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The Canadian Mining Journal

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CIRCULATION.

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CONTENTS.

AMALGAMATED ASBESTOS.

Destructive criticism of established industries is no part of our aim. When, about eighteen months ago, the Amalgamated Asbestos Corporation, Limited, was organized with a total capitalization of $25,000,000, the CANADIAN MINING JOURNAL drew immediate attention to certain unhealthy features. Amongst the points that we dwelt upon were the overcapitalization of the company, and the extravagant nature of the statements made by the promoters. Our criticisms were not well received. Several newspapers were loud in their counter cries. These same newspapers are now equally loud in their condemnation of the action of the Amalgamated in passing the last dividend and in issuing a future call upon the underwriters of the bond issue. Violent communications are appearing almost daily in columns that were once devoted to exploiting the merits of the whole scheme.

Now we have no intention of adding our voice to the chorus of the discontented. In fact our advice to them is to sit tight and look squarely at conditions as they are. Nothing can be gained and very much may be lost by disturbing the peace now. The reasons are apparent.

In the first place, whilst it is admitted that Amalgamated Asbestos has been over-financed, there is no question that physically the properties are in much better shape than ever before. Economies large and small have been effected. Mechanical equipment has been enlarged and improved. Mill products have been standardized, and every effort is being made to extend the market. We believe, also that in general the administration has been rendered much more efficient and much less expensive.

However painful to the shareholder may be the absence of a dividend, we are firmly convinced that payment of that dividend would be exceedingly bad business. In the early stages of any such huge enterprise it is unwise to begin disbursements. The Amalgamated is not yet two years old. For some time yet all earnings should be returned to the mines and plants.

While we do not for a moment wish to pose as an apologist of the promoters, yet we must say that we feel no sympathy whatever for those who are trying to block the present management in its attempt to make the best of a difficult situation, a situation created in part by the highly-coloured representations of a specialist who was an accredited officer of the Federal Mines Branch.

The future of Amalgamated Asbestos depends altogether upon close and efficient management and upon unremitting attention to the development of the market. We see no reason why that market cannot be greatly enlarged. But the process of securing new consumers

is long and costly. Hence shareholders should be content to dispense with dividends until such time as they can be paid without injury to the business.

The present condition of the market has been induced by the unwise desire to make a fine showing. Over-production has adversely affected prices. It is certainly not yet possible to market the present outputs. How soon it will be possible is a matter of conjecture. And this is the crux of the whole question. Over-production is a costly expedient. It is not worth while. The time has come to lend every energy to mining, milling, and marketing. Of these three the last named is, just now, by far the most important.

Greatly overdone as has been the amalgamation of Canadian enterprises, it is wrong to condemn sweepingly the principle of consolidation. Consolidation without the injection of superfluous water brings many and decided advantages, especially in such an industry as asbestos mining. Amalgamated Asbestos had more than a fair injection. But the water is there and must remain there until removed by catastrophe or by gentle evaporation. The latter method is to be preferred.

THE NINETEENTH ANNUAL REPORT OF THE ONTARIO BUREAU OF MINES.

Part I. of the Nineteenth Annual Report of the Ontario Bureau of Mines has just come to hand. It contains the usual exhaustive and clear statistical review from the pen of Mr. T. W. Gibson, Deputy Minister of Mines. Mr. E. T. Corkill, Inspector of Mines, reports upon and analyses in close detail the mining accidents that occurred during 1909. Mr. Corkill also reviews the mining operations of the year and the development of water powers in mining districts.

The Kent gas field is the subject of a short paper by Mr. G. R. Mickle, Mine Assessor. Mr. G. C. Mackenzie continues his valuable researches in the concentration of iron ores. His present contribution "Concentration of Low Grade Magnetites," contains several exceedingly useful treatment determinations on Ontario ores. Mr. Mackenzie's general conclusion is that the process of magnetic separation is well worthy of serious and immediate consideration by operators in this province. This conclusion is based upon continuous and systematic investigations covering several years.

Dr. E. S. Moore writes of the Lake Savant iron range area. Although no rich ore has been encountered here as yet, Dr. Moore expresses the opinion that the range is worth prospecting.

"Nepheline Syenites of Port Coldwell" is the title of the concluding paper, of which Mr. H. L. Kerr is the author. This is an academic dissertation upon the petrographic characteristics and the geologic associations of the above mentioned rocks.

The Nineteenth Annual Report is profusely illustrated and is accompanied by three coloured geological maps, —respectively, of Lake Savant Iron Range, District of Thunder Bay, and Porcupine Gold Area—and one map profile from Toronto to the Archean-Palaeozoic boundary on the Hudson Bay slope. Along with the Porcupine map are several detail maps.

Our readers will welcome the announcement that Part II. of the Annual Report, which will appear later, is to consist of a revision of Dr. W. G. Miller's classic Report on the Silver Regions of Northern Ontario. This will not only be brought up to date, but will also be much more comprehensive than before. South Lorrain, Montreal River, and Gowganda will be dealt with in addition to Cobalt.

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In several respects we notice improvements in the Ontario Report. The illustrations are well chosen and more numerous than heretofore. The statistical tabular statements are more complete. Particularly is this the case in Mr. Corkill's painstaking summary of mining accidents. The review of mining is creditably complete considering that this work also falls upon Inspector Corkill's shoulders. In fact, the whole volume is instructive. But we must once again express our conviction that it is foolish and futile to throw the inspectoral work of the whole of Ontario upon one individual.

There is no room to doubt the past and present need of more rigid inspection. It is a physical impossibility for one man to cover Ontario adequately. It is also most unjust to expect any faithful and competent officer, —and both of these adjectives apply to the present inspector— to cover, in detail, a field like Ontario. The province can well afford to appoint a staff of paid assistants for the work.

MINING ACCIDENTS IN ONTARIO DURING 1910.

The Ontario Bureau of Mines Report for 1910, referred to generally in another column, deals more thoroughly than usual with mining accidents.

We note in reading the inspector's report that 34.7 per cent. of the fatalities are classified as resulting from accidents due to danger inherent to the work itself; 10.2 per cent. from accidents caused by defects in the mine workings; 8.2 per cent. from accidents through fault of fellow workmen; 40.8 per cent. due to accidents through fault of injured persons. The remaining fatalities, 6.1 per cent., are not susceptible of classification.

According to this analysis, at least 59.2 per cent. of the fatalities that occurred during 1909 were preventible. In other words they were due to carelessness on the part of workmen, or to negligence on the part of operators. But the latter is not seldom a contributory cause. And whilst it is impossible to prevent carelessness altogether, it should be quite practicable to reduce it to a minimum. It is not appropriate here to discuss the proportion of blame that falls upon the operators. But we can assert without fear of contradiction that accidents would have been fewer had the operators done their whole duty.

During 1909, Ontario's mining industry grew notably. It is growing every day. Much new territory is being opened. Hence the newer districts are dotted with numerous small workings. Inspection of these is difficult, but absolutely necessary. And regular inspection of all established mines is equally essential. A toll of 49 lives is too large. The annual expenditure of a few thousand dollars in salaries for assistant-inspectors would be amply justified if but two or three lives were saved; but it is probable that the decrease in fatalities would be larger than this.

Nothing but praise is due the work being done at present. The potent truth is that there should be provision made for ten times more of it. This is not the first time, nor shall it be the last time, that we shall refer to this question. We hope that when next we touch upon it, however, it will be to congratulate the Government of Ontario on augmenting its absurdly small appropriation for the inspection of mines.

COAL MINING IN ALBERTA DURING 1909.

Somewhat belated is the Annual Report of the Coal Mines Branch of Alberta. Nevertheless it is highly interesting.

According to figures here presented the output of coal in 1909 was 2,174,329 tons, an increase of 17.85 per cent. over 1908. This increase would have been still larger had not three-quarters of the production been shut off for three months owing to strikes.

Since 1905, Alberta's output has multiplied by three. There are now 121 operating mines, of which 32 were opened during 1909. During that year, also, eight mines were abandoned.

The quantities of lignite, bituminous, and anthracite mined during the past year were respectively, 763,673 tons; 1,197,399 tons; and 213,257 tons. The production of coke was 87,812 tons; and the production of briquettes, 89,785 tons.

The average number of persons employed underground was 3,893; whilst the average number employed overground was 1,314. The total fatalities numbered nine, two overground and seven underground. It is pleasing to note that the number of fatalities is smaller than ever before in proportion to the number of tons of coal mined. In 1908, there was one fatal accident for each quantity of 167,721 tons mined. During the past year 241,592 tons were mined for each life lost. This improvement is directly attributable to the installation of safety lamps and to the use of permitted explosives.

The Report includes a record of additions and improvements to existing plants, and brief notes regarding new ventures. It also presents a useful directory of operating companies. The concluding pages give the examination papers for managers', fire-bosses'. and pit-bosses' certificates.

EDITORIAL NOTES.

The Commonwealth of Australia is providing for a note issue of £7,000,000. Against this issue a gold reserve of 25 per cent. is to be maintained. Issues beyond the sum mentioned must carry a gold reserve of 100 per cent.

The Montreal Herald, for October 1st, contains a most readable account of the Timmins mine, Porcupine. Mr. Alex. Gray is the author.

Mr. F. A. Sundt, professor of metallurgy, University of Chile, Santiago, is the author of an exhaustive monograph on mining and metallurgy in Chile. Mining engineers who can construe Spanish will find this monograph most instructive.

Mining and Scientific Press makes the suggestion that mining engineers follow the example of doctors and develop a system of small fees for office consultations. Difficulties beset any such attempts. Yet we are persuaded that in the hands of decent professional men, some such idea could be realized. Once put into practice it would eliminate the importunate questioners who are forever seeking free advice.

In the opinion of Mr. George E. Collins, expressed in a lecture delivered at the Colorado School of Mines, the virtual abandonment of contract work in Gilpin County mining resulted in a marked decrease in the average efficiency of labour, and a corresponding increase in the cost of mining. The advance in daily wages, and the increase in cost of living, have affected mining costs relatively little.

Next year's meeting of the International Geological Congress is to be held in Canada. The Dominion Government, and the Canadian Mining Institute have joined in extending invitations. Would it not be seemly for Nova Scotia, Quebec and British Columbia to go and do likewise.

A correspondent informs us that the mineral exhibit at the St. John (N.B.), Exposition was in no sense representative. It appears that the provincial government could not see its way clear to spend a respectable amount upon the exhibit. Until this unprogressive attitude is changed, New Brunswick, despite her known mineral potentialities, will remain dormant.

Our Prince Rupert, (B.C.), exchanges show the same symptoms that broke out in Toronto papers when Cobalt was young. Shrieking brokers' advertisements of mining shares are making their appearance. We deprecate these yellow spots.

The extent to which taxation of industrial concerns is carried in Germany is indicated in a recent consular

report. In one instance quoted, an iron manufacturing company pays 33 per cent. of its dividend (formerly paid entirely to its shareholders) to the government. Nineteen per cent. the government devotes to sickness—accident—and invalid-insurance. The remaining 14 per cent. is paid as government taxes. In the case of the Krupp Company, a sum equal to 93 per cent. of its dividend is appropriated by the government. We wonder how this system would work in Canada!

The British Columbia mineral exhibit, now being displayed at Spokane, is probably to be made a permanent feature. This will do away with the constant loss of money, effort, and material that ensues when the collection has to be gathered afresh as occasion requires.

CANADIAN MINING INSTITUTE.

Election of Officers and Council, 1911.

The attention of members is called to Section 32 of the by-laws, which reads as follows:

32. "Not later than the 1st of November of each year the secretary shall notify all members of offices falling vacant at the end of the next annual meeting, and call for nominations to such offices. The list of such nominations shall close on January 1st following. All nominations for offices shall bear the signatures of not less than ten members in good standing. In the event of the secretary failing to receive nominations for all vacant offices, the council shall complete the list."

Pursuant to the above, notice is hereby given that offices as under will fall vacant at the end of the next annual meeting, March, 1911, and nominations for the same will be received by the undersigned from November 1st, 1910, to January 1st, 1911, inclusive:

President, vice-presidents (2), councillors (10).

The retiring officers are:

President—

Dr. Frank D. Adams, Montreal, Que.

Vice-Presidents—

Dr. A. E. Barlow, Montreal, Que.

Mr. J. Obalski, Montreal, Que.

Councillors—

Mr. R. W. Brock, Ottawa, Ont.
Mr. J. Stevenson Brown, Montreal, Que.
Mr. Thos. Cantley, New Glasgow, N.S.
Mr. Arthur A. Cole, Cobalt, Ont.
Mr. C. J. Coll, Stellarton, N.S.
Mr. John Donnelly, Kingston, Ont.
Mr. H. E. T. Haultain, Toronto, Ont.
Dr. Milton L. Hersey, Montreal, Que.
Dr. J. B. Porter, Montreal, Que.
Mr. J. B. Tyrrell, Toronto, Que.

(N.B.—All or any of the retiring officers or councillors are eligible for re-election.)

The following gentlemen will continue to serve on the council for the year 1911:

Vice-Presidents—

Mr. A. B. W. Hodges, Lima, Peru.
Mr. R. W. Leonard, St. Catharines, Ont.

Councillors—

Mr. Selwyn G. Blaiock, Moyie, B.C.
Mr. R. W. Brigstocke, Naughton, Ont.
Mr. Robt. A. Bryce, Cobalt, Ont.
Mr. John A. Dresser, Ottawa, Ont.
Mr. Chas. Fergie, Montreal, Que.
Mr. R. T. Hopper, Montreal, Que.
Mr. G. G. S. Lindsey, Toronto, Ont.
Mr. James McEvoy, Toronto, Ont.
Mr. J. J. Penhale, Sherbrooke, Que.
Mr. O. E. S. Whiteside, Coleman, Alta.

Including the past-presidents, who are ex-officio members of the council, it will be noted that representation by provinces, according to the above list of officers and council already elected to serve for the year 1911, will be as follows:

Quebec, 4; Ontario, 7; British Columbia, 3; Nova Scotia, 0; Alberta, 1.

The retiring officers and councillors represent:

Quebec, 6; Ontario, 5; British Columbia, 0; Nova Scotia, 2; Alberta, 0.

H. Mortimer Lamb,
Secretary.

Secretary's Office,
Rooms 3 and 5, Windsor Hotel,
Montreal, Que.
September 15th, 1910.

PORTLAND CANAL DISTRICT, BRITISH COLUMBIA.

Mr. R. G. McConnell, of the Geological Survey Branch of the Canada Department of Mines, has returned to Ottawa after having spent the field-work season of 1910 in making investigations in the Portland Canal district of British Columbia. Included in his party were an assistant geologist and a topographer, and much data was obtained for use in preparing topographical and geological maps of the area examined.

Interviewed when passing through Vancouver, B.C., at the end of September, Mr. McConnell was reported to have said:

"There is not a very large area of mineralization in the Portland Canal district, but it is yet a little premature to pass any final opinion respecting the possibilities of mining there. With only two noteworthy exceptions, most of the work done has been of a superficial character. Owners of claims have been chiefly occupied during the past season in cutting out roads and trails, prospecting the surface of their ground, and getting in supplies for the ensuing winter's operations. This preliminary work in a new camp is inevitable.

"I visited various camps and saw some promising prospects. Conditions in the Salmon River district, farther inland, are much the same as in the Portland Canal country. At Salmon River I also saw a number of good showings, but no orebody has yet been outlined or proved up. The value is principally in gold, silver, and lead. I was shown some fine specimens of gold ore, which, according to report, had been found this season across the divide, in Nass River district.

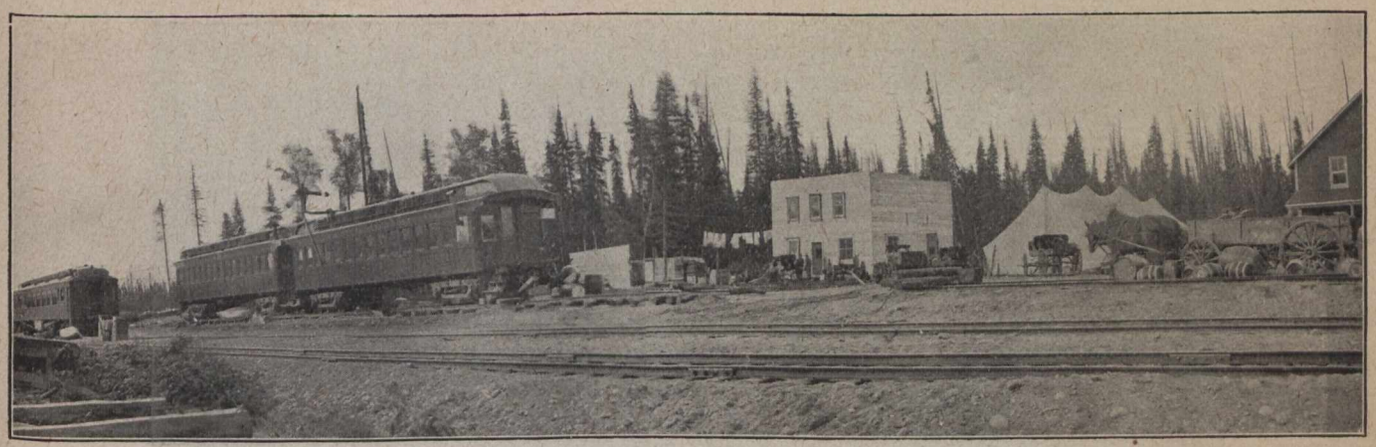
"It was unfortunate that sensational and untruthful reports about the discovery of rich free-milling gold ores on Bitter Creek, were sent broadcast last June. Such practices should be severely condemned, as they tend to injure the real merits of the country. As a matter of fact, the existence of free-milling ore on Bitter Creek has not yet been established. It is true that specimens of free gold in small quantities were found in one or two spots. Similar exaggeration took place concerning the so-called gold placers on Bitter Creek, which has been staked from end to end. If the gold is there, nobody has yet tried to get it out."

All commercial cyanide contains more or less sodium cyanide, and so-called 125 per cent. cyanide is the nearly pure sodium compound.

THE PORCUPINE TRAIL

Written for the Canadian Mining Journal by Reginald E. Hore, Houghton, Mich.

Porcupine, Ontario's newest gold camp, is 130 miles north of Sudbury and on the edge of the great clay belt. A line drawn from the mouth of Moose River, James Bay, to the mouth of the Whitefish River, Lake Huron, passes through Porcupine 200 miles from the former and 170 from the latter point.



Kelso. Mileage 222, T. & N. O. Ry. The Jumping Off Place for Porcupine.

In summer the camp is reached 43 hours after leaving Toronto on the Cobalt Special. From Cobalt to Porcupine takes 25 hours. Daily trains with Pullman service pass at Kelso, within 25 miles of Porcupine Lake, and the balance of the journey is made by stage, motor boat, canoes and afoot.

