Pfanhauser, Leipzig, Saxony, Germany, processes for the manufacture of ductile electrolyte iron.

119622. A. G. Betts, Troy, N.Y., processes of treating nickel ores.

119623. R. Huber, New York City, apparatus for desulphurizing ores.

119624. U. S. James, Newark, N.J., ore concentrators.

119644. G. V. Barton, Liverpool, Eng., salts or oxides of lead.

119656. L. Horst, Altona, Germany, carbonic acid motors.

119700. F. Concord, Swissvale, Pa., systems of distribution for mercury-vapor rectifiers, Canadian Westinghouse Co., Ltd.

119692. W. H. Yost, Montreal, Que., means for piling coal and the like, W. H. Yost, O. W. Meissner.

EXCHANGES.

The Mining Journal—75th Anniversary Number, August, 1909.—The 75th Anniversary Number of our London contemporary is a formidable affair of more than 100 large pages of reading matter. Beginning with a sketch of its own history, it presents to the reader a large variety of articles, taking up progress in mining, ore-dressing and metallurgy.

On page 5 appears a reproduction of a page from *The Mining Journal and Commercial Gazette*, August 29, 1835, which is of unique historical interest. Despite the stilted phraseology, the editorial, 75 years old, displays commercial acumen and a laudable appreciation of the functions of mining.

We regret that the only article on Canadian mining is, to all intents and purposes, a prospectus of the Amalgamated Asbestos Corporation, Ltd. Thus the *Mining Journal* has fallen into one of the traps that are set for the unwary righteous everywhere. Of course, it has done so innocently.

Taken as a whole, our revered contemporary's anniversary number is decidedly worth while. It gives evidence of abundant vitality and enterprise.

Mining and Scientific Press, Sept. 4, 1909.—"Taxing Unoperated Land" is the caption of a leading editorial in this issue. The assessor of Huerfano County, Colorado, is to be removed from office because he assessed as grazing land the areas controlled by coal companies outside of the portions actually involved in mining operations. "If this step is taken," says the *Press*, "because of illicit transactions between the assessor and the coal companies, it is justified; otherwise it would seem to be drastic. The principle involved is not precisely that of taxing the unearned increment. No man can definitely affirm the amount of such unearned increment until a transfer of title occurs. Thus is seen the virtue of the laws prevailing in certain countries whereby real estate is not taxed directly, but an amount, usually five per cent. of the purchase price, is taken when the property changes hands. . . . Taxation is essentially a contribution out of earnings. Incidentally it seems as a deterrent to the locking up of

resources; but manifestly the simultaneous utilization of the great reserves of mineral deposits is impossible. These are held in trust for future generations. The ascertainment of their extent and richness, and their control by effective working organizations, is a distinct contribution to the welfare of the future."

DEATH OF MR. C. G. WARNFORD-LOCK, M.I.M.M., F.G.S.

Charles George Warnford-Lock was the son of a mining engineer, and was born in Hampshire on September 9th, 1853.

He was educated at Cranleigh, and his first professional engagement was in the sulphur mines of Iceland. He was afterwards engaged in alluvial mining in Hungary, and later on held responsible positions as mine manager in the Black Hills of South Dakota and in New South Wales. It was in the latter country, in 1896, that he took charge of the Wentworth Gold Fields Proprietary Company's mines. While he was controlling affairs there a prolonged strike took place, and it was owing to his energy and determination that he was able to run the mines during the period of disturbance, and bring the strike to a satisfactory issue. Mr. Warnford-Lock also managed mines for the Bulawayo Exploration Company at Gwelo, Rhodesia; and for the Raud Gold Mining Syndicate in the Malay Peninsula. For some time he resided in Sydney, where he practised as a consulting mining engineer.

He was the author of several well-known works on mining and cognate subjects, of which the chief are: "Practical Gold Mining" (1889); "Mining and Ore Dressing Machinery" (1890); "Economic Mining" (1895); "Principles and Practice of Gold Milling" (1901), and "The Miner's Pocket Book," which ran into five editions, the last being published in 1907. In that year he also brought out his last work, "Mining in Malaya for Gold and Tin," the second edition of which has already been issued.

Mr. Warnford-Lock was one of the original members of the Institution of Mining and Metallurgy, and served on its council and on its various committees. He moreover contributed several papers on mining and metallurgical subjects to the transactions of the Institution, and always maintained a keen interest in its affairs and well-being.

He returned to Malaya in 1908, where he was engaged in inspecting and reporting on properties for various mining companies. An attack of ptomain poisoning in the autumn of last year seriously impaired his constitution, and he was compelled to take voyages to China and Ceylon to recuperate his health. These were unfortunately unavailing, for after eight weeks' severe illness he died at Bandarawella, Ceylon, on July 30th last.

FLOW SHEET OF THE GOLDFIELD CONSOLIDATED MINES COMPANY.

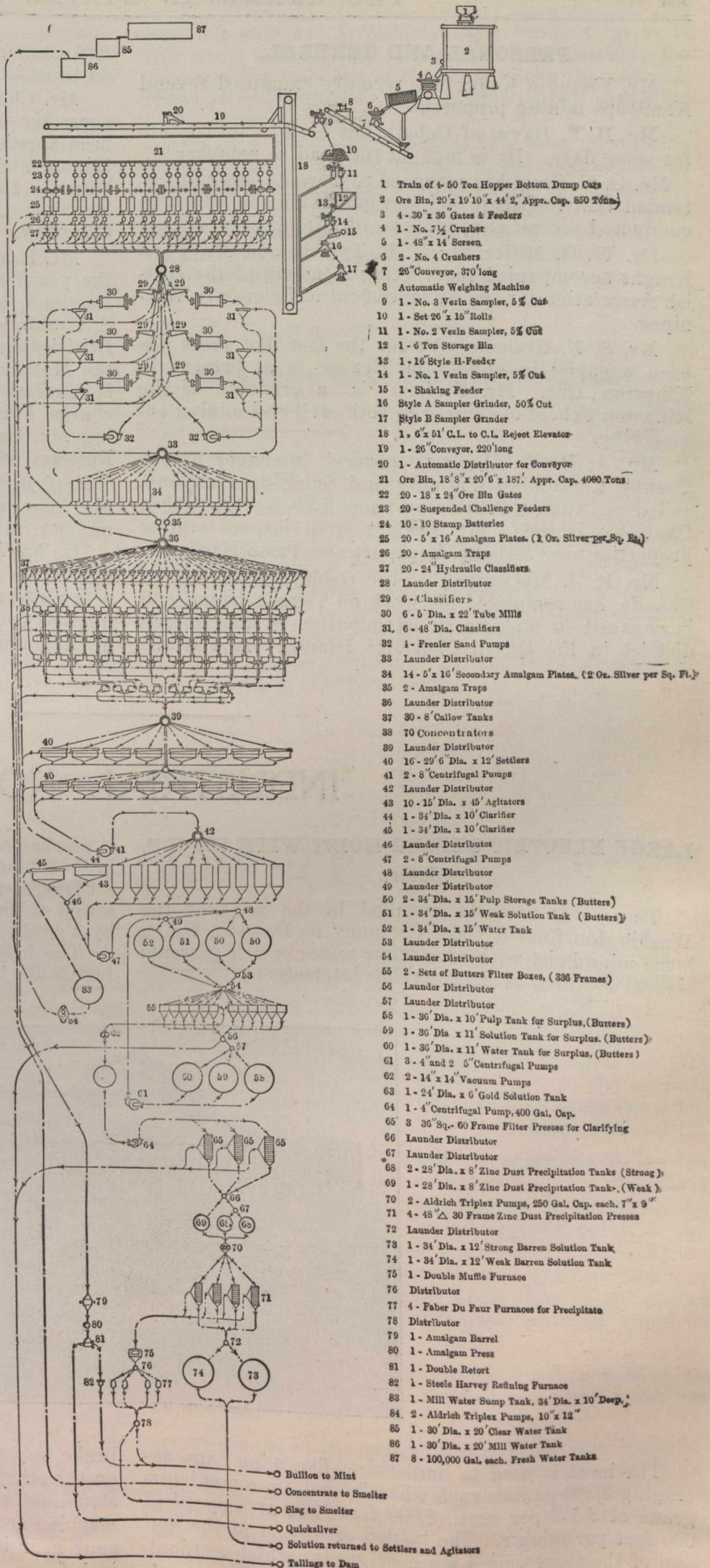
The Goldfield Consolidated Mines Company's 600-ton mill at Goldfield, Nevada, was designed and erected to remedy an intolerable condition. Before its erection, ore had to be shipped to outside points, and no ore running less than \$50 per ton could stand the charges imposed. The new mill starting upon \$50 ore, will soon treat \$30 ore. Ultimately the grade of the ore will be reduced to between \$10 and \$15. When this point is reached, practically everything between walls in the company's mines will be broken down and sent to the mill.

The mill site lies on the west slope of the foothills at the base of Columbia Mountain, near the Sandstorm claims, which were the first claims staked in the Goldfield camp. The company's mines are about a mile and a half southeast of the mill. Manager J. H. MacKenzie and his staff designed the mill; Francis L. Bosqui, metallurgical engineer for the company, was responsible for the cyanide end, and Grant B. Shipley, engineer of Allis-Chalmers Company, which furnished the machinery, designed the mechanical details of the entire plant.

The main building, built on a side hill, is of the usual terraced construction, and has four departments, all in one structure. The batteries occupy a section 50 ft. 6 in. wide by 210 ft. long; the tube mills a section 62 ft. wide by 210 ft. long; the concentrator section is 60 ft. wide by 266 ft. long; and the cyanide department is 222 ft. 6 in. wide by 294 ft. long. The difference in elevation between the first wall and the last wall is 132 ft. 1 in. Below this last level is sufficient fall to carry the tailings to the tailings dam in the desert below.

