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MINE TIMBER.

The serious consideration of the fact that Canada's available supplies of mine timber are rapidly vanishing is forced upon us. The data collected by Messrs. MacMillan, Robertson, and Boyce for the Dominion Forestry Branch, represent the first attempt to define the present situation.

During the past year, mine timber to the value of \$827,337 was used in Canada. 52,848,000 linear feet of round timber, valued at \$523,339; and 22,305,000 board feet of sawn timber, valued at \$303,908, made up the total. The average cost of the former was \$9.90 per thousand linear feet, and of the latter \$13.63 per thousand board feet.

Of the round timber, British Columbia used 55 per cent. The average cost per thousand linear feet was \$7.01. Nearly all this was Douglas fir, 20,000,000 feet of which was of four to six inch diameter, used as lagging in coal mines. This accounts for the low average cost.

Nova Scotia used 30 per cent. of the round timber, or 15,653,000 feet, the average cost of which was \$10.74 per thousand. Most of this timber was five inch spruce.

Alberta's consumption, 7,484,000 feet, consisted largely of lodge-pole pine, supplemented by spruce and small quantities of Douglas fir. The average cost was \$17.75.

Ontario's mines are credited with only 549,000 linear feet, costing \$26.83 per thousand. About one-half of this was five to seven inch spruce; while one-third was pine of small diameter.

Although twelve species of wood are reported, only two are used in important quantities. These are Douglas fir and spruce, used respectively in the coal mines of British Columbia and Nova Scotia.

As regards sawn timber, practically the same proportions hold as for round.

Timber used in mining has shorter life than when used overground. Underground conditions are conducive to decay. The danger of fire in coal mines is an added risk. Hemlock has a life of about five years in its natural condition. Spruce lasts only three years. When treated with creosote or zinc chloride the durability of all species is increased from 100 to 300 per cent. An added argument in favour of such treatment is the fact that inferior woods may be successfully used.

The use of preservatives has got far beyond the experimental stage. Particularly in the United States has the subject been investigated. Practical applications have been made of results obtained. Hence,

Canadian mine operators have merely to borrow from the experience of others.

It may or may not be practicable to create and enforce legislation on this subject. There is no question, however, as to the present duty of all large consumers of mine timber. Apart from other aspects, the fact that the use of preservatives makes for economy is sufficient cause for change in the present attitude of indifference.

THE ORIGIN OF PETROLEUMS.

That tireless champion of the theory of the inorganic origin of petroleum, Mr. Eugene Coste, contributes to the last bulletin of the Institution of Mining and Metallurgy, a vigorous attack upon the supporters of the organic theory.

After asserting that the advocates of the latter theory persistently start from wrong premises, and that they thus impede progress in the solution of an important problem, Mr. Coste proceeds to flay his opponents in characteristic fashion.

To show that a substantial body of thinkers have given their support to the inorganic theory, Mr. Coste quotes such names as Berthelot, Mendeleef, Moissan, Elie de Beaumont, Humboldt, and others of high repute. Hence, it is incorrect to argue that the inorganic theory is held by chemists only. Moreover, says Mr. Coste, the one fundamental fact that the only phenomenon analogous to the production of petroleum visible to-day is in some phases of volcanism. This is entirely overlooked by the advocates of the organic theory.

Abundant evidence has been furnished by scientists to show that associated with active volcanoes and with ancient volcanic rocks are large quantities of hydrocarbon gases. Massive crystalline rocks contain as much as 0.2 per cent. of carbon. This, Mr. Coste believes, establishes the fact that the source of all carbon was far removed from the organic realm.

The oil-bearing character of strata in "petroliferous provinces" does not depend in any way upon the presence of fossils, but does depend solely upon the fact that faulting and fissuring have provided ingress for petroleum emanations from the interior. In further support of this statement, Mr. Coste cites the facts that oil is obtained even in crystalline schists and gneisses, that productive sands range from the Archaean to the Quaternary, and that the oil everywhere presents the same characteristics.

On the other hand, although the "organics" admit that the process of petroleum production must be operative to-day, they also admit that there is no visible evidence of the fact. Mr. Coste, commenting upon this, asseverates that never in nature did a petroleum production process "coeval with the kingdoms of life" exist. That there is any genetic relation between coal and petroleum he categorically denies. That methane exists both in coal and in petroleum proves merely that

methane can be formed in two ways. "Although we 'are surrounded . . . everywhere with the 'death, decay, and decomposition of countless organisms, animal and vegetable, no one has yet been able 'to . . . establish one single case in which these 'mixtures of hydrocarbons known as petroleum are 'found through the natural processes of decaying organisms, while its constant and abundant production 'in volcanic phenomena cannot be disputed any 'longer.'"

On two major propositions Mr. Coste lays strong emphasis. Vegetable organic remains were always transformed into coal, and soft organic tissues were never entombed in sedimentary rocks.

Several quotations from adherents of the organic theory are given by Mr. Coste. These show a surprising lack of agreement. The assumption that time and temperature compensate each other in the natural distillation of petroleum, is laughed at. Why, asks Mr. Coste, are coal-beds left undistilled? To believe that the mere passage of time can make up for the absence of heat is as reasonable as to assert "that by leaving a 'turkey long enough in cold storage, it will cook itself to the most succulent point.'"

Point after point is scored by Mr. Coste. These we cannot touch upon. Suffice it to indicate the seven positive statements on which he bases his position. These are:—

First, bituminous shales containing bitumens or petroleum, as such, never constitute widely and uniformly spread sheets, nor thick horizons; they are found only as isolated patches of comparatively small extent along faults, fissures, or joints or in brecciated zones of sandy shales, and the secondary nature of their bitumen is as a rule plainly evident.

Second, so-called bituminous shales, forming entire horizons in sedimentary formations, are really not bituminous shales, but are black carbonaceous shales containing the carbon as coal.

Third, even very fossiliferous strata contained when deposited only the remains of the calcareous or silicious parts of the organisms, from which no petroleum could possibly be produced.

Fourth, petroleum, as a rule, are not associated with fossils, which are themselves almost always absolutely devoid of petroleum of any kind.

Fifth, the association of petroleum with sedimentary strata is one of secondary replacement.

Sixth, not only shales, but almost all other strata, constitute in the unaltered sedimentary formations of the oil fields, saturated impervious beds; and this imperviousness precludes the supposition that oil, gas, and water could travel through the fine pores of the sediments, which from the time of their deposition were already occupied by water.

Seventh, the mode of occurrence of petroleum deposits in the sedimentary strata of all ages, but in certain districts only, and the constant recurrence of

hydrocarbons in volcanic and igneous rocks, in volcanic emanations, in metallic and other veins, in meteorites, in comets and other stellar bodies, clearly demonstrate that petroleum is not of organic origin; if they were, their distribution could not possibly resemble the actual occurrences that are known.

Without doubt, Mr. Coste has given his opponents some hard nuts to crack. The chief bar to proper discussion, however, is the fundamental divergence in the postulates of each party.

We shall make it a point to inform our readers of the answers that Mr. Coste's paper is sure to evoke.

THE NEW CHAIRMAN OF THE TRANSCONTINENTAL.

The Premier's selection of Mr. R. W. Leonard to fill the important post of Chairman of the National Transcontinental Railway Commission, will be viewed with profound satisfaction by all those who know Mr. Leonard. Particularly will the appointment appeal to mining men.

Mr. Leonard is a native of Canada. Since graduating from the Royal Military College about twenty-seven years ago, his professional work has consisted in railroad engineering and power-plant construction, interspersed with a certain amount of actual mining. Good fortune, a function oftentimes of initiative and vision, led him to take chances in Cobalt in the earliest days of that camp's existence. Now, as the largest holder of Coniagas shares, he is able to keep several packs of wolves from his door. In fact, the emoluments of office will be a negligible quantity. This is by no means a disadvantage.

Apart from his attainments as a civil engineer, Mr. Leonard may fairly be looked upon as a member of the mining fraternity. In addition to holding high office in the Canadian Society of Civil Engineers, he is one of the four vice-presidents of the Canadian Mining Institute. This position is elective, and signifies the fact that the members of the Institute have confidence in his judgment. Moreover, he is the only member of the Board of Governors of Toronto University who has mining affiliations. This honourable post he accepted about a year ago, to fill the vacancy created by the death of Dr. Goldwin Smith.

In all probability no more arduous and ungrateful task could be conceived than that of guiding the destinies of the National Transcontinental Railway Commission. Mr. Leonard possesses at least two of the qualities that are essential to such a position. He is endowed by nature and by experience with a certain decisiveness, and with a judicial temperament. Whether these qualities in themselves are, or are not, sufficient to carry him successfully through the administrative troubles that are brewing we cannot say. He is "fortiter in re"; much will depend upon his becoming "suaviter in modo."

From the point of view of the industry that the CANADIAN MINING JOURNAL has the honour to represent, it is necessary to impress upon our readers the need of co-ordinating mining and transportation. If, in the course of his tenure of office, Mr. Leonard succeeds in inducing the Grand Trunk Pacific to regard mining as the basic industry of the country, as the one that in season and out of season will yield constant freight supplies, he will have accomplished much.

STOCK VALUE AND MINE VALUE.

Under the above caption, Dr. A. C. Lane, formerly Michigan State Geologist, now professor of geology at Tufts College, contributes to this issue the first of a series of papers in which he discusses the various factors that cause fluctuations in the value of shares, particularly shares in mining companies.

Dr. Lane takes particular pains to accentuate the inherent difference between mining shares and others, and postulates as a necessary yield for mining investments an annual return of from 7 to 10 per cent. apart from amortization or return of capital.

The five elements that fix prices are, according to Dr. Lane's analysis, return, stability, marketability, activity, and control. Each of these elements is discussed fully.

In view of the storm of protest aroused by Mr. J. R. Finlay's appraisal of the Michigan copper mines, Dr. Lane's articles will be timely.

We especially request our readers to send in early comments.

WEST SHINING TREE.

A preliminary report on the West Shining Tree region will be found on another page. Of seven samples taken by Mr. R. B. Stewart, one contained no gold, whilst the others ranged from 40 cents to \$6 per ton. As these samples were taken from different properties, it is reasonable to believe that they are characteristic of the country generally. This is not encouraging.

The mischievous practice of lauding to the skies any possible gold-bearing region must be discountenanced. West Shining Tree will suffer. Naturally, no brief inspection can furnish sufficient evidence thoroughly to damn a large tract. But Mr. Thompson's report will certainly dampen the ardour of the hotel-pro prospector who has been shouting deliriously for some months about the superlative merits of West Shining Tree.

TUBE MILL PRACTICE.

Proofs are accumulating that the best results in the employment of tube mills are obtained when the battery produced is very coarse. At the El Oro mine, for instance, one hundred stamps crushed 360,294 tons of ore in the year ending June 30th, 1911; whereas in the preceding year two hundred stamps crushed

only 285,181 tons. One tube mill is installed for each nine stamps. As illustrating the other extreme, it may be noted that at the mill of the East Rand Proprietary only fourteen tube mills are in commission for 820 stamps, or one mill for 58 stamps.

The El Oro practice not only gives greater capacity, but effects a considerable reduction in costs.

MORE ABOUT THE GIESECKE MILL.

Late reports have it that the Rand Mines Trials Committee, after a searching investigation of the Giesecke mill, has found that the high claims of efficiency cannot be substantiated. Neither in point of capacity nor in operating costs were the hopes of the inventor realized.

Much time and more trouble have thus been saved. Had the Giesecke been placed on the market before being investigated, no doubt many operators would have given it a trial. Now, however, very few customers will be found for a device that has been officially declared uneconomic.

A CORRECTION.

The retirement of Mr. Harold Kingsmill from the management of the Rea mine, Porcupine, gave rise to several damaging rumours as to the physical condition of that mine. We have been requested by Mr. Kingsmill to state plainly that his only reason for leaving was that he wished to accept a far more remunerative billet. Not the slightest unpleasantness had occurred.

Mr. Kingsmill requested us further to quote him as being responsible for the statement that the mine is in good condition and that no discouraging features have been encountered. The bringing in of a promising body of low grade ore has added to the possibilities of the mine.

We give these statements publicity for the reason that irresponsible story-tellers have attributed to Mr. Kingsmill assertions that reflected not only on the mine but also on Mr. Kingsmill's discretion as an engineer.

EDITORIAL NOTES.

The official estimate of the gold resources of the Rand is two billion pounds sterling. With an annual output of £40,000,000, this gives a life of 50 years to the Rand proper.