Leaving Cobalt in mid-afternoon, and stopping at Englehart for supper, you reach Kelso in the early evening, having opportunity on the way to note the extensive improvements in the Northern Ontario hinterland. The rugged scenery of the pre-Cambrian formations at Temagami and Cobalt is succeeded near Haileybury by gently sloping fields underlain by Niagara limestone. To and beyond Englehart numerous farms have been cleared and cultivated, with results that promise well for the country's future. Further north there is another stretch of rocky country, which extends eastward to Larder Lake and Quebec. Then follow clay and sand flats covered with spruce, jackpine and poplar. Beyond Kelso the steel extends across broad muskegs to Cochrane and the Transcontinental Railway, 147 miles north of Cobalt.

On The Kelso Road. Showing Old Trestle Built by Tie Contractors and Now Used as Highway Bridge.

At Kelso you must jump off in the gravel ballasting,

for no platform has yet been built, and an old day coach on the siding is the station house. Fortunately, however, hotels have been built within a few paces of the rails, and here you will find a good meal and a clean bed.

The Kelso Road.

The regular stages leave Kelso for Frederick House River at 7 a.m. It is customary to occupy your seat and start with the stage, but you soon have occasion to become more intimately acquainted with the famous clay belt. The road is over remarkably level forest-clad country. The first few miles is clay, then follows a few miles of sand and a second long stretch of clay which extends to the lake. The clay is covered by only a few inches of vegetable mould, and being very poorly drained, can hardly be expected to afford a good road-bed except in very dry weather. The sand has even less cover, but is fortunately comparatively hard, and makes a good natural road. Unfortunately there is an absence of such glacial moraines as in many localities afford a supply of gravel. The clay and sand are remarkably uniform in composition, having been well sorted by and laid down in water, probably in the glacial Lake Ojibway.

Thick forest covers both clay and sand areas. The trees are small, mostly under 12 inches. Black spruce and jack pine are the most abundant conifers, though balsam, fir and cedar are plentiful in some localities. The latter, owing to lack of milled lumber, is in great demand at the camps. Poplar and white birch are conspicuous, and stand out distinctly from the dark evergreens. The largest trees, few of them over 18 inches, are the poplars.

During the construction of the T. & N. O. Railway this section was cut over for ties, and, indeed, the present highway follows, for some distance, the old road into the tie camps. A relic of the construction days is the narrow gauge tramway trestle, one-half mile west of Kelso, and which some of the teamsters now drive over rather than descend into the little valley.

On the Kelso Road—The Stage on a Newly Laid Corduroy.

Golden City. Looking Down the Main Street to Porcupine Lake.

A large portion of the country traversed by the Kelso road was burned over a few years ago. The fire was naturally more disastrous on the dry sand plain, which now presents with its blackened sticks, a very desolate appearance. The first disagreeable impression is soon dissipated, however, when you find that large patches of the ground are covered with prolific blueberry bushes.

It is two hours' journey westward along the forest-

walled road to the shore of Frederick House Lake—a sheet of muddy water lying in a shallow clay basin about twenty square miles in extent. A good natural road is furnished by the artificially exposed lake bottom, and the edge of the water is followed for about 3 miles to Crawford's Landing, at the head of the lake.

Frederick House to Hill's Landing

The stage line ends at Crawford's, and the river is ascended in gasoline launches. A run of eight miles southward is made on this gently-flowing stream, then the northwest arm of Night Hawk Lake is crossed and you ascend the Porcupine River to Hill's Landing, which is reached two hours after leaving Crawford's. To accommodate the passenger traffic there are three covered launches. Freight is carried in flat-bottomed pointers. Passengers from Kelso to Hill's are charged $3.50, and the freight rate is $1.25 per cwt.

Hill's to Porcupine.

From Hill's to Porcupine, traveller and freight go by different routes. The former gets a good dinner at the Landing and proceeds afoot, while the latter is taken up the river.

The river route is very circuitous and about 28 miles in length. The freight is taken on the motor boats to the first portage about one-half mile above Hill's; but for the balance of the trip canoes are used almost exclusively. With an average load, 1,100 pounds, in the 18-foot canoe, the trip up is made in 10 to 12 hours. The down trip takes three or four hours less. The freight rate from Hill's to Porcupine is $1.50 per cwt.

The trail from Hill's to Porcupine is about 7 1-2 miles; but fortunately, for the walking is bad, two lakes are crossed on the way, and the walk thereby shortened to about six miles.

Timmins-McMartin Mine, Porcupine. Looking East. At Right is Hollinger Dome of White Quartz

Timmins-McMartin Mine, Porcupine. The "Shake" Cover has just been put on Shaft

The first three miles to Three Nations Lake is now best made over the new government wagon road. At present it differs from the Kelso road chiefly by being uniformly bad all the way, for it is all clay, and the clay is wet. Further west a more sandy plain will be crossed, and then the two roads will be about on a par. It is unfortunate that the roads are in such condition, but little else can be expected from such materials as are immediately available.

Mine Roads

To take in supplies from Porcupine, the mine operators have cut roads across the spruce covered clay flats, and have thereby demonstrated very clearly some difficulties of transportation in the clay belt. When first cut out the roadway looks promising enough, with no steep grades to be negotiated and no muskegs to cross. After a little use and a few heavy showers, however, it is evident that the ordinary ungraded bush road cannot be relied upon even for occasional service. Once wet, the roads never become dry and firm again, and the effect of a really dry spell is but to make the clay more sticky. Under the conditions the best carrier is the pioneer's "jumper" which, loaded with but a few hundred pounds and sliding alternately in the mud and over the corduroy, quickly wears out an ordinary team. It is perfectly evident that the cost of taking in mining supplies in the summer is enormous, and in most cases should be prohibitive. The northern winters afford much more economical methods, and until steel is laid into the camp, and the clay roads dressed with crushed rock or gravel, the amount of material moved in summer will be kept at a minimum.

Power will be a less difficult problem than transportation. For preliminary operations, there is a plentiful supply of firewood and water, and the Mattagami River will doubtless be harnessed to develop power as soon as a regular demand is assured.

One of the Timmin's Veins. Miller Lake ai left. Width of White Quartz about equals that of Wood Pile

As the road is not yet finished into Porcupine, it has been customary to cross Three Nations Lake and follow a trail thence to Bob's Lake. This trail runs across 2 1-2 miles of wet "clay belt" and over some small outcrops of grey schist. At the lake, as at Three Nations, a ferryman is on the lookout for passengers, and you are quickly carried across in his canoe. A mile westward on another wet trail brings you down the main street of Golden City to Porcupine Lake. It is but a few minutes' walk along the shore to the Shuniah Hotel, a remarkably pleasant stopping place at the north end of the lake. With average luck in making connections with the ferrymen, the trip from Hill's to Porcupine takes about three hours. When the road is finished, about one hour less should do. To reach any point on the lake, motor boats and canoes are available. It is a half-hour paddle from the Shuniah to South Porcupine, whence trails lead to several of the chief properties in Tisdale Township.

At Hill's Landing, Porcupine River, Showing "Pointers Used for Carrying Freight

At Crawford's Landing on Frederick House River

Dome Mine, Porcupine, Shaft No. 1 at Left. Test Mill at Right. Diamond Drill at Left Background, on the White Quartz "dome." Shaft No. 2 at Right Background. Quartz Outcrop in Centre.

The Rock Outcrops.

The rock outcrops in Tisdale Township rise but little above the clay flats. They evidently represent the higher knobs of a pre-Cambrian area, which was almost completely covered by silt and fine sand deposited from a large glacial lake. Near Porcupine the outcrops are small and isolated; but further west and south, they are more continuous. All are low, and afford no very favourable mill sites, so that pulp will have to be handled.

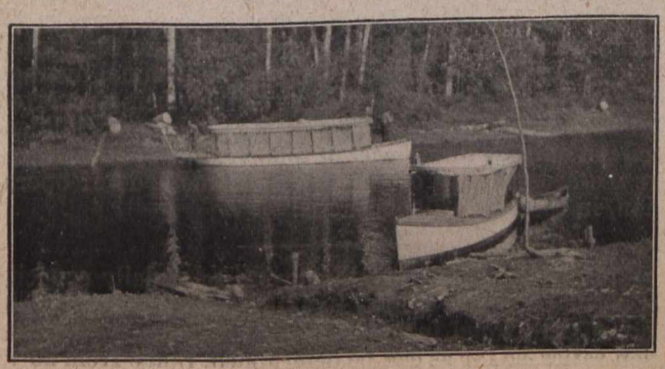
Many of the rocks are more or less schistose altered volcanics of varied compositions. They range in colour from light grey to dark green, while some varieties are yellowish. Intimately associated with the volcanics are grey and yellowish schistose carbonates. The series is in many respects similar to rocks at Temagami and Larder Lake, and is probably of Keewatin age.

There are also rocks which show distinct sedimentary bands of greywacke, grey quartzite, and altered shales. These are in some instances steeply inclined without being markedly schistose; but in most instances show secondary cleavage in the sediments, and the shaly member is usually represented by a very fissile slate or a mica schist. These rocks are probably Huronian, and resemble those of Sudbury and parts of Michigan more closely than they do those of the Nipissing silver fields.

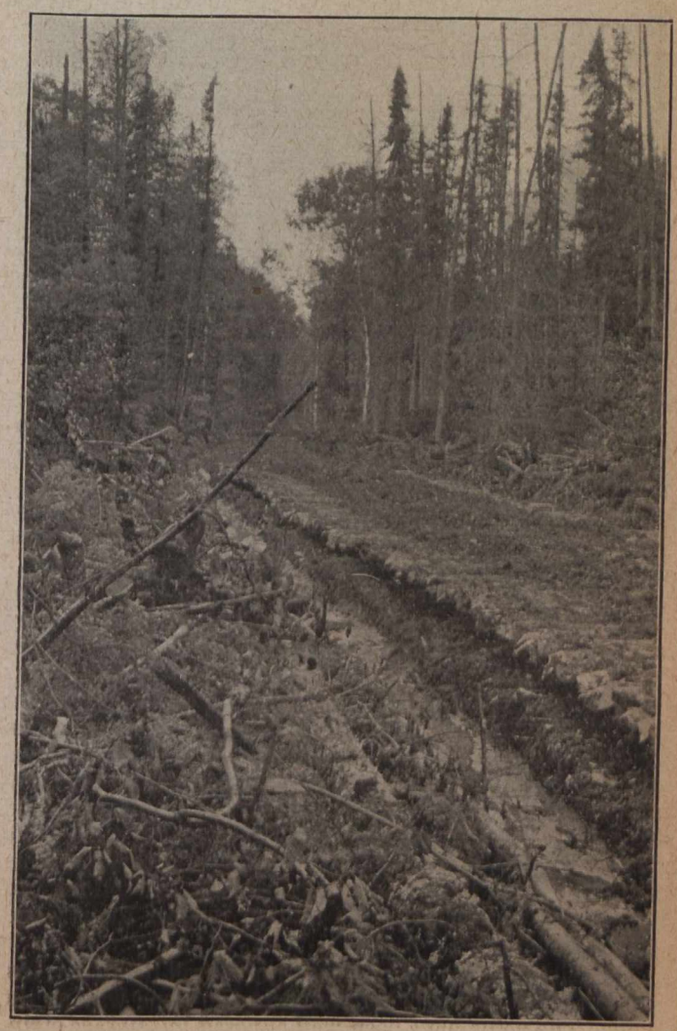
A third distinct type of outcrop is a somewhat schistose conglomerate composed of light coloured pebbles of several types set in a fine grained grey coloured matrix. The conglomerate appears to overlie the schist series and underlie the greywacke, and probably represents a low horizon in the Huronian.

The Ore Deposits.

The Huronian and Keewatin series alike are impregnated with secondary quartz. In the distinctly bedded rocks there are seams of white and grey quartz conforming to the stratification, and there are also veins which strike obliquely across the bedding. In the schists there are veins which strike across the secondary cleavage, and also other fillings which conform to the schistose structure. Some of the gold-bearing quartz masses show very decided direction, and by stripping at intervals, veins 2 feet to 10 feet wide, have been traced for several hundred feet. Others are extremely irregular in shape, and their extent is known only so far as they have been com-



On the Porcupine River



On the Road from Hill's Landing to Porcupine

Kelso Road, a Typical Spot in the Clay

pletely stripped. There is in most cases a marked association of the gold-bearing quartz with schistose carbonate wall rock, and the quartz has to some extent replaced the carbonate.

The most extensive testing in the camp is being carried on at the Dome and the Timmins-McMartin properties, both of which should be important producers next year.

At the Dome there is a large oval-shaped mass of white quartz with enclosed fragments of pyritic grey schist. The whole mass, measuring 100 by 250 paces, is being systematically sampled. The light overburden has been almost completely removed and surface samples carefully taken. At depth the testing is being carried on by exploration shafts with cross cuts at the 60-foot level and also by diamond drilling. A Nissen stamp is crushing a sample of the rock broken, and the results obtained are said to be very satisfactory. It is stated that a 40-stamp mill will be installed this winter, and the operators expect to have, before the mill is ready, an estimate of the values contained in one million tons of quartz and pyritic schist.

The Timmins property shows quite well-defined veins, and is therefore not being tested in the same way as the Dome. The veins have been well exposed by surface stripping. Vertical shafts were sunk and the deposits proved

Shovel Sampling at the Dome Mine, Porcupine. Test Mill at Left. Camp Buildings in Right Background. Quartz Outcrop in Foreground.

to be steeply inclined. A considerable tonnage of ore is now being blocked out by drifting at the 100-foot level. A two-stamp Tremain mill is being used to test the ore, which has proven to be spectacular at depth as well as on the surface. Lack of power prevents development from proceeding as rapidly as might be desired, but already a remarkable amount of work has been done.

There are in Tisdale Township a number of large veins showing free gold, and good assays have in several instances been obtained from very unlikely looking "bull" quartz. It will be remarkable if some of these do not prove producers. In most cases the exploration this summer has been by stripping, and the care with which this has been done is as remarkable as it is unusual, reflecting clearly the effect of prospecting in Cobalt camp. Without power and supplies, few operators have managed to explore their properties to any considerable depth, and the extent of the deposits is therefore not yet known.

DICTIONARY OF METALLURGICAL AND CHEMICAL MATERIAL— 219 PAGES—PAPER COVER—PRICE 50 CENTS. PUBLISHED BY METALLURGICAL AND CHEMICAL ENGINEERING, 239 WEST 39TH STREET, NEW YORK, 1910.

This convenient and time-saving little volume is a model of conciseness. It gives the reader accurate descriptions of the different makes and special features of any of metallurgical or chemical apparatus and material. A directory of manufacturers is included. Supplementary sections are headed "Measuring Instruments and Laboratory Supplies," and "Professional Directory."

The average value per ton of coal produced in Great Britain was 7s. 6d. in 1906. In 1908, the average value rose to 8s. 11d. A similar rise in value took place in all the large coal-producing countries, including the United States. In the last named country the nominal average value of coal is lower than in any other, being reported for 1908 as 5s. 11 3-4d. The average values are influenced not only by differences of quality, but by differences in the accessibility of the seams, in methods of operation, in the cost of labour, etc.

Cobalt concentrating mills have a total daily capacity of about 1,200 tons of ore. 242 stamps are dropping. The largest individual installation is 52 stamps. Concentration ratios, so far as can be determined, range from 25 : 1 to 60 : 1.

THE KENT GAS FIELD

By G. R. MICKLE.

(Reprinted from Nineteenth Annual Report Ontario Bureau of Mines.)

The most interesting and important event in connection with the development of the natural gas industry in Ontario in recent years is the discovery and delimitation of this field, covering portions of the townships of Romney, East Tilbury and Raleigh. The accompanying sketch shows the field forming roughly a triangle with the base resting on the lake.

Where and How the Gas is Found

Drilling operations commenced in what is marked as "Oil Territory" on the plan in the year 1905, and the operations were pushed southwards. In December, 1906, the first well was drilled in the area near the lake, which has since proved to be productive of the wells of greatest capacity. Operations continued throughout 1907 and 1908, and by May of 1909 the limits of the field could be determined with some exactness so far as the land area is concerned. The gas-bearing rock, without doubt, however, extends some distance under the lake, and the wells of largest capacity are found not far from the lake shore.

The gas exists in the Onondaga formation (Jour. Can. Min. Inst., Vol. X., p. 82) in a dolomite rock. Usually four pay streaks are present. Thus, in three wells, which may be taken as typical of the southern or most productive part of the field, the levels at which "gas pay" was found were as follows:

		Feet Depth.
(1)	First gas found at	1,120
	Second gas found at	1,210
	Third gas found at	1,305
	Fourth gas found at	1,345
(2)	First gas found at	1,145
	Second gas found at	1,240
	Third gas found at	1,355
	Fourth gas found at	1,380
(3)	First gas found at	1,145
	Second gas found at	1,305
	Third gas found at	1,375
	Bottom of hole	1,380

The Probable Supply of Gas.

The capacity of the wells in this field is much greater than is usual in Ontario. Thus the "open flow" measurement of the wells in the Haldimand field, near Selkirk, which has not been drawn upon for long and is therefore near its maximum, averages less than 200,000 cubic feet in 24 hours. Only about 4 per cent. of the wells show a measurement of 500,000 feet or over. In the Kent field, on the other hand, a number of wells have an open flow capacity up to 7,000,000 feet, and the average of 17 wells known to the writer is about two and a half million feet.

At the present time the gas is piped to the following towns or cities, besides supplying farm houses along the lines, viz.: Chatham, about 14 miles; Windsor, about 45 miles; Sarnia, 55 miles; Blenheim, 14 miles; Ridgetown, 23 miles; Tilbury, Merlin and several other smaller places on the way to Windsor and Sarnia. In all, something like a population of 50,000 people is served by natural gas from this field.

The Factors of Supply

The question naturally arises, How much gas will be produced here? The quantity of gas depends on four factors, viz.:

(1) The area over which the gas-bearing rock is found.

(2) The average aggregate thickness of gas-bearing rock.

(3) The rock pressure.

(4) The amount of pore space in the rock.

With regard to the area, as the field is fairly well delimited, and practically no dry holes are found, this can be calculated. In measuring this, as all the evidence points to the gas-bearing rock extending some distance under the lake, a line was drawn parallel to the shore line one mile out in the lake and this was included in the gas area shown on plan. A planimeter was then used to measure the area. It proved to be 34.6 square miles. The chances are greatly in favour of the field extending further than this under the lake, and later on when the pressure drops, as the supply of gas diminishes, this gas will find its way in, as it is inconceivable that there could be a pressure of say 50 pounds or less on the land area, and 600 pounds in the same strata of rock under the lake. The figure arrived at below, therefore, is probably too small. It cannot be too large.

The second factor, the average thickness of gas-bearing rock, can be approximated by observations taken in drilling, and noting by measurements of the flow of gas from time to time how much this increases as the hole advances. Thus a layer of gas-bearing rock will be struck and the flow measured every foot, say, till the measurement is constant. There will then be no further increase of the flow till another pay streak is struck. The aggregate thickness of these layers has been taken as 10 feet, which is a safe estimate given by drillers.