The mill building is entirely of steel construction, furnished and erected by the American Bridge Company of New York. There is between 500 and 600 tons of structural steel in the building exclusive of roofing and siding, which is of asbestos-protected corrugated metal.

It is impossible here to give further details concerning the construction of this phenomenal mill. The flow-sheet diagram that appears herewith shows fully the units that go to make up the equipment of this phenomenal plant, which is a monument to the engineering skill of its designers and to the efficiency of the manufacturers who supplied and installed the machinery.



PERSONAL AND GENERAL.

Mr. Frederic Keffer has recently examined several Kamloops mining properties.

Mr. H. P. Davis, of Cobalt, has been ill in Toronto for some days. He is now on the road to recovery.

Mr. O. N. Scott has returned to Toronto after an extended visit to Cobalt and Gowganda, during which he conducted several examinations of mining properties.

Dr. W. G. Miller, Mr. J. B. Tyrrell, and Mr. Cyril Knight accompanied the visiting members of the British Association for the Advancement of Science to Winnipeg.

Mr. S. N. Graham, who for the last five years has been engaged in mining in Mexico, is at present in Kingston, Ont. Mr. Graham is a graduate of the Kingston School of Mining in both civil and mining engineering.

Mr. A. B. W. Hodges, general manager of the Granby Consolidated Mining and Smelting Company, sailed on August 26th from Vancouver for the Queen Charlotte Islands. Mr. Hodges is to inspect mining properties near Jedway, Lockport and Tasso Harbour.

Mr. R. J. McConnell, of the Geological Survey of Canada, has completed his work on Texada Island and is engaged in making an examination of the mining district in the Queen Charlotte Islands. This is the

first time in many years that a Survey official has visited these islands.

Mr. Charles Graham, one of the underground managers for the Western Fuel Company at Nanaimo, has been appointed mine manager for the Vermillion Forks Mining and Development Company, Princeton, Similkamen. He is a brother of Mr. Thomas Graham, of Nanaimo, General Superintendent of the Western Fuel Company.

Mr. Ernest Levy, of London, has been appointed to the position of manager of the Le Roi No. 2 mine at Rossland, made vacant by the resignation of Mr. Paul S. Couldrey, who recently accepted a position with the British Columbia Copper Company as superintendent of the Mother Lode mine at Greenwood. Mr. Levy, who is familiar with the properties of which he will have charge, having on several occasions filled the office during Mr. Couldrey's absence, is expected to arrive in Rossland in a few days.

Prof. R. C. Allen was selected August 9th to succeed Mr. Lane, whose resignation we announced in the July number, as State Geologist of Michigan.

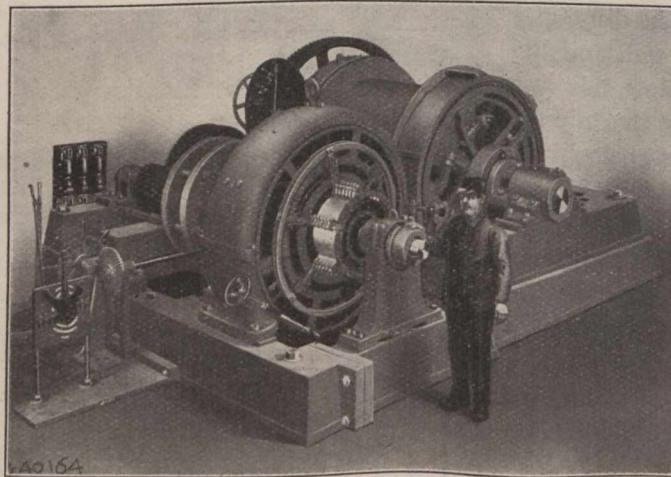
He has been Assistant Professor of Economic Geology at the University of Michigan the past year, was a favorite pupil of Prof. Leith at Madison, and under him has done work on the iron ranges both of Northern Michigan and of Canada.

INDUSTRIAL NOTES.**LARGE ELECTRIC MINING HOIST WITH 500 H.P. Motor.**

There was recently installed in the mine of the Washington Coal & Coke Company at Dawson, Pa., a large mine hoist with an electric motor which presents several features of considerable interest.

is reached near the top where the loaded cars are pulled in on a landing on a grade of about 6 per cent. and on a curve of 150 foot radius. The empty cars will be allowed to drift down the slope by gravity, controlled by a brake on the hoist drum.

The hoisting drum is six feet in diameter and five feet wide between flanges. It is fitted with a hand



The hoist is used to haul thirty-five mine cars, averaging 3,800 pounds each when loaded, up a maximum grade of 8 1-2 per cent., 8,000 feet long at a speed of 600 feet per minute. The loaded cars start at the bottom of the slope on a 4 per cent grade, which gradually increases until the maximum grade of 8 1-2 per cent.

brake on one end, and a hand operated friction clutch on the other end. The drum is of very heavy steel construction, with a 12-inch shaft. All the gears on the machine are cast steel with machine cut teeth, the main spur gear being 10-inch face and the motor gears 13-inch face.

The frame is made in sections for convenience in installing in the mine. The drum and large gears and the friction clutch parts are also made in two pieces for the same purpose.

The hoist is driven through a flexible coupling by a 500 H.P. direct current non-reversing compound-wound Westinghouse motor. It is controlled by a standard semi-automatic Westinghouse magnetically-controlled unit switch controller. These switches are operated from the controller shown in the illustration, the controller carrying only small currents, while the main motor current is handled by the magnetically operated switches, thus doing away with the difficulties from arching.

This controller has an accelerating relay which prevents the starting switches from closing too rapidly and thereby prevents too large starting currents. Thus the second switch cannot close until the current allowed to flow by the closing of the circuit has fallen to a predetermined value. As soon as this value is reached the second switch closes thereby short-circuiting a resistance section and the current rises, but the third switch cannot close until the current has again fallen to the predetermined value. This not only prevents injury to the motor from careless handling during acceleration, but also insures the most rapid starting possible.

The controller also has a safety relay which opens the resistance switches in cases of excessive overload, and thereby protects the motor while running. If this relay operates while the motor is running, the motor

does not stop but is automatically brought up to its full speed again. This is a particularly valuable feature in an installation of this kind where the cars may strike some obstruction, as it affords perfect protection to the apparatus.

When it is remembered that this hoist is installed some 800 feet below the surface of the ground, the advantages of the electric transmission of power are evident. In no other way could this large amount of power be transmitted as economically, or as easily.

The hoist was supplied by the Connellsville Manufacturing and Mine Supply Company.

THE LONGWALL SYSTEM OF MINING.

In the case of the flat reefs in the Far Eastern Rand the longwall system of mining has been adopted, because it reduces mineral losses to a minimum and affords better facilities for the application of mechanical power through permitting a continuous working face, extending over many hundreds of feet in length and to allowing the level to be driven 500 feet apart. This will simplify the working. This class of mining is much more prevalent in the coal mines of the Continent than in this country in consequence of the flatness of the seams. The driving of levels so far apart is a great saving, as in steep angles of dip the levels are made 100 feet instead of 500 feet apart.

CORRESPONDENCE.

To the Editor of The Canadian Mining Journal,

Sir,—I have read with much interest Dr. Ledoux's article on "The Sampling of Cobalt Ores," which appeared in your issue of July 1st and on which you specially invite discussion.

The fact that Messrs. Ledoux & Co. consider that the errors of any system of mechanical sampling on rich Cobalt ores are of sufficient magnitude to warrant the laborious and costly hand sampling method now in use in their works, while mechanical sampling is employed on the same class of ores at Copper Cliff, Deloro and Denver, surely proves that discussion is likely to be both interesting and valuable.

The present practice of Messrs. Ledoux & Co. reduces the labour and cost of their former methods very considerably with, to my mind, no sacrifice in accuracy; for, though four samples, each reduced from the original, should theoretically agree with each other more closely in assay value than samples reduced from four quarters of a well mixed whole, the average value of the latter four samples should be at least as accurate as the average of the former. This principle, which is apparently admitted by Messrs. Ledoux & Co., since they have adopted it in their latest practice, is an important one.

Dr. Ledoux states that one of the two chief objections to automatic sampling devices is that they "do

not admit of taking more than one sample of the whole lot starting practically from the beginning each time."

Though this is true of the single samplers at present in general use, in mechanical sampling plants in most districts, double samplers, giving two separate samples of the whole, have for some time been in the market, and it would not be a difficult matter to make samplers, which would give three or four such samples if desired.