That sanguine person, Col. L. R. Stuart-Weatherley, accuses some person or persons unknown of hiding his "discoveries" at Porcupine. The Colonel is somewhat original. In his breezy way he assures the public that he has nothing to sell. This may be taken in two senses.

Mr. T. A. Rickard's letter in this issue serves indirectly to press home the need of more publicity for Nova Scotian gold mines. The report of a carefully chosen commission is needed and needed badly. Many Montreal and Toronto investors would willingly take a shot at Nova Scotia if they had authentic information.

Yukon's gold output for the current year is unofficially estimated at \$4,650,000. This is a gain of \$400,000.

The parabolic curve described by Kerr Lake shares is unusually marked. On a share capital of \$3,000,000, the mine has paid dividends amounting to \$3,720,000. The par value of the shares is \$5. The market price of these shares has fluctuated between \$11 (January, 1910), and the present figure, \$3. The management has never taken the public into its confidence. This essentially narrow policy usually brings its own reward. Dividend rates reached a maximum of 42 per cent. in this present year of grace. Yet the shares decline.

Sir James Whitney is being maligned for lack of initiative in devising means for opening up northern Ontario. The most practical retort that could be made would be the construction of good roads where they are most needed. A good road to Gowganda would be a fine starter. Farming follows mining. Mining cannot expand without transportation.

CORRESPONDENCE

GOLD MINING IN NOVA SCOTIA.

The Editor:—

Sir,—In your issue of September 15th you refer to the report made by me in 1905 for the Government of Nova Scotia, and you state that "the colour of the report is not known to the public." It may simplify matters and save controversy if I quote the last paragraph of the letter accompanying my official report, as it summarizes my views on the subject.

"The conclusion which I formed from the sifting of all the evidence obtained, is that there is a geologic

similarity to Bendigo, as regards the gold-bearing quartz, for in both cases the miner has encountered 'saddle reefs' or anticlines of quartz; but there are differences so great between the two districts as to destroy the economic value of the structural likeness. The occurrence of ore capable of yielding a reasonable profit, say, a stoping-width of 6 or 8 dwt. per ton, is so scanty in Nova Scotia as to render invidious the comparison with Bendigo; and, as far as is known, there is no justifiable expectation of such persistence of good ore in depth within the northern goldfield as in that

of the Antipodes. Gold mining on a large scale has rarely proved profitable in Nova Scotia, and the likelihood of developing such enterprises has been decreased by the events of recent years, because these have indicated the improbability of a repetition of ore-shoots in the underlying quartz formations. By 'ore' I mean gold-bearing quartz from which, under existing conditions, a profit can be won. On the other hand, it is my opinion that mining operations on a small scale, carried out by working miners, without the investment of large sums of money, either in equipment or exploration, but based upon local knowledge and skilful prospecting, are likely to prove remunerative. I do not endorse the attempts made (chiefly by those who spend large amounts of money lavishly, and too often improvidently, in undertakings not founded on careful preliminary investigation) to belittle the local syndicates and parties of lessees who have found and worked most of the profitable mines of Nova Scotia, and I advise that the policy of the Department be so shaped as to encourage this form of domestic enterprise. It is upon such that the future of gold mining in Nova Scotia must depend; as it has done, for the most part, in the past."

Surely any responsible person can see the report and the covering letter by applying to the Minister for Mines at Halifax.

T. A. RICKARD.

London, October 5.

THUNDER BAY DISTRICT.

The Editor CANADIAN MINING JOURNAL:

Sir,—I note in your editorial, in the issue of 15th inst., regarding the twentieth annual report of the Ontario Bureau of Mines, that you say, "Mr. N. L. Bowen's description of the Thunder Bay silver district will stir up interest in that historic mining country."

And that you "quite concur in the belief that the district is worthy of attention."

I have not seen Mr. Bowen's article; but I am pleased to know that the Thunder Bay silver district has, at last, begun to attract some attention. It was the misfortune of this district that it was discovered 25 years too soon.

Speaking of the small group of mines lying to the southwest of the city of Port Arthur, this section of the district first began to attract attention about 1885. Considering the amount of development and exploratory work done, the results obtained were certainly such as to warrant a more systematic and extensive development than then obtained. This section of the district had about the year 1888 five shipping mines all producing high grade silver ore.

All the silver produced in Ontario, in the late nineties came from this district. The writer from 1888 until 1890 had charge of one of these mines, which produced in this period upwards of \$300,000 worth of silver. At least one other mine exceeded this production in the same period.

The transportation problem at this time was a serious one, as all supplies and ore had to be freighted by team from 25 to 40 miles.

The mines were all closed down about 1890, before the completion of the railway through the district, and they have been practically closed to the present time. Such efforts as have been made to revive the industry were made in a way to discredit rather than revive it.

This silver field is a large one. It is the belief of the writer, based on a wide knowledge and experience gained in the 21 years that have intervened since the closing of these mines, that there is a good chance for success.

Had the mines, and the whole district, been as thoroughly explored, and the mines operated as persistently and in as up-to-date a manner as now prevails in Cobalt, the history of the district would be another story.

However, the deposits are still here, awaiting the prospector and investor.

Yours truly,

HERBERT SHEAR.

October 20th, 1911, Port Arthur, Ont.

THE LAY MIND.

Editor CANADIAN MINING JOURNAL:

Sir,—In the current issue you suggest that the "lay mind" does not recognize that profits come to those who enter the mining business. As a matter of information, it would be of great interest if you could let your readers know how far the individuals who put up money for the Centre Star group were rewarded. In the last annual report of the Canadian Mining & Smelting Company it is stated that the Centre Star group has produced minerals to the value of \$21,488,745. The "lay mind" would greatly appreciate your statement as to how this value was distributed among those who took part in its production. The same question applies to the production of St. Eugene mine, which is given in the report as \$10,394,520.

Yours faithfully,

G. C. BIGGAR.

Toronto, Ont., October 18th, 1911.

TIMBER USED IN MINING OPERATIONS

Compiled by H. R. MacMillan, M.F., assisted by Bruce Robertson and Guy Boyce.

COURTESY OF DOMINION FORESTRY BRANCH.

The statistics of the timber used in the mines of Canada in 1910 are based upon reports received from 136 coal and ore mines throughout the various provinces, as follows: British Columbia, 59; Ontario, 27; Alberta, 20; Nova Scotia, 15; Yukon Territory, 9; Saskatchewan, 4; Manitoba, 2. These represent practically all the mines using timber in any quantity. There are a

large number of mines in Canada which do not use timber in their operations.

In the tables two main divisions have been made, viz.: round timbers, and sawn timbers. The round timbers are used underground to give artificial support for insecure roofs or walls and to protect shafts, drifts, and gangways. The sawn timber reported is mostly

lumber, together with a small quantity of square timber, and was used principally above ground for buildings, breakers, tipples, washers, and trestles. A small quantity was used underground for sets, stulls, and ventilator shafts.

Including round and sawn timbers, timber to the value of \$827,337 was used in Canada during 1910 for mining purposes.

This total is made up of 52,848,000 linear feet of round timber, worth \$523,339, and 22,305,000 board feet of sawn timber, which cost \$303,998.

The various species of woods used by mining industries are chosen, not because of their superior technical qualities, but because of their cheapness, suitable size and accessibility. Thus, Douglas fir is the most-used mining timber because it grows in the province where most of the mining is done, and is easily obtained. When this is understood it is easily seen why the use of each species is confined to one province. British Columbia used all the Douglas fir; Nova Scotia used practically all the spruce, balsam, hemlock, birch, beech, and maple; Alberta used almost all the jack pine and poplar.

Round Timber.

Table 1 shows by provinces the quantity and value of the round timber used by mines in Canada during 1910.

TABLE 1.
Round Mining Timber, 1910, by Provinces; Quantity, Value, Average Cost, and Per Cent. Distribution.

Province or District.	Quantity M linear ft.	Per cent. Distribution.	Value	Av. cost per M linear ft.
British Columbia	29,047	55.0	\$203,597	\$ 7.01
Nova Scotia	15,653	29.5	168,142	10.74
Alberta	7,484	14.1	132,900	17.75
Ontario	549	1.2	14,724	26.83
Saskatchewan	105	.2	3,597	34.25
Yukon	10	*	379	37.90
Canada	52,848	100.	\$523,339	\$ 9.90

*Less than one-tenth of one per cent.

The mines of Canada used, in 1910, 52,848,000 linear feet of round timber, which cost \$523,339. This is an average cost of \$9.90 per thousand.

British Columbia alone used 55 per cent. of this consumption, i.e., 29,047,000 linear feet, at an average cost of \$7.01 per thousand. This is a lower price for round timber than in any other province, the smallness of price being due to the fact that nearly 20,000,000 feet



Norway Pine Typical of Nipissing District.



An Albertan Fire—how too much good timber disappears.

of this amount was four to six-inch Douglas fir, used by two of Canada's largest coal companies for lagging.

Nova Scotia, using 30 per cent. of the Canadian consumption, is second in importance; 15,653,000 linear feet were used at a cost of \$168,142. The price thus averages \$10.74 per thousand linear feet, and is, after that current in British Columbia, the lowest price. Spruce five inches in diameter formed a great proportion of this province's consumption.

Alberta used 7,484,000 linear feet, or 14 per cent. of the total. This quantity cost an average of \$17.75 per thousand. Over 70 per cent. of this was small lodge-pole pine. Spruce made up nearly 25 per cent. and the balance was mostly Douglas fir.

The foregoing three provinces, namely, British Columbia, Nova Scotia, and Alberta, contain all the important coal mines in Canada, and consume 98.6 per cent. of the timber used in mining. The remaining 1.4 per cent. was used in Ontario for ore-mining, and in Saskatchewan and Yukon for small coal mines supplying local demands.

Ontario mines used 549,000 linear feet, at an average cost of \$26.83 per thousand. Nearly one-half of this was spruce five to seven inches in diameter; one-third was pine of small diameters. The remaining one-sixth was tamarack and timber of unspecified species. The mines in Ontario use, so far, a very small amount of timber per mine as compared with the large mines of British Columbia. Most of the Ontario mines are small and shallow, and are excavated in the solid rock, so that little timber is required for protection. Moreover, a great number of the mining companies incorporated in this province have not advanced sufficiently far in their operations to require any timber.

Saskatchewan has a very small number of coal companies, only one of which sells to the public; 105,000 linear feet were used in this province, and cost, on an

average, \$34.25 per thousand. The high price of this timber is due to transportation charges, either from the spruce and tamarack belt of northern Saskatchewan or from the Rocky Mountains.

Ten thousand linear feet of spruce were used by the coal and gold mining companies of the Yukon territory at an average cost of \$37.90 per thousand. This is all native wood and the high cost of this amount is due to expensive labour. The small quantity of timber reported from Yukon is explained by the small number of deep mines. Mining operations do not extend far below the surface, and therefore there is no great necessity for timbering.

Table 2 shows by relative importance of species, the round timber used in Canada in 1910.

and British Columbia, and comprises 90 per cent. of the so-called "jack pine" listed.

Hemlock, which was the cheapest species of lumber produced in Canada in 1909, formed only 2.3 per cent. of the total consumption of mining timbers in 1910. Nova Scotia used all the hemlock, 1,172,000 feet, at an average cost of \$13.39 per thousand. Very little hemlock grows in the mining districts of Canada.

The above five species (Douglas fir, spruce, jack pine, balsam, and hemlock), of which jack pine was the most expensive, were the important woods used by the mining industries, forming over 96 per cent. of the total quantity of the 12 species reported.

Tamarack or larch was used to the extent of 893,000 feet, and cost \$15,029. This is an average cost of \$16.72 per thousand linear feet, the highest price paid

TABLE 2

Round Mining Timber, 1910, by Species; Quantity, Value, Per Cent. Distribution and Average Cost per Thousand Linear Feet.

Species.	Quantity M linear ft.	Per cent. Distribution.	Value	Av. cost per M linear ft.
Douglas fir	28,268	53.8	\$198,776	\$ 7.03
Spruce	14,417	27.5	179,734	12.46
†Jack pine	4,455	8.5	66,751	14.96
Balsam	2,170	4.1	21,215	9.78
Hemlock	1,172	2.3	15,691	13.39
Tamarack or Larch	893	1.7	15,029	16.72
Pine	720	1.4	10,234	14.21
Birch	326	.6	4,311	13.22
Poplar	54	.1	848	15.70
Cedar	23	†	1,107	48.13
Maple	1	†	11	11.00
Beech	1	†	11	11.00
*Total	52,848	100.	\$523,339	\$ 9.90

*The total includes a small amount of timber not identified by species.