The third factor, the rock pressure, is measured direct by a pressure gauge. The conventional way is to open the well if closed before, or close it if open, for five minutes, and take the reading at the end of five minutes. It is evident that this is a severe test when applied, as it will be later on, to a calculation of the amount of gas which has flowed from the field between certain periods of time. The rock pressure is about 600 pounds per square inch (a trifle less as a rule), or about 40 atmospheres. As a cubic foot of gas means a cubic foot at normal atmospheric pressure, and the volume occupied by gas varies inversely as the pressure—i.e., double the pressure expressed in atmospheres and the volume is decreased one-half—it is plain that when the pressure on the gas is reduced, as it always is before using, to about the normal atmospheric rate, the gas will occupy forty times the space it did in the rock. So that the insignificant pore spaces in the rock, very often so small that they cannot be seen by the naked eye, are capable of storing a large amount of gas.

The amount of pore space in the rock is the only factor in the calculation which cannot be measured directly or approximated in any way. From observations in other fields, however, it is calculated that the pore space runs generally from 4 to 16 per cent. of the total volume of the rock. Taking 10 per cent. as the mean,

with the area, thickness and rock pressure mentioned above, we arrive at about 38,000 million cubic feet as the total probable output of the field.

This calculation admittedly depends on one thing which cannot be measured directly, but an independent check can be applied by an observation of the difference in rock pressure at two periods of time sufficiently far apart, and noting at the same time the amount of gas which has been produced. Thus from January 1908, to May, 1909, inclusive, the total amount of gas produced from this field, including the waste, was about 1,810 million feet; this is 4.8 per cent. of the total supply calculated above, whereas the actual drop in the rock pressure, which is a definite accurate measure of the loss of volume, is only about 3.0 per cent. It is not possible with any other mineral product to make a calculation of this nature. We must, then, conclude that either the area or the pore space or the thickness has been assumed as too small. Applying this correction gives about 61,000 million feet as the probable output. This, as emphasized before, cannot be too large and probably is too small, as any extension of the gas-bearing rock under the lake could not show its effect on the pressure till a considerable reduction of the gas supply, and consequently in the pressure, takes place. The amount given, about 61,000 million feet, is the minimum possible supply. The length of gas-bearing rock measured along the lake shore is 8 miles, an extension of that two miles more out into the lake—and there is no reason why it should not go ten miles—would increase the area by about 16 square miles, or about 50 per cent., and would probably increase the gas supply by the same amount. For the probable amount 70,000 million feet would doubtless be nearer an intelligent estimate than 61,000 million.

How Long Will the Supply Last?

The interesting question of how long this supply of gas will last is more difficult to determine, as it depends on the uncertain action of individuals animated by a variety of purposes, and not on any of the laws of nature. It will depend mainly on how well the gas is conserved; this in its turn is governed by legislation, and the manner in which the law is enforced. The greatest danger threatening the natural gas supply is the action of those drilling for oil. As mentioned in explanation of the operations of the Supplementary Revenue Act in 1909 elsewhere in this report, the gas area and the oil territory in the County of Kent are closely connected. The oil if obtained can be sold at once, whereas to sell the gas, long expensive pipe lines must be laid, franchise obtained from towns and cities, and then so much gas only can be sold each year. Moreover, the great expense of pipe line, increasing as the distance to which it is to be transported increases, prohibits taking the gas far to market. The individual interested in oil will, unless restrained, undoubtedly in the future as in the past sacrifice gas recklessly to secure a trifling amount of oil.

The use of natural gas for certain industrial purposes, e.g., as a substitute for coal under ordinary boilers to make steam, will tend, of course, to shorten the life of the field. Assuming that it was used only for domestic purposes, i.e., cooking, heating and lighting, the supply ought to last the 50,000 people who are now connected with the field thirty-three years at least, with a strong probability that it will exceed that period of time considerably.

The above calculation allows one million cubic feet per day throughout the year for each 10,000 of population. This is a liberal allowance. The city of Toronto, using artificial gas in many houses for cooking and heating and also for lighting, and to some extent for industrial purposes, with a population of 350,000, say, consumes about seven million feet per day all the year round, or 200,000 feet per day for each 10,000 inhabitants. This artificial gas is not equal to natural gas in heating efficiency, which varies according to the mode of manufacture; the kind supplied in Toronto is equivalent to only about two-thirds the same amount of natural gas. Thus, the efficiency of Toronto gas is 651.8 British thermal units per cubic foot (Dr. Ells' report on System of Lighting for Toronto, 1900), whereas the natural gas has an efficiency of about 1,000 B.T.U. (Poole, Calorific Power of Fuels). The town of Galt, with about 10,000 people and approximately 1,800 meters in use, the gas being consumed for cooking, lighting, and to some extent for heating, consumes about 280,000 feet per day (statement from Dominion Natural Gas Company). The best example is probably Chatham, which takes its supply of gas from this field. The average consumption per day for domestic purposes, as shown by the 2,000 meters installed, is 700,000 cubic feet (Volcanic Oil and Gas Company). The population is about 10,000 and gas is used freely. On this purely domestic basis of consumption, 30 per cent., or ten years, more should be added to the life of the field.

In 1894 a select committee of the Legislature was appointed to enquire into the production of natural gas in Ontario. After investigating the matter thoroughly this committee stated in its report:

"That as regards the economic uses of natural gas, witnesses are agreed that it is one of the most valuable of all fuels, and in view of the limited supply it appears desirable that its use as far as possible should be confined to the purposes of domestic fuel and in the production of the finer classes of manufacture."—(Journal Legislative Assembly, Vol. XXVII., 1894, Appendix No. 1, p. 6.)

Nothing has happened since to modify the conclusion arrived at then; in fact, the continued depletion of all fuel supplies emphasizes the soundness of this judgment. In calculating the life of the field, therefore, it seemed desirable to give it under the best possible conditions. The actual life will depend on how nearly these conditions are fulfilled.

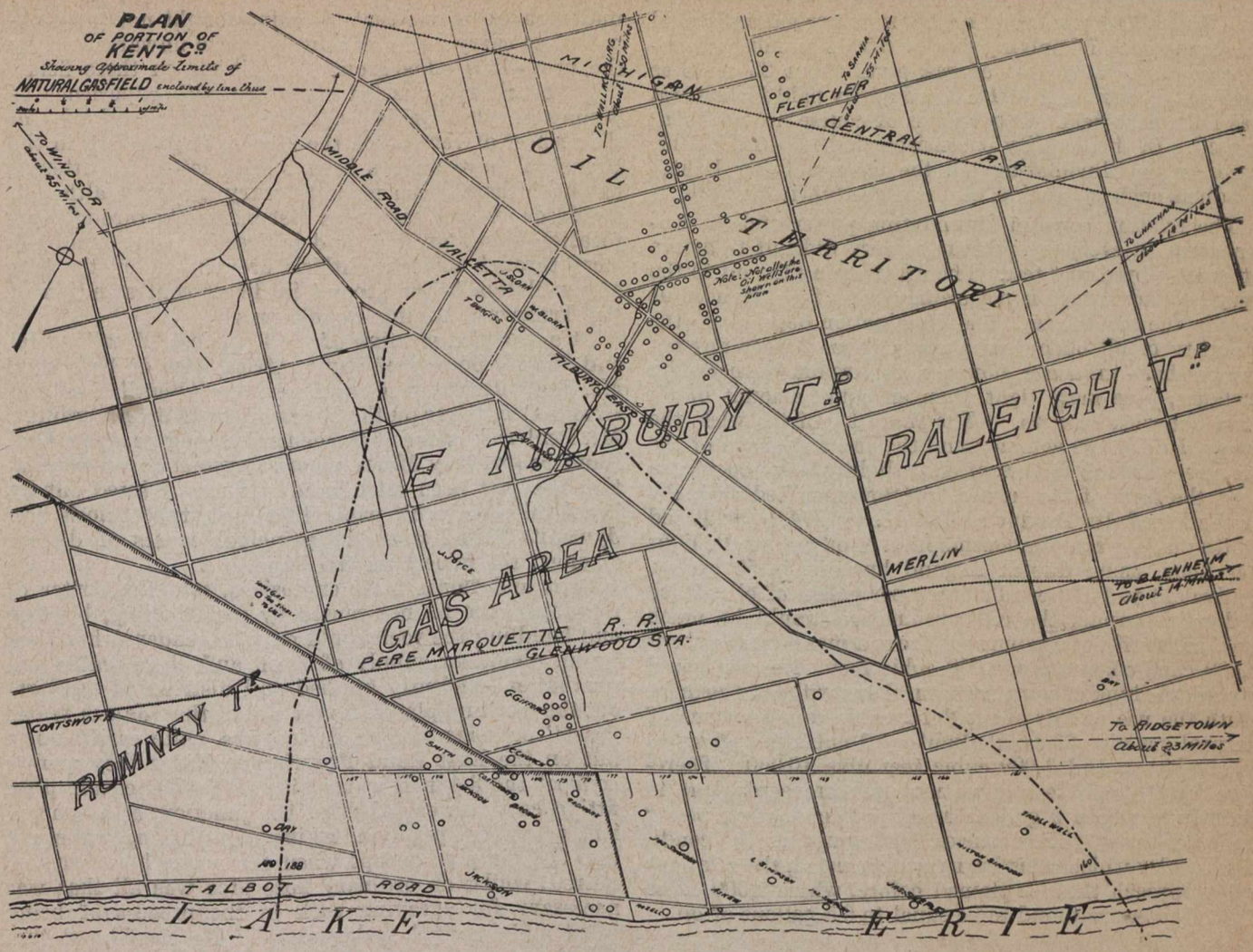
Relative Value of Oil and Gas.

As the units used in speaking of gas and oil are quite different, it seems desirable to reduce both to some common basis so that a comparison may be made between the two. Natural gas is employed mainly as a source of heat, the amount used directly for light being relatively insignificant. Oil, on the other hand, is chiefly known as an illuminant. Gas and oil will be compared both as heat producers and illuminants. The most rational method is to find the heating efficiency of each. When the two products are used for lighting under the most economical conditions, that is with a mantle, the light given is proportional to the heating power. What occurs is that the mantle is heated to a high temperature and radiates the light; where the naked flame is used the particles of carbon become heated and act as radiators.

Poole, "Calorific Power of Fuels," p. 251, gives the following data concerning various oils:—

	British thermal units per gallon.
Bothwell oil	173,400
Ohio, refined	164,736
Ohio, crude	172,800
Canadian Oil, refined (Dr. Ells' report quoted above)	154,585

Natural gas averages about 1,000 B. T. U. per cubic foot; thus Poole, p. 254, gives 1,050 as the mean for Ohio



gas, which is most closely allied with the gas in Kent. No determinations of the Kent gas for heating efficiency have been made, as far as the writer is aware. With 1,000 cubic feet as the unit for gas, this would give, of course, 1,050,000 B. T. U., and assuming the average efficiency of the oils given it will be seen that about 6.5 gallons of oil are equivalent to 1,000 cubic feet of natural gas. A barrel of oil (35 gallons) is therefore equal to about cubic feet of natural gas in heating power and, consequently, in illumination.

Coming to the question of the quantity of oil that will be produced, no such calculation of the amount in a given field can be made as was done with gas. The rock pressure as an indicator fails here. The oil being a fluid cannot find its way as readily through the rock. All we have to rely on is the actual result in production from wells drilled; where these are sufficient in number (several hundred in this case) and show the same general results, the evidence is strong enough to form a conclusion. As far as the strata already tested are concerned (i.e., to about 1,430 feet in depth) the information seems sufficient. Thus the production from the oil territory in question in East Tilbury, Romney and Raleigh is given in the Eighteenth Report of the Bureau of Mines, p. 33, as follows:

	Barrels.
1906 (first production in this year) ..	106,992
1907	411,588
1908	201,283
1909 (see present volume)	124,003
Total	843,866

It will be noticed that there has been a very rapid falling off in the oil production—about 50 per cent. in each year. For 1910 the amount will probably not exceed 50,000 to 60,000 barrels. The yield of well after well has declined in a way that must be painfully monotonous to the operators. The total production of oil, therefore, up to the end of 1909 is equivalent, on the basis explained above, to 4,556 million cubic feet of gas. As the minimum gas supply in the Kent field was calculated to be 61,000 million feet, the oil production to the end of 1909 is equivalent to only about one-thirteenth the estimated gas production. The probable yield of 50,000 barrels of oil for 1910, or 1,750,000 gallons, is equal to 270 million feet of gas, or less than the average production of gas for one week from that field during 1910. There may, of course, be oil in lower strata, but that is only a possibility.

Looking at the matter in another way, 6.5 gallons of oil are equal to 1,000 cubic feet of gas in efficiency, or 6,500 gallons of oil equal one million feet of gas. At the rate of five million feet per day, assumed above in calculating the life of the gas field, this is equivalent to 32,500 gallons of oil per day, or somewhat less than 1,000 barrels per day, more exactly 339,000 barrels per year, and, as was shown above, this can continue for thirty-three years at least.

Comparing the cost to the consumer of illumination derived from oil and gas respectively, it will be seen that he would have to buy refined oil for the same price as is paid the producer for crude oil delivered at the railroad, in order to have an equal amount of light for the same cost as from gas bought at the current rates in that locali-

ty. Thus $1.24 per barrel or 3.5 cents per gallon is paid for crude oil; multiplying this by 6.5 the number of gallons equal to 1,000 feet of gas, gives about 23 cents as against 25 cents per 1,000 feet ordinarily paid for natural gas from that field. Crude oil is of course not all burning oil. In this locality it consists of about 40 per cent. kerosene or illuminating oil, the balance being lighter products such as benzine, etc., and the lubricating oils.

The relation between illuminating power and oil consumption in everyday practice is very difficult to arrive at exactly by direct test. The art of using the oil to the very best advantage is not ordinarily as far advanced as it is in the case of gas. The illumination depends on the quantity of oil burned in a given time. Other circumstances have influence, however, as Argand burners, for instance, give more light from an equal amount of oil than flat wick burners. "The character of the wick, the dimensions of the chimney and the size and shape of the oil reservoirs are factors of only slightly less importance than the form of the burner." (Boverton Redwood, Petroleum and Its Products, Vol. II., p. 674.) Redwood states that the average consumption of oil per candle light per hour, using duplex Argand burners, is 50 grains, equivalent to 1,120 candle-hours per gallon of oil. With ordinary burners the oil consumption would be much greater. Artificial gas burnt without a mantle gives about 2,800 candle-hours per 1,000 cubic feet. No one would nowadays think of burning natural gas without a mantle. With the use of this about 2 1-2 cubic feet per hour of natural gas give 25-candle lights or 1 cubic foot gives 10 candle-hours, and 1,000 cubic feet give 10,000. Therefore 1,000 cubic feet of natural gas are equivalent to slightly less than 9 gallons of oil in illuminating power under ordinary circumstances. Of course, as the conditions under which oil is burnt are perfected, the relations will approach those explained before, where 1,000 cubic feet of gas were found to be equal to 6.5 gallons of oil.

Special Correspondence South Africa

Mine Ventilation on the Rand.

(Written for the Canadian Mining Journal.)

The subject of mine ventilation is just now receiving considerable attention on the Rand and at last there seems some hope that the scourge of miner's phthisis so long prevalent on these fields is in a fair way of being reduced to a minimum.

It is unnecessary to give figures showing to what extent this disease is rampant amongst miners on the Rand, they have been so frequently quoted that repetition is unnecessary, save to say that it exists to a much larger extent amongst the gold miners on the Rand than in any other mining district of the world. So evident was this that three years ago the Transvaal Government appointed a commission to enquire into the Mining Regulations and report in what way they required amendment in order to combat this and other evils, and their report has just been issued. As far as ventilation is concerned the Commission recommend the adoption of a quality standard in place of a quantity standard for the mines, apparently on the ground that they consider that the quantity of air laid down by the present Mining Regulations the same as in Australia and New Zealand, viz.: 70 cubic feet of air per minute per person underground is one that the mines ought not to be expected to carry out, a conclusion quite unwarranted by the prevailing underground conditions on these fields.

It has always puzzled engineers with experience of mining in other British colonies to understand why in the respect of ventilation the Mining Regulations in the Transvaal have always been a dead letter, no attempt having hitherto been made to carry them out although hundreds of lives have been lost indirectly through suffocation below ground, and indirectly many hundreds more through miner's phthisis brought on by the lack of ventilation below ground in direct contravention of the Transvaal Mining Regulations.

At a crowded meeting of the Chemical, Metallurgical and Mining Society of South Africa, held on Saturday, Mr. S. Penlerick read a paper on "Ventilation and Health Conditions on the Mines of the Witwatersrand." Mr. Penlerick is one of the general managers of the East Rand Proprietary Mines, where a system of fan ventilation has just been introduced. It was pointed out by Mr. Penlerick in his paper that dust, tuberculosis and dynamite fumes were the principal causes of disease amongst the miners on the Rand.

Dust and fumes from explosives, said the writer of the paper, the former caused by rock drilling, blasting and handling the rock could only be rendered harmless by an abundant supply of fresh and clean water and ventilation efficiently applied and distributed throughout the working places. As for water, the "James Water Blast" or some similar device was quite satisfactory, but on the East Rand Proprietary Mines they simply connect the 3-4-inch water pipe to the 2-inch air pipe, fitting cocks on each behind the junction, at a convenient point for operation, taking care that no water got into the air pipe except when the water blast was required, whilst an ordinary hose pipe was all that was necessary for spraying rock in the process of being filled and handled underground. He considered that neglect to use these appliances on the part of the miners should be made a criminal offence, and punishment meted out accordingly.

Ventilation would remove all the very fine dust, and he was distinctly of the opinion that wet and dry bulb temperature observations should be taken at least once a month in all development drives and working stopes and systematically recorded in a book kept for that purpose. He quite agreed with the recommendations of the Mining Regulations Commission that the proportion of carbon dioxide should not exceed twenty volumes per ten thousand of air, or one volume of carbon monoxide to ten thousand of air, whilst no determinable amount of the oxides of nitrogen should be allowed to be present.

Mr. Penlerick then went on to describe the ventilating fans brought into use at the East Rand Proprietary Mines, which are as under.

Angelo mine; Sirocco double inlet; diameter, 10 feet 6 inches; width, 8 feet 6 inches; output, 300,000 cubic feet per minute; W.S., 3 inches.

Cason mine; Barclay's double inlet drum pattern, diameter, 16 feet; width, 8 feet; output, 350,000 cubic feet per minute; W.S., 4 inches.

The Sirocco fan produced a total return air current of air at the shaft of 317,000 cubic feet of air per minute with a 3.25-inch water gauge—whilst the Barclay fan produced 179,000 cubic feet of air at the Cason upcast shaft with a 1.3. inches of water gauge. The difference in intake amounts of air recorded at the different shafts were: Cason, 101,400 cubic feet; New Comet, 90,000; Angelo, 140,000, and the Farrar shaft at the

Driefontein section, 140,000 cubic feet of air per minute.

The results of the application of fan ventilation to the East Rand Proprietary Mines were to reduce the average condition of the atmosphere of the mines from .493 per cent. of CO_2 to .127 per cent. of CO_2 and CO from .012 to .005 whilst the average temperature of the atmosphere of the mines was reduced by 2 degrees to 3 degrees F.

The total expenditure of capital in erection of the two fans, including cost of fans, motors, equipment of upcast shafts bratticing, doors, pipes, etc., was no less a sum than £25,000, whilst the running cost, including maintenance, came out less than a penny per ton milled.