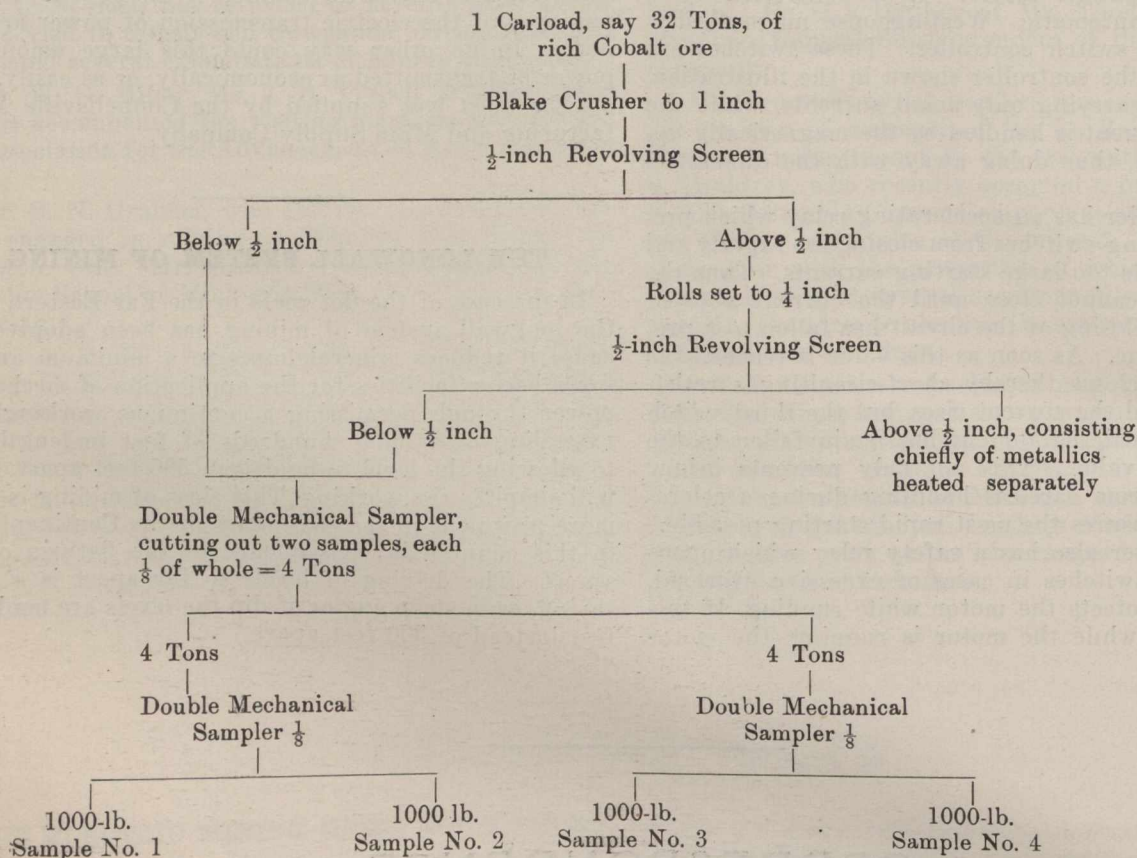
Now it is apparently admitted, according to Dr. Ledoux's article, since this is not one of the objections raised, that mechanical samplers can in one operation cut out as fair a sample, up to a certain point, as can be done by the successive coning and quartering by hand to the same fraction. A series of experiments to settle the proportion, which could thus be cut out as accurately as by hand on the same material would be worth making.

In the proposed sampling plant below I have assumed that one-eighth is a safe proportion to cut out in one stage.

In regard to the objection that there is a "possibility that in grinding in a ball mill or other similar device there may be a mechanical concentration in the mill":—this there undoubtedly is, with the result that the last ton or so is not only enriched but gets increasingly richer toward the end. There seems, however,

no reason to suppose that any greater error should be introduced in sampling this than in sampling the bulk of the ore, which runs through it under exactly the same conditions.

This possible error, however, could be eliminated by crushing by the same or similar means to those adopted by Messrs. Ledoux & Co. in hand sampling, in some such way as outlined below.



Continue as in latest method in use in Messrs. Ledoux & Co.'s works.

An economy in capital outlay could be effected, where speed in sampling was not important, by receiving the 4-ton samples in separate bins, from which they could each in turn be returned to the first sampler.

The above scheme of sampling could doubtless be

improved; but will serve to show the directions in which the laborious and costly hand sampling methods under discussion could, in my opinion, be reduced in cost and labour without sacrifice in accuracy.

D. B. Langford.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

The Dupes of the U. M. W. A. in Nova Scotia.—The true inwardness of the U. M. W. A. trouble in Nova Scotia has been overshadowed and befogged by a multitude of side issues, intelligible only to the initiated. With a few commendable exceptions, the newspapers have been unable to disassociate their political predilections from the real points at issue. The "Montreal Gazette" recently remarked: "Politics have entered into

the U. M. W. A. situation in a manner that no one outside of Nova Scotia can understand." It may be added there are people in Nova Scotia also who cannot sight the political bearings of the present trouble, for the ways of the politician are dark and tortuous, and do not invite the closest inspection. Be that as it may, there is one fact that emerges clearly and more clearly from the mists of misrepresentation, namely, that the miners of Nova Scotia who have listened to the leaders of the U. M. W.

of America have been wantonly, wickedly and most cruelly duped. The present condition of the followers of the U. M. W. is not without a certain irony, but of the grimmest, and not to be compared with what is to follow. The victims of the glaring lies, the naked and unashamed mendacity of the salaried American strike-breeders have this coming winter to face bitter adversity and penury, aggravated by the knowledge that the workers of this deception will not share in nor suffer from the certain harvest of their deceit, and by the further knowledge that their fellows who refused to listen to the orators of the piratical U. M. W. A. and persisted in remaining at work as advised by their Canadian officers, have been richly justified in their course.

There is one word only which is strictly applicable to the actions of the U. M. W. leaders in Nova Scotia. They have acted wantonly. Apart from the unbelievable mendacity of these men, which is their outstanding characteristic, their campaign has been conducted with such an utter lack of common-sense, with so palpable a disregard for the welfare of our industries and our Canadian institutions and for any ultimate success which the U. M. W. might conceivably hope to attain by the use of those methods which are approved by honesty and public opinion, that we are perforce driven to the conclusion that these men are actuated solely by a desire to do damage, to run amuck. Their methods are iconoclastic, but without consuming zeal to condone them. Wicked and wanton destruction has marked the doings of the U. M. W. A. in Nova Scotia this summer. The leaders claim falsely that they were invited to Nova Scotia. If we may be pardoned the use of a metaphor, these self-invited guests have committed arson upon the dwelling of their host, and will depart hurriedly, leaving behind a scarred and roofless ruin and a beggared household.

There is a distinct difference between the situation at Springhill and that at Glace Bay. Strikes at Springhill have become a habit, and it is more than probable the thinking portion of the Provincial Workmen's Association regard the defection of the turbulent lodges of Springhill with great complacency. It is quite understandable that affiliation with so rampantly militant a union as the United Mine Workers would appeal to the Springhill men, particularly as the principles of international socialism have permeated Springhill for many years. After President Lewis' interview with Mr. Cowans and his strictures on the poorly balanced distribution of the mine labour there, added to the report of the Conciliation Board, it might have been thought that the leaders of the U. M. W. A. would for the sake of their union funds have tried to restrain the Springhill men from once more indulging in their annual diversion of a strike. Instead of this, however, they prepared a schedule of wages so grotesque in its demands that to read it is to laugh, and the resolution to strike was carried in the usual wanton manner of the U. M. W. by show of hands, and not by secret ballot. The ballot was carefully avoided by the leaders, as they knew it would have resulted very differently from the light-hearted show of hands. The leaders of the U. M. W. A. were under no misapprehension as to what would take place if a strike were called. They knew that recognition of the U. M. W. A. and acceptance of its demands were impossible, and knowing this, not only did they call the strike, but they even refused to allow the pumpmen and enginemen to work. The mine is indefinitely closed, a portion of it permanently abandoned. Is it to be wondered at if people conclude that the U. M. W. A. have no constructive policy, but are bent upon mischief for mischief's sake. No other conclusion can be arrived at.

As we have explained in previous correspondence, the desire of the U. M. W. A. to obtain control of the miners of Eastern Canada was based upon the fact that our coalfields here are the only serious competitor the bituminous mines of the United

States have to fear, and it is a natural and not unstatesmanlike policy on the part of the U. M. W. A. to endeavor to dominate the miners of Eastern Canada, for reasons that it is unnecessary to detail, so obvious are they. Unfortunately this policy has become confused with the personal ambitions of President Tom Lewis, whose office is open for re-election in January next. President Lewis' opponents are strong, and his re-election will be vigorously opposed. The addition of a solid Nova Scotian vote in his favour would ensure Lewis' election. Under the rules of the U. M. W. A. every person in receipt of strike pay is de facto a member. Up to the time of the Nova Scotian strikes the members of the U. M. W. A. were few, and fewer still had paid their dues. The strikes were called to hold together the membership of the U. M. W. in Nova Scotia. Had they not been called, the agitation, not being grounded in any real complaint, but being purely an artificial unrest skilfully fomented by salaried strike-breeders, would have died a natural death this summer, and President Lewis would have lost his votes. For this same reason it may be anticipated that the U. M. W. A. will not call off the Nova Scotia strikes, but will continue to dangle before the eyes of their poor dupes the same old illusions as long as they will serve their purpose. It is further not to be anticipated that the U. M. W. will trouble much about their Nova Scotian victims after next January, for the reasons following: Mr. Lewis' opponents are not in sympathy with the predatory and extra-national policy pursued by the present leaders, and in case they oust Mr. Lewis, they will speedily put a stop to the idiotic waste of their union's funds in Nova Scotia. If Mr. Lewis, by the help of the Nova Scotia strikers, manages to gain re-election, his ambitions will be gratified, for then he will be assured of a certain life-sinecure in the gift of the U. S. Government. Therefore, no matter how President Lewis' election goes, the Nova Scotian members of the U. M. W. A. will assume the unenviable position of the "poor relation," and will still further realize their folly.

The case of Dominion No. 1 colliery of the Dominion Coal Company presents an epitome of the piratical and intrusive policy of this foreign union, and illustrates very well their propensity to "butt in." Throughout this strike "Dominion"—as it is usually termed—has maintained an output of from 200 to 300 tons greater than it produced during the corresponding months of last year, and the workmen of that colliery have worked as they never did before. But in order to prevent forcible interference with the workmen by the idle U. M. W. A. pickets from other collieries the company were obliged to fence and guard the mine as rigidly as any of the other collieries, although practically every man was wishful and determined to continue at work. Dominion is the home of the grand Secretary of the Provincial Workmen's Association, and a stronghold of the P. W. A. For once a prophet has been honored in his own country, and Mr. Moffatt can withstand with equanimity the abominable torrent of lies and invective that his enemies have poured upon his devoted head, when he considers how loyally the members of the P. W. A. stood by him and their contract in his own village. But we may ask, is it right, is there any justification or reason why a coterie of salaried and trained breeders of discord, preachers of sedition and lawlessness from an alien country should be allowed to harry and persecute a body of Canadian workmen whose only request is to be allowed to mind their own business and manage their own affairs, and to put Canadian corporations to great expense for police protection, which the constituted authority of this amazingly democratic country was unable to afford. Where is the consistency between the Alien Labour Act of Canada and the toleration of a state of affairs such as we have referred to? If ever the term "conspiracy in unlawful restraint of trade" were justified, surely it is as applied to the unrestrained insanity which the U. M. W. A. is committing in our very midst.