†Includes jack pine and lodgepole pine.

†Less than one-tenth of one per cent.

The mines of Canada reported the use of twelve species of wood in their mining operations.

Douglas fir alone was used to the extent of 53.8 per cent. of the total represented by the twelve species. 28,268,000 linear feet of fir was used, which cost \$198,776. This is an average of \$7.03 per thousand, which is the smallest price paid for any species. Fir is a very popular wood for mining purposes, particularly in British Columbia, on account of its accessibility and strength.

Spruce stands second in importance and contributed over one-quarter of the total; 14,417,000 linear feet were used at a cost of \$179,734. This is an average cost of \$12.46 per thousand. The great quantity of spruce is due to its occurrence in Nova Scotia, where it is used by most of the coal mines. Although in amount nearly twice as much fir was used as spruce, in value fir was worth only \$19,042 more than spruce; this is due to the difference of \$5.37 per thousand feet in the cost of spruce over that of fir.

Jack pine was the third important species; 4,455,000 feet were used, at a cost of \$66,751. This is an average cost of \$14.98 per thousand. The entire quantity of jack pine mining timber was used in Alberta. Two species of pine are included under jack pine. The one is the true jack pine, (*Pinus Banksiana*), and the other is lodge-pole pine (*Pinus Murrayana*). Lodge-pole pine occurs extensively on the slopes of Alberta



Typical Jack Pine Country

for any mining timber except cedar. Over 700,000 feet of this was used in British Columbia; 158,000 feet was used in Alberta, and the remainder was about equally divided between Saskatchewan and Ontario. Larch is a splendid mining timber, but its use is limited by its scarcity.

Five-sevenths of all the pine used was consumed in British Columbia coal mines. Ontario ore mines used nearly all the balance. The pine used in British Columbia is yellow pine and western white pine. The total pine used was 720,000 feet, and cost \$14.21 per thousand linear feet. Small quantities of red and white pine were used in Ontario.

Birch formed less than one per cent. of the total; 326,000 feet were used in all, costing \$4,311. This is an average of \$13.22 per thousand linear feet. All the birch mining timbers were used in Nova Scotia.

All the poplar used, 54,000 feet, at \$15.70 per thousand, was used in Alberta. Poplar is cheap and accessible, but is not sufficiently durable for use in mines.

One thousand feet each of maple and beech were used in Nova Scotia at \$11 per thousand.

There were also used 348,000 feet of timber, the kind of which was not specified. It came principally from the provinces of Ontario and Nova Scotia, and averaged in price \$27.62 per thousand.

In table 3 is given the quantity, total cost, and average cost of the round mining timbers used in Canada, 1910, by diameter-classes and species.

There were used 1,835,000 linear feet over ten inches in diameter. This timber cost, on an average, \$37.82 per thousand, and included the best quality of timber used in the mining industry. These large-sized timbers are used for heavy props and in gangways. For such purposes timbers are used up to three feet in diameter.

In comparing the prices of different species in the same class, consideration should be given to the fact that the diameter varies a great deal within each class.

Of the Douglas fir used in the mining industry, 17,411,000 linear feet was less than five inches in diameter and cost only \$2.33 per thousand. The timber used under five inches diameter was practically all Douglas fir and was used by the large coal companies of British Columbia. Of timber varying from five to nine inches in diameter, 10,110,000 linear feet were used, which cost \$12.92 per thousand feet. Fir also stands second in importance in the largest diameter class; 747,000 feet were used, which cost, on an average, \$36.92 per thousand linear feet.

Spruce was used to the extent of 445,000 feet in the class under five inches in diameter. This species was used more in the five-to-nine-inch class than any other species, the amount being 13,116,000 feet. The 856,000 feet over ten inches in diameter was all used in Alberta. Spruce of the first diameter-class cost \$8.35 per thousand, while fir of this size cost only \$2.33 in British Columbia. This apparent inconsistency is due

TABLE 3.

Round Mining Timbers, 1910, by Diameter-Classes and Species: Total Quantity, Total Cost, and Average Cost.

Species	Class 1—Under 5 In.			Class 2—5 In. to 9 In.			Class 3—10 In. and Over.		
	Quantity M linear ft.	Value	Average Cost.	Quantity M linear ft.	Value	Average Cost.	Quantity M linear ft.	Value	Average Cost.
Douglas fir	17,411	\$40,583	\$ 2.33	10,110	\$130,617	\$12.92	747	\$27,576	\$36.92
Spruce	445	3,716	8.35	13,116	148,807	11.32	856	27,211	31.80
Jack pine	1,156	6,132	5.30	3,216	55,497	17.25	83	5,122	61.60
Balsam	.....	.....	.....	2,170	21,215	9.77	.....	.....	.....
Hemlock	.....	.....	.....	1,155	14,123	12.23	17	1,568	92.30
Tamarack or Larch	.....	.....	.....	801	9,596	11.98	92	5,433	59.05
Pine	.....	.....	.....	688	8,361	12.15	32	1,873	58.53
Birch	1	11	11.00	325	4,300	13.23	.....	.....	.....
Poplar	.....	.....	.....	54	848	15.70	.....	.....	.....
Cedar	.....	.....	.....	15	487	33.47	8	620	77.50
Maple	1	11	11.00	.....	.....	.....	.....	.....	.....
Beech	1	11	11.00	.....	.....	.....	.....	.....	.....
*Total	19,046	\$50,765	\$ 2.66	31,967	\$403,171	\$12.63	1,835	\$69,403	\$37.82

*Includes a small amount of timber not identified by species.

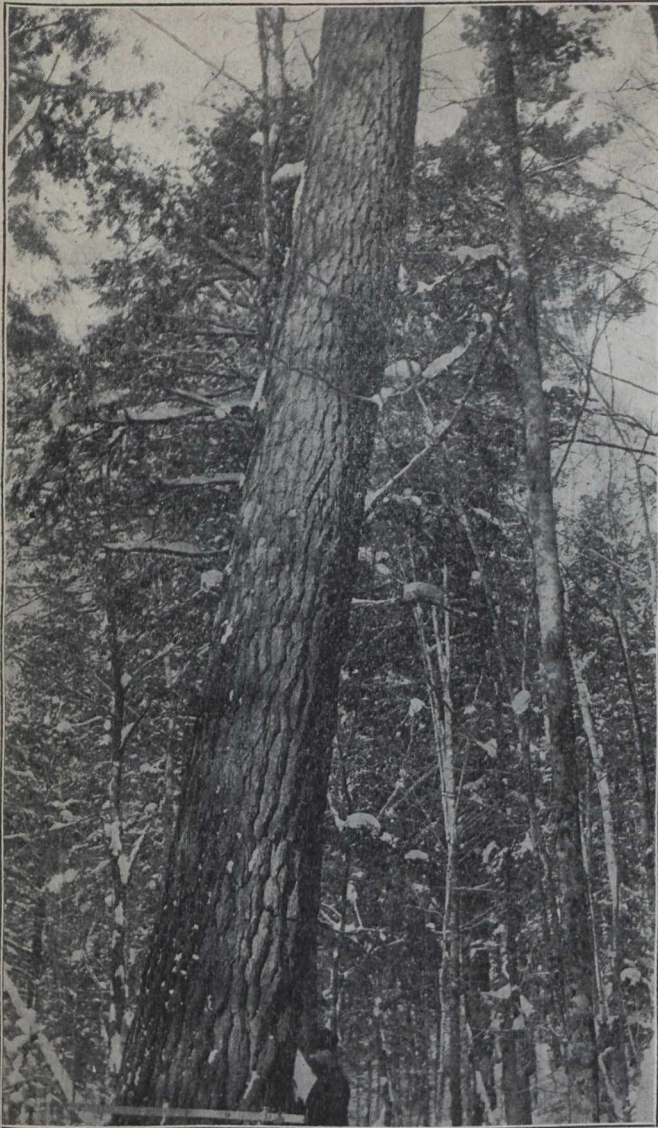
Of the 52,848,000 linear feet of round timber used in Canada during 1910, 31,967,000 feet were from 5 to 9 inches in diameter. Timber of this size cost, on an average, \$12.63 per thousand, and was used for various purposes; 5 to 6 inch timber was used for caps 2 to 10 feet long, and for ties, 6 to 8 inch timber for long caps, and 12 to 16 foot booms, 5 to 9 inch material for props. In some mines, where the seam was narrow, four inch timber was used for props.

The class "under 5 inches in diameter" includes 19,046,000 feet, or over one-third of the total consumption. This cost on an average only \$2.66 per thousand linear feet. It is used mainly for pinning and lagging. For pinning it is used in short lengths; for lagging it is used in lengths varying from eight to twelve feet.

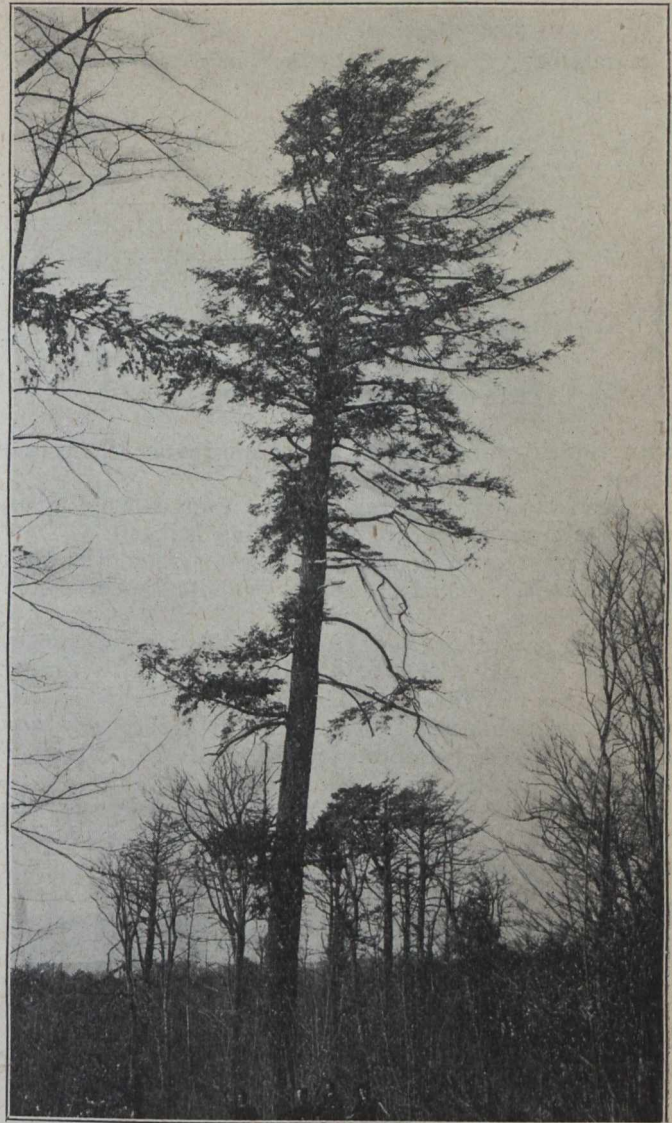
to the fact that the spruce was used for props and the fir for lagging. The large spruce was all used in Alberta and cost \$31.80 per thousand, less than the cost of big timbers in any other province.

Jack pine was important mainly in the second diameter class; 3,216,000 linear feet of this dimension was used in Alberta, costing \$17.25 per thousand. To a small extent this species was also used in the third diameter class, and cost \$61.60 per thousand. 1,156,000 feet of jack pine under five inches in diameter was used in Alberta, and cost \$5.30 per thousand, making it next to Douglas fir in cheapness in this class.

The use of balsam was confined to the second diameter class and consisted of 2,170,000 linear feet at an average of \$9.77 per thousand. Balsam appears as the cheapest species in this class, because it was all



White Pine



Hemlock

five-inch timber used by a Nova Scotia company. It is a weaker and less durable wood than spruce or hemlock, and is worth less for mining purposes.

Hemlock was used only in two classes. In the second diameter class 1,155,000 feet were used, costing \$12.23 per thousand. In British Columbia 17,000 feet used ranged from 10 to 36 inches in diameter. These large-sized timbers made the average cost \$92.30 per thousand linear feet, the highest price paid for mine timbers.

Of tamarack or larch, 801,000 feet, five to nine inches in diameter, was used throughout the various provinces, and cost an average of \$11.98 per thousand. Larch to the extent of 92,000 feet of 10 inches or more in diameter was used in British Columbia. It cost on the average \$59.05 per thousand feet.