It is clear from the above that if the recommendations of the Mining Regulation Commission regarding ventilation are to be carried out, every mine on the Rand will have to be ventilated by fan, or other artificial means, and not be left to depend on natural ventilation aided by the exhaust air from the drilling machines.

The paper gave rise to a long discussion. Dr. Irvine who has long been an advocate of better mine ventilation on the Rand, urged that the paper showed that it was possible to have good ventilation, and laid once and for all the bogey of bad underground conditions now prevailing in the Rand mines. He would not take away the blasting certificates from miners found to be suffering from tuberculosis, as recommended by the Commission, but would refuse to give certificates to fresh applicants unless they produced medical certificates proving that they were free from that disease.

Mr. Penlerick in reply to a question said that the East Rand Proprietary Mines had been repaid many times over for the capital outlay involved in the ventilation scheme.

Mr. Gascoigne complimented the author on the up-to-date methods of ventilation, and pointed out that the other mines would do well to work as much as possible on the same lines. Fresh air underground was as essential as water for dust laying operations. Compliance with the law should be insisted upon and he ridiculed the idea, as stated by the Commission, that 70 cubic feet of air per minute per person could not be provided. He pointed out that proper distribution was necessary, and congratulated Mr. Penlerick upon taking his intake air to the lowest point and providing shafts solely for upcast purposes, an essential condition other mines on the Rand seemed disposed to ignore.

Mr. Judge thought detonation produced more dust underground than the machines.

Dr. Macauley pleaded for the adoption of mechanical ventilation from one end of the Rand to the other on the lines introduced at the East Rand Proprietary Mines.

Dr. Porter, a member of the Mining Regulation Commission, defended the report of the Commission against the attacks made against it and the Government against the complaints that the report had been delayed in view of the elections. He agreed with Mr. Judge as to the origin of dust underground, but pointed out that in Johannesburg the deaths from pneumonia compared favourably with those resulting from the same cause in England and Wales.

Further discussion was adjourned.

Rowland Gascoyne,
New Club, Johannesburg.

PRACTICAL AND ECONOMICAL MINING

By Neil A. Nicholson, Deputy Inspector of Mines, Sydney Mines, N.S.

(Paper read before the Mining Society of Nova Scotia.)

A new era in the history of coal mining is rapidly developing in Nova Scotia, and the hand-pick, wherever conditions are favourable, is being supplanted by machines for under-cutting coal. Where coal-cutting machines cannot be used, improved methods of mining have been adopted which tend to greater economy and better results.

The larger coal companies, such as the Dominion, and the Nova Scotia Steel & Coal Companies, having coal-fields lying at easy angles and therefore favourable to machine mining, have equipped their collieries with the most modern and improved coal-cutting machines, and in common with many of the smaller coal companies, have adopted the latest methods of handling, cleaning and assorting coal on the surface in preparation for the market.

The principal reasons for the installation of mining machinery are, to reduce the cost of production, to increase the output, and to obtain the largest percentage of lump coal.

The introduction of machinery into the coal mine has not reduced the number of men employed, but as in other trades, the stimulus of labour-saving devices has greatly helped the industry, and a scarcity of miners rather than a surplus now exists.

If we make a comparison of, say, one machine colliery with a hand-pick, or a number of hand-pick collieries, the advantages of coal-cutting machines will be fully demonstrated. Dominion No. 1 colliery, Cape Breton, during the year 1909, employed underground 463 men. The output for the year was 544,499 tons. The hand-pick collieries of Cumberland combined, only produced 508,202 tons in the year 1908, yet they employed underground 1,806 men.

While mining machines are of great value in coal getting, they are a most important factor in the rapid development of the collieries.

The introduction and extended use of coal-cutting machines in thin "seams," or beds have made the working of these profitable and placed many of them on a competitive basis with the thicker seams. The British Royal Commission on Coal Supplies in their report stated that in the year 1900 about 17.7 per cent. of the total output of the United Kingdom of Great Britain was obtained from the seams of less than three feet thickness. If seams less than three feet can be worked successfully in any other country, there is no reason why they should not be worked in Nova Scotia, conditions being equal.

Coal mining being the chief industry of Nova Scotia, the province's greatest asset is her mines and minerals. These should therefore be protected, as they are the heritage of the people. Along the eastern seaboard of the County of Cape Breton there are valuable coal-fields. Some of these fields contain five or six workable seams overlying each other with a variable thickness of strata

intervening. The question arises, which of these seams should be first attacked? In my opinion, if the market affords it and other conditions permit, the descending order of working is the most practical. Working the top seam first is beneficial to the seams below, forming a cushion over them, especially over the thick seams. By thus relieving the pressure above, the proportion of slack in the underlying seams is reduced. The liability of a crush is averted, and the risk of men's lives is lessened by the lessening of the vertical pressure of the strata. Fatal accidents have often resulted in times of "creeps" or "crushes" in coal mines when sudden pressure has been exerted, and large lumps of coal suddenly forced out upon the miner without any warning whatever.

By working the lower seams first, all the strata right up to the surface is disturbed and broken; and while this settling process is taking place, the upper seams are damaged and sometimes wholly destroyed.

The possibility therefore of danger to other seams must be carefully considered in opening up a coal-field containing seams overlying each other, and the method least calculated to seriously affect the commercial value of the coal-field should be adopted. The tendency of past years seems to have been to work the most profitable seams first, but it has had very baneful effects, and has not always been the most profitable system of mining. Of course I am well aware that competition plays a large part in determining what seams must be opened up first. But if keen competition forces the opening up of the thicker seams at the beginning, might it not be well to consider the workings of thin seams at the same time? This would be a decided improvement on the methods of mining coal, and wherever tried in the province has met with good results.

The method of mining is generally determined after a careful study of the thickness of the seams, the nature of the strata above and below, the angle of the seam and the texture of the coal.

The method of mining coal in Nova Scotia is generally either bord-and-pillar, or long-wall.

The conditions favourable to long-wall working are thin seams which freely part from the roof, and tender strata over head. A band of "dirt" which is easily separated from the coal, makes material for stowage with which to fill up the goaf when the coal has been extracted, so that the roadways, which sometimes must be naturally very long, can be supported. Particular pains, are, however, taken to support the roadways and packs, or packwalls are built on each side of the roadway from the floor to the roof. These are usually of stone blasted from the roof or the pavement. In the long-wall method, ventilation is simple, as the full current sweeps along the working-face without the aid of brattice, and free from obstructions met with in the bord-and-pillar system. In very deep workings the vertical pressure is such that long-wall is the only system that can be adopted.

When conditions are not favourable to long-wall the most practical system is the panel system . When passages are being driven to win the coal, these should be continued back to the boundaries. At the same time headways or balances should also be driven from the main levels to the rise, a distance of four or five hundred feet, and rooms turned off to suit the cleavage of the coal. As soon as the rooms have been driven through to the adjoining balances, pillars should be drawn at once and all the coal extracted. This would save the expense of ribbing, would relieve the pressure and prevent a "crush" or "creep" in that district, and, as usual, where work is concentrated, the cost would be reduced to a minimum and larger profits obtained.

The size of pillars varies in different collieries and is determined by the nature of the coal, the thickness of the seam and of the cover over it. Small pillars have often induced "crush" and "creep" and brought great loss to the owners; but this lesson has been so well learned in Nova Scotia that the present tendency is now all the other way. Especially must large pillars be left where the roof and floor are very strong and the nature of the coal is soft and tender. Where these conditions are the opposite, a smaller pillar may be left; but at no time should any risk be taken, and the margin of strength in the pillar be less than that stated by leading mining authorities.

As passage-ways are driven to win the coal, and districts opened up, all coal should be extracted, except where it is necessary to leave pillars for the support of surface plants, residences, main roads and railways. Under-sea working (and we have at the present very much of it in the Island of Cape Breton) requires special attention and has to be dealt with according to the nature and thickness of the cover. The fact that much of the coal that is now being extracted is taken from collieries opened up fifty years ago, is proof that present methods are superior to those of our predecessors, and it is only natural that they should be.

Discussion.

President Brown.—I would like to have the great pleasure of proposing a vote of thinks to Mr. Nicholson for his paper. This paper touches on a subject that is of the utmost importance, successful coal mining in the Province of Nova Scotia. He has put on the records of the society the first paper treating on this subject.

R. H. Brown seconded the motion.

J. A. Johnson.—In Mr. Nicholson's paper there is one striking point to me, namely that about 400 men have produced 500,000 tons of coal in Cape Breton, while in Cumberland with 1,000 men they did not produce so much.

President Brown.—The conditions under which coal is mined in Cumberland and in Pictou counties are so much more unfavourable, that the production of the counties is not to be criticized.

T. Cantley.—The idea might be got from the remarks of Mr. Johnson that because in the case of Cape Breton five hundred thousand tons are produced by four hundred men, that a thousand men in Cumberland should produce more. I wish it were so, but unfortunately it is not. In order to install mining machinery to do such work as is done in Cape Breton you must invest a very large amount of money in machines, piping, etc., and all the expenditure for wear and tear, which is a matter which runs into very large figures; so that the difference in cost of production in the two districts is not so great as would at first appear. The large amount of capital which is employed in a machine-wrought colliery against the lesser capital employed in a hand-picked mine, must be considered. Dominion No. 1 colliery, Cape Breton, employed 463 men, and the output for the year is 544,-500. The hand-picked collieries of Cumberland employed 806 men and the output was 582,202 tons in the year.

A vote of thanks was presented to Mr. Nicholson.

At the Mammoth smelter, Shasta County, California, 1,000 woollen bags are used to filter the smelter fumes. The bag house is divided into five sections, each of which can be shut down to empty the bags. The bags are emptied and shaken mechanically. The dust is removed in cars, dumped into a receiver, mixed with water, briquetted, and charged back to the furnace.

OUR EUROPEAN LETTER.

The Rand no Longer a Land of Sensation—The Speculator's Loss and Investor's Gain—The View of the Present Situation—Pessimistic Views of Maikop—Japanese Mining Exhibits in London—Unhealthy Tin Movements—The Romance of Northern Nigeria—Cinderella of Mining Region Coming into Her Own.

(Exclusive correspondence of "Canadian Mining Journal.")

London, Sept. 21st, 1910.

No special activity is as yet being shown in mining share dealings in London or Paris and no startling news has come from South Africa to liven things up. This makes "Kaffirs" less interesting to the speculator but interests investors more. If Rand mining companies had depleted their gold reserves in August as was done in December, 1908, their return for last month would quite easily have established a new high record. The actual gold production has now reached an average of $440,820 per day, as compared with $437,590 in July, and judging by the preparations for starting new heavy stamps at a number of properties the day cannot be far distant when the average output will attain $500,000. There were again a few properties whose result in August fell short of the reasonable anticipations of their owners. This was in a measure due to the replacement of about 20,000 time-expired native miners by about 18,000 raw workers, whose inexperience had naturally an immediate effect on the output.

With every year that passes, the Transvaal gold mining industry becomes more stable.

One of the contributory reasons for the settling down of the Rand gold-mining companies into a regular and comparatively humdrum, prosaic existence is the ease with which the labour requirements of the industry have been met during the past two years. Recently there have been fluctuations calling for some comment, but the old-time alarm which used to periodically upset the equanimity of proprietors and help the operations of the speculator when a shortage of "boys" took place has been practically non-existent.

On the question of mechanical improvements the Rand is very much alert. Much has been accomplished in the way of reforms, both before and since the departure of the Chinese in organizations, in the economy of labour, and in the adoption of new mechanical appliances, but more remains to be done. That well-worn subject of controversy—the tube-mill—is still under occasional discussion, and the results obtained from it have helped to concentrate more attention than ever on the problem of crushing. It is considered that the Mines Trials Committee have done good work in bringing the efficiency of the tube-mill up to "25 per cent. of that of stamps," but it is thought by some of the most practical mining engineers on the Rand that the qualities of the tube-mill are not fully understood, and that when it is fed with ore of the size best suited for such treatment a still higher efficiency will be obtained. The ore-crushing problem is still receiving keen attention, and it is tolerably evident that either the present form of stamps is quite likely to be very much improved or this plan of treating the ore abandoned in favour of something altogether more efficient.

In mining fields where the surface of the country is either mountainous or very much broken some system of telpherage or overhead transport, is usually found the most economical for mining purposes. But on the Rand this system has never found much favour, and, although efforts are still being made to introduce new methods of telpherage the nature of the surface hardly justifies the initial outlay and cost of upkeep.

If it be true, as appears to be the case, that the majority of the Liquor Commission is in favour of resuming the supply of alcohol for the natives on the Rand, then the decision is a matter of very serious import to the whole mining industry. The majority of the report and the recommendations of the Commission indicate that an attempt will be made to at least introduce native wine. In this connection it has to be observed that the Cape wine farmers control sixteen seats, and this circumstance places the report of the Commission in a very sinister light. The Commission appears to ignore the well-known fact that when a Kaffir gets drunk he becomes a homicidal maniac of a most pronounced type, and that the habitual drunkenness of the "boys" in the pre-war days was one of the most serious handicaps to the mining industry.

The "Great Maikop Oil-field" has retired somewhat under a cloud. The experts, who day after day were ladling out views and opinions, have retired from the arena, and bad reports are drifting in from Russia. The only ground properly existing for the optimistic reports turns out to be the outbreak of the great gusher in September last year. This it will be remembered was plugged and it is impossible in the present state of affairs to estimate its future—even its near future. Other alleged gushers, it is stated in responsible Russian journals, do not exist in any form. The leading Russian paper says that, apart from the great gusher named, not one of the other wells sunk or being sunk is worthy of mention. The only reason that may be said to exist for a hopeful view otherwise apart from the said gusher, is that certain geologists maintain that the geological formation favours an accumulation of petroleum.

The Japanese British Exhibition, which is a popular feature of the London season this year, shows many exhibits, specimens and large diagrams relating to the mineral resources and industries of the Island Kingdom. It appears that the oldest established mining company in Japan on a large scale is the Mitsu Bishu Company, with a capital of $7,500,000. This combines mining with banking, shipping and manufacturing. Its six coal mines and ten metal mines (gold, silver and copper, produce annually 1,300,000 tons of coal, 6,500 tons of copper, sixteen tons of silver, and 1,680 pounds of gold.

The Mitsui Company comes next in importance. This is also a banking company, its total capital being $20,000,000. It owns one metal and four coal mines. Its annual coal output is now two and a half million tons. In its biggest colliery, which has large quantities of water to contend against, it uses over 1,600,000 horsepower in 76 pumps which pump about 18,000,000 tons of water per year. The pumps are Davey Company, differential, Sulzer turbine, and Schleifmuhle. It employs 6,000 hands, looks after its working people very well, even to the establishing of creches, as many women work at loading.

The Fugita Company has a capital of $3,000,000, and includes gold mining, forestry and agriculture. At Kosaka this company has complex sulphide copper ore to deal with. By persistent scientific researches upon commercially economic methods of dealing with the by-products, it has made it a profitable venture. This

company employs 9,300 workers. The bulk of its operations is in open or surface work. The ores are first smelted in blast furnaces, then crushed, and afterwards calcined and further reduced in Herreschoff calciners and reverberatory furnaces.

The oldest and richest gold mine in Japan is on the Sado Island, producing 13,800 ounces of gold and 113,000 ounces of silver per annum. The oldest copper mine is that of Beshi, worked over 200 years by the Sumitomo family. It has lately been developed on modern lines and turns out copper annually worth nearly $2,000,000. There are other great colliery enterprises, initially encouraged by the Mikado's Government. The Hokkaida Company produces annually coal worth $3,500,000. One unusual feature of Japanese mines resulting from the volcanic character of the country is that many of them are on small islands. The mine occupies the whole area of the island and in some cases stretches under the sea. The oil production of Japan is of considerable importance, one company alone having an annual output valued at one and a quarter million dollars.

In view of the recent revival here of speculation in tin shares, which was obviously chiefly accelerated by the startling rise in the price of the metal, it may be well, perhaps, to remember that present market conditions are altogether abnormal and are in no way due to any improvement in the statistical position. The returns issued for August, indeed, disclosed an increase of about 1,100 tons in the London stocks, while the visible supply was swelled to about 18,300 tons, which is only some 1,500 tons less than a year ago, when the price was $120 per ton lower. Hardly ever in the history of the industry has there been a lift of prices of $80 per ton such as recorded in the last few weeks in the face of similar adverse statistical developments, and manipulation on a scale heretofore unknown has been mainly responsible. The London stock, amounting to some 5,700 tons was but 800 tons under that of last year, but the fact remained that very little of that large stock was actually available for market needs.

Since the richness of the alluvial tin fields of Northern Nigeria, West Africa, has become an established fact, whenever two or three old West Africans meet together you hear nothing except about lost opportunities in Northern Nigeria, and it is really a fact that in an unscientific manner reports about the richness of these fields have been circulating on the coast for years. But the traders and the civil service men had too comfortable berths to risk their skins in prospecting and pegging out work. More kudos then, to the plucky Mr. Laws, the mining adviser to the Niger Company, for hanging on through no report and bad report to his prospecting work Bauchi way, notwithstanding the cold water which his own officials at home threw upon his initial efforts. It is notorious that the directors of the Niger Company did not want to be bothered with mining.

Still, the mineral resources of Northern Nigeria were not appreciated in London adequately to their prospects. It generally requires a forlorn hope to do justice to a new mineral country. Is it not a fact that "Beam-enders" have been generally the class of men who have done justice to nearly all the great mineral fields of the world? Beam-enders discovered the Great Boulder, and I could give any amount of instances of desperate mineral enterprises which have led on to fortune.

Lord Scarbrough, year after year, told the British public, through his annual speech to the shareholders of the Niger Company, that there was treasure in Northern Nigeria in the shape of alluvial tin. He had to wait until a company—the Champion Gold Reefs of West Africa, Limited—having abandoned its gold property on the Gold Coast, and really desperate how to utilize its remaining capital—about $60,000, I believe,—came along, and sent some prospectors, followed out by engineers, to Northern Nigeria, who secured the pick of the country. On the 4th of February this year, the Champion Gold Reefs of West Africa, Limited, acquired from the Niger Company, the Naraguta for a large sum of money, and Lord Scarbrough was no longer a mining John the Baptist crying in the wilderness, nor need the shareholders of the Champion Gold Reefs of West Africa feed any longer on locusts and wild honey, for on the strength of the profits of their Northern Nigeria enterprise, they declared in March last, an interim dividend at the rate of 100 per cent. and since its acquisition of the Naraguta property during the last six months an estimated net profit of $50,000 has been made upon the sale of tin from that one property.

Since the Champion Gold Reefs of West Africa turned disciple and listened to the teaching of Lord Scarbrough, the Northern Nigeria Mining School of Adventurers have added to their number representatives of Messrs. Wernher Beit, the Consolidated Gold Fields of South Africa, groups of bankers and others.

In all seriousness, to use the words from an address before the Royal Colonial Institute on Recent Developments in West Africa: "If the professional reports upon these tinfields in Northern Nigeria are anything like approximately correct, and the supply is regulated, a fabulous amount of wealth is waiting to be extracted."