One of the most unfortunate effects that have been brought

about by the discontent-mongers sent here from the United States is the disturbance of the pleasant relations which have hitherto existed between the management of the Dominion Coal Company and its workmen. We have previously emphasized the fact that the present strike is the first in the history of this company, the only one in sixteen years. Will it be believed that a part of the campaign to which the U. M. W. A. has devoted very large attention has been the destruction of these amicable relations and the inculcation of a spirit of disbelief and distrust in the good faith of the management. Before the strike the leaders of the U. M. W. A. gave publicity to a report that the policy of the general manager was not endorsed by the higher officers of the company, and that the general manager was in disfavour. The president of the company gave most emphatic denial to this report. Thereupon it was reported that the Board of Directors would veto the policy of the management, and these lies were given to the dupes with portentous solemnity at every lodge meeting. Now the U. M. W. have tried a fresh tack. They are gravely stating that the failure of Springhill to make its shareholders rich is due to gross mismanagement by the present responsible officers. The general manager of the Dominion Coal Company is now considered by the U. M. W. A. leaders as "no longer fit for his job." Such a statement from such a source discovers a desire on the part of the U. M. W. gentlemen to get rid of an opponent who has driven them hard, and is, in fact, a reluctant compliment. These tactics, of course, merely raise a smile among those who are competent to judge, but they serve their purpose among those who meekly swallow any lie proffered in the name of the U. M. W. The magnitude of the falsehoods set on foot by these walking delegates is only equalled by the incredible gullibility of their dupes.

The "Montreal Gazette," in commenting on the situation, remarks: "If the strikers have any wise friends, they will advise them to return to work as rapidly as they can. The U. M. W. organization is a reed that the longer they lean on it the worse it will pierce their hands."

The wisdom of this remark is undoubted, but it will not be heeded, and that is the pity of it. To satisfy one man's ambition, and to aid the political advancement of a few others, there has been brought about—we speak advisedly—a state of affairs more disastrous than any previous labour crisis in Nova Scotia. The loss of millions of dollars, of trade, of work, of homes and savings, or confidence, of reputation, all these have seemingly been necessary to teach us that Canadians can manage their own affairs without the assistance of American usurpers, and that all our elaborate legislation to protect Canadian industries against American interference is useless. We are a nice, quiet, long-suffering people in this Dominion, and the United States labour agitator is fully aware of the fact.

QUEBEC.

Sherbrooke.—There is a deposit of tripoli in Stanstead County, from which many boxes have been filled and sold, as it is an excellent polishing powder, but the extent of it has not been ascertained.

The management of the Compton Gold Dredging Co. has apparently dug up another excuse for delay. When individual interests and private stock deals are allowed to interfere with a promotion, before it has fairly got its feet on the ground, it is mighty apt to be a good candidate for the slow race.

The variety of Quebec minerals shown at the Fair is a surprise to nearly all, and strangers wonder that so little development has been done in this province.

But many a promising prospect never gets beyond the promotion stage. Stupid incompetency, and consequent misstatements and perversion of simple things to cover the same, are

as bad in results as criminality, and even verge thereon. Yet to kick a certain small animal is a poor remedy for bad odor. One can only avoid intimate association after seeing its stripes.

The New York "expert" recently at Moe's River, after his employer's expressing his desire to have him meet Mr. Hardman, on being apprised of that gentleman's expected arrival, took the first train for home and mother. There's a large sized colored gentleman in the aggregation of fibrous fuel, and only his head is out of sight.

The introduction of a foreign element, with capital, is desirable, but the same without even credit, and with the capital yet to be made, is as deadly as the sleeping sickness.

The New York people who had an option on J. McDonald's copper property in Weedon have allowed it to expire, although the result of work done was more than gratifying. It is rumored that the same thing has resulted on Geo. E. Smith's mine at Memphremagog, although a new and probably permanent main vein has been uncovered, and the property is looking better than ever.

The bum brokers, etc., who, posing as mining men, reach out from New York or Montreal, with one hand to get a grip on a property, and with the other for an "angel" to put up the funds, are doing serious injury to the mining interests of the townships. Failing to secure the "angel" they invariably give the property a black eye, rather than confess their inability to make good. Sometimes they get an option, which is allowed to expire, then they banter for better terms. But don't imagine you can spot them at sight, or by Bradstreets. Like other confidence men, they put up a great front, and, having no scruples, get your confidence by pleasant manner, much promising and wheedling, until they are in a position to bully. Then the mask is dropped, sometimes a little prematurely, perhaps. The only safeguard is to insist on a substantial cash payment down. If your people won't or can't make that, cut them out.

Some specimens of bituminous coal from Stanstead were shown at the mineral exhibit at the Fair, said to be from several narrow seams. Following the usual line, the owner will probably put the price of \$100,000 or more on that farm, until he finds it mostly bituminous shale.

John E. Hardman, SB., M.E., and a party came to Sherbrooke, Tuesday, the 7th, to inspect some local properties.

ONTARIO.

Gowganda.—The wagon road from Elk Lake to Gowganda has been cleared and graded for ten miles. The work is making good headway, and it is hoped that the whole road will be completed and ready for traffic before winter. Over one hundred men are working at present.

The road from Bisco to Gowganda is already cut, and most of it is already cleared of bush and stumps.

Now that the fly season is over and the camp has been able to get down to work in earnest, many new veins have been uncovered. A new vein carrying native silver was found on the Ryan, Gowganda, while trenching recently.

Active prospecting work is now being carried on at the Hedges claim, which adjoins the Boyd-Gordon.

The Reeves-Dobie property now have their machinery installed. On their north claim three new veins have been uncovered carrying good silver values.

The Bonsall mine near Miller Lake has stopped all underground work, and the mine has been completely closed down, except for some surface trenching. It is said that the shut-down was caused by the ore pinching out.

On the Boyd-Gordon their No. 8 vein has been cut in the south cross-cut at a depth of 80 feet. The vein averages from

four to six inches wide, and carries native silver and smaltite right across.

The Morgan mine has been sinking on the big niccolite vein. Silver has been struck in the shaft at a depth of 25 feet.

Several new smaltite veins have been discovered recently on the Mann property. A new vein has been uncovered north of the original discovery of a vein averaging two inches wide, which is heavily shot through with native silver.

On the Morrison claim near Miller Lake active prospecting work has been carried on for some time. Seven silver-bearing veins have been uncovered. The most recent is a six-inch vein assaying from four to five thousand ounces per ton. A company known as the Northern Mining Company has recently been incorporated to develop and mine the claim.

On the Millerett mine, in the Miller Lake district, formerly the Blackburn, two shafts have been sunk and considerable open cutting and tunnelling done. The main shaft, sunk beside the principal vein, is down a distance of 80 feet, and No. 2 shaft is down 50 feet. About 200 feet of drifting has been done from both shafts. On the main surface vein 100 feet of open cutting has been done, followed by a tunnel 120 feet long, which follows the vein into the hillside. The company has commenced stopping on this vein. The Millerett property consists of 40 acres, and 65 men are employed, a portion of whom are doing trenching and surface work.

At the Big Six mine, not far from the Millerett, two shafts have been sunk for 50 and 65 feet respectively, and some drifting has been done from both. The ore is all being left in the stopes, but a considerable amount has been blocked out. The property consists of 160 acres, and 25 men are employed. At present no surface work is being done.

Port Arthur.—The furnace of the Atikokan Iron Company is now producing No. 1 iron steadily. The output is about 100 tons per day, and will be gradually increased. The ore-roasters are working efficiently, reducing the sulphur contents of the ore from about 2 per cent. to a figure that presents no difficulty from a fluxing point of view. The roasted ore averages about 61 per cent. iron. The coke ovens are on 72-hour coke, 30 ovens producing all the fuel now necessary. Six and a half tons are charged per oven, where formerly only 4½ to 5 tons were charged. The yield is 4 tons of coke per oven. One Covington coke-drawing machine, operated by two men, draws the thirty ovens. The total number of men employed at the ovens is 8, viz: Foreman, operator and helper on Covington machine, 2 back-scrappers, 2 chargers, 1 labourer to plaster doors and water coke. The drawing is usually completed by 2 o'clock. The saving in time and labour under the present arrangement is considerably more than 100 per cent.

A "Brown" hoist, with bucket and magnet attachment, is another labour-saving addition to the plant. With the bucket attachment cars can be loaded with limstone or ore with a minimum loss of time. The magnet attachment is used to handle and load pig iron. It lifts 20 to 30 pigs at a time, and in loading a car makes two trips per minute.

A slag-granulator is also installed. The granulated slag makes excellent ballast, and is much in demand.

Cobalt.—The Silver Cliff mine is putting in a 30-stamp concentrator to handle the large quantity of low-grade ore which they have on the dumps and in the stopes. The contract for the machinery was given to the Traylor Engineering Co. They have also purchased an electrically driven hoist.

Every once in a while reports are heard of new strikes on the Beaver. These strikes are simply chutes in the same vein. This vein is irregular, and the values pinch in and out.

There is a good deal of activity at Cobalt Lake owing to the fact that development on the vein discovered some time ago has

shown that it increases in width and values. When first discovered it was about 3 inches wide but now there is about 6 inches of high-grade ore.