Pine, birch, and poplar were used in small quantity and practically all ranged from five to nine inches in diameter. The term "pine," as used in Table 3, includes western yellow pine, western white pine, red pine, and white pine; of this timber 96 per cent. belonged to the first diameter class and four per cent. to the third diameter class.

In Alberta there were used 54,000 linear feet of poplar five to six inches in diameter, which cost, on an average, \$15.70 per thousand.

Cedar was used only in British Columbia, and of the small cut of 23,000 feet used, two-thirds were in the medium class and one-third in the largest class. Cedar was used chiefly in the gold mines.

One thousand feet each of maple and beech were used in Nova Scotia; this was small-sized timber.

Less than one per cent. of the total amount of round mining timbers reported was of undetermined species; 317,000 feet were five to nine inches in diameter, and cost \$29.90 per thousand. A very small amount, 31,000 feet, of ties were not specified, and cost \$9.70 per thousand linear feet.

Sawn Timber.

Table 4 shows the quantity and value of sawn timber used in the mines of Canada during 1910, by provinces.

22,305,000 board feet of sawn timber were used, representing an expenditure of \$303,998. This is an average of \$13.63 per thousand. British Columbia used over 50 per cent. of this amount, of which the principal species was Douglas fir. The price of sawn lumber in British Columbia was only \$12.28 per thousand, less than in any other province.

It is impossible to give correctly the species of sawn timber used in the various provinces, as the reports did not always state the species, but in most cases the

TABLE 4.

Sawn Mining Timber, 1910, by Provinces: Quantity, Value, Per Cent. Distribution, and Average Cost Per Thousand Ft. B.M.

Province.	Quantity M Board ft.	Per cent. Distribution.	Value	Av. cost per M Board ft.
British Columbia	11,933	53.6	\$146,510	\$12.28
Alberta	5,569	25.1	77,114	13.85
Nova Scotia	3,282	14.8	45,281	13.80
Ontario	1,390	6.4	29,470	21.20
Yukon	105	*	5,025	47.85
Saskatchewan	26	*	598	23.00
Canada	22,305	100.	\$303,998	\$13.63

*Less than one-tenth of one per cent.

sawn timber would be the same species as the round timber.

Alberta used 25 per cent. of the total sawn timber, seven different species of wood being utilized.

Fifteen per cent. of the total consumption was used in Nova Scotia. Spruce was the principal species used in this province.

Ontario used about equal amounts of pine and spruce to make up the 1,390,000 board feet of sawn timber used in this province. Yukon and Saskatchewan used very small amounts. Yukon paid the highest average price for sawn timber, (namely, \$47.85), most of which was spruce.

Table 5 shows by relative importance of species the amount and value of sawn timber used in Canadian mines during 1910.

Douglas fir was the most important species used for sawn timber, forming 56 per cent. of the total; 10,107,000 feet were used at an average cost of \$10.25 per thousand, the smallest average price paid for sawn mining timbers, except cedar. Spruce was used to the extent of 3,689,000 board feet, and formed over one-fifth of the total consumption. Spruce was much more expensive than fir, costing \$18.33 per thousand. The two species just mentioned, namely, fir and spruce, alone formed over three-quarters of the total amount of the sawn timbers used. Tamarack (larch), pine, cedar, jack pine, hemlock, and birch were used in small quantities and ranged in price from \$9.90 per thousand feet for cedar to \$19.39 for pine; 48,000 feet of oak were used, mostly by the metal mines of northern Ontario. The average cost of this timber was \$89.26 per thousand feet; 436 feet of cypress at \$110 per thousand was also used by one mine of this province.

Preservation.

The preservation of mine timbers by chemical treatment has not yet been adopted by the mining industries of Canada. In many localities, however, the distances required to transport mining timbers are becoming greater, poorer qualities of woods have to be used, and the annual cost of the upkeep of mine timbering is becoming greater. In the United States much has been done in the treatment of mine timbers, and it has been proven that a treatment of creosote or zinc chloride decreases the destruction due to decay, fire and insects. This increases the life of the timbers and decreases the annual cost of replacing mine timbers. Timber used in mines has, on the average, a shorter life than wood used for any other purpose. The surroundings in a mine are very conducive to rot, which, after a period of three to five years, causes the timber to break, crumble and become useless. Experiments have been conducted in United States mines with a row of untreated and treated mine props alternately placed. In one instance, after 18 months, every untreated stick was weakened by decay and broken, while the treated props were sound and useful. From various practical experiments of this kind with different species of wood, important results have been obtained.

Douglas fir has an average of five years' life when untreated. Treated, it lasts twelve years. Hemlock, lasting as a natural wood five years, doubles its term of life when treated, as does tamarack. Spruce is one of the species which decays quickest when untreated, lasting only three years. If treated, it will last twelve years, thereby increasing its life 300 per cent. To sum up, wood preservation not only prolongs the life of



Nova Scotia Spruce

TABLE 5.

..Sawn Mining Timber, 1910, by Species: Quantity, Value, Per Cent. Distribution and Average Cost per Thousand Ft., B.M.

Species.	Quantity M Board ft.	Per cent. Distribution.	Value	Av. cost per M Board ft.
Douglas fir	10,107	56.7	\$104,151	\$10.25
Spruce	3,689	20.8	57,622	18.33
Tamarack or Larch	1,540	8.6	21,586	14.01
Pine	743	4.2	14,385	19.39
Cedar	614	3.5	6,070	9.90
Jack pine	539	3.0	8,121	15.09
Hemlock	361	2.0	5,055	14.00
Birch	148	.9	1,821	12.30
Oak	48	.2	4,285	89.25
Balsam	12	.1	420	35.00
Maple	4	‡	102	24.28
Beech	3	‡	71	20.28
Poplar	3	‡	95	27.14
Cypress	4	‡	48	110.09
Total	22,305	100.	\$303,998	\$13.63

*Includes a small amount of timber not identified by species.

‡Less than one-tenth of one per cent.

...durable timbers, thus decreasing their annual consumption, but also permits the substitution of inferior spe-

...cies, whose use considerably reduces the drain upon the more desirable kinds.

Stock Value and Mine Value

Written for the CANADIAN MINING JOURNAL by Alfred C. Lane.*

My object, or perhaps it would be fairer to say my conclusion, for I did not know the hole at which I should come out when I started this investigation, is to show that the value of a share of stock as given in the fluctuations in the various stock exchanges is by no means wholly that of the property which the stock represents. Thus it is not fair in assessing that property for purposes of taxation to suppose that it has the value that might be shown by measuring the price of the shares of stock by the number of shares of stock based on it. It has often been attempted to value mining property for taxation in just this way, but I think it can be clearly shown that such an effort would be very unjust as compared with adjacent property from which no shares have been issued.

Again, I may give some idea of what rate of return may fairly be expected in mining investments. It is not fair to expect a person who obtains a return which is uncertain in amount and time to be satisfied with the same return that he can obtain regularly and with no loss of principal or interest. A little study of mining stock values such as I propose to undertake will, I think, show this, and we shall see that where a man is satisfied with 4 per cent. if the security is perfect and the returns regular, and he can at any time obtain his money to put into other forms of investment, he will naturally and properly expect more, say about 6 per cent., if he can not get his money back when he wants it; and if his money is to be tied up for an indefinite time he will on the average expect about 10 per cent. I think it may also be said fairly that mining property should yield something like 7 per cent.

to 10 per cent., even not allowing for extraordinary risks, but only for those that are inherent in the fluctuating prices of labour, supplies, and the metal produced. This, of course, has its bearing on questions of capitalization. I derive these conclusions by a study of past values and prices.

Five Elements in Fixing Price: Return, Stability, Marketability, Activity, Control.

One can not with much hope of success take a great mass of price fluctuations purely at random. If but two factors were involved it might be done by arranging the prices in order with regard to the variation of one factor and seeing how the other varied. But in fixing the price of a stock (which represents a share in a property) a number of factors play a part. While these can never be wholly separated, in some cases one is so much more important than another that it can largely be isolated. Then, by allowing for its effect we can little by little isolate the others. I tried to separate five factors in fixing price—five elements of value.

First, return, annually or regularly, in the shape of dividends or income.

Second, stability, respectively the remote increment or decrement of the principal. While this is not theoretically separable from the other, when the dividend or annual income is irregular, it is particularly important for us to consider it separately, as it and the values found are to be handled in a very different fashion.

Third, marketability, that is, the readiness with which a security may be sold for the money paid for it.

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Fourth, activity, that is the range of fluctuations in price.

Fifth, control, or the value of the voting privileges attached to the stock.

(1) Return, the first element, is the fairly regular net return yielded by way of interest or dividend. The word "net" is added to remind us that if one security is subject, or liable to be subject, to taxation, the amount of tax or a part thereof proportional to the risk of the tax being collected must be deducted. This first factor of return is almost the only element of value to be considered by trustees of estates in considering securities of unquestioned value, and is by far the most important element of value in good bonds and mortgages.

Their value, however, is also affected by their marketability. To get this value as pure as possible, cases should be taken where the question of ready marketability did not come in. An ideal case, perhaps, would be a first-rate mortgage on property worth very much more than its value in the hands of a man of ample means known locally to be prompt and able to pay all obligations. This might be perfectly secure to any one knowing the facts but might not be readily marketable because of the investigation needed to convince a purchaser of these facts. In such cases as English consols, fluctuations in price and hence in interest take place which depend in part at least upon the prospect in the near future of a greater or less demand for consols and the possibility of buying the same at a less price or selling them at a higher.

(2) This suggests the second factor. The second factor, stability, is taken to cover the prospect of permanence or of increase or decrease in the value of the principal. This is the main element of value involved in speculation in any improved city lots and must be a large element in fixing the price of any stocks which do not pay dividends.

(3) The third element of value is that of ready marketability. The enlarged market means a higher price. If a certain class of securities is made a legal investment for savings banks or trustees, it at once increases their value. The capacity to turn the investment promptly into money so as to take advantage of some opportunity to reinvest or to pay debts as they come in, is worth something. Insurance companies and many other corporations must carry a certain proportion of their capital in securities of this class. This value is illustrated and to some extent measured by the difference in interest which will be paid for call money and for time loans. The man who lends money on call at a lower rate of interest than he could get for a time loan does so because he values the privilege of being able to get it back again at any time he sees a chance to make an especially good investment. If the rate for call money is about $2\frac{1}{2}$ per cent. and for time loans about $3\frac{1}{4}$ per cent., an addition to value of a stock of 30 per cent. or more would be a comparable amount.

(4) A fourth element is the value of a stock as a medium of exchange or as an implement of organized speculation. Not only are stocks recognized to be desirable because they have a ready market, but to some people activity, that is to say, a continued play of values up and down, is an attractive feature. Though a ready market is made very largely by the activity of a stock as a means of speculation and the marketability and activity values are interwoven, yet the fundamental idea behind them is not the same and the fundamental motive is very different. In the one

case the value is enhanced by the power to get money back at short notice without fluctuation. On the other hand, the value as the medium for speculation is enhanced by the very fact that a stock does fluctuate.

In the proposed consolidation of the Calumet and Hecla and many of the smaller Michigan copper mining companies, much of the complaint of the brokers and holders of the small companies was not at the value set upon their stocks as measured by any present or definitely ascertained prospective returns, but at the fact that they would be obliged to change an active for an inactive stock with a loss of speculative possibilities. I shall later show how a definite numerical statement of this loss (?) can be given. By the activity value, then, is meant a value dependent upon the hope to make a profit by change in the value of stock without regard to whether this change is up or down.

It is hardly conceivable that this value should exist without some other element of value. It exists in its simplest condition in a poker chip and may well be called the poker chip value; and while it does not ordinarily exist apart from the value of the stock in other ways, yet one can to some degree isolate it as a factor in price or value.

(5) The fifth element of value may inhere in the voting privileges that a stock carries, and may reside in a particular certificate of stock or a particular number of shares of stock. It may not vary with the value of the property as a whole, but rather with the control of the whole property that it gives. Were I to go out of the field to which I propose to confine myself, the famous struggle for the control of the Union Pacific or the quoted value of the Equitable Life Insurance Company paying but 7 per cent., but carrying the control of that company, might be cited. Another illustration is that Alexander Agassiz was offered \$1,000 a share for his interest in the Calumet and Hecla carrying with it the control of the property. Upon his reply that whatever was offered him must be made to every other stockholder, the matter was dropped.* One can compute in such a case, roughly speaking, the value of this control factor. The selling price of a small quantity of Calumet and Hecla within a year before and after was between \$600 and \$800, and as will be seen, \$600 was not so far from the value of the property on other grounds, so that the additional control value was something like \$300 to \$400.