A NEW MINES BRANCH EXPERIMENTAL PLANT.

The Mines Branch of the Department of Mines is installing an experimental testing plant in Ottawa for the concentration of magnetic ores.

When completed, the plant will consist of a standard Gröndal concentrating unit, comprising an ore crusher, ball mill, and two Gröndal magnetic separators operating in tandem; the capacity of the plant being from two to four tons of crude ore per hour.

The plant is being installed for the purpose of testing low grade magnetic iron ores and sands, with the view of proving their amenability to concentration by the Gröndal wet system.

Tests will be carried through for the determination of the following points:—

(1) Extent of crushing required to raise the iron content of the crude to 65-70 per cent. in the concentrate.

(2) Extent of crushing required to depress sulphur, phosphorus, or titanium content to percentages acceptable to furnace men.

(3) Number of tons of crude that are required to produce one ton of concentrate.

(4) Power consumed per ton of crude ore concentrated.

(5) Cubic feet of water used per ton of crude ore concentrated.

It is expected that the plant will be ready for operation about the first week in November, 1910. Tests will be made free of charge on Canadian ores, but it is required that shipments shall be delivered carriage paid at the testing plant at Ottawa.

Shipments of ore for testing purposes should not be less than five, nor more than twenty tons; and it is particularly requested that shipments be made in bags containing not more than 100 pounds of ore, to facilitate handling.

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA, LIMITED

DIRECTORS' REPORT

To the shareholders of the Consolidated Mining and Smelting Company of Canada, Limited:

Gentlemen,—Your directors beg to submit the fifth annual report of the company's operations, together with the managing-director's report, the financial statement and auditors' report for the year ending June 30th, 1910.

The tonnage of ore handled at the smelter was 487,125 tons, against 347,417 tons in 1909.

The profit for the year was $309,945.08 and added to the balance at the credit of profit and loss account as shown last year makes a total of $671,011.09 at credit of that account.

During the year two properties have been purchased. The La Plata, or Molly Gibson group, near Nelson, B.C., for payment of which 2,000 shares of the capital stock was issued, also the No. 7 group in the Boundary district. The operating of these mines, your directors believe, will prove profitable to the company.

The property and plant accounts, after paying for the above properties and additions referred to in the managing-directors' report, and after writing off for depreciation $175,502.60 from the profits of the year, show an increase of $244,202.19.

W. D. MATTHEWS,
President.

Toronto, 27th September, 1910.

Financial Statement

The Consolidated Mining and Smelting Company of Canada, Limited, for year ending June 30th, 1910

LIABILITIES

Capital:		
Authorized	$7,500,000.00	
Issued 55,552 shares of $100 each		$5,555,200.00
Sundry banks:		
Bank of Montreal:		
Loan and overdraft ..	763,528.55	
Accrued interest	680.95	
	$764,209.50	
Pay roll bank accounts overdrawn	1,803.10	
		766,012.60
Contingent liability at June 30th, 1910, on drafts against matte shipments ..	131,845.95	
Accounts payable and unpaid dividends		51,673.44
Reserve: Including provision for claims awaiting adjustment		42,723.79
Profit and loss account:		
Balance June 30th, 1909 ..	$361,066.01	
Profit for year ended June 30th, 1910	309,945.08	
		671,011.09
		$7,086,620.92

ASSETS

Mines, mineral claims, and shares in other companies.	$4,142,181.12	
Expenditure on No. 7 group	22,207.31	
Expenditure on Phoenix Amalgamated group ..	55,840.82	
		$4,220,229.25
Mining, smelting, concentrating and refining plants:		
Balance June 30th, 1909..	$1,498,639.04	
Construction for year to June 30th, 1910	215,143.14	
	$1,713,782.18	
Less sales of plant.. .. ..$ 1,511.99		
Less depreciation 175,502.60		
	177,014.59	
		1,536,767.59
Smelter product on hand and in transit to refineries:		
Pig lead, bullion, matte, blue-stone and antimony	$170,437.30	
Ores and metals on hand and in transit to smelter at June 30th, 1910:		
Value of metal contents corrected to market quotations:		
Ores on hand..$349,472.02		
Refinery, metals on hand 281,686.10		
Ore in transit to smelter 11,337.77		
	642,495.89	
		812,933.19
Mine and smelter stores and material....		353,600.99
Accounts receivable		138,780.27
Insurance and taxes paid in advance		14,081.07
Cash in banks and on hand:		
Head office, Toronto	$2,042.81	
Sundry pay roll bank accounts	8,185.75	
		10,228.56
		$7,086,620.92

AUDITORS' REPORT

We have audited the accounts of the Consolidated Mining & Smelting Company of Canada, Limited, for the year ended June 30th, 1910, including the mine and smelter accounts maintained at the offices at Moyie, Phoenix, Rossland and Trail, B.C. The inventories of ore and smelter products at June 30th, 1910, are as certified by the company's officials; the values of metal contents have been corrected to market quotations of that date, and the estimated cost of refining products in course of treatment has been deducted. Stores and materials on hand at the mines and smelter have been verified by the storekeepers.

Subject to the foregoing, we certify that the above balance sheet is, in our opinion, properly drawn up so

as to exhibit a correct view of the financial position of the company as at date of closing the accounts to June 30th, 1910.

Clarkson, Cross & Helliwell,
Chartered Accountants.

Vancouver, B.C., August 26th, 1910.

Profit and Loss Account

For year ended June 30th, 1910

To smelter product on hand June 30th, 1909, and in transit from smelter to refineries		$ 349,741.22
To ore in transit to smelter June 30th, 1909, and in process of treatment		754,644.20
To customs ore, lead and bullion purchased		1,666,504.23
To freight on ore from company's mines		200,950.28
To mining, smelting and general expense:		
"St. Eugene" mines	$ 441,234.61	
"Centre Star" mines	538,010.55	
"Snowshoe" mines	162,336.14	
"Richmond-Eureka" mines	21,232.93	
"Queen Victoria" mines	5,495.90	
"Sullivan" mines	18,774.73	
Trail smelter and refinery	1,521,381.46	
		2,708,466.32
To development expenses:		
"St. Eugene" mines	$163,276.69	
"Centre Star" mines	298,553.70	
"Snowshoe" mines	5,837.78	
"Richmond-Eureka" mines	21,045.07	
"Sullivan" mines	7,057.51	
		495,770.75
To royalty on ore		37,154.89
To depreciation general plant and equipment		175,502.60
To directors' fees		8,800.00
To sundry items written off (including bad debts)		13,988.64
To balance, profit		309,945.08
		$6,721,468.21
By sales of smelter products, ore, etc.		$5,904,004.90
By smelter product on hand June 30th, 1910, and in transit from smelter to refineries:		
Pig lead, matte, bullion, bluestone and antimony		170,437.30
By ores and metals on hand and in transit to smelter June 30th, 1910; value of metal contents corrected to market quotations:		
Ores on hand	$349,472.02	
Refinery metals on hand	281,686.10	
Ore in transit to smelter	11,337.77	
		642,495.89
By rents and sundry revenue		4,530.12
		$6,721,468.21

Managing Director's Report

Trail, B.C., August 15th, 1910.

To the Directors of the Consolidated Mining & Smelting Company of Canada, Limited:

Gentlemen,—I beg to submit the results of the Consolidated Company's operations for the year ending June 30th, 1910, including balance sheet, profit and loss account, production, and general report.

Financial Statement

After writing off $175,502.60 depreciation upon plant and equipment (as compared with $153,218.31 depreciation written off in the previous year), $13,988.64 sundry items including bad debts, and charging to profit and loss account $495,770.75 expended upon development, the operations for the year show a profit of $309,945.08, which added to last year's balance of $361,066.01, leaves a net credit of $671,011.09.

During the year additions to the various plants and the additional equipment of new properties have amounted to $140,977.05. The increase in the investment in lands near the smelter has been $6,704.10. The cost of new properties and their development has been $222,622.76 and the estimated value of plant included with the purchase of the Molly Gibson and Number Seven $65,950; a total of $288,572.76, paid for in stock $200,000 and in cash $88,572.76.

The total cash expended, therefore, upon the above items of property and plant was $236,253.91.

The Snowshoe overdraft guaranteed by this company, the balance of which at June 30th, 1909, was $16,549.12, has been paid in full by the Snowshoe Gold & Copper Mines from royalties on ore shipments, and the liability of this company thereby terminated.

The company's obligations for borrowed capital show a reduction in the year of $462,090.50, or from $1,228,103.10 to $766,012.60.

The quotations for London lead, New York silver, and electrolytic copper have been exceedingly low during the year, having averaged: London lead, £12.921, as compared to £13.249 during the previous year; New York silver, 51.948c., as compared to 51.410c., and electrolytic copper 12.981c., as compared to 13.254c.

Since the formation of the Consolidated Company, the cost of new properties acquired has been $1,142,181.12; additions to plant, including the acquisition of existing plants connected with new properties, have cost $1,235,942.20, making a total of $2,378,123.32. Treasury stock, issued in payment for new properties and plants connected therewith, accounts for $856,400 of this total, and the remainder, $1,521,723.32, was covered by cash expenditure.

Production

Following are the productions of the different properties controlled, leased and operated by the Consolidated Company for the year ending June 30th, 1910, and the total production to date as far as can be ascertained. It will be noted that the gross value of metals produced at the company's smelting works was $5,911,767, as compared to $5,505,526 during the previous year. There was an increase in the gold and copper production, a reduction in silver, and a slight falling off in lead; the total, in spite of low prices for metals, exceeds any previous year. The tons smelted increased from 347,417 to 487,125, the largest in the history of the company.

Year Ending June 30th, 1910

	Tons Ore	Gold in Ounces
Centre Star Group	194,013	78,812
St. Eugene—Ore	114,136	.....
—Conc.	17,987	.....
Richmond-Eureka	3,399	.....
Snowshoe (leased)	182,383	12,413
Sullivan (leased)	6,704	.....
Queen Victoria	777	10
	Smelted	
Trail Smelter	487,125	137,614

Silver in ounces	Lead in pounds	Copper in pounds	Value
51,888	.....	2,263,711	$1,935,886
.....	.....	.....	.....
468,693	22,182,611	.....	1,028,740
185,270	1,190,785	.....	138,398
42,561	.....	4,029,902	803,300
46,196	2,451,758	.....	110,790
293	.....	24,555	3,430
2,162,406	42,368,816	5,974,959	5,911,767

Production Beginning 1894 to Date

	Tons Mined	Gold in Ounces
Centre Star-War Eagle group..	1,477,324	721,636
St. Eugene—Ore	954,115	.....
—Conc.	180,125	.....
Richmond-Eureka	7,958	.....
Phoenix Amalgamated	249	7
Snowshoe	520,092	35,993
Sullivan	92,110	.....
Number Seven	1,086	224
Queen Victoria	4,204	36
	Smelted	
Trail Smelter	2,458,684	952,056

Silver in ounces	Lead in pounds	Copper in pounds	Gross Value
850,750	.....	28,239,017	$19,508,633
.....	.....	.....	.....
5,055,433	216,064,521	.....	9,965,476
443,983	2,848,743	.....	334,648
44	.....	2,214	451
137,978	.....	12,750,718	2,913,361
781,993	38,653,397	.....	1,931,226
11,511	.....	.....	11,048
3,203	.....	204,199	41,794
16,999,873	220,872,555	43,453,814	42,646,025

The Centre Star Group is mining and shipping about 14,000 tons per month; the St. Eugene mining and concentrating 5,000 tons (from which 800 tons of lead concentrates are being produced); the Snowshoe, 10,000 tons; the Richmond-Eureka 300 tons; and the Sullivan 2,500 tons, making a total being mined per month of 32,600 tons.

Development

There are over 24.6 miles of underground development or narrow work in the Centre Star Group, Rossland; 18 miles in the St. Eugene, Moyie; 6,041 feet in the Richmond-Eureka, Sandon; 2,581 feet in the Phoenix Amalgamated, Phoenix; 5,277 in the Molly Gibson mine; 4,575 feet in the Sullivan mine, Kimberley; and 3,357 feet in the Number Seven mine, Central Group.

In the company's mines 28,144 feet or over 5 miles of narrow work, has been driven during the year, and 40,824 feet of diamond drilling as follows:

	Drifting and Crosscutting
Centre Star Group	13,165
St. Eugene	7,711
Sullivan	367
Richmond-Eureka	2,505
Number Seven	864
Total	24,612

Raising	Sinking	Total	Diamond Drilling
1,346	211	14,722	28,834
1,483	160	9,354	11,456
8	...	375	534
324	...	2,829	.....
.....	...	864	.....
3,161	371	28,144	40,824

In the Centre Star-War Eagle group, Rossland, new ore has been found upon the Centre Star, 3rd, 6th and 10th levels. No pay ore has been found below the 12th level. From the 16th level, 7,867.6 feet of diamond drilling has been done, without finding ore. One or two more holes will complete the exploration in the deep levels of the Centre Star.

There has been an improvement in the Idaho, during the year, both as to ore reserves and prospective value, due to the finding of a new ore shoot (470) above the 4th level and to the expansion of 539 stope, under 461 stope (above the 4th level).

Developments in the War Eagle continue to be encouraging, increased tonnages having been developed on the 8th, 9th, 10th and 11th levels. The ore body on the 9th level War Eagle, referred to in the previous report, has been located on the 8th level. Parallel to this ore body an entirely new ore shoot has been found on the 9th level. Stopes 1086 and 1155 have yielded a large tonnage. The country in which these ore bodies are located is not fully prospected. The future outlook for this part of the mine is most promising. On the 12th or bottom level War Eagle there are small streaks of ore, but nothing of importance has as yet been discovered.

The Iron Mask developments have also been encouraging, one ore body having been opened by a crosscut from the 4th level Centre Star, and a smaller ore body has been opened on the Josie vein from the 4th War Eagle level, considerably east of the old main workings. The stopes in the Iron Mask above the 4th level War Eagle look well.

The ore reserves of the Centre Star group are estimated at 245,640 tons.

No new large ore bodies have been found at the St. Eugene during the year, although a considerable amount of work has been performed upon the 2,100, 2,200 and 2,400 foot levels. The total number of feet of diamond drill holes driven from these three levels has been 8,683.6.

The ore reserves in the St. Eugene group are estimated at 20,000 tons.

While drifting upon the Richmond-Eureka has not opened up much new ore, yet indications are that a fair tonnage, not yet included in estimated reserves, will come from the Summit and No. 6 tunnel, from which no stoping has been done. The ore reserves in the Richmond-Eureka are estimated at 3,475 tons.

No new development work has been done upon the Phoenix Amalgamated and only a few hundred feet upon the Number Seven, mostly in broken country.

On the Snowshoe, upon which the company holds a lease, no new developments have taken place. The ore reserves in the Snowshoe are estimated at 84,000 tons of shipping ore and 93,000 tons containing copper, about 0.80 per cent., which is too low to be shipped at present copper quotations.

In order to determine the grade of the Queen Victoria ore and the cost of mining, trial shipments have been made. These operations have indicated that after sorting, ore containing copper 1.5 per cent. to 1.7 per

cent. can be shipped, but that it is unprofitable to work the mine until the price of copper is much higher.

Construction

The principal new installations or construction work at Trail during the year were a centrifugal pump with driving motor direct connected, located on the Columbia River; a plant for making bullion anodes from the lead blast furnace without re-melting; improvements in copper mills; additions to the lead refinery.

At the company's lime quarry at Fife, a new railway siding has been built.

In connection with the mines, the principal expenditures upon capital account have been for the following:

Ore testing plant for determining methods of economically treating ores and for devising improvements upon present methods in concentrating ores from the company's mines, a railway spur and tramway at the Phoenix Amalgamated property in the Boundary; the equipment of the Number Seven mine in the Boundary, including an aerial tramway with terminals, a short railway spur, a power line, and motors for driving the compressor.

The value of machinery and buildings at the Molly Gibson and Number Seven, which were included with the mining property in the agreements for sale, has been estimated at $65,950, and this amount has been charged to plant account.

New Properties

In order to maintain the company's earnings, it seemed advisable to secure such new properties as promised to yield a fair return upon the cost of the property, plus the amount necessary to equip them for economical operation, and providing always that there was a reasonable chance that such properties would produce a sufficient tonnage of ore to repay the capital expenditures incurred through their purchase and equipment. After examining a great number of mines and prospects, it was decided that the No. 7 mine in the Boundary and the Molly Gibson mine near Nelson were the most promising.

The Number Seven mine and some adjoining claims were therefore purchased. This property has a hoist, compressor, mine buildings, a shaft 325 feet deep, and a total of 3,357 feet of narrow work. It is estimated that there are developed 20,000 tons of ore containing about $10 gross assay value. An aerial tramway, electrical equipment and a railway spur are about completed.

After long negotiations, the Molly Gibson mine was secured by the payment of 2,000 shares of the company's treasury stock. The Molly Gibson Company owned an 8,000 foot aerial tramway, a concentrator, compressor and mine buildings. Former managements have driven 5,277 feet of narrow work. The ore reserves are estimated at 6,000 tons of ore containing a gross assay value of $30 per ton.

A lease has been taken upon the Sullivan mine near Kimberley. A royalty is paid upon all ore shipments, and the Consolidated Company has undertaken to perform $10,000 worth of development work. The mine is producing about 2,500 tons monthly of ore containing approximately, lead 18 per cent., silver 6.0 ounces per ton.

Management

The operations and business of the company have been ably directed by the following gentlemen:

R. H. Stewart, manager of the company's mines; T. W. Bingay, comptroller; A. J. McNab, superintendent of the smelter; John F. Miller, superintendent of the refinery; M. E. Purcell, superintendent of the Rossland mines; S. G. Blaylock, superintendent of St. Eugene mines at Moyie and the Sullivan mine near Kimberley; Charles Biesel, superintendent Phoenix mines and the Number Seven mine south of Phoenix; John Bakke, superintendent Richmond-Eureka mines; F. W. Guernsey, superintendent Molly Gibson and Queen Victoria mines; James Buchanan, metallurgist; A. W. Davis, assistant to the mine manager; and John M. Turnbull, mining engineer.

Mr. Jules Labarthe, who for many years has efficiently managed the works at Trail, resigned, to accept the general management of the Mason Valley Mines Company of Nevada.

Respectfully submitted,

W. H. Aldridge,

Managing Director.

A UNIQUE SECTIONALIZED POWER PLANT.

The El Tajo Mining Company, of San Sebastian, State of Jalisco, Mexico, has recently ordered a unique sectionalized power plant to supply power for its new mill. The head of water available is 500 feet, and there is being supplied a special Pelton water-wheel of the two-unit type capable of developing 125 h.p. at this head when running at 1,200 r.p.m. With this water-wheel will be supplied two pairs of jaw clutch couplings, thus rendering it possible to disconnect either of the two generators which are driven by this wheel. The water-wheel will be sectionalized for mule back transportation and no piece will weigh over 300 pounds. A mechanical governor will be furnished to control the water-wheel.