In the dump of the La Rose, which is being treated by the Northern Customs Concentrator on a royalty basis, it is estimated that there are about 45,000 tons of ore, with a gross value of about 1,250,000 ounces. The profit accruing to the La Rose will be about \$330,000.

The development on the latest find on the Lawson has shown that it is one of the richest so far discovered. It has been uncovered for a distance of over 175 feet, and in one spot there is about 14 inches of high grade ore, and the wall rock is also well mineralized. The shaft sunk on the Keewatin vein has also been productive of very good results. On the surface there was only about one inch of ore, but in the bottom of the shaft, which is now down about 45 feet, there is a 6-inch vein of smaltite, carrying good values in silver.

Until further action is taken with regard to the Provincial mine, this property will rent their air to the Waldman claim in the Gillies Limit, and the Goulds Consolidated on Cart Lake. The Waldman now have their pipe line in, and are operating one drill. The Gould Consolidated have also connected up, as the Nipissing need all their air for their own use. The Waldman has lately installed a small boiler and hoist, and the work of sinking the shaft will be carried on rapidly. So far the development on this property has not been productive of very encouraging results, as the vein which showed such high values on the surface has changed to calcite, with a small stringer of cobalt, which carries but little silver at the bottom of the shaft.

A discovery of importance was made a short time ago at the North Cobalt mine, which is in the same vicinity as the Green-Meehan, Red Rock, Black Mining Co. and others. The North Cobalt Mining Co. commenced work in 1907, and sank on a small vein of calcite carrying practically no values. The shaft was sunk for a depth of about 60 feet, but as the results obtained were not very encouraging, work was stopped and the property lay idle until the Jacobs Exploration Co. took over a working option and obtained control. Machinery was installed and the work was persistently carried on. When the shaft was down 182 feet a cross-cut at the 170-foot level was started, and when the working was in about 40 feet the new vein was encountered. At this point there is about 20 inches of calcite carrying considerable silver.

The most important find of the season outside of Cobalt was made a short time ago on the Morrison claim, a property in the Le Roy group to the south of Miller Lake. A good deal of surface trenching has been done on the property, and several very promising leads were discovered. The one that has caused the excitement is a 6-inch vein carrying about four thousand ounce ore. A company known as the Northern Mining Co. was recently formed to develop the property, and it is financed by Montreal and Ottawa men.

Three new veins, known as Nos. 128, 130 and 131, have been found on the surface at the Nipissing. The first has been uncovered for about 60 feet, and shows one to two inches of high-grade ore. The second, which was found only a short distance from No. 129, varies in width from 2 to 6 inches of high-grade ore. No. 131 was found in the same locality.

The diamond drill which has been working on the Alexandra property to the south of the Cobalt Central, shows that the Huronian slates underlie the diabase at a depth of about 250 feet. At the present time the shaft is down about 160 feet, and when this has been timbered and put in shape, sinking will be continued to the 250-foot level. The good results obtained in this formation by the Cobalt Central have decided the management of the Alexandra to continue their development work to a greater depth.

The large number of new companies that have been formed recently to exploit properties in this district is a forerunner of the boom which will come this fall. Altogether new companies with a capitalization aggregating about twenty millions have been formed. The one of most interest to this district and the outside public is the Hudson Bay Mines, Ltd., with a capitalization of \$3,500,000. This company will take over the Coleman Township properties of the Temiskaming & Hudson Bay Mining Co.

Another drilling contest, open only to local teams, will be held on Labour Day, Sept. 6th. It is understood that Page and Pickens, of Globe, Arizona, who won the \$1,000 prize in the competition held August 19th, will give an exhibition. The work done by these men was a revelation to the local teams, and it is expected that the contest on Labour Day will be much improved in consequence of this.

At a point about 300 feet north of the first strike on the Foster another important discovery has been made. The vein has been uncovered for some distance, and shows a width of about 6 inches of high-grade ore. Considering the conditions of the lease which the argentum Mines Co. has on this property, it is doubtful if the Foster stockholders will benefit very much.

The Silver Lake Mining Co. at Silver Lake has let a contract for 1,500 feet of diamond drilling. The machine has been shipped in through Elk Lake, and been installed. This is the first diamond drill to be used in this section of the camp, and the knowledge of the formation which will result will be of great benefit to the surrounding properties.

It is reported that in the near future the Crown Reserve will commence the construction of a concentrator. There is a large amount of ore on the dump and in the stopes, but the main reason is the result that has been obtained in the recent development in the Keewatin formation. At a depth of 170 feet the conglomerate gave place to Keewatin, and although there was no great change in the value of the ore, the veins were found to be much more split up, and as a consequence mining operations result in the production of a much larger amount of low-grade than formerly. The east and west winzes have been connected at the 200-foot level, and a raise has been started to connect with the main shaft. It is expected that it will be completed in a short time. At the Imperial Crown, which is controlled by the Crown Reserve, the surface is being trenched in a very thorough manner. A force of men has been working all summer, and the property has been cut into 100-foot squares with trenches. Several veins of calcite carrying some silver values have been located. On one of these veins at the west side of the property a shaft is down about 40 feet. Another shaft will shortly be started on a vein near the Kerr Lake-Majestic line. A diamond drill is working to try and locate the underlying Huronian slates.

In the Latour Lake district discoveries of silver have recently been made on the Lang-Caswell property and the Wright claim. The former has the greatest amount of work done of any mine in this section. The No. 1 shaft is down 75 feet, and sinking is still in progress. The vein in the bottom of the shaft is about 6 inches in width, and carries considerable cobalt. The discovery on the Wright property consists of a calcite vein carrying a good deal of smaltite with values in silver. So far but little work has been done, a test pit on the vein having been sunk only about 6 feet.

It is reported that the White Reserve Co., in the Maple Mountain district, will make a shipment of high-grade ore in September. This company has been in a position to make shipments for some time, but it deferred sending any ore out until it was in a position to ship continuously. The machinery on the property has now been all installed.

During the month of August there were shipped from 18 mines 81 cars of ore, aggregating 2,6064 tons. This is slightly

behind the July output, which was 85 cars, amounting to 2,715 tons.

At the 60-foot level of the Nancy Helen work was recommenced a short time ago on a vein which had been for some time abandoned. The drift was continued only a few feet toward the southeast when the vein widened and good values were found. When the work was started there was only about one inch of barren calcite, but this developed into about 3 inches of high-grade ore with values in the wall rock.

Underground work will shortly be resumed at the Drummond mine, and the main shaft is now being pumped out. During the summer a large force of men has been engaged in surface trenching, and a shaft is now being sunk at the southwest corner near the Silver Cross property. During the last few months the Drummond has been making large shipments of low-grade ore to Trout Mills.

Progress is being made on the Trethewey mill, and in a few days the concrete foundations will be finished. The mill will have thirty stamps, and will be able to handle about 80 tons a day. In order to connect it with the shafts, a small electric tramway will be built. This mine has a large tonnage of milling ore on the dumps.

At the 300-foot level of the Temiskaming mine good ore is still being obtained, the vein running from 6 to 12 inches in width of smaltite ore, carrying high values in native silver. A considerable amount of drifting has been done on this level, and a cross-cut is being run to cut some of the other veins. When the drift on No. 4 vein reaches the shaft, another winze will be sunk to the 300-foot level, and when this has been done the main shaft will also be sunk and connected up with the winze. The building for the crushing end of the new mill is completed, and it is expected that the machinery will be on hand and installed in a short time. Foundations for the concentrating end, distant about 300 feet from the shaft, are nearly finished.

Conditions at the Kerr Lake mine are steadily improving, and the amount of ore in sight has greatly increased in the last few months. So far veins Nos. 3 and 7 have been the principal producers, and the latter has been developed by a shaft to a depth of 190 feet, and the ore in the bottom of the work is as good as ever, and runs about 3,000 ounces to the ton. On the No. 3 vein the shaft is down 350 feet, and a winze is being sunk from the sixth level. The ore runs over 4,000 ounces to the ton. During the past month two new high-grade veins have been located underground, one of them at a depth of 160 feet. Two surface veins have also been recently located, and these both show values of over 1,000 ounces. When the winze from the sixth level is completed, it will be down 400 feet, and will be the deepest working in the camp. It is said that the cash on hand and ore in transit amounts to about \$800,000.

The trial of Angus McKelvie, vice-president of the Temiskaming & Hudson Bay Mining Co., held in North Bay on Sept. 4th, resulted in his being honourably acquitted. Mr. McKelvie was charged with having bribed John Piche to induce him to leave the country, so that his evidence in a suit brought by the Attorney-General's Department of Ontario against the T. & H. B., affecting their title, could not be given. Piche was one of the original discoverers of the Hudson Bay mine, and it was stated that at the time the claims were staked, a legitimate discovery such as was required by law, had not been made, and as a consequence application was made to the Attorney-General to have the company's rights to the property set aside. When the case came up, Piche, who was one of the principal witnesses, had disappeared. He was arrested on his return to New Liskeard a short time ago, and subsequently Mr. McKelvie was also arrested. The evidence showed that the money which passed between the two men was in settlement of a claim made by Piche against the Hudson Bay Co., and had nothing to do with the Attorney-General's suit.

The Station Grounds Mining Co. are diamond drilling under Cobalt Square in an effort to locate a vein which is supposed to be running east and west underneath that section of the town. The drill is operating from the Coniagas property, and will be in their territory for about fifty feet before it crosses the line.

A considerable amount of work is being done at the Victoria mine, and recent developments on a contact vein between the Keewatin and diabase at the 200-foot level have resulted in the discovery of niccolite with some silver values.