Now, while this last element becomes conspicuous in such illustrations as those cited, it remains to be seen if it exists at all times to a greater or less degree, and can be traced in the fluctuation of a stock. It is one of the elements that make it hard to assess a property fairly on stock market basis or to tax the owners of such stock on the basis of single sales. There never was a time when all the stockholders of the Calumet and Hecla Mining Company could get \$1,000 for their stock nor will any one compute any such value as $100,000 \times \$1,000$ for that mine.

Now I plan to find the value of organized speculation by finding first the yield from securities which have not such a ready market as organized speculation affords and then compare the yield from listed securities as similar as possible. The reduction in yield will measure that part of the value which is due to

*Editor's Note:—The action of Mr. James Ross in stipulating that all shareholders of the Dominion Coal Co. should be paid at the same rate as was offered for his shares furnishes a parallel Canadian instance.

marketability, or due to activity or to conditions other than the return either regularly or by appreciation at the end of a period of years.

I find that some people object to the idea that a stock exchange can be valuable by reducing income yield; but it seems to me clear that the activity of stock exchanges and organized speculation can not increase the income yield in any fashion. If they can make the stock with a given yield otherwise more desirable—if listing adds to the value of the stock—they will raise the price and thereby reduce the yield of the stock. It does not, however, follow that it will reduce the yield to the holder. The man who must have a certain sum of money at short notice, if he has no place where he can readily market his securities, might have to keep them in an old stocking and get no return, or in a savings bank and get 3 per cent. Thus the yield on the security in relation to its price or value may be reduced and yet the income to the purchaser may be better than he could otherwise get, since the security would not be otherwise available to him.

Investigation Confined to Michigan Securities.

In order to get rid of the effects of the different laws I shall confine this study mainly to Michigan securities with a particular view to the listed Michigan copper stocks. I am more familiar with them, and, moreover, Michigan laws enable one to obtain important facts not to be obtained elsewhere. Also, the age of the mines and the records of price are sufficiently long to enable one to study average fluctuations in a way in which it can be done for mining stocks in no other districts. Compared with the railroads, the elements of financial and political entanglements are reduced to a minimum. Finally, the recently proposed consolidation of a number of companies has made public in the papers many facts which are of help in our inquiry.

There is one element that I have found difficult to treat satisfactorily. That is the question of unenforced taxation laws upon the yield that stockholders can be fairly supposed to get. Were all stockholders residents of Michigan, that would be eliminated, since property is taxed only once; but the Michigan copper stocks are largely held in Boston and other places where there is a pretence of double taxation. For instance, a stockholder having a residence in Michigan can not be taxed on his copper stock, but if he should move to Massachusetts he would theoretically be taxed at a rate which around Boston would vary between 1 per cent. and $2\frac{1}{2}$ per cent., or about a quarter of his income. This, however, is generally not collected from business men; but to some extent is collected from widows and orphans and their trustees. Consequently on the death of an owner of these stocks and the passing of the stocks into the hands of trustees it becomes at once of less income-bearing value. If thrown on the market by the trustees the value of the stock itself may be affected. If volume of "Lake buying" or Michigan buying is sufficient to determine the range of prices, this factor need not be considered, and it is a platitude of economics that a very small amount of buying added or subtracted may control the prices. Judging from newspaper comments "Lake buying" has a distinct effect upon Boston stock exchange prices. It will be noted that very considerable mines like the Calumet and Arizona are controlled in this district. One can then compare the prices of copper mines and other securities open to the Michigan investor.

The same principle, namely, that the price is affected by the subtraction of even a small group who can find a more profitable investment open to them elsewhere, also applies in comparing these stocks with trust fund investments. If the same people did not purchase either there would be no possible connection in price. But some people do have investments in both classes of securities, so that a large disparity in prices between the two would tend to change their investments, and, even though the vast bulk of purchasers belong to different classes, the appreciable number who hold in common may be sufficient to produce a connection in price. The Michigan law compels a filing of lists of stockholders and the larger have been published in the papers. It is possible, therefore, to be sure that there are some common holders of the various stocks which are to be compared.

I propose to place in the body of the paper just enough figures to make clear the point of the argument, leaving to a series of notes (something like the old-fashioned excursus, which always used to delight me) details of figures and qualifications and answers to possible objections.

Return from Stable, Non-Marketable Stock 6.3 Per Cent.

The first question to which we shall address ourselves is to find the part of the value of a stock which is due merely to its income-producing power. In Michigan we get this as nearly pure as possible in mortgages, or in shares of building and loan association stock which are but the average result of such mortgages. The Northern Michigan Building and Loan Association, of Hancock, in the copper country, has been maturing shares which have yielded from 6 per cent. to 7 per cent. For instance, shares at \$1 a month and 50 cents initiation fee mature at \$102.50 in eleven years, making a compound interest rate of 6.3 per cent., or a paid up share of \$80.50 yields \$4 a year. This is close to the common "legal" rate of interest of 6 per cent. It will, of course, vary from community to community and from time to time, but during the past twenty years the national bank in Houghton, which is the principal banking town of the copper country, has been making time loans at 7 per cent. I assume, then, that a security yielding 6.3 per cent. a year and absolutely secure, or a group of securities which on the average will not depreciate or increase in value, should be worth \$100. Any lower rate of yield would mean an increased value due to some other cause, and a higher yield would mean a decrease of value due to insecurity or irregularity of yield or some other cause.

Return from Stable, Marketable Shares 4.2 Per Cent.

Let us next look at equally secure stocks, which have the added advantage of marketability, to see how much lower rate of interest they yield. We find them best represented in such guaranteed Michigan railroad stocks as the Fort Wayne and Jackson, the Detroit, Hillsdale, and South Western; the Grand River Valley, and the Jackson, Lansing and Saginaw — guaranteed stocks of the New York Central system. Though the rate of interest varies from 3.5 per cent. to 5.5 per cent., the price was (December, 1910) so adjusted that the income return varied only from 4.07 to 4.34. They had fallen two to five points in a year, but never vary widely. In July, 1911, the yield had dropped to 4.03, as money was then very cheap in New York. The yield upon such stocks (4.2 per cent) may be taken as that which could be obtained from an investment

which is absolutely certain, in which no question of taxes could arise and which is readily marketable. The savings banks of the copper country also had been paying 4 per cent. on savings banks deposits. Theoretically those savings banks deposits are subject to taxation at a rate of nearly 3 per cent., which would leave a net yield to the owner of 1 per cent. I need not comment upon this. The law is obviously a farce.

Increase of Value 50 Per Cent. Due to Organized Speculation.

It follows that if 4.2 per cent. is the yield of stock combining marketability and security and 6 per cent. to 7 per cent. (say 6.3 per cent.), if the security is not so marketable, there is 52 per cent. difference in rate of income. This is due to an increase of 52 per cent. in the value of the listed stocks over what they would sell for were they on the same basis as the building and loan.

I presume some may challenge so large an increase of value as that, but there can be little difference of opinion as to the normal interest return of about 4 per cent. on a perfectly safe guaranteed marketable stock, and I could produce plenty of evidence of a return from 6 per cent. to 7 per cent. in Michigan on as safe securities not so readily marketable. Moreover, this is often the ratio of difference between "call" money and "time" money, which differ in just the same way.

Return from Unlisted, Unstable Securities 10 Per Cent.

The next question is that of the stability factor, the appreciation and depreciation of principal and its combination with other factors. It is to be expected that, on the whole, one would want and, on the average, receive rather more return for such investments than on a mortgage, where one must wait an uncertain time before getting his reward. I shall again measure the stability factor by its effect on the return. A difficulty arises in that individual transactions do not mean much since they are so much affected by individual circumstances that they throw little light on the question as to whether a man prefers one dollar or one chance in one thousand to have one hundred dollars — whether a bird in the hand is worth two in the bush or more or less, or whether in average speculative real estate investments the net average return is the same as on a mortgage and to the average American the fact that he has to take a chance is no disadvantage if only he stands to win as much as he stands to lose.

Land appreciation.—St. Mary's Canal Mineral Land Company.—Can one, then, find any clue to the speculative value of land in Houghton county, that is, the income to be derived from its appreciation? I think one may obtain a rough idea from the profits of the old St. Mary's Canal Mineral Land Company — a corporation that existed from 1863 to 1900 and held large tracts of land sprinkled all over the Keweenaw Copper Range, having, when reorganized in 1901, something over 104,000 acres of land. There were only 20,000 shares, and it was always very closely held and (up to the last few years) was not listed and not readily marketable at a forced sale. Between 1863 and 1900 it paid in cash some \$111 per share beside certain shares in stock, which seem to have been enough to raise the total value to \$135 per share. This makes an average return of \$2.74 a share per annum for the 57 years, and during the years 1891 to 1896 it sold at from \$27.75 to \$35 per share. This was on a basis of about 10 per cent. return.

At the end of this period very valuable mines were developed on an adjacent property belonging to the Copper Range Company, and the company was reorganized and adopted the policy of holding rather than distributing many of the shares issued for land. It was also listed but we can see what the results would have been if it had continued its previous policy from its annual reports.

It seems, therefore, likely that speculative investments in mineral lands may net an average interest of 10 per cent., for though it must be remembered that the lands of the St. Mary's Company were shrewdly picked in early days and that to some extent perhaps the lands sold may be the cream—on the map they appear scattered almost at random. Other facts, however, in the sale of tax titles and individual purchases are known to us which suggest that the speculative value of random mineral copper lands represented by unlisted companies is not far from \$25 an acre, at which price it may be expected to yield 10 per cent.

This simply shows that in a field of unlisted investments where quick returns are out of the question, uncertainty is not more attractive than certainty, and on the average, business men do not buy and hold mineral lands on speculation unless they can average to get a good deal more than bank discount or mortgage loan interest for it—a not surprising conclusion. A curious fact is that the ratio which appears to be as 10 per cent. to 6.3 per cent. is not so very far from the traditional ratio of the bird in the hand to the bird in the bush.

Probable Return from Good Unlisted Copper Mines About 10 Per Cent.

To find the value or interest return of a copper mine apart from its marketability is not easy, since none of the Michigan copper mines seems to be worked except by corporations which, if they have amounted to anything, have rarely ever had their shares listed.

It might be expected that the returns would be something like those of the Mineral Land Company since the very same men were interested, and that men would not put their money into copper mining with the uncertainties due to accidents like fires and caving and fluctuation in the price of copper, to say nothing of the uncertainties of the deposit itself, unless they could get as much as they get in mineral land speculation and more than bank discount or mortgage interest.

This inference is confirmed by the estimates of engineers. In the collection of articles by various engineers published as the "Economics of Mining" (page 225) we find Robert Stevenson referring to gold mines as follows: "Having found all these, the extra capital should be subtracted from the gross profit, and the balance capitalized, so as to yield 10 per cent. per annum during the time necessary for exhaustion, and at the same time redeem the principal." He also cites Mr. Curle to the same effect. Other pertinent remarks will be found in this book, especially on page 79 where the theory is criticized that a mine should have 60 per cent. of its market value represented by net profit on ore and must yield 10 per cent. on the investment price.

From the form of the tables and the examples used by Hoskold's "Engineering and Valuing Assistant," it seems that at least in England in coal mine leases, etc., which are rarely public propositions, it has been customary to allow 10 per cent. to 20 per cent. interest beside a fund to replace the capital at a much lower rate of interest up to 4 per cent. These lower rates obviously represent the absolute security rate of interest, and the fact that his Table X runs up to 20

per cent. suggests that mining interest up to that figure is a practical proposition. This appears also from the examples and the tone of various comments in the text.

Hoskold stoutly maintains that one rate of interest should be assumed on the money and another and lower rate of compound interest on that part of the return which is laid aside to replace the principal. This would, indeed, be true in case there were an actual sinking fund, that is, amortization fund, built up and invested at savings bank rates to replace the capital at the end of the life of the mine. But if one is going to discuss what rate of interest is received in mine investments it seems better to discount payments, actually received or expected, by that rate of compound interest which may fairly be expected on mining investments in general.

Hoover, however, in his "Principles of Mining" (page 43) says that the mining business is "one where 7 per cent. above provision for capital return is an absolute minimum return of capital."