The two generators to be driven by this wheel, as with all the electrical apparatus, come from the works of the Westinghouse Electric & Manufacturing Company, and will be of 50 k.w. capacity each. These also will be 3-phase, 60-cycle, 600 volts and run at a speed of 1,200 r.p.m. corresponding to the water-wheel. They will have extended shafts for belt driving the exciters. The generating station also provides for the usual switchboard, lightning arresters and protection apparatus.

The power generated is to be consumed at the mill by various alternating current motors, one of which, belt drives the stamp mill line shaft at a speed of 150 r.p.m., resulting in 100 drops per minute. The tube mill line shaft runs at 200 r.p.m., the mill itself making 37 revolutions per minute. Other motors are scattered about the mill for the usual drives in a mill of this kind.

Since the generating plant is located close to the mill, the generator gives 600 volts and the motors employed are for 550 volts. The lighting is taken care of by separate transformers.

The Uruguayan Republic last year provided for the coinage of $500,000 worth of metal money. The pieces are, respectively, 5-cent, 2-cent, and 1-cent. Twenty million pieces in all were provided for.

A new winder is being installed at the Micklefield Colliery, England. It is to be electrically operated, and will be capable of raising 150 tons of coal per hour from a depth of 300 yards. At every wind three tubs, each containing 12 cwt. of coal, will be raised. The winding period is set at 35 seconds, and the banking interval at about eight seconds. A balance rope will be used, and the parallel drum, 11 feet in diameter, will be driven directly by means of two continuous current winding motors.

Waterborne Packing of Stopes in the Transvaal

For some time past the question of packing the stopes solid has been attracting attention on the Rand and the adoption of the waterborne system is being seriously considered, several of the principal mines, both outcrop and deep level, being busily engaged making experiments in connection therewith. The system is not by any means new, but up to the present it seems to have been principally used in connection with the working of the thick coal seams in Silesia.

The Rand gold mines have hard, cohesive, unyielding quartzite hanging walls and near the outcrop small pillars will suffice, but now that the working costs have been so reduced it has been found profitable to extract the whole of the pillars hitherto considered unpayable, but the difficulty very often has arisen of finding suitable stowing material. Owing to this several nasty falls of the hanging have taken place and down to a depth of six hundred feet these falls have generally worked their way to the surface, and it is probable that at even greater depths it is only a question of time before the surface over these open stopes will also become affected.

Several of the deep mines on the Rand have now attained a depth of between four and five thousand feet and there are indications that at this depth the pressure of the superincumbent strata is a coming difficulty to contend against, and, if successful, the waterborne system of sand filling the stopes promises to afford the Rand mines an easy and cheap way out of the difficulty. As an illustration of the difficulties of deep mining the Cinderella Deep accident may be quoted, where sixteen natives lost their lives through the collapse of a large pillar at a depth of 4,000 feet from the surface. This is one of the few mines allowed by the government to work with a single shaft or outlet, and this permission can only be obtained on extraordinary steps being undertaken with the view of the prevention of accidents, so that at this mine the discipline must be of an exemplary character. However, the other evening at nine o'clock, whilst a white overseer and over twenty natives were working as usual in the 4,000-foot level, a loud report was heard, and a large pillar collapsed, killing sixteen natives and injuring several others, without the slightest warning. A government enquiry was held into the accident and the cause attributed to the excessive pressure of the superincumbent strata at this depth. Several managers on the East Rand, however, still hold the view that with such a cohesive hanging wall, a pressure of the nature required could not have resulted from depth alone, forgetting the fact that under the circumstances a cohesive unyielding hanging wall is the most likely to break in large masses and, thus, bring about such an accident. Now, from actual experiments made with the Rand quartzites it would seem that they fracture at pressures varying from 1,945 to 6,804 pounds to the square inch and with an average pressure of 4,566 pounds to the square inch, and, as at a depth of 4,000 feet from the surface, the actual weight of the overlying strata, would be 4,888 pounds, a pressure nearly equal to the weight of the whole thickness of the overlying strata, must have been thrown on to the pillar. It is difficult to see how in a comparatively new mine like the Cinderella Deep, such a condition of affairs could have been brought about, but the fact must not be overlooked that stoping operations throw extra weight upon the pillars, and the extraction of one-half the reef by means of stopes doubles the work cast on to a pillar, so that at this great depth unusually heavy pressures are possible. An overlap fault also exists in the locality and it is possible that this may have had something to do with the accident. However, it is becoming evident that nearer the outcrop, where it is found profitable to extract the pillars, and in depth, where the superincumbent pressure is beginning to show itself, solid filling of the stopes is absolutely necessary and it is due to these reasons that the sand filling process is being extensively tried.

One great advantage on the Rand is the existence of thousands of tons of old tailing sands sufficient to last for many years in close proximity of water and sand to produce a ready flowing mixture, whilst a fall of 1 in 10 is considered the minimum. With such a fall the sand and water readily flows to the shaft, but where the sands lie below the level of the shaft some mechanical means of transport must be used. In such a case bins or hoppers are built near the shaft and the sand mixed with water and then conveyed by six-inch pipes lined with hardwood down the shaft and to the spot in the stope at which it is intended to deliver the sand. Wherever possible the use of launders is preferred as being simpler and less liable to choke, but they must have a minimum gradient of 1 in 10. For vertical and horizontal lines pipes are essential, but the horizontal lines need a head of at least 3 to 1 to keep the waterborne material moving, whilst rising lines of pipes are to be avoided. Of course, some preparation is necessary in the stope before the deposition of the sand. All openings must be closed at the lowest point, either by building water-tight tracks or barricades, the water escaping from outlets formed at the side as the stope becomes gradually filled with sand. Too much pressure must not be thrown against the artificial barricades or packs and, for this reason, the receiving stope should have length in preference to height, but by building packs the depositing of the sand can be regulated at will. To ensure that the overflow water, before reaching the pumps is clear of sand, it may be necessary to construct catch pits or weirs, whilst to protect the pumps and pipes against the action of any cyanide a small proportion of lime is added.

This question of the tailings still containing cyanide has been fully gone into, and to avoid such an occurrence as much as possible, only old tailings are being used, of which there is an ample supply at most of the mines to last for many years. Experiments are also being made with the object of destroying any cyanide the tailings may contain and considerable success has attended those experiments, for although entire destruction of the cyanide in fresh tailings has not been achieved, Dr. Irwin, the chemist to the Transvaal Government Mines Department, has succeeded in reducing the cyanide to three or four parts per million, which ought to be sufficient for all industrial purposes. So far when once a stope is properly filled the shrinkage by continued drainage does not seem to be sufficient to materially interfere with the success of the system whilst with regard to the quantity deposited in the stopes no difficulty is being experienced at the Village Deep in sending into the mine 200 tons of sand per hour. It is not anticipated that the cost will exceed two pence to four pence per ton, as this is the cost at one of the mines where the sand filling process was carried on under favourable conditions for some time on a small scale. It is not unlikely that if proved successful the sand filling process may in a sense revolutionize mining methods at present employed on the Rand.

Rowland Gascoyne.

Personal and General

Mr. C. McK. Campbell, head mining engineer for the Granby Consolidated M. S. & P. Company, has returned to his post at Phoenix, B.C., after having spent a month's vacation visiting Winnipeg, Montreal, and other places.

Messrs. James McEvoy, of Toronto, and R. G. Drinnan, of Vancouver, B.C., both well known coal mining engineers, have been engaged during the summer just past in locating, for a Toronto syndicate, coal lands in the country west of Edmonton and north of the Brazeau district, Alberta. Mr McEvoy returned to Toronto last month, and Mr. Drinnan to British Columbia.

Mons. A. Fournier, of Kaslo, B.C., manager for the Selkirk Mines, Ltd., a French company owning the Cork mine and concentrating mill on the south fork of Kaslo Creek, has, after some delay, received from France, the Medal of Merit, for valour and discipline. Mons. Fournier served 16 years in the French army, and now holds the rank of captain in the reserve.

Mr. Robert R. Hedley is investigating a gold-copper mine in the vicinity of Alberni Canal, Vancouver Island, B.C., which is under bond and option of purchase to a Vancouver syndicate, for whom he is acting.

Mr. Wm. Fleet Robertson, Provincial Mineralogist for British Columbia, who recently returned to Victoria from a trip through the Lillooet country, has gone to Portland Canal to make investigations there in his official capacity.

Mr. W. W. Leach, who has spent the field-work season of this year in the Skeena district, British Columbia, is expected to return to Ottawa during October.

Mr. R. P. Williams, western representative of the Canadian Rand Company, Limited, last month returned to his headquarters at Vancouver, B.C., from a trip to Whitehorse and Dawson, Yukon Territory, and thence to Nome, Alaska.

Mr. Charles Graham, formerly one of the underground managers for the Western Fuel Company, with large coal mines near Nanaimo, Vancouver Island, B.C., has been appointed superintendent of the Nicola Valley Coal & Coke Company's Middlesboro colliery, in the Nicola Valley, B.C., in succession to Mr. James Gray, resigned.

Mr. Newman Erb, of New York, president of the British Columbia Copper Company, Limited, has been visiting the company's mines and smelting works in the Boundary district, British Columbia.

Mr. G. G. S. Lindsey, of Toronto, lately paid a visit to some mining property in the Portland Canal district, British Columbia, in which he is interested.

Mr. A. B. Stewart, formerly manager of the Chester Basin gold mine, Nova Scotia, is at present in Porcupine.

Mr. H. C. Meek, superintendent of the Dome mine, Porcupine, is at present in the West.

Mr. J. B. Tyrrell has been appointed consulting engineer in Canada for an important English mining company that has heretofore confined its operations to South Africa.

Mr. J. McEvoy has returned to Toronto from the West and has taken an office in the Stair Building.

SPECIAL CORRESPONDENCE

ONTARIO.

Cobalt.—Mr. Lorne McGibbon, president of the La Rose Consolidated, recently stated that the proposed amalgamation of the more important Cobalt properties, was further away now than it had been a few months ago. This is due to the stronger position of the La Rose, which has made important gains on the No. 3 vein of the original mine, and also on the Lawson and Princess claims. One of the best discoveries of the year was made a short time ago on the Princess and subsequent development serves to increase its importance. At the recent annual meeting the directors declared the regular quarterly dividend of two per cent. payable on October 20. It was anticipated in certain quarters that the dividend rate would be raised, but the management has decided not to take such action until the properties have been more thoroughly developed. Although no official notification has been issued, it is known that the annual report, which will shortly be in the hands of the shareholders, will be very favourable.

The shaft on the Dreadnought property formerly known as the Rothschild, is now down 150 feet, and from this point crosscuts will be run under the lake. A couple of calcite veins have been located, and a considerable quantity of float nuggets have also been found.

The raise from the 288 to the 190 foot level of the Cobalt Lake Company, has been finished and it was in ore all the way. The vein is about two inches in width of high grade ore, and the values extend for some distance into the wall rock.

Surface work has been started on the Bartlett property in Gowganda, with the result that one of the best veins in the country has been found. A small shaft has been started and at a depth of eight feet the vein showed seven inches of high grade ore. This company has some of the best claims in Gowganda, and if conservatively managed there is every reason to believe that it may make good.

For some time the Ontario Department of Lands, Forests and Mines has been collecting data regarding the water power available in the northern parts of the province. The water powers of Northern Ontario figured largely in these estimates, which totalled an aggregate of 2,000,000 horse power. The powers in question are located over a distance of approximately 600 miles, occurring principally along the main tributaries of the Moose, Albany, Winnipeg and Rainy Rivers, which drain northward into the Hudson Bay. Some of these powers range from fifty to one hundred thousand horse power, and form a tremendous reserve that can be turned into electric energy. It it believed in some quarters that it may eventually be used for the electrification of the Grand Trunk Pacific.

The Northern Customs Concentrator has installed two more Nissen stamps, so that they now have in operation fifty regular stamps and four Nissens. This gives the mill a capacity of 160 tons a day, so that it is with the Coniagas treating the largest tonnage of any mill in the district. At the present time it is handling ore exclusively from the La Rose and City of Cobalt mines, and these contracts alone are sufficient to keep the mill in operation several years. The La Rose ore is all coming from underground operations, none of it being from the big dumps.

All Cobalt mines operating concentrators have received notification from the president of the Lord's Day Alliance that they must close down at 12 o'clock Saturday nights for the 24 hours' Sabbath rest. The general practice has been to close the mines down but to run the concentrators till about seven in the morning, and then to start up again at seven o'clock Monday morning. If the Alliance forces this action on the mill oper-

ators it will be extremely inconvenient and cause considerable loss. The Mine Managers' Association has taken the matter up, and written the Alliance, showing that the men obtain 24 hours' rest, and that to force the mills to shut down at twelve o'clock Saturday night would be a hardship both to the employees and the companies.

With regard to the Cobalt Central, the Referee in Toronto has decided that the question of selling the properties of the company will be definitely postponed till December 28th. He has also ruled that in the meantime all those connected with the former management shall be subpoenaed to Toronto, in order that their actions suggesting the liquidation of the company some months ago may be gone into.

Further exploration in the vicinity of the No. 1 shaft of the Trethewey has opened up two stringers of high grade ore that will give a stoping width of approximately fourteen feet. The greater part of the ore for the mill is coming from Nos. 2 and 4 shafts. The northern end of the property has been showing up exceedingly well and there are now five high grade veins showing in the No. 4 workings. The concentrator is treating over 100 tons a day, practically none of which is coming from the dumps.

A new shaft is being put down by the Coniagas, from which a crosscut will be run to explore the southern half of their property. The sinking is being done on a lot belonging to the Cobalt Central close to the boundary and is about 600 feet distant from the nearest working of the Coniagas. This section is in the conglomerate but no surface finds of any importance have been made.

At the Wyandoh mine, silver has been encountered at a depth of 135 feet. From the 80 foot level a winze was sunk on the vein, which at that point was barren. At a depth of 45 feet, however, the calcite changed to smaltite, which carries some silver values.

The Little Nipissing has obtained a lease of the ground on which the Peterson Lake Company started their shaft, and they will work this lease from their own shaft. Some of their veins carrying high grade ore have been found to lead into it. The lease is for seven years and the Little Nipissing has to pay a bonus of $10,000.

The Trethewey Company has declared a dividend of 10 per cent., payable October 15th.

Good results are now being obtained on the Provincial, and some fine ore is being taken from the 175 foot of the No. 2 shaft. At this point there are two veins showing high grade ore and a crosscut is being run to the south to intercept a promising surface vein. An ore house will shortly be erected, that will contain a small concentrating plant, to reduce the ore. The management expects to ship a car each, of high and low grade in about a month. This will be the first shipment from the property for a couple of years.

At the annual meeting of the T. & H. B. Company, held Sept. 26th, two reports were submitted, one from the original company and the other from the Hudson Bay Mines, the operating company. The former showed that $148,169.05 had been received from the sale of ore, while the latter showed receipts amounting to $383,451.60. The directors have tried unsuccessfully to float the stock of the Hudson Bay Mines, which is capitalized at $3,500,000, so that it is extremely improbable that the stock will be distributed among the shareholders of the parent company, as was originally intended. The construction of the new concentrator is being held up on account of the failure to deliver the machinery.

Recent heavy rains all over the district have greatly retarded surface development and assessment work. Practically every day for the past three weeks rain has fallen to such an extent that the Montreal River has risen over two feet.

Porcupine.—The township of Shaw has lately been coming into prominence on account of several reported discoveries of free gold. A good many prospectors have been into that section, and there have been several sales of undeveloped claims.

The main shaft of the Scottish Ontario Company is now down 100 feet, and from this point crosscuts will be run to open up the four veins discovered on the surface. It is probable that during the winter a couple of stamps will be installed for sampling purposes.

The Homer veteran claim in Tisdale has been sold to New York capitalists.

The owners of the Vipond property have decided to install a small steam plant and a single stamp for sampling purposes. There are two veins showing on the surface and samples from these show good values in gold. Two shafts are being sunk, but work has been greatly hampered on account of the shortage of supplies. There are at the present time five tons of ore on hand, which assays about $1,000 to the ton.

Four claims known as the McIntyre properties have been sold to New York men. Machinery and supplies will be taken in during the winter.

An important discovery has lately been made on the Armstrong-McGibbon properties while the assessment work was being done. The find was made about 150 feet from the boundary line of the Crown Chartered and the showing of free gold is as spectacular as any seen in the district. Several small test pits have been sunk on the vein and they show free gold in the bottom.

Active mining operations are shortly to be started on the Bilsky properties which are owned by New York and Montreal men who are closely identified with the Jacobs Exploration Company. It is stated that some promising veins have been found.

The freight from Kelso to Porcupine is arriving in greater quantities than formerly and it is also being looked after better. It is anticipated that there will be several hundred teams on the road this winter.

BRITISH COLUMBIA

The total tonnage of ore received at the Kootenay and Boundary district smelteries during nine months to September 30, is in excess of 1,500,000 tons. The aggregate tonnage mined during that period is larger, though, by probably 150,000 tons, this quantity representing ore either concentrated or milled. Then there is a small tonnage from Coast district mines to add, ore having also been smelted at the Tyee Copper Company's works on Vancouver Island, and other British Columbia ore sent to Tacoma, Washington, for treatment.

The annual general meetings of several British Columbia mining and smelting companies will have been held before this shall be printed. The more important of these are that of the Consolidated Mining and Smelting Company of Canada, Limited, called for September 27th, and that of the Granby Consolidated M. S. & P. Company, for October 4th.

Cassiar.—A press despatch dated Atlin, September 27, is as follows: "John P. Lamb, employed for a number of years by the North Columbia Gold Mining Company in cleaning bedrock, was arrested by Chief Constable Owen on Friday, 23rd inst., and charged with stealing gold. He afterward appeared before Magistrate J. A. Fraser and was committed for trial. Some time ago two native children playing behind Lamb's cabin found a small tobacco tin containing more than 13 ounces of gold in nuggets. Later, the police found 3 ounces more in his cabin. When they arrested Lamb, they recovered 47 ounces of amalgam valued at more than $700, which had been cached under a stump near Taku, and the hiding place of which had been disclosed by Lamb." The North Columbia Gold Mining Company is a Cincinnati organizaztion, of which Mr. J. M. Ruffner is manager. It operates on a larger scale than any other company in Atlin camp, hydraulicking extensively on Pine Creek in gold-bearing gravel in places 45 feet in depth and much of it yielding gold to the value of 40 cents a yard. Its water supply

ditch is five miles in length and of a stated capacity of 15,000 miner's inches. Much of the gold recovered is coarse, and it is reported that included in this season's yield was a nugget of 27 ounces in weight.

East Kootenay.—The gold mining season is drawing to a close on Wild Horse, Perry, and other streams in East Kootenay on which placering is carried on so long as weather conditions permit and sufficient water is obtainable. Lode mining at the St. Eugene and Sullivan lead mines, respectively, continues to constitute the chief feature of this branch of the industry, operations at other mines being small in comparison, and not yet productive of much ore for shipment. The output of the St. Eugene for nine months, to September 30, has been between 11,000 and 12,000 tons of lead-silver concentrate from 80,000 to 90,000 tons of ore, and from the Sullivan about 14,000 tons of crude ore. Both mines are worked by the Consolidated M. & S. Company, and both ship their product to that company's smeltery at Trail.