At the south end of Cross Lake a good deal of work is being accomplished on several of the properties there. The Eastern Township, formerly known as the Old Chap, is sinking on a big calcite vein. The shaft is down about 75 feet, and the work is being carried on with a small steam plant until compressed air can be obtained from one of the companies now coming into Cobalt. At the Silver Cross a new headframe is being put up, and when this has been completed the shaft will be timbered and sinking continued. A considerable amount of surface trenching is also being done. On the Belmont a force of men is prospecting the property, and a large calcite vein has been located. This has been cut by trenches in several places, and varies in width up to a foot. The Silver Lode Company are working with a small steam plant, and have a shaft down over 100 feet. When the 150-foot level is reached, cross-cuts will be started to explore the surrounding country.

The McKinley-Darragh will not rebuild the headframe at the Savage, which was destroyed by fire some time ago. The new shaft will be sunk another fifty feet, and from that point will be connected with the underground workings of the old shaft at the 75-foot level. At the last meeting of the directors held in Toronto it was decided to build a new office, laboratory and ore-house at the property.

The name of the Silver Cross Mining Co. has been changed to that of Silver Cross Mines, Ltd. Good progress is being made in sinking the new shaft at the Lumsden mine, which is situated close to the Rochester. Air to run two drills has been obtained from the Temiskaming, and as a consequence sinking is progressing much more rapidly. The shaft is down about 75 feet, and when the 100-foot level is reached a cross-cut will be run to cut the vein, which dipped from the shaft a short distance below the surface. After the vein has been tested sinking will be continued to the 200-foot level, and from this point the management expect to carry on a considerable amount of work. From the main shaft of the Pan Silver in the same locality a cross-cut is being driven under the lake, and some good indications have been discovered. At the Columbus mine a good deal of work is being done at the 250-foot level.

The Rochester mine has been shut down on account of there being no money with which to carry on the work. A plan for the reorganization of the company is already under way, and it is understood that the new capitalization will be two million dollars. Part of the extra million will be sold to raise sufficient money to carry on development.

At the Cobalt Central operations are under way to open up a new level. This work will be in the Huronian slates, the development of which has given such satisfactory results to the company. A short time ago about sixty men went out on strike, owing to dissatisfaction with the quality of the food provided by the company. The management expect to fill the places of the strikers in a few days.

Cobalt is suffering from an epidemic of typhoid fever, and at the present time there are over 100 cases in the hospital. The hospital is not large enough to accommodate the number of patients, and tents have been put up behind the hospital, and others will be put up on the Coniagas property in a few days. A good deal of blame is attached to the town authorities on account of the poor sanitary conditions existing in the town. About five per cent. of the population is down with fever.

Things are picking up in the Gowganda district, and the chances are that this fall and the coming winter will see a large increase in the amount of work being done. Several good discoveries have been made lately, which have been largely responsible lately for the optimistic tone now prevailing. A short time ago a new vein was found on the Mann property, and has been traced for 500 feet. It has also been traced for about 100 feet on the Boyd-Gordon. It will average about 4 inches in width, and carries a considerable quantity of native silver. Sinking has been stopped in the shaft while it is being timbered. On the Millen property, which adjoins the Mann, a 1-inch vein of very high-grade ore has been found. The Bartlett mines have the most up-to-date plant in the district, and their shaft is down about 115 feet. At the 100-foot level a cross-cut is being run to catch the vein, which dipped from the shaft at a depth of about 40 feet. At the Blackburn mine, which is said to be the best property in the whole of the Gowganda district, there is a tunnel in 125 feet on a 2-inch vein of high-grade ore. A shaft was sunk a short distance away from the vein, which it cut at the bottom at a depth of 80 feet. So far no drifting has been done from the shaft, as they have been bothered with water, and have been handling about 20,000 gallons a day with the bucket.

BRITISH COLUMBIA.

Rossland.—At the Le Roi mine the initial diamond drill work in the big development plan has been contracted for and work begun. The contract was let to O. L. Wright & Co., an energetic diamond drill contracting firm who have done much work in this district and the Boundary. No time will now be lost, and the work of opening the main vein at the Le Roi for another thousand feet will be energetically executed. It is likely that the work will entail the sinking of the main shaft a few hundred feet more. By doing this and some drifting it is thought better results could be obtained with the diamond drill on certain portions of the vein to be prospected. The probabilities are that this work will open up large quantities of gold ore similar to the lenticular deposit of \$100 ore taken out of the 1,650 level of the mine shortly before the shut-down. Mr. A. G. Larson, who has been superintendent of the Le Roi for some years, is in charge of the new work, and if application and a keen sense of the order of things underground have anything to do with it the present work will surely result favourably. The business end of Le Roi affairs here has been handled for the past several years by Mr. W. S. Rugh, who as office manager has got things about the mine down to an economical basis, and if it were not for the handicap that was placed on this mine in the extravagant days of the past, there is little doubt but that it would be working as a paying mine to-day, but as it is, the old mine not only has to pay its own way, but must give tribute to an incubus of debt fastened to it in days when the business was not as economically handled as it is to-day. The men who are interested here, however, look for brighter things in the future, as they do not think that Mr. Carlyle would have recommended the expenditure of a million dollars in developing the lower levels of the Le Roi unless the chances were very good for opening up large bodies of good ore.

There has been a change of management at the Le Roi 2, Ltd., Mr. Paul S. Couldrey, who has so ably managed the property for the last six years, leaving Rossland to take a position with the B. C. Copper Co., Ltd. Mr. Couldrey will be superintendent of the Mother Lode mine at Greenwood, and will no doubt do the same good work in that camp that he has done here with the Josie mine. While Mr. Couldrey has been in charge of the Le Roi 2, Ltd., the company has paid from four to eight shillings per share in dividends, having already paid four shillings during the present calendar year. Mr. Couldrey will be succeeded by Mr. Ernest Levy, a gentleman who has

been in charge of the work here at Rossland at one or two different times, and who, therefore, is not a stranger to the peculiar conditions attached to mining in this camp, nor is he a stranger to the Josie property and the methods of working it that have paid so well during late years. So, taking things as they look now, it is not likely there will be any radical change in the policy of the Le Roi 2, Ltd., at present, but that, with a few possible small changes, things will run along as they have for some time, at least.

Shipments from the Centre Star group keep up near the record mark for the year, and things are running along in an evenly balanced tenor. The mine is being run on an economical basis, mining, development and expansion being handled in a conservative yet aggressive manner by Mr. R. H. Stewart, the chief engineer, of the Consolidated M. & S. Co. of Canada. This company has recently acquired the Black Jack claim in Wellington camp, where the B. C. Copper Co. is opening up some new claims, and it is rumored that the Consolidated is behind the work being done on the No. 7 in Central camp, where the B. C. Copper Co. also has a good property with a lot of ore blocked out ready for shipment. A spur of the Canadian Pacific Railway will be run to tap these two camps in the near future, much of the preliminary work having already been done. The expansive policy of the Consolidated will assure a steady supply of ore for the Trail smelter and refinery, which is being gradually enlarged as the operations of the company increase.

Phoenix.—It is still anybody's guess how the shuffle of New Dominion Copper affairs will turn out, although it is practically assured a merger has been arranged, all but the final details. During the past week Mr. John Seward, of New York, arrived in the Boundary to take charge of the property of the New Dominion Copper Co. Mr. Seward expects to go over the ground carefully and consider just what policy can be adopted to place the property on a proper working basis. There is little doubt but that work will be resumed at the mines in a very short time, probably by the first of September, but it will likely be in the form of development for a short while, and the likelihood of the Boundary Falls smelter being blown in is small, although there is a possibility of the B. C. Copper Co. smelter having all it can do to handle the ore from its own mines, after the railway taps its Wellington and Central properties, so that the rumor that the New Dominion ore would be smelted at Greenwood may not mean that it will be smelted there permanently; that is, unless the hinted merger is consummated and the smelter at Greenwood is enlarged to take a greater tonnage. Of course, one of the furnaces is now being enlarged with a view to heavier operation, and it is no doubt the intention to enlarge the other two smelters in turn. One thing everyone here seems satisfied upon, and that is the mines will be worked, and that means progress for the district at large. What the details of the organization are will be of little moment so long as the mines and smelters are in operation and paying a profit.

A visit was paid to the property of the Dominion Copper Co. last week by B. W. Lincoln, of New York, who represents \$300,000 in stocks and bonds of dissenting shareholders in the old Dominion Copper Co. Mr. Lincoln says that his visit to the mines and to the coast is in connection with a plan he has in mind for obtaining from the new company certain rights which he thinks the old shareholders are entitled to.

The Snowshoe mine of the Consolidated broke another record for the week ending August 21st, shipping 4,430 tons to the smelter at Trail, B.C.

It is now authentically announced that the deal for the Nickel Plate mine of Hedley has been consummated. The Exploration Syndicate, behind which stand big Wall Street capitalists, has paid nearly one million dollars for the property. The property is now equipped with a 40-stamp mill and good mining equipment, but it is the intention of the new purchasers to augment both the milling and mining plants, and to work the property on a large scale. M. K. Rodgers, a local mining man of note, who has great faith in the Nickel Plate, and who was the one who brought this property to the attention of the late Marcus Daly, negotiated the sale. It is stated that Frank A. Ross, who has been acting as manager of the Nickel Plate for the past few years, will continue in that office under the new regime.

Nelson.—The hoodoo that follows the Silver King property at Nelson put in its appearance again the other day, when a fire destroyed the surface workings and part of the tramway, causing a cessation of work. It is too bad that the fire should occur at this time when things were just getting in good running order. This accident is almost enough to cause the lessees to wait until next spring before starting in again; although it is announced that the buildings will be renewed.

Another property has been acquired by J. S. Airheart, who is now successfully working the Highland-Buckeye property at Ainsworth. This recently acquired property is the United mine, which is situated not far from the Highland-Buckeye. The Highland mill is amply large enough, and will treat the ore from the United, as well as the others.