In view of the fact that most mines are listed this is not inconsistent with the other statements. It seems pretty clear that a return of over 7 per cent. and probably at least 10 per cent. (to which must be added something in case the rate of production is such as to exhaust the mine within a period when its exhaustion is of importance) is expected and received.

With regard to exhaustion being of importance if one assumes such a relatively high rate of interest on money as 10 per cent., then the present worth of a dollar to be paid after 35 years is but three cents. Consequently if one assumes that money invested in mining is going to earn such high rates of interest the importance of final replacement of capital becomes relatively small as soon as the mine has a generation lifetime.

(To be Continued.)

PERSONAL AND GENERAL.

Mr. R. W. Leonard was in Toronto on his way to Cobalt on October 23rd.

Dr. J. A. L. Henderson, of London, England, who is developing the oil and gas fields near Moncton, N.B., was in Toronto on October 24th.

Mr. James McEvoy spent several months this summer on Groundhog Mountain, near Hazelton, opening up coal measures for a Toronto syndicate. He will probably spend the winter in Toronto.

Mr. J. T. Stirling, of Edmonton, Alberta, provincial inspector of mines, recently visited the Crow's Nest Pass Coal Company's colliery at Coal Creek, near Fernie, B.C.

Mr. Francis Aspinall, formerly engaged in coal mining in the Crow's Nest Pass district of British Columbia, has been appointed inspector of mines in the Crow's Nest district of Alberta, with headquarters at Macleod.

Mr. E. Jacobs, of Victoria, B.C., has been visiting coal mines situated along the Crow's Nest Railway, from Fernie, B.C., to Lethbridge, Alberta, obtaining information for a series of descriptive articles on the mines visited.

Mr. Robert H. Morris, late superintendent for the Mexican Coal and Coke Company, is now superintendent for the Jasper Park Collieries, Limited, which is opening coal mines at Pochahontas, Alberta, distant 205 miles west of Edmonton, along the line of the

Grand Trunk Pacific Railway. The G.T.P. is now taking coal from one of this company's mines.

Mr. Lewis Stockett, of Hosmer, Crow's Nest Pass district, B.C., chairman of the Western Coal Operators' Association, was in Lethbridge, Alberta, on October 13th and 14th, in connection with a renewal of negotiations with the officers of District No. 18, United Mine Workers of America, relative to a resumption of work by the coal mine employees, who have been on strike since April 1st, last.

Mr. A. J. McNab, who for the last three years has been superintendent of the Consolidated Mining and Smelting Company of Canada, Limited's, lead and copper smelting works at Trail, B.C., recently resigned that position to join the metallurgical staff of the Mason Valley Mines Company, with smelting works in Nevada. Mr. Jules Labarthe, formerly manager of the Trail smelting works, is now general manager for the Mason Valley Company.

Mr. W. W. Leach, of the Geological Survey of Canada, having completed the season's field work in the Blairmore-Frank district, Alberta, where he has been investigating the geology of the country, is about to return to Ottawa. Mr. G. S. Malloch has been continuing this year the work in the Skeena district upon which Mr. Leach was engaged several years until his illness last winter.

Mr. Chas. Fergie, of Montreal, Que., was in the Lethbridge and Pincher Creek districts, Alberta, about the middle of October, visiting several coal mines being developed and equipped under his direction. Mr. Fergie acts in an advisory capacity for the Lethbridge Collieries, Limited, with colliery at Kipp, near Lethbridge; the Western Coal and Coke Company, Limited, which is opening a coal mine at Beaver Creek, about 14 miles southwest of Pincher, on the C. P. R. Company's Crow's Nest Railway; the St. Albert Collieries, Limited; and the Pacific Pass Coalfields, Limited, developing coal property situated along the line of the Grand Trunk Pacific Railway, about 160 miles west of Edmonton.

ENGINEER'S REPORT ON ST. ANTHONY MINE.

[Editor's Note.—The following interim report by J. C. Houston is of interest as supplementing the description reproduced elsewhere in these columns.]

Dear Sirs,—As per your request, I beg to herewith hand you a supplementary report on the present physical condition and the possibilities as indicated by the last few months' work on the St. Anthony property.

On the main vein to the south we have driven for a distance of 160 feet past the old No. 3 shaft (on the 100-foot level), or to directly under the edge of Couture Lake. It was not thought advisable to drive under the lake at this level, as there would not be enough ore available above the level to warrant the work. At the point where work was discontinued the vein is about 30 feet wide, with three separate bodies of 8 feet, 5 feet, and 3 feet in width, respectively. For the full 160 feet, which we drove on the first or easterly body, it is the full width of the drive and in places more than that, and of \$12 to \$15 in value.

We are at present breaking out a stope to the south of No. 3 shaft, and have to take 10 to 12 feet in places to get all the ore. Sampling through the mill shows this to be from \$12 to \$14 ore.

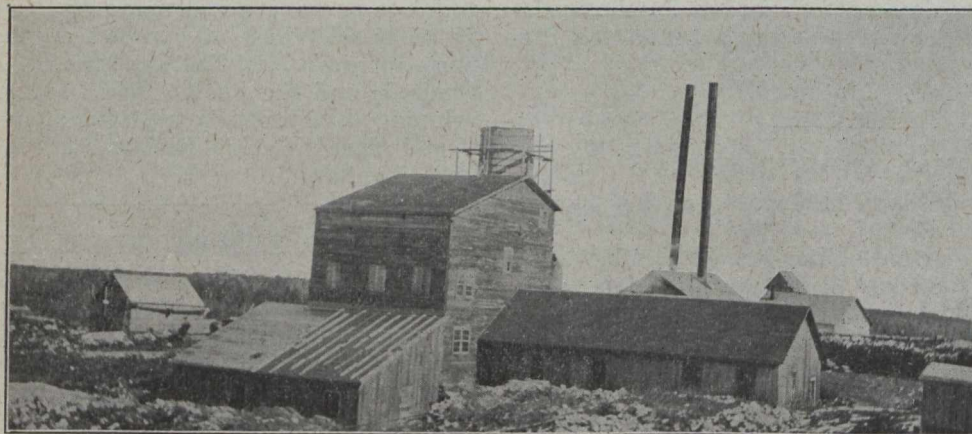
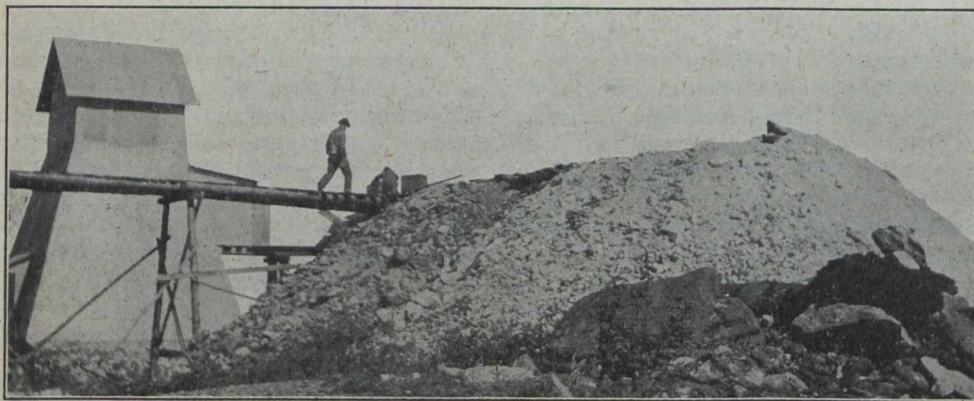
Further north, beyond the north end of the open cut, on the 100-foot level, we have cut into a lens of ore, in the west wall of the drive, which had been over-

looked by the former operators. We are driving back south on this, and find that it is paralleling the small vein on which the old operators drove through on. It is about 6 to 8 feet wide, of \$14 ore. We have cross-cut into it in the wall of the open cut about 20 feet above the level, and find it 10 feet wide, of excellent ore, which will probably carry through to the surface or near there. This fills in the gap which my first sampling showed very low grade, the main vein having been left in the wall. I think it will be found that the main vein will carry a good width of good mill ore all the way to the main shaft, and probably 300 feet beyond to the north. This vein at the furthest point south on the 100-foot level, where work was suspended, is larger and stronger than at any other point opened, and should continue for several hundred feet further under Couture Lake. This can be opened up on the second and succeeding levels.

cut it, on the 100-foot level from the main shaft.

Between it and the main vein there is a small vein which we have partly stripped. It is about three feet wide, and shows some free gold. This is probably the outcrop of the vein that we started the No. 2 winze on at the 100-foot level. Both these veins give great promise of a large tonnage of good mill ore. The surface assays, showing from \$3 to \$30 per ton, and the underground samples on the small vein even better.

The really important development of the summer was the discovery of the new No. 4 vein, which was uncovered about 180 feet to the west of, and paralleling, the main vein on the south end. We have not had time to strip it nor has there been a shot put in it yet. It shows rich pannings in the surface dirt at any point along the outcrop, it being not uncommon to get as much as \$3 worth of gold in a single pan. We are driving a crosscut from the main vein at the 100-foot



The No. 2 winze was put down 60 feet, and a cross-cut started to get under the main shaft. This cross-cut is in about 35 feet and has about 15 feet more to go. As soon as the station at this level is cut and the shaft raised through to the first level a crosscut will be run west to intersect the main vein, which dips in that direction.

To the north of the main shaft, on the first level, some stoping has been done, but as ore still keeps showing on the east or footwall side, notwithstanding that the stope is 20 feet wide in places, it was thought better to crosscut into this wall to see how wide the ore body really is before starting to timber. This ore on sampling through the mill, runs from \$16 to \$18. This work, as well as a lot of other exploration work that has been planned, will have to wait until we have the power necessary to carry it through.

The big No. 2 vein to the east has not had any work done on it yet. We still have about 25 or 30 feet further to go in the crosscut, which we are driving to

level at the south end to cut this vein. It is in now about 80 feet and has about 90 feet more to go. Small stringers were encountered at different points in this crosscut, some showing visible gold, and all giving good assay values.

The close proximity of all these veins (all being within a width of 400 feet), with the main vein in the centre, makes an ideal proposition for cheap and quick development.

The location of the property, lying, as it does, between Sturgeon and Couture Lakes, and within nine miles of the main line of the G.T.P., gives it natural advantages possessed by no other property in Ontario.

The mill sampling bears out the statements made in my former report, that we have large quantities of \$10 to \$15 ore, enough to keep a mill at work for many years.

Awaiting your further commands, I remain,

Yours very truly,

(Sgd.) J. C. HOUSTON.

The Vipond Mine of the Porcupine Gold Mines Co.

Written for the CANADIAN MINING JOURNAL by H. P. DAVIS.

The Porcupine Gold Mines Company was organized under the laws of Delaware in March, 1910, and at the date of organization took over the North and South Vipond properties, two mining claims in Mountjoy Township, and, through the ownership of the Ridgely Porcupine Mines Company, acquired a three-fourths interest in the Atchison-McDougal claims. Since the organization the Porcupine Gold Mines Co. has purchased the Airth claims, and has taken a working option on the South Thompson property. The company at the present time owns or controls the following properties:

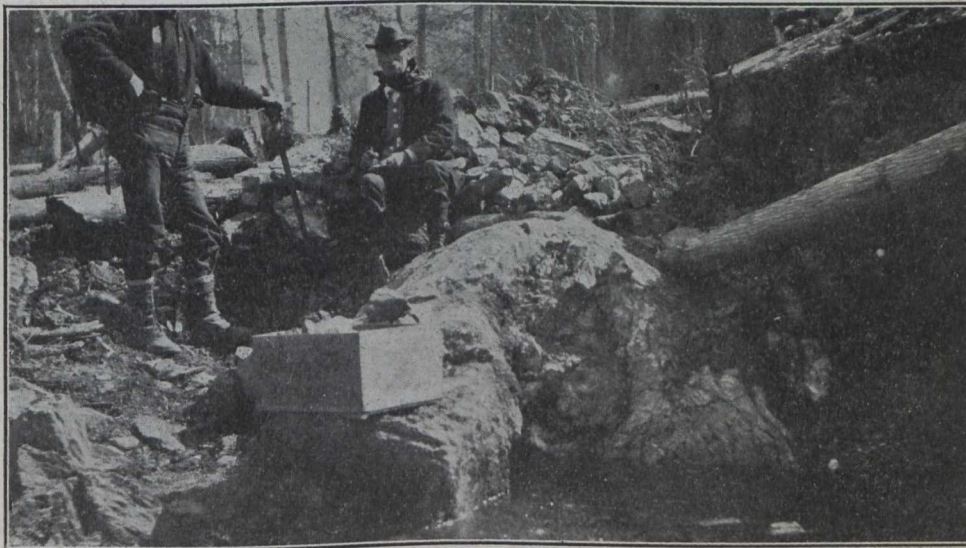
North Vipond, s.e. quarter or south half Lot 10, Con. 11, Tisdale	40 acres
South Vipond, n.e. quarter of N. Lot 10, Con. 1, Tisdale	40 acres
Airth, n.w. quarter of north half, Lot 9,	

basalts immediately south of the contact of the quartz porphyry of the Pearl Lake area.