In coal production, the Crow's Nest Pass Coal Company has been maintaining a large output, the tonnage for the month of August having been 109,000, as compared with 73,000 tons in the corresponding month of 1909, this showing an increase in output of nearly 50 per cent. Both the Hosmer and Corbin collieries are also producing coal in considerable quantity, though on not nearly so large a scale as the Crow's Nest Pass Coal Company. Prospecting the coal measures in the upper Elk River country, north of Michel, is being proceeded with, and too, in the Flathead country, in the southeast corner of the province. Both these new districts are likely to have railway transportation next year.

West Kootenay.—In Ainsworth division, the mines on which work is being done are the several that have had mention in recent numbers of the Journal. Two or three others are expected to shortly resume after having been idle for a time. The list includes the Highlander, Highland, Blue Bell, several mines up the south fork of Kaslo Creek, and one at Poplar Creek. Wagon road communication has been established with McGuigan, Bear Lake, and Whitewater, so that building materials have been received at the Whitewater, Lucky Jim, and Rambler-Cariboo mines, and mining has been resumed in the last mentioned. It is intended to haul ore from both the Rambler-Cariboo and Lucky Jim to the C.P.R. at Three Forks, for shipment thence to smelteries. The Slocan Star, near Sandon, has lately been shipping some ore after a long period of practical non-productiveness, last year's output having been only 64 tons. The fact that ore is being again shipped has given rise to the statement that work was only lately resumed after a long period of idleness, which is an error. It is true that during several years no work had been done in the old workings affected by the Star vs. White litigation, happily finally settled last November ,but work has been in progress on the other side of the Star gulch with little intermission for two years or more. In 1909 about 1,550 feet of underground development was done, beside surface trenching and other prospecting work. This mine was visited last June by the writer of these notes, and shortly afterwards the following information relative to it was published: "The Slocan Star and Richmond-Eureka are both interested in the further extension of the latter's No. 6 tunnel. This was started on the Eureka claim; at about 500 feet in it entered the Hidden Treasure of the Slocan Star group and has been driven about 500 feet in that claim. At 200 feet farther ahead, or 1,200 feet from its portal, it will be in the Summit claim of the Richmond-Eureka group. An incline raise is being made in the vein from No. 6 to Eureka No. 5, a distance of 170 feet. This raise is up nearly 90 feet and it is expected it will be through to No. 5, which passes through one corner of the Hidden Treasure, early in July. A tunnel has also been driven on the vein about 200 feet lower down than No. 6, on the Slocan King claim of the Slocan Star group; this has passed through into the Hidden Treasure, and its breast is about 1,600 feet from its portal. Three shoots of ore have been passed through, and it is expected that another shoot, opened in Nos. 5 and 6 above, will be reached at about 1,800 feet in from the portal of this King tunnel. The chief purpose now is to get the two drifts well into the mountain (to cut several ore shoots known to occur in No. 5), and to connect them by raises to ensure good ventilation. When this shall have been done the miners will go back and cross-cut wherever deemed advisable, and stopes will be opened in the ore shoots." The account also described some aerial tramway improvements being made, and concluded thus: "The give-and-take arrangement between the two companies concerned makes it practicable to work their adjoining claims at less cost than if operated independently one of the other. As practically all of the ore from the workings above-mentioned can be shipped crude to the smeltery, it now appears unlikely the Slocan Star concentrating mill will again be operated until work shall be resumed in the old workings of the Slocan Star mine, which may not be done this season." This information will serve to show that instead of being "tied up" as mistakenly chronicled in Nelson, much development work has been in progress on the Slocan Star property during the last two years, with results that may be expected to allow of shipment of a lot of ore of good grade whenever the management shall deem it advisable to make shipments regularly to the smeltery.

In the Slocan Lake section of the district, developments at the Standard and Hewitt mines are regarded as satisfactory, with large shoots of ore opened ready for stoping. The Van Roi, in the same neighbourhood, is also being put in condition for maintaining an output of ore continuously; meanwhile the erection of a concentrating mill is being proceeded with. About Nelson, the Molly Gibson silver-lead mine, for several years known as the La Plata, is being worked by the Consolidated M. & S. Company, with Mr. A. W. Davis in charge as superintendent. The Athabasca gold mine is reported to be developing encouragingly. An announcement has been made of the intention of a syndicate to acquire and work the Silver King, Dandy, and other properties situated on Toad Mountain, near Nelson. In Ymir camp, the Yankee Girl, Wilcox, and Dundee mines are being worked, but only the first-named is producing ore in considerable quantity; it has this year sent to the Trail smeltery more than 4,000 tons. In Sheep Creek camp, The Queen and Nugget are keeping their respective stamp mills going, while the Mother Lode is being developed to a greater extent than other claims in the camp, though not taking out ore except that broken down in the course of development.

In Rossland camp, beside the larger mines—Centre Star group, Le Roi, and Le Roi No. 2—there are the Cliff, lately bonded to the Granby Company; the Mayflower, and the Blue Bird, and from these three results are expected that it is hoped will admit of their becoming regular shippers of ore to Trail. Resumption of work on the Beatrice silver-lead mine, Lardeau district, has been announced, while the Silver Cup, also in northern Lardeau, is sending ore out and now has a total production for the current year of about 900 tons of high-grade ore.

Boundary.—Shipment of ore from the Rawhide mine to the B. C. Copper Company's smeltery at Greenwood was commenced during the week ended September 17. This mine is one of the Dominion Copper Company's properties; some time ago its production was comparatively large and the ore was sent to the Boundary Falls smelting works. Publication of the reports prepared for presentation at the annual meeting of the Granby Consolidated M. S. & P. Company in New York on October 4, is being awaited with much interest. It is stated the company's net earnings during the fiscal year ended June 30 last, have been equal to $4 per share. As there are 150,000 shares in the company, this would mean a net profit for the year of $600,000. The British Columbia Copper Company is reported to have cash in hand and due for copper delivered, to the amount of about $250,000. Beside this, there is the value of copper in transit—

about $50,000. The Phoenix Pioneer is authority for the statement that "when the company shall have $500,000 in actual cash, the management propose to place the stock on a dividend basis." The aggregate tonnage of ore produced by Boundary mines during nine months to September 30 is given at about 1,260,000 tons.

Texada Island.—The general average value of the ore produced at the Cornell mine, near Van Anda, Texada Island, by the Northern Texada Mines, Limited, during seven months of this year, to August 31, is higher than that of last year's production, as shown by the following figures: In 1909 the production tonnage was 10,178 tons of ore, having an average metal content of: Gold, 0.297 ounces and silver 1.38 ounces per ton, and copper 3.78 per cent. During the seven months of 1910 the production was 4,301 tons, having an average metal content of: Gold, 0.407 ounces, and silver, 1.73 ounces per ton, and copper 4.47 per cent.

Portland Canal.—The mining properties on which the chief work is being done are those of the Portland Canal, Stewart, and Red Cliff companies. The Portland Canal Company's concentrator will be at work in October, and profitable results are looked for with confidence, there being much ore of good trade available for concentration. The Red Cliff Company is driving a long deep-level tunnel to cut at a considerable depth a shoot of copper ore opened by an adit at a higher level. This tunnel will soon be in about 100 feet from its portal.

Skeena.—Reports are published of the occurrence of silver-lead ores in several parts of the district about Hazelton, and of others in the Babine range, farther east. Samples of ore shown are of good grade, and the development of several silver-lead mines is expected.

Queen Charlotte Islands.—The work of prospecting the coal measures on Graham Island of the Queen Charlotte group is being proceeded with. Several companies have been organized to develop the coal resources of this island, and it is claimed the outlook for successful results is promising.

GENERAL MINING NEWS.

NOVA SCOTIA.

Halifax, Oct. 9.—The troubled mining centre of Springhill had unlooked-for excitement during the past week. Following the injunction granted by Judge Drysdale, which virtually stopped picketing , a period of lethargy set in. Men came to Springhill and found employment with the company without interference by the strikers. Last week the scene changed. James D. McLennan, provincial organizer of the U. M. W. from Glace Bay, arrived in Springhill early in the week. A mass meeting of strikers was held behind closed doors, and the morning following picket duty was resumed in greater force than ever before. Those of the strike breakers who did not live behind the palisade had to run the gauntlet of from three to six hundred men. The company acted quickly, and had warrants issued for eight of the principal U. M. W. leaders. The men arrested were J. D. McLennan, provincial organizer; J. B. Moss, of the Nova Scotia U. M. W. Executive; A. C. Bonnyman, president of the local lodge; Emile Michelson, Lionel Dobar, Richard Richardson, W. A. Mattix, and David Colwell. The last mentioned is an elder of the Presbyterian Church, and one of the most highly respected citizens in Springhill. The trial was called for Saturday afternoon before Stipendiary Ross, but before any evidence was taken an adjournment was made until next Saturday at 10 o'clock. Mr. Moss expressed the view that the men would ultimately win out, that the mines could not be successfully operated by the class of labour employed, that the longer the company operated under existing conditions the more money it would lose.

Over against the statement of Mr. Moss must be set some hard facts viz., the company is steadily increasing its coal output, it has about as many men employed as it desires, and, while a portion of them are far from desirable citizens, many are from Glace Bay and other Cape Breton collieries, and are experienced miners. There is no sign of yielding on either side.

NEW BRUNSWICK.

St. John, N.B.—Messrs. Charles Russell and H. E. Tiebur, representing large oil refining interests in the United States, after a careful inspection of the oil shales in Albert City, have made an offer to Senator Domville, representing the General Oil Shales Company of Canada, which holds large areas in Albert county, to purchase the entire product of the property for 25 years or more at a fixed price, for the purpose of refining the oil.

The proposition of Messrs. Russell and Tiebur is to build a refinery either at Hillsboro or St. John, preferably at St. John, connecting it with the mines by a pipe line 80 miles long.

Senator Domville will lay the proposition before the General Oil Shales Company, which is composed of English capitalists.

ALBERTA.

Coleman, Sept. 29.—An accident occurred on Tuesday at the International Coal & Coke Company's mine when M. Pieblado, an Italian, was unfortunately caught between two coal waggons and had his side crushed. He was taken to the miners' hospital and is progressing favourably.

BRITISH COLUMBIA.

Vancouver.—Since the first discovery of coal on Graham Island by Mr. Robertson, of Victoria, a syndicate has been formed with a capital of $1,000,000, which has acquired 43,500 acres of coal lands on the north end of the island and round the Masset Harbour district. The company has taken out mining licenses from the Provincial Government and will develop its holdings on a large scale.

Vancouver, Oct. 1.—A ten million dollar merger covering all powder companies in the Dominion has just been formed, the only concern outside the deal being the works of the Giant Powder Company of San Francisco, located at Telegraph Bay on the island. The new company is known as the British Columbia Explosives Limited. The merger is controlled by the Nobel Company, operating powder plants in every European country, and the Dupont Company controlling the industry in the United States. The plant of the Hamilton Powder works near Nanaimo, and of the Western Explosives Company on Bowen Island, figure in the deal and representative interests are now here inspecting the properties. It is understood that the amalgamation was arranged to put an end to keen competition and in future each company will operate within definite limits.

YUKON.

Dawson.—Dawsonites now making the journey five miles from Dawson over the Hunker Boulevard to a point a mile this side of Bear Creek can see in the making the largest gold recovering machine ever designed. Not in the history of man has there been such a mammoth machine built to recover gold.

The Canadian-Klondike Mining Company, Limited, is building the giant dredge.

President and General Manager Joseph W. Boyle has more than 100 men engaged on the construction, rushing the work

day and night. During the hours of darkness the numerous electric arc lamps make it almost as light as day, and the work progresses without a hitch.

At the rate the undertaking is being pushed along, the dredge should be finished and receive the juice before the end of the season. The outlook now is that the big machine will have ample time for a thorough test before the closing of the dredging season.

The dredge is to be known as the "Canadian." The name is taken from the first part of the company's name. Large metallic name plates are prepared to be placed on the side of the house.

The cost of the dredge will run between $300,000 and $400,000. The freight on the machinery alone, to say nothing of the penalties to be added because of the enormous size of many parts, will reach something like $100,000.

The dredge will be driven with power from the new plant now being installed on the north fork of the Klondike by A. N. C. Treadgold. The giant motors for the new dredge are on the ground. No transformers are to be used on the dredge, and every wire going aboard the boat will be absolutely insulated, and the craft thus fully protected from fire risk.

The digging line will have a 300 horse power motor, and will be guaranteed to stand an overload of 50 per cent. A 200 horse power motor will operate the ladder hoist. The total capacity of the motors is 1,000 horse power. The motors were designed especially for this work by the General Electric Company.

The digging ladder and the stacking ladder have steam heating apparatus especially designed to keep the ice from interfering with the work. Other machines have much trouble from ice on these parts, especially late in the fall.

With this new device for warding off of ice, Mr. Boyle calculates on being able to dredge 200 to 215 days.

The Canadian will have a capacity of 10,000 cubic yards a day. The company's dredge No. 1,now at work on the Klondike, has a capacity of 4,000 yards. The big dredge will handle 15 cubic feet of material with every bucket.

The second largest gold dredge in the world is the Natoma No. 1, in California. Its buckets are a little more than 13½ feet each.

MINING NEWS OF THE WORLD.

NEWFOUNDLAND.

St. John's.—The company which has been prospecting near Parsons Pond, Nfld., has struck oil and will proceed with development operations immediately.

The Steamer Harlaw, which sails on Tuesday from Halifax, will have almost a cargo of equipment for the Parsons Cove concern this trip, and is loading the goods at G. S. Campbell & Company's wharf now. They came from New York by the Florizel and Bornu and include two three-ton boilers and attachments, heavy steel drills, an immense lot of iron piping, derricks, timbers, etc., for the development work; also a large quantity of flour and food supplies.

UNITED STATES.

Los Angeles, Cal., Sept. 30.—The American Mining Congress placed itself on record yesterday as opposed to the Roosevelt and Pinchot conservation policies, and by a vote that was practically unanimous declared in favour of state control of water power and all other natural resources as against federal control.

As indicative of the attitude and sentiments of the delegates in the matter of national conservation of natural resources, the congress accepted a report of the committee on Alaska mining laws in which L. R. Glavis, the land office special agent dismissed by Secretary Ballinger, was attacked, and applauded a delegate who denounced Colonel Roosevelt's attitude on conservation.

Los Angeles, Cal., Oct. 3.—It is officially stated that the report of an agreement between the Associated Oil Company and the Independent Producers' agency for the sale of 10,000,000 barrels of oil to the Associated is premature. No such deal has been perfected, although it is admitted that negotiations are under way. The difficulty in closing the deal appears to be in the price, the agency demanding at least 35 cents per barrel, and the Associated refusing to pay more than 30 cents.

Cripple Creek, Colo.—It is learned that 48 new applications for leases have been filed since the announcement of the United States Reduction & Refining Company's big cut in ore treatment charges, and the holdings of these nine corporations represent less than 11 per cent. of the ground in that section of the district known as the mineral belt. To place the present number of applications at 200 in covering the entire camp would be conservative, as mining men declare they are besieged by men after leases, and at this time it is predicted that the reduced treatment rates will result in an ore tonnage increase of at least 10 per cent. before the expiration of 30 days.

Cripple Creek, Colo.—The output of the Cripple Creek district for September, compiled from figures given out by mill managers, was 68,570 tons, with a gross bullion value of $1,314,838.50, being a slight increase in money value over August, with a decrease of 230 tons handled. The figures follow:

Mill.	Tonnage.	Av. value.	Total.
New Portland	8,650	$ 3.55	$ 30,718.50
Wild Horse	1,000	3.00	3,000.00
Stratton's Independence ..	7,800	3.60	31,040.00
Smelters	4,120	65.00	267,800.00
Portland	9,000	20.00	180,000.00
Golden Cycle	25,600	30.15	515,840.00
U. S. P. & R. Co.	12,400	23.10	286,440.00
Totals	68,570		$1,314,838.50

Danville, Ill., Oct. 6.—One hundred and fifty men were entombed in the Hartshorn coal mine, which took fire near this city to-day. All of the miners were taken out safely. The fire is confined to the lower levels and the managers say there is no danger.

New York, Oct. 1.—Returns of copper exports to Europe in September show that sales of the metal abroad the present month were the largest in more than a year. Not including the shipments made yesterday, exports of the month have totalled 31,630 tons, which compares with 27,976 tons in August and 22,875 tons in July. Not since the summer of 1909 have any one month's exports been equal to those of September.

The present month's large total was the result of the buying movement which gathered considerable headway in August, when it was announced that production of the metal was to be curtailed. Since that movement came to a stop, the copper market has been very quiet.

SOUTH AMERICA.

Colombia.—The American Vice-Consul at Barranquilla reports that the discovery of petroleum by a Canadian company near the town of Tubara, Colombia, has led the company to take steps to prospect extensively for the fluid. A large quantity

of American equipment has been ordered and operations are to be commenced almost immediately.

AUSTRALIA.

The discovery of gold in payable quantities in Australia dates back to 1851. From that year to the end of 1908 gold was raised to the value of £501,474,770. Silver was discovered in Australia as early as 1839, but was not worked until 1864. The mineral mined to the end of 1908 was, in conjunction with lead, valued at £57,993,423. The total mineral production of the Commonwealth to the end of 1908 was valued at £714,903,750. The total is made up as follows: Gold, £501,474,770, silver and lead, £57,993,423; copper, £51,863,038; tin, £26,749,012; coal, £63,454,277; other minerals, £13,369,230. Queensland's contributions to those figures were: Gold, £68,277,156; silver and lead, £1,753,314; copper, £6,313,083; tin, £6,950,156; coal, £4,121,425; other minerals, £1,276,262.

GREAT BRITAIN.

The Cambrian Colliery Combine men, who number 12,000, decided to go out on strike on Sept. 19th.

This decision is directly opposed to Saturday's conference at Cardiff, at which it was decided to take a ballot of all South Wales miners as to whether there should be a general stoppage in sympathy with the Cambrian men or whether the latter should be supported by a levy. Those who represented the Cambrian men at the conference undertook that they should continue at work pending the taking of the ballot. In deciding to cease work the men have flouted those who represented them and gone contrary to the advice of their leaders.

It is feared that the owners may retaliate by locking out the whole of the men in the South Wales coalfield. The owners see indications of a general stoppage in the not distant future, and are believed to prefer to enter upon the fight at once—if there is to be a fight—rather than await the convenience of the miners' leaders. Hence it is feared they may seize the opportunity that the action of the Cambrian men seems to offer of calling a general lock-out.

WEST AFRICA.

The West African Chamber of Mines states that the gold yield of the colony for August was 13,921 ounces, valued at £57,713, a decrease of 1,643 ounces, or £838, compared with the preceding month.

SOUTH AFRICA.

A cablegram from Johannesburg states that during August the mines of the Witwatersrand (that is, excluding outside mines) crushed 1,834,105 tons. The average yield per ton was 28s. 3d., the working costs per ton were 17s. 8d., while the profit per ton was 10s. 6d., and the aggregate profit £961,304. Compared with July, 19,419 tons more were crushed, the daily average tonnage being 59,164 in August, as compared with 58,538 in the previous month.