The air is full of the news of the acquirement of mining property in this district by capitalists from various parts of the country, and not only is the property changing hands, but work is being started. The large mines, which are the backbone of the district, are preparing for wider scope in the work of the near future, and are week after week breaking the preceding records of ore shipments for the year, so that it looks as though the next year or eighteen months, at least, would see a wonderful change in mining in this locality. Things may quieten a little this winter, but there is little doubt that next year will be a hummer, always provided we are bothered or hindered with strikes or car and fuel shortages, which is not likely, as conditions are fairly settled for a while anyway.

GENERAL MINING NEWS.

NOVA SCOTIA.

Amherst.—The Maritime Coal, Railway and Power Company, head-quarters at Montreal, with principal mine at Joggins, Cumberland County, N.S., completed the installation of an endless haulage system on Sept. 2nd. This is a great improvement in facilitating the raising of coal from the pit. The output of No. 7 slope has already been increased from 250 to 1,500 tons,

and the new haulage system will increase the mine output by six times the output under the old haulage. Senator Mitchell is president of the company. There is no sign of labor trouble at this colliery.

Sydney Mines.—The open-hearth furnaces of the N. S. Steel and Coal Company, which were closed for repairs during August, are now in commission once more.

Sydney, Aug. 28.—The Colonial Coal Company, which has re-opened the old Toronto mine at Little Bras D'Or, which has been closed down for over thirty years, announces that it will be shipping coal by the middle of September.

ONTARIO.

Cobalt.—A new vein was cut on the Foster recently, the second in three weeks. It is two inches wide and is mainly native silver.

Cobalt.—The Nova Scotia mill, it is estimated, will cost about \$100,000. It is claimed that, given a capacity of 75 tons per day, there is sufficient milling ore in sight to keep the mill running for four years.

Port Arthur.—The Dominion Bessemer Co., owning 6,000 acres of iron ore lands, 22 miles east of Port Arthur, and near Beck Siding on the C.P.R., is making arrangements for shipping ore. Mr. F. W. Goodrich is in charge of operations.

South Lorrain.—The first considerable shipment of high-grade ore from South Lorrain camp has just been completed. The Wettlaufer mine has just finished loading a car of firsts that will go by C. P. R. to Perth Amboy, from Mattawa and Prescott, the mine finding it to their advantage to ship down Lake Temiskaming and by C. P. R. rather than to Haileybury and over the T. & N. O. The car was of 50,900 pounds, and it is valued at \$25,959. The ore is stated to be 2,800 ounces. The ore was taken from the Wettlaufer in wagon for two and a half miles to 66, where it was put on scows and taken down the lake for transshipment to the C. P. R.

QUEBEC.

Quebec.—It is announced that the Provincial Government has determined to impose a royalty upon asbestos. What the new impost will amount to is not yet known.

Montreal.—The Amalgamated Asbestos Corporation, Limited, has decided to increase its rolling stock slightly. At the King Mine, Thetford Mines, and the British-Canadian Mines at Black Lake the rolling stock consists of eight locomotives and 220 cars. Two new saddle-tank locomotives have been ordered for the Beaver and Standard properties.

BRITISH COLUMBIA.

Hedley.—Under its new management the Nickel Plate mine is to be developed extensively. The mine has already yielded \$2,000,000 in gold.

Rossland.—On the Hattie Brown the project of diamond drilling has been temporarily abandoned, and, instead of doing this, cross-cuts are to be run from the bottom of the shaft in a northerly and southerly direction clear across the property for the purpose of tapping several ledges that run through the claim. The work of driving the cross-cuts will be let by contract.

The Le Roi Mining Co., Ltd., issued from its London office, on August 10th, the following notice to its shareholders: "The directors beg to inform the shareholders that the managing director has returned to British Columbia, and that the scheme of exploration and development outlined by W. A. Carlyle, the consulting engineer, is now being carried out at the mine. Any development of importance during the progress of this work will at once be communicated to the shareholders. Harold A. Wesson, secretary."

Rossland.—The Sappho group of five claims, two miles from Midway, has been bonded to the B. C. Copper Co. for \$20,000. The bond extends over 18 months.

Rossland.—Contracts for extensive diamond drilling on the Le Roi mine have been awarded to O. L. Knight & Co.

Hedley.—The Daly Reduction Company's mill and the Nickel Plate mine have been sold for a large figure. It is stated that J. J. Hill is interested in the transaction.

Silverton.—At the Vancouver mine the Van Roi Mining Co. are operating three shifts. In all, 70 men are employed. The concentrator will soon be working to full capacity.

Phoenix.—The Murex magnetic process is to be tried on the ores of the Vancouver mine at Silverton.

Fernie, Aug. 31.—A new town, to be called Carbondale, has been platted at a point on the railroad where the McGillivray Creek Coal & Coke Company are installing their plant, and houses will be built for the employees on easy terms by the Townsite Company.

Rumor has it that the entire output of this coal mine has been contracted for by one of the new transcontinental railroads.

This company's holdings represent a total of 2,600 acres of coal land, lying directly north of the Canadian Railway tracts. The property is estimated by engineers to contain a large tonnage of coal. The machinery is fast being installed by the McGillivray Creek people, and construction of coke ovens will begin early this autumn.

MINING NEWS OF THE WORLD.

GREAT BRITAIN.

The Scottish coal market was at least fairly active throughout the first three weeks of August. Complaints are coming in from coal miners, to the effect that they cannot obtain sufficient employment to enable them to earn the minimum day's wage, 6 shillings.

At a conference of labour delegates representing the twenty colliery districts of Mid-Lothian and Haddingtonshire, held on August 14th, at Dalkeith, Secretary Brown stated that securing the 6s. minimum wage was one of the greatest events in the

history of the Scottish coal trade. He declared that this was but a step towards securing a rate of 1 shilling per hour.

SOUTH AFRICA.

Under the supervision of Mr. R. B. Ballantine, the inventor and patentee of the process, the South African Cyanide Company is carrying on experimental work with a view to establishing a manufactory in Johannesburg. Mr. Ballantine's methods have been much criticized.

AUSTRALIA.

The production of coal in Australia for the year 1907 has just been published. The total tonnage was 9,681,095 tons, valued at £3,302,974. New South Wales was incomparably the largest producer. Its output was 8,657,924 tons. South Australia furnished no coal. The total exports amounted to 5,748,507 tons, valued at £2,662,218. In 1857, the average value of Australian coal was 11s. 10d. Rising in the following year to 15s., the price declined steadily, until in 1871 it stood at 7s. After various fluctuations, ranging from 5s. 4d. to 12s., the average price in 1907 settled at 6s. 3d., although the actual prices current in individual states varied greatly.

UNITED STATES.

According to the official figures of the Coalinga Oil Producers' Agency, California produced 5,100,000 barrels of oil during July; 477 producing wells contributed to this total. There were 112 well drilling, and 47 new rigs being erected.

Electric power is to be introduced into the mines of Butte, Montana. It is expected that this will bring costs of production down by one-third of a cent per pound. Fuel and supplies have to be hauled uphill for several miles at some of the mines. The saving in these instances will be marked.

Indiana coal production is looking up. The domestic demand is strong. Many of the mines are working full time.

At the Copper Queen, Bisbee, Arizona, a new precipitating plant has been erected. Wooden pegs have been substituted for nails. Nails were used in the former outfit, but their corrosion caused the collapse of the plant. The plant is designed for the recovery of copper from the mine waters by precipitation by scrap iron.

Company Notes.

On September 1st the directors of the Dominion Iron & Steel Company declared a dividend of 7 per cent. on the preferred stock. This is payable October 1st. President Plummer pointed out that this was to be paid out of earnings, as no final settlement had yet been reached with the Dominion Coal Company. There still remains 28 per cent. due on the preferred stock.

KERR LAKE AUGUST REPORT.

The report of the Kerr Lake Mining Company shows its financial condition as of August 25 is as follows: Cash on hand, \$380,600; 95 per cent. of estimated value of silver contents for shipment of ore delivered but not settled for, 331,579 ounces; 95 per cent. of estimated contents of shipment of ore in transit, on hand, 20,000 pounds at 2,000 ounces to 336,500 ounces; 97 per cent. of vein 7 ore ton 19,000 ounces; vein 3 ore on hand, 20,000 pounds, 3,000 ounces, 28,500 ounces; total, 715,579 ounces, at 50 cents, \$637,780; totala, \$728,479.

A statement issued by the Empire Zinc Company, of Denver, Co., shows that of 38 cars of Lucky Jim (Kaslo, B.C.) ore shipped to that company's plant, the lowest value per ton was \$26.56 and the highest \$32.33.

The highest total value of the ore per car was \$1,407.13 and the lowest was \$778.73.

The highest amount of freight per car was \$391.60, and the lowest \$264.

The highest amount received by the mining company per car was \$1,014.65, and the lowest \$514.73.

The net value of the 38 cars was \$25,152.11, and the average value per car was \$635.58.

STATISTICS AND RETURNS.

The official estimate of the Dominion Coal Company's output for Saturday is 9,061 tons, made up of 6,073 tons from the mines, and 2,988 tons from the banking stations.

COBALT ORE SHIPMENTS.