The intrusion of the quartz porphyry has resulted in a very extensive fissuring in this area. The general course of the fissuring is northeast and southwest. The veins in this immediate vicinity show great resistance in strike, and are generally well defined with continuous ore shoots, and evenly distributed gold values.

In April, 1910, the Porcupine Gold Mines Company started development work on the Vipond claims, and by surface trenching and stripping exposed numerous quartz veins. Underground development work has been confined to veins Nos. 2 and 3. These veins have a general trend of northeast and southwest, and are approximately 100 feet apart.

Vein No. 2, which has been uncovered on the surface



Outcrop No. 3 Vein

Con. 1, Tisdale	40 acres
South Thompson, n.w. quarter of north half, Lot 10, Con. 1, Tisdale	40 acres
(Held under option agreement.)	
Three-fourths interest in Atchison-McDougal group of six claims in Lot 5, Con. 11, Tisdale	240 acres
Mining Claim No. 15443, Mountjoy Township	40 acres
Mining Claim No. 15444, Mountjoy Township	40 acres
Total	480 acres

The Vipond Group.

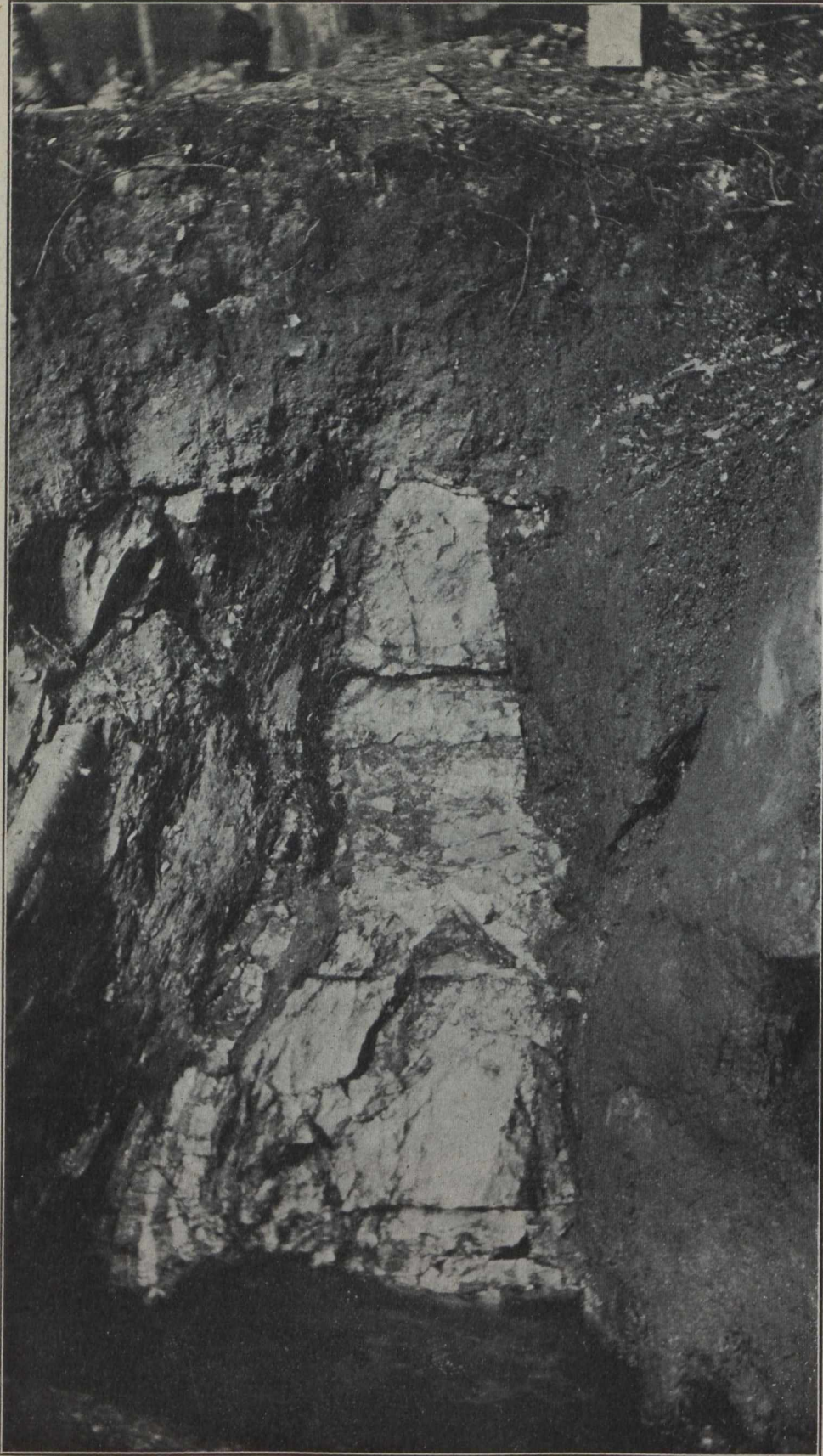
This group includes the North and South Vipond, the Airth, and the South Thompson, 4 claims of 40 acres each, making a compact block of 160 acres, located southeast of the properties of the Hollinger Mines. The geological formation is of the Keewatin series. The claims referred to lie in the amygdaloidal

for 600 feet, shows a varying width of from 4 to 6 feet of quartz, mineralized schist, and ferro-dolomite. The outcrop of this vein was sampled in June, 1910. Channel samples show an average value of approximately \$30 to the ton. These results have been repeatedly checked and verified by independent engineers.

On No. 3 vein sampling of the outcrop shows that the quartz for an average width of 12 inches assays \$83.45 to the ton. At various points along the vein assays have shown values of from \$8 to \$16 for a width of 8 feet. In these samples the richer ore shoot was not included.

A working shaft has been sunk to the 100-foot level midway between veins Nos. 2 and 3, and at this level a crosscut driven from the shaft to vein No. 2 and drifts driven on No. 2 vein, for a total distance of 320 feet.

The ore from these drifts for an average width of 42 inches assayed \$23.10 to the ton. These results were



Test Pit No. 2 Vein

confirmed and checked by the operations of a one-stamp Nissen mill.

No. 2 vein has been proven on the surface for 600 feet, and at the 100-foot level for 320 feet.

At a point 120 feet west of the shaft a crosscut has been driven from No. 2 vein 110 feet to vein No. 3. The crosscut reached the vein just before the Porcupine fire destroyed the surface plant of the company. Where

encountered, the No. 3 vein shows 15 feet of ore which averages, after careful and repeated sampling, \$11.20 to the ton.

The south wall has not yet been reached, and as the drill holes for the last round of shots fired showed quartz and sulphides, additional width is assured.

The working shaft has been sunk to a depth of 200 feet, at the 200-foot level a station has been cut. When the timbering is completed, crosscuts will be driven north to the No. 2 vein, and south to the No. 3 vein. Drifts will be run both east and west on each of these veins.

Plant.

At a meeting of the directors of the company, held in New York, on Tuesday, October 3rd, it was announced that \$125,000 had been provided for treasury purposes, and that orders had been placed for a mill with the capacity of 100 tons per day. In addition to the new mill, a complete mining plant, including a 10-drill compressor, boilers, a 30 horse power hoist, and drills, is being installed.

It is expected that the mill will be in operation by February 15th. The small test mill destroyed by fire, which operated under difficulties owing to the lack of sufficient motive power, earned sufficient money to carry on development work on the property. The new mill will be operated by electric power furnished by the Porcupine Power Company.

The plant and mill have been so designed that the capacity can be increased as warranted by mine development.

The development work at the 100-foot level has already blocked out a considerable tonnage of high grade milling ore in the No. 2 vein. As the limits of the ore shoot have not yet been reached, further development will naturally increase the reserves above this level.

The crosscut in the No. 3 vein at the 100-foot level has indicated a large tonnage of pay ore.

On the completion of the compressor plant in December, the development work will be carried on at the rate of 500 feet a month both on the 100 and 200-foot levels. Crosscuts will have been run from the station at the 200-foot level to the No. 2 and No. 3 veins, and drifting will be started both east and west on both veins. Development work, including upraises and a small amount of stoping, will amply supply the mill.

The main shaft will be continued to the 300-foot level.

For the present, development work will be confined to the known ore bodies, and every effort will be made to increase the ore reserves.

IMPORTANT COAL MINING DEVELOPMENTS.

Although production of coal from the Crow's Nest Pass Coal Company's mines in southeast Kootenay has not yet been practicable during the last six months, owing to the miners and other employees having been on strike, the management has not been idle, for attention has been directed to the examination of the surface of parts of the company's property where the general manager, Mr. W. R. Wilson, thought it likely there would be found seams of coal not previously worked, or where some of those already known might be opened to greater advantage. As a result, the development of several practically new seams is in progress, with promise of them, in due course, becoming

productive of coal of excellent grade and in considerable quantity. Some of these are at Coal Creek colliery and others at Carbonade, on Morrison Creek.

On the south side of Coal Creek four such seams are being opened. All of these are above No. 2, which has long been known as the best seam from which coal has been mined at that colliery. These are severally known as No. 1, A, B, and C seams. Their respective heights above No. 2 seam, the entry to which is at tipple level, are as follows; No. 1, 80 feet; A, 200 feet; B, 340 feet; and C, about 500 feet. The coal opened in A, B, and C seams is of excellent coking quality, a full average working section having shown on analysis but 6 to 7 per cent. ash, while picked samples gave only 3 per cent. The C seam was found 11 years ago, when Mr. Wilson was formerly in charge of the property, but had not since been developed. A plan for the systematic opening of this seam is now being outlined. The coal in both C and A seams, so far as indicated by the work done on them to date, is quite equal in quality to that of No. 2 seam, already mentioned as having proved to be the best in the Coal Creek mines. A double-track, endless-rope tramway is being constructed from the level of the colliery tipple up past No. 1 to B seam. This will have a total length of 1,900 feet, and will serve for opening three of the new seams.

On the north side of Coal Creek, prospect tunnels are being driven for the purpose of also developing there A, B, and C seams, all lying above No. 1, which last seam has been extensively worked on that, though not on the other, side of the creek.

At Carbonade, on the south side of Morrissey Creek valley, the work done during recent months has been chiefly with the object of further proving a change in the structure of the coal found to have occurred where this development was commenced; also of prospecting three seams not previously worked in this part of the property. The outlook for this colliery is now regarded as more favourable than for some time past, for there appears to be good reason for hope that it will hereafter be practicable to ship from the Carbonade mines a considerable quantity of coal of good marketable quality. Only a few men are employed here at the present time, but it is expected that when labour conditions shall again be normal in the district, quite a number will be engaged in mining and shipping coal.

CONDITION OF TURTLE MOUNTAIN, ALBERTA.

The commission appointed by the Dominion Government to examine Turtle Mountain, near Frank, Alberta, and to report whether there appears danger of another slide taking place, thereby endangering life and property, has completed its examination of the parts of the mountain reported to be unsafe, and the several members have returned east.

The commission consisted of Mr. Geo. S. Rice, of Pittsburg, Pennsylvania, one of the senior officers of the United States Bureau of Mines; Dr. R. A. Daly, of the Boston School of Technology, formerly one of the geologists of the Geological Survey of Canada; and Dr. Willet G. Miller, provincial geologist for Ontario. Mr. John T. Stirling, of Edmonton, Alberta, provincial inspector of mines, was also at Frank while the mountain was being examined.

Of course, no information as to the conclusions of the commission has yet been given out, for necessarily these will be included in the report to be made to the Canadian Government, Ottawa. All that is known in

the district is that the members of the commission made a careful examination of the mountain and of such parts of the Canadian Coal Consolidated Company's mine workings as may possibly have in some degree led to a movement of the rock structure above. Whether or not the theory that was several years ago advanced, that the operation of this company's coal mine caused the big slide from Turtle Mountain that occurred in 1903, has been in any way supported by later developments, may be expected to be one of the points upon which the members of the commission will express opinion. The question of whether or not the continued operation of this coal mine, or any part of it in the mountain below the peak (that some fear may fall on the town of Frank), may be regarded as being attended by risk of a repetition of the disaster of 1903, is one of much moment, both to the company owning and operating the mine, and to owners of property and residents in that part of the town likely to be affected should a second large slide take place.

The purport of the report of the commission, and the decision of the Dominion Government after the consideration of the recommendations that shall be made by the commissioners, is being awaited with much interest, and in some cases with anxiety, by those immediately concerned, so it is hoped there will not be any unnecessary delay in disposing of this matter, which is unique in the history of both coal mining and geological phenomena in Canada.

WEST SHINING TREE REPORT.

Chemistry and Mining Building,
Toronto, October 5th, 1911.

T. W. GIBSON, Esq.,
Bureau of Mines.

Dear Sir:—

Prof. Miller requested me, on my return from the West Shining Tree district, to submit to you a preliminary report on the area.

The region visited includes the townships of Asquith, MacMurphy, Churchill, and Fawcett. West Shining Tree Lake, near which gold was discovered first, lies in the townships of Asquith and Churchill, and is 70 miles north of Sudbury, 60 miles south of Porcupine, and 20 miles west of Gowganda.

The territory was reached by C. N. R. from Sudbury to Gowganda Junction on Blue Lake, and by canoe the rest of the way, through Blue, Oshawong, Shoo-Fly, Meteor and Opickinimika Lakes and the Opickinimika River. The route leaves the latter river about the centre of the west boundary of Asquith, passing through two small lakes into West Shining Tree Lake.

The country around West Shining Tree Lake is one of low relief. While level and with no prominent elevations, it cannot be called swampy, as the general level is well above the water of the numerous small lakes that occur in the region. The area for the most part is not heavily drift covered but, owing to the level nature of the ground, the rocks are not exposed extensively excepting the part of the country that has been burned over. The forest growth is chiefly spruce, jack pine, balsam, birch, and small cedar.

The geology of the area is rather complex. Numerous samples of rock were brought down but have not yet been examined carefully. The rocks, where the claims are located, are of Keewatin age. They consist of greenstone, altered diabase, and schist. Associated with these are porphyry, rhyolite, and a rusty

weathering rock which, I believe, corresponded to the ferrodolomites of the Porcupine district. Very fresh looking diabase was found in several places, and may prove to be post-Huronian. The schists, as a rule, have a strike several degrees north of east, and are nearly vertical but tipped slightly to the north. An area of Laurentian granite lies to the south. Outcrops of the granite were observed along the Montreal River across the Township of Fawcett and on the first small lake south of West Shining Tree Lake in the Township of Asquith. Occasional outcrops of granite were observed along the route into the district as far south as the north end of Meteor Lake.

The discoveries, for the most part, are located on zones of weathered schist containing veins and stringers of quartz that generally conform to the strike and dip of the schist. As to their extent but little can be said, as very little stripping had been done at the time of my visit. The quartz widens in places to several feet, but does not carry this width far till it breaks up into stringers or disappears. On one claim where some work had been done one of these zones had been traced for 8 or 9 chains. The quartz is usually white and contains considerable rust, but on three properties a bluish quartz was found. In some places the quartz and schist contains considerable iron pyrites. Small amounts of galena were observed in two places.

While the most of the quartz veins and stringers have a strike conforming to the general strike of the schist, that is, a few degrees north of east, it was noticed on three properties that the strike of the quartz outcrops was in a northwesterly direction. These suggested that a second system of veins occur in the district.

The following properties were visited:

- A. Gosselins' (2195-96), east of West Shining Tree Lake.
- S. Jepson's (2277), east of West Shining Tree Lake.
- T. Thompson's (2312,2310), east of West Shining Tree Lake.
- Moore & McDonald's (2275-76), east of West Shining Tree Lake.
- R. Cryderman's, near 2312.
- P. McGuire's, south of West Shining Tree Lake.
- M. Caswell's (2393), northeast corner of Fawcett.
- Jefferson's (2504), southwest corner of MacMurphy.
- T. Seville's (2535-36), southwest corner MacMurphy.
- McIntyre's, southeast of (2504).
- S. Jepson's (2538), southwest corner MacMurphy.
- Caswell's (2532, 2542), southwest corner MacMurphy.
- G. Bennett's (2544), southwest corner MacMurphy.

Free gold was seen in place at Gosselins', Jefferson's, and Caswell's (2532). Gold was seen panned from the decomposed material on Cryderman's claim.

The property known as Gosselins' has attracted more attention than any other in the district. The stripping already done reveals what is apparently a very large body of quartz with free gold in several places. What is evidently the same body has been located at intervals for over 10 chains with a width of three or four chains. The rock associated with the quartz is a rusty schist and also a hard flinty rock in which a schistose structure has been developed in places. The rocks in places are intersected with quartz stringers which form, at times, probably one-half of the total. In a place where the most stripping has been done the quartz shows continuously for 2 chains. A trench at almost right angles shows quartz for about 70 feet, but with some streaks of schist. The stripping

has been done in a northwesterly direction, which may prove to be the strike of the ore body.

Another property that attracted attention is that known as Clark's, about one mile in a southeasterly direction from Gosselins'. Work done on this property shows a large mass of quartz and a greenish rock that weathers very rusty. A great deal of pyrite crystals occur in the rock, and sometimes in the quartz. No gold was seen here, but it is claimed that gold can be panned from the decomposed material. This was the most extensive showing of what was considered the carbonate rocks, that I saw in the district.

At the time of my visit to the region definite information regarding many of the properties was difficult to obtain, as many men had gone out to the front or were prospecting in other localities.

* * * * *

Since writing the above, I have received the results of assays from the Belleville office on seven samples of quartz I collected from different properties where no gold was to be seen. One of these samples did not contain gold, and the others carried values ranging from 40 cents to \$6 to the ton.

Yours truly,
R. B. STEWART.

The Sturgeon Lake Gold Field.

Abstract of report of Dr. E. S. Moore.*

History of the Field.

According to Mr. W. McInnes, of the Canadian Geological Survey, who seems to have been the first geologist to describe Sturgeon Lake and the geology of its vicinity, gold was discovered on Sturgeon Lake in the summer of 1898, when a number of claims were staked. A little later the most important deposit of the region, now owned by the St. Anthony Mining Company, and at first known as the Jack Lake mine, was discovered, and in 1901 Dr. A. P. Coleman describes the work which was being done on this property. A little to the north of it the Sturgeon Lake Mining Company had erected a stamp mill and installed machinery on the Dawson property, named after G. Dawson, president of the company. Mining continued, with periods of cessation, at the St. Anthony Reef mine, until 1908, when it ceased, and almost no mining work has been done since, although some new camps and other buildings were erected last summer and underground development work was begun.

During the years 1901-2 the United States Gold Mining Company did considerable work on what is known as the Shore properties, near the west end of King's Bay and on claim B. G. 136 on the southwest shore of North Bay. Three shafts were sunk on the former property and a tunnel about 50 feet long driven into a hill on the latter.

The work on those properties being unsatisfactory, they were abandoned the next year, and nothing has been done with them since.

Camps were built and shafts were sunk on the Symmes prospect on B. G. 139, on North Bay, about the same time as those mentioned above. About this time also the camps at the Northern Light and other properties near the northern part of Northeast Bay were erected, but soon fell into disuse.

In 1906-8 there was some activity in the vicinity of Belmore Bay, where the Belmore Bay Mining Company sank a shaft 260 feet deep and built a three-stamp mill, and the Douglas Mining Company did a considerable amount of development work.

In 1909 prospecting received a new impetus through the construction of the Lake Superior Branch of the G. T. P., and the establishment of steamer lines on the lake for the transportation of materials for railway construction. These afforded facilities for easy access

to the region, and a good many prospectors entered the district, but the boom was only temporary. On account of the delightful lake, the ease with which the region can be reached and supplies obtained, it has often seemed that many prospectors have found it a very desirable one in which to spend a summer at the expense of someone else, and this has led to the foolish and useless expenditure of time and money on what has been called development work. Efforts have been made to sell properties that are known to be absolutely valueless. Many large pits have been sunk in rock where there is almost no sign of quartz and no gold in what quartz there is.

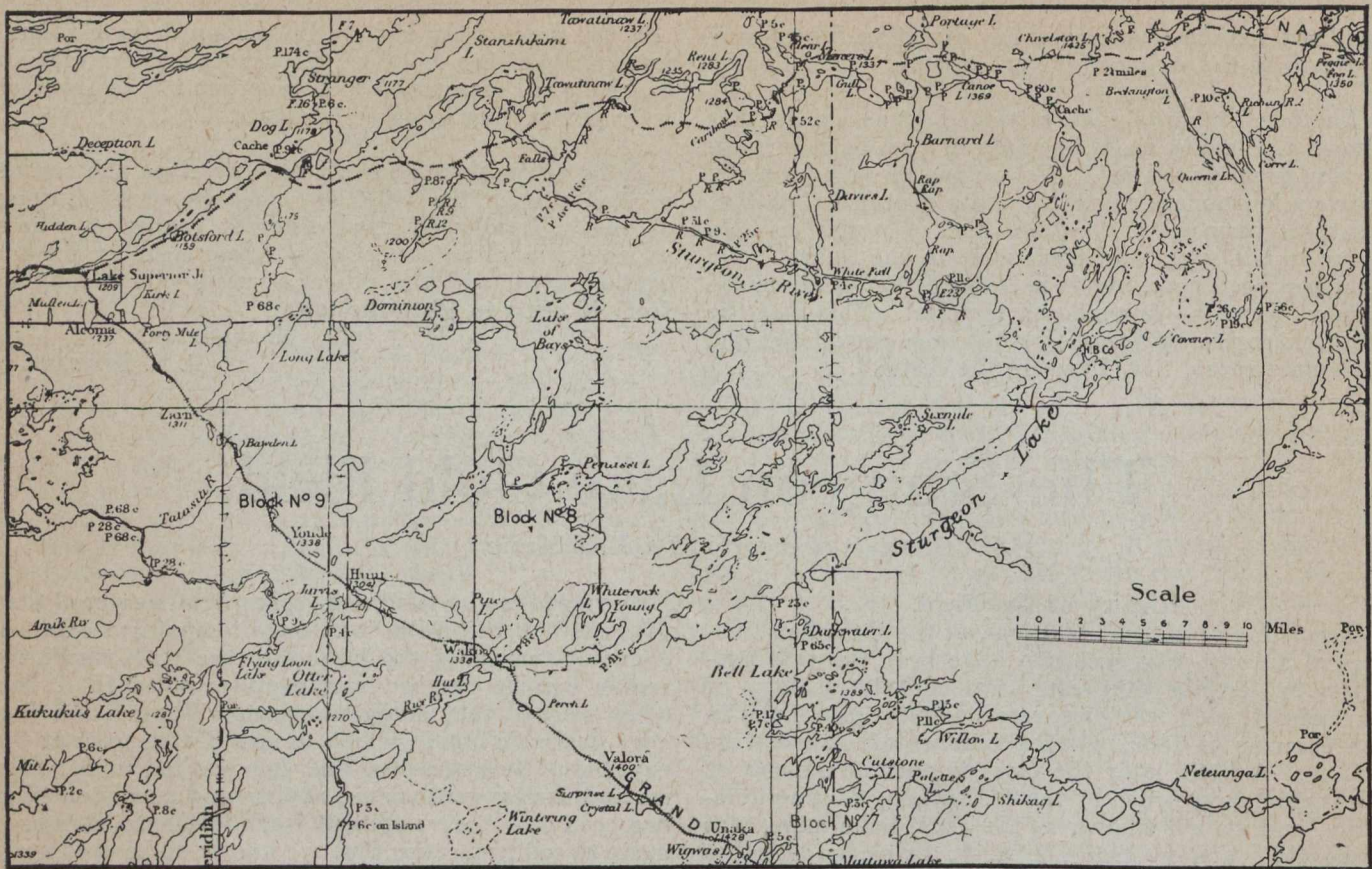
Besides the writers already mentioned, several others have written geological notes on the Sturgeon Lake region. Among these are Dr. W. G. Miller, who in 1902 wrote a good account of many of the deposits. W. H. Collins, of the Canadian Geological Survey, and E. T. Corkill, Inspector of Mines, have written briefer notes on