The Simmer and Jack report for the year ended 30th June shows a profit of £584,700. The shortage of labour during the year necessitated the use of extra drills, and that has been the chief factor in the reduction of the grade of ore, together with the inclusion of ore from poorer stopes hitherto neglected. The total ore reserve estimates are now given as 2,690,000 tons, assaying 6.3 dwts. The filling of old stopes with waste sands is now being carried out, permitting of the recovery of pillars of ore previously left in the mine as supports. This system increases the amount of pay reef extractable and will improve the total profit per claim area.

Developments upon the Modderfontein mine show an aggregate of 2,582,000 tons, averaging 7 dwts., being an increase during the year of 1,000,000 tons and an improvement of 1 dwt. per ton in the value. These figures and facts are unique in the history of mining on the Rand. Further capital expenditure on plant and development will enable the handling of 52,500 tons monthly by January next. The new central vertical shaft is to be built on the circular plan to a depth of 2,000 feet. The consulting engineers estimate that by means of the new shaft 8,250,000 tons of ore can be developed by June, 1913, at a very low cost. The new battery, in course of erection, will increase the crushing capacity by an additional 39,000 tons per month. It is estimated that from June next a dividend of a sovereign per share will be distributed.

SPAIN.

Private telegraphic advices have been received in Glasgow to the effect that the mining strike at Bilbao has been settled through the intervention of the Spanish Government. The men are to resume work. The news created considerable comment both in the iron trade and in shipping circles. The reserve ore stocks of hematite makers are nearing exhaustion, and it is anticipated that there will be considerable pressure to get forward cargoes. It will probably be some months before production on a normal scale can be resumed.

HOLLAND.

The contest between the Standard Oil and the Royal Dutch Petroleum Companies is, according to an Amsterdam dispatch to "L'Information," of Paris, becoming more and more acute. Recently the Royal Dutch Company put down the price of benzine from 16 to 12 cents a litre, but now the Societe des Automates, subsidiary of the Standard Oil Company, of New Jersey, is offering best quality motor essence for 10 cents the litre and is inviting dealers, before concluding contracts, to inquire of them as to details and conditions. The Royal Dutch Petroleum Company is now selling "sumatrine" at 10 cents and "autoline" at 12 cents.

AUSTRIA.

A Vienna dispatch to the "Kolnische Zeitung" announces that the Vacuum Oil Company, which is the Austrian subsidiary of the Standard Oil Company, has in many cases informed its customers that, in consequence of the measures adopted against the company by the authorities, it is unable to carry out the deliveries of benzine in accordance with the existing contracts. The customers, therefore, placed the matter before the Chambers of Commerce, which, in turn, forwarded the complaints to the Government. An order has now been issued by the Government recommending the customers to take legal proceedings, as the Vacuum Oil Company has not suspended working, but has sought, it is declared, under the pretext of "force majeure," to withdraw from its obligations of delivery under unfavourable contracts. It is added, for the rest, that the union of refineries is prepared to accept such contracts.

COMPANY NOTES.

VAN ROI MINING COMPANY, LIMITED

The following statement has been issued by the shareholders of the above company from the London office:

The recent satisfactory developments on the vein parallel to and south of the main lode, now known as the Beryl vein, have decided the board to at once proceed with the erection of the new mill on the Mountain Boomer site. This vein has now been opened up on No. 4 level for a length of 360 feet with the following result:

Average width, 4 feet 2 inches; average assay, silver 16.68 ounces, lead 6.5 per cent, zinc 11.8 per cent.

A drift is also being run on No. 3 level, but has not yet reached the point where it is expected to encounter the ore shoot.

The lease of the Wakefield mill having terminated on the 15th of August, possession was accordingly given up on that date and the work of moving the aerial tram to the Mountain Bloomer end of the mine was commenced. Foundations for the new mill are already completed and the flume work finished. Construction of the mill house will be commenced early this month, as soon as the bunk house to accommodate the men is ready. From the 15th of August all stoping ceased the only work taking place in the mine was the necessary development for preparing the Beryl vein for future stoping. The amount of work necessary is approximately:

240 feet crosscutting on Level No. 5.

80 feet raising from Level No. 5 to Level No. 4.

225 feet raising from Level No. 4 to Level No. 3.

80 feet of drifting on Level No. 3.

Contracts have been let for this work at satisfactory prices.

It is expected that the new mill will be in operation about the beginning of January.

The following cable has been received from the company's managers at Rossland:

Mill report to August 15th: Total amount crushed, 1,226 tons, assaying 12.6 ounces silver, 3.4 per cent. lead, 6.1 per cent. zinc—yielding 65 tons lead concentrates, assaying 141.9 ounces silver, 64.3 per cent. lead, and 9.9 per cent. zinc; and 70 tons zinc concentrates, assaying 41.5 ounces silver, 1.7 per cent. lead and 43.8 per cent. zinc. Total approximate value, $6,925 (£1,428). Mill ran 264 hours.

Estimated expenditure for the month of August: On development, $6,121; on ore production, $1,093; on milling, $1,688; total, $8,902 (£1,835).

Beryl Vein: No. 4 Level—Advanced westwards 35 feet. Raised No. 4 Level to No. 3 Level 51 feet, of which last 30 feet assayed 12 ounces silver, 7⅜ per cent. lead, 14 per cent. zinc, over 2⅝ ft.

No. 3 Level: Advanced westwards 102 feet.

CHAMBERS-FERLAND.

A statement of the Chambers-Ferland Company's affairs, as of August 31st, 1910, shows the assets now represent about $131,000 in cash and bills receivable, and upwards of $70,000 in estimated ore reserves, or nearly the present market valuation of the stock, without taking the property into consideration. The statement is as follows:

Cash on hand	$106,456.19
Bills and accounts receivable	8,458.96
Ore in transit and smelters	16,698.95
Ore on hand	5,621.00
Accounts payable	6,264.56

The ore reserves are estimated at 146,700 ounces.

GRANBY.

At the annual meeting of Granby Consolidated on October 4th, J. B. F. Herreshof, G. W. Wooster, Wm. Hamlin, E. R. Nichols and Northrup Fowler were elected directors to succeed Crawford Clark, jr., J. Langeloth, H. L. Higginson and Payne Whitney resigned.

Mr. Langeloth was president of the company and the largest individual stockholder.

It was voted to request the directors to issue a report every six months on general business conditions and affairs of the company.

BRITISH COLUMBIA COPPER COMPANY.

The British Columbia Copper Company is in good condition, according to late returns. There is in the treasury $250,000, which includes amount due for copper delivered.

The British Columbia Copper Company has ores running high in both gold and silver, particularly the former, from which there is a standard income of $20 an ounce. This ore comes largely from the Jack Pot, the company's new shipper in Wellington camp. This has enabled the company to produce its copper and lay it down in New York ready for sale—notwithstanding the railroad haul across the continent—in the neighbourhood of seven cents a pound, a record which many producers of the continent have not yet attained.

Now that one of the furnaces at the company's reduction works has been enlarged the smelter has increased and will be able to treat about 2,000 tons of ore daily.

The company's August operations resulted in a net revenue of $32,500. These profits compare with $11,918 in July and $7,121 in June. After crediting gold and silver values it cost the company 7.7 cents a pound to produce its copper in August, with only two furnaces in operation.

The production during the previous seven months was as follows:

	Copper (lbs.)	Gold (ozs.)	Silver (ozs.)
January	656,473	2,513	7,530
February	683,234	2,500	7,627
March	891,419	2,623	9,191
April	340,061	125	3,611
May	.....	.....	.....
June	417,040	1,550	5,221
July	574,172	1,960	6,623

STATISTICS AND RETURNS

NOVA SCOTIA STEEL AND COAL.

The statement of the Nova Scotia Steel & Coal Company for September, just issued, shows an output of 55,100 tons of ore, 7,387 tons of coal, 7,220 tons of pig iron, 6,830 tons of steel, while the company shipped 90,000 tons of coal.

COBALT ORE SHIPMENTS.

The ore shipments from Cobalt camp for the week ended October 1st were comparatively large, aggregating 1,387,258 pounds, or 668 tons. Kerr Lake, which made no shipments the previous week or two, heads the list with 420,000 pounds. The total shipments aggregate 47,197,530 pounds, or 23,859 tons.

Shipments for the week and year, in pounds of ore, are:

	Week ended Oct. 1. Ore in lbs.	Year. Ore in lbs.
Beaver	45,600	226,617
Buffalo	60,990	1,783,738
City of Cobalt	66,000	548,875
Chambers-Ferland	.....	1,341,100
Cobalt Central	64,049	562,237
Cobalt Lake	.....	260,000
Cobalt Townsite	.....	366,840
Colonial	.....	193,480
Coniagas	.....	1,363,968
Crown Reserve	65,000	5,059,160
Drummond	.....	664,200
Hargraves	.....	401,170
Hudson Bay	.....	417,925
Kerr Lake	420,999	7,546,714
King Edward	.....	263,460
La Rose	172,620	8,662,001
McKinley-Darragh	150,000	2,944,969
Nipissing	187,270	9,342,907
O'Brien	.....	928,416

Peterson Lake		432,320
Provincial		65,000
Right of Way	82,330	1,311,567
Rochester		60,750
Silver Cliff		268,720
Temiskaming	122,400	1,771,480
Trethewey		808,520
Waldman		63,992
Wyandoh		48,300

Following are the shipments from the Cobalt camp for the week ending October 8th, and those from January 1st, 1910, to date:

	Oct. 8. Ore in lbs.	Since Jan. 1. Ore in lbs.
Beaver		226,217
Buffalo	56,100	1,839,738
City of Cobalt		548,875
Chambers-Ferland	58,800	1,399,900
Cobalt Central		293,286
Cobalt Lake		260,900
Cobalt Townsite	88,000	454,840
Colonial		193,480
Coniagas	138,300	1,502,266
Crown Reserve	58,740	5,117,900
Drummond		664,200
Hargraves		401,170
Hudson Bay		417,925
Kerr Lake	303,280	7,849,994
King Edward		263,406
La Rose	238,530	8,900,531
McKinley-Darargh	108,820	3,053,789
Nipissing	440,780	9,783,687
O'Brien	58,800	987,216
Peterson Lake		432,420
Provincial		65,000
Right of Way		1,331,567
Rochester		60,750
Silver Cliff		268,720
Standard Cobalt		258,951
Temiskaming		1,771,480
Trethewey		808,580
Waldman		63,992
Wyandoh		48,300

Ore shipments for the week ending October 8th were 1,550,150 pounds, or 775 tons.

Total shipments from January 1st to October 8th were 49,269,080 pounds, or 24,634 tons.

PIG IRON PRODUCTION.

According to "The Iron Age," pig iron production in September amounted to 2,054,175 tons, or 68,470 tons a day, an increase of about 50 tons a day over the August rate. Production of all kinds of pig iron is now at the rate of about 24,900,000 tons a year. The United States Steel Corporation has 45 blast furnaces idle and its capacity active is 67.82 per cent., there being practically no change in three weeks. The September bookings in wire products were greater than for any previous September, save one. Specifications and new contracts exceeded those for August. The foundry iron market is uninteresting. Large buying for 1911 is still deferred and the shadow of lower prices for ore in 1911 has now been thrown across the situation.

BRITISH COLUMBIA ORE SHIPMENTS

The Bluebird mine of Rossland and the Hewitt mine of Silverton have both entered this year's shipping list the past week, the former with a shipment of 25 tons, and the latter with a shipment of 22 tons. Both mines have been doing active development work. The Bluebird was a prominent shipper last year, its ore being gold-copper-silver. The Hewitt is in the dry ore belt. The Fern mine makes its second shipment of the year.

The following are the returns of the ore production and movement for the past week, ended October 1st:

Boundary Shipments.

Granby	14,305	871,135
Mother Lode	6,300	258,587
Snowshoe	2,363	114,696
Jack Pot	383	9,457
Other mines		11,923
Total	23,351	1,265,798

Rossland Shipments.

Centre Star	3,072	144,025
LeRoi No. 2	270	23,971
LeRoi No. 2, milled	300	11,700
Bluebird	25	25
Other mines		12,681
Total	3,667	192,402

Slocan-Kootenay Shipments.

Greenwood, B.C.

St. Eugene, milled	2,775	108,225
Van Roi, milled	800	31,200
Queen	420	16,380
Granite-Poorman	250	9,750
Nugget, milled	110	4,290
Highland, milled	450	6,700
Wilcox, milled	75	450
Richmond-Eureka	97	3,257
Standard	68	1,222
Fern	12	39
Emerald	26	1,535
Yankee Girl	32	4,040
Eastmont	35	587
Sullivan	1,065	14,277
Ruth	36	458
Idaho	30	71
Slocan Star	33	88
Hewitt	22	22
Other mines		32,624
Total	6,336	235,215

The total shipments for the week, including the estimated amount milled, were 33,354 tons, and for the year to date, 1,693,415 tons.

B. C. Copper Company's Receipts.

Greenwood, B.C.

Mother Lode	6,300	258,587
Jack Pot	383	9,457
Other mines		11,739
Total	6,683	279,783

Granby Smelter Receipts.

Grand Forks, B.C.

Granby	14,305	871,135
Other mines		120
Total	14,305	871,255

Consolidated Company's Receipts.

Trail, B.C.

St. Eugene, concentrates	178	11,551
Van Roi, concentrates	31	944
LeRoi No. 2, pt. concentrates	270	23,971
Queen, concentrates	38	585
Centre Star	3,072	144,025
Snowshoe	2,363	114,696
Richmond-Eureka	97	3,257
Standard	68	1,222
Fern	12	39
Emerald	26	1,535
Yankee Girl	32	4,040
Eastmont	35	587

Bluebird	25	25
Sullivan	1,065	14,277
Ruth	36	458
Idaho	30	71
Slocan Star	33	88
Hewitt	22	22
Other mines	.....	30,075
Total	7,433	351,413

The total receipts at the smelters, including concentrates, were, for the week, 28,481 tons, and for the year to date, 1,502,451 tons.

SHARE MARKET.

(Courtesy of Warren, Gzowski & Co.)

Miscellaneous—October 10th, 1910.

	Bid.	Ask.
Amalgamated Asbestos	..	15
Dominion Coal Company	63	..
Dominion Steel Company	63	..
Nova Scotia Steel	..	83
Granby	30½	31
Consolidated Smelting	60	65
Crow's Nest Pass	..	80¼
Dominion Steel & Coal Corporation	..	61¾
Black Lake Asbestos	18½	..

New York Curb.—October 10th, 1910.

Boston Copper	17	19
British Columbia Copper	7	7⅛
Butte Coalition	12	12¾
Canadian Mines	6¼	6½
Chino Copper	19⅜	19½
Davis-Daly Copper	2	2⅛
Ely Consolidated	.28	.32
Giroux Mining	7¼	7⅜
Goldfield Consol.	7⅞	8⅛
Greene-Canadian	7⅜	7½
Harcuvar Copper	10	15
Inspiration Copper	9⅜	9½
Miami Copper	19½	19¾
New Baltic Copper	4	8
Nevada Con. Copper	20¼	20⅜
Ohio Copper	1¾	1 13/16
Rawhide Coalition	.05½	.06
Ray Central	1 15/16	2
Ray Consolidated	19	19⅛
Union Mines	15/16	1 1/16
Yukon Gold	3 15/16	4 1/16

Cobalt Stocks.—October 10th, 1910.

Amalgamated	.02	.03
Bailey	.07½	.07⅝
Beaver Consolidated	.33	.33¼
Big Six	.01	.06
Buffalo	2.00	2.05
Chambers-Ferland	.16⅝	.16⅞
City of Cobalt	.25⅜	.26
Cobalt Central	.07	.08
Cobalt Lake	.15¾	.16½
Coniagas	4.20	4.50
Crown Reserve	2.65	2.68
Foster	.08	.11
Gifford	.07	.09
Great Northern	.08¾	.08⅞
Green Meehan	.02⅝	.02⅞
Hargraves	.32½	.33
Hudson Bay	90.00	105.00
John Black	.04	.06½
Kerr Lake	6.55	6.65
La Rose	3.85	3.95
Little Nipissing	.27⅛	.27¼
McKinley	1.01	1.02
Nancy Helen	.03	.04¾
Nipissing	10.50	10.65
Nova Scotia	.25¼	.26
Ophir	.28	.32
Otisse	.02	.02⅝
Peterson Lake	.24¾	.25
Right of Way	.32⅝	.33
Rochester	.15	.16
Silver Leaf	.05	.06½
Silver Bar	.02	.06
Silver Queen	.03	.08
Temiskaming	.85	.86
Trethewey	1.24½	1.26
Watts	.02	.10
Wettlaufer	.65	.66

SILVER PRICES.

		New York cents.	London pence.
September	24	53¾	24 13/16
"	26	53¾	24 13/16
"	27	53⅞	24⅞
"	28	53¾	24¾
"	29	53⅞	24 13/16
"	30	54	24⅞
October	1	54⅛	24 15-16
"	3	53⅞	24⅞
"	4	53¾	24 13/16
"	5	53⅞	24⅞
"	6	54⅛	24 15-16

TORONTO MARKETS.

October 11.—(Quotations from Canada Metal Co., Toronto.)

Spelter, 6 cents per pound.
Lead, 3.65 cents per pound.
Antimony, 8 to 8½ cents per pound.
Tin, 38 cents per pound.
Copper, casting, 13.25 cents per pound.
Electrolytic, 13.25 cents per pound.
Ingot brass, 8½ to 12½ cents per pound.

Oct. 10.—Pig Iron (Quotations from Drummond-McCall Co., Toronto)..

Summerlee No. 1, $23.00 (f.o.b. Toronto).
Summerlee No. 2, $22.50 (f.o.b. Toronto).
Midland No. 1, $20.50 (f.o.b. Toronto).
Hamilton No. 1, $20.00 (f.o.b. Hamilton).
Hamilton No. 2, $19.50 (f.o.b. Hamilton).
Clarence, $20.00 (f.o.b. Toronto).
Cleveland, $20.50 (f.o.b. Toronto).
Coal, anthracite, $5.50 to $6.75.
Coal, bituminous, $3.50 to $4.50 for 1 1-4-inch lump.

COKE.

Oct. 6.—Connellsville Coke (f.o.b. ovens).

Furnace coke, prompt, $1.60 to $1.65 per ton.
Foundry coke, prompt, $2.10 to $2.25 per ton.

Oct. 6.—Tin (Straits), 36 to 36.75 cents.

Copper, Prime Lake, 12.75 to 12.87 1-2 cents.
Electrolytic copper, 12.65 to 12.75 cents.
Copper wire, 14 cents.
Lead, 4.47½ cents.
Spelter, 5.62 1-2 cents.
Sheet zinc (f.o.b. smelter), 7.50 cents.
Antimony, Cookson's, 8.15 cents.
Aluminium, 22 to 22.50 cents.
Nickel, 40 to 47 cents.
Platinum, ordinary, $35.50 per ounce.
Platinum, hard, $37.50 per ounce.
Bismuth, $1.95 per pound.
Quicksilver, $46 per 75-lb. flask.