There were eight shippers among the Cobalt mines last week, but the figures are not as lucid as they might be, one shipment of 636,410 pounds of ore being credited to the Carnegie Company, a smelting company in Pennsylvania, to whom the ore was sent instead of to the mine producing the ore. Shipments for the week and year (in pounds of ore) are:—

	Week Aug. 30.	Year to date.
Buffalo		791,028
Carnegie	63,410	63,410
Chambers-Ferland		961,010
City of Cobalt		1,002,522
Cobalt Central		558,344
Cobalt Lake		79,960
Coniagas		1,043,315
Crown Reserve	124,000	4,182,719
Drummond		920,000
Kerr Lake		1,422,026
King Edward		183,740
La Rose	193,020	8,374,233
McKinley	40,980	1,278,536
Nipissing	255,170	8,841,763

Nancy Helen		83,400
Nova Scotia		380,810
O'Brien	129,640	1,759,402
Peterson Lake		281,110
Right of Way	60,310	2,134,891
Silver Queen		598,395
Silver Cliff		123,820
Temiskaming		2,046,060
Trethewey	66,000	1,362,698
Temiskaming & Hudson Bay		1,106,260
Muggsley Consolidated		72,900

COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending September 4, and those from January 1, 1909, to date:—

	Since Sept. 4. Ore in lbs.	Jan. 1. Ore in lbs.
Buffalo	41,640	832,668
Carnegie		63,410
Chambers-Ferland		961,010
City of Cobalt	40,000	1,042,522
Cobalt Central		558,784
Cobalt Lake		79,960
Coniagas	110,170	1,153,485
Crown Reserve	60,730	4,243,449

Drummond	920,000
Kerr Lake 60,130	1,482,156
King Edward	183,740
La Rose 390,500	8,764,733
McKinley-Darragh 104,760	1,383,296
Nipissing 458,480	9,291,243
Nova Scotia	480,810
Nancy Helen	83,400
Peterson Lake 42,930	324,040
O'Brien 71,700	1,831,102
Right of Way	2,154,891
Silver Queen	598,395
Silver Cliff	123,820
Temiskaming	1,506,060
Trethewey	1,362,698
Temiskaming & Hudson Bay	1,106,260
Muggley Consolidated	72,900

Ore shipments to Sept. 4 from Jan. 1 are 40,604,832 pounds, or 20,302 tons. Total shipments for week ending Sept. 4 are 1,381,040 pounds, or 690 tons.

BRITISH COLUMBIA ORE SHIPMENTS.

Nelson, Aug. 21.—Appended are the ore shipments and smelter receipts in detail for the past week and year to date:—

Ore Shipments.

Boundary—	Week.	Year.
Granby	19,592	624,731
Snowshoe	3,583	82,226
Mother Lode	6,840	155,396
Other mines		2,122
Total	20,015	864,465
Rossland—		
Centre Star	3,731	111,807
Le Roi No. 2	712	19,863
Le Roi No. 2 (milled)	260	19,863
Other mines		9,561
Total	4,703	139,651
Slocan-Kootenay—		
Queen (milled)	420	13,650
Granite Poorman (milled)	250	8,100
Whitewater Deep (milled)	700	22,900
Kootenay Belle (milled)	70	2,280
Second Relief (milled)	145	4,715
Nugget (milled)	110	3,580
Bluebell (milled)	900	29,300
St. Eugene	252	13,731
Silver King	229	2,521
Van Roi	83	514
Bluebell	55	3,177
Second Relief	19	239
Wellington	9	29
Eastmount	24	24
Ferguson	67	98
Emerald (Iron Mt.)	36	36
Whitewater	21	756
Northern Light	3	3
Yankee Girl	69	1,364
Other mines		12,576
Total	3,462	119,593

The total shipments for the week were 38,180 tons, and for the year to date 1,133,709 tons.

Smelter Receipts.

	Week.	Year.
Granby, Grand Forks	19,592	625,181
Consolidated, Trail	8,949	248,246
B. C. Copper Co., Greenwood	6,840	156,879
Le Roi, Northport		12,761
Total	35,381	1,043,067

BRITISH COLUMBIA ORE SHIPMENTS.

Nelson, Aug. 28.—The ore shipments and smelter receipts for the past week were about average of the year to date. The details follow:—

Ore Shipments.

Boundary—	Week.	Year.
Granby	18,688	643,419
Snowshoe	3,729	85,955
Mother Lode	7,182	162,578
Other mines		2,122
Total	29,599	894,064
Rossland—		
Centre Star	3,183	114,990
Le Roi No. 2	891	20,754
Le Roi No. 2 (milled)	260	8,680
Other mines		9,561
Slocan-Kootenay—		
Queen (milled)	420	1,470
Total	4,334	153,985
Granite Poorman (milled)	250	8,350
Whitewater Deep (milled)	700	23,600
Kootenay Belle (milled)	70	2,350
Second Relief (milled)	145	4,660
Nugget (milled)	110	3,690
Blue Bell	900	30,200
St. Eugene	356	14,087
Bluebell	45	3,322
Queen	47	439
North Star	204	1,130
Rambler-Cariboo	61	600
Yankee Girl	105	1,469
Emerald	45	698
Whitewater	21	777
Cord	17	237
Granite-Poorman	37	325
Other mines		12,922
Total	3,533	123,126

The total shipments for the week were 37,666 tons, and for the year to date, 1,171,175 tons.

Smelter Receipts.

	Week.	Year.
Granby, Grand Forks	18,688	642,869
Consolidated, Trail	8,741	256,987
B. C. Copper Co., Greenwood	7,182	164,061
Le Roi, Northport		12,761
Total	34,611	1,077,678

The total output of gold from Rhodesia for the month of July is cabled as 53,511 ozs., valued at £225,234, as against 51,78 ozs., valued at £217,600, in the previous month. This is an increase on the month of £7,634. There were 225 gold producers last month. The output of other minerals for last month was: Silver, 23,341 ozs.; lead, 92 tons; coal, 15,113 tons; copper, 7 tons; chrome ore, 2,240 tons, asbestos, 25 tons.

PIG IRON PRODUCTION.

Ten-year totals (tons of 2,240 lbs.):—

1868-77	19,984,735
1878-87	42,484,217
1888-97	82,236,958
1898-07	181,470,757

Annual totals:—

1901	15,878,354
1902	17,821,307
1903	18,009,252
1904	16,497,033
1905	22,992,380
1906	25,307,191
1907	25,781,361
1908	15,936,018

Annual rate during

First half, 1908	13,850,000
Second half, 1908	17,900,000
January, 1909	21,508,000
February	22,600,000
March	21,963,000
April	21,500,000
May	22,518,000
June	23,835,000
July	25,087,000
Prospect for 1909, continuing July rate	23,670,000

METAL STATISTICS.

The statistics formerly compiled by the Metallurgische Gesellschaft, of Frankfort-on-Main, now issued jointly by the Bergwerks and Metallbank and the Metallgesellschaft, give the world's output of the four leading metals for the last three years, as follows, in metric tons:—

	1906.	1907.	1908.
Lead	973,100	984,300	1,052,500
Copper	717,800	703,000	738,900
Spelter	702,000	738,400	722,100
Tin	98,800	97,700	106,500

In all cases the output shows steady growth, which is most pronounced in the case of copper, and least so in that of lead, the average yearly increase during the past decade having been as follows: Lead, 2.7 per cent.; copper, 4.5 per cent.; spelter, 4 per cent.; and tin, 3.9 per cent.

A very interesting summary of consumption is included in the statistics, the countries dealt with being Germany, Great Britain, France, and the United States, and from this the following details are abstracted, the figures representing metric tons and applying to the year 1908:—

	Lead.
United States	321,000
Germany	211,300
United Kingdom	228,800
France	103,000
	Copper.
United States	210,600
Germany	180,700
United Kingdom	128,900
France	73,900
	Spelter.
United States	188,300
Germany	180,200
United Kingdom	138,500
France	78,000

Tin.

United States	32,800
Germany	16,700
United Kingdom	19,000
France	7,600

The outstanding feature of the returns is the enormous preponderance of the United States as a consuming country and the comparative insignificance of France.

TORONTO MARKETS.

Metals.

Sept. 8.—(Quotations from Canada Metal Co., Toronto.)

- Spelter, 5½ to 5¾ cents per lb.
- Lead, 3.40 to 3.50 cents per lb.
- Antimony, 8 to 9 cents per lb.
- Tin, 32 cents per lb.
- Copper, casting, 13¾ cents per lb.
- Electrolytic, 13.75 cents per lb.
- Ingot brass, 9 to 12 cents per lb.

Sept. 8.—Pig Iron.—(Quotations from Drummond, McCall Co.)

- Summerlee, No. 1, \$23 (f.o.b. Toronto).
- Summerlee, No. 2, \$22.50 (f.o.b. Toronto).
- Midland, No. 1, \$21 (f.o.b. Toronto).
- Coal—Anthracite, \$5.50 to \$6.75.
- Bituminous, \$3.50 to \$4.50 for 1¼-inch lump.

Coke.

- Sept. 3.—Connellsville coke, f.o.b. ovens:—
- Furnace coke, prompt, \$1.90 to \$2.00 per ton.
- Foundry coke, prompt, \$2.15 to \$2.40 per ton.
- Sept. 3.—Tin (Straits), 30.45 cents.
- Copper, prime Lake, 13.00 to 13.10 cents.
- Electrolytic copper, 12.90 to 13.00 cents.
- Copper wire, 15.00 cents.
- Lead, 4.37½ to 4.40 cents.
- Spelter, 5.70 to 5.80 cents.
- Sheet zinc, 8.00 cents.
- Antimony, Cookson's, 8.50 to 8.62½ cents.
- Aluminium, 23.00 to 24.00 cents.
- Nickel, 40.00 to 47.00 cents.
- Platinum, \$24.50 to \$28.25 per oz.
- Bismuth, \$1.75 per lb.
- Quicksilver, \$43.00 to \$43.50 per 75-lb. flask.

SILVER PRICES.

	New York.	London.
	Cents.	Pence.
August 19	50⅞	23 7-16
" 20	51	23½
" 21	51	23½
" 23	51	23½
" 24	51⅞	23 9-16
" 25	51¼	23⅝
" 26	51⅞	23 13-16
" 27	51⅞	23 13-16
" 28	51½	23¾
" 30	51¾	23⅞
" 31	52	24
September 1	51¾	23⅞
" 2	51¾	23⅞
" 3	51½	23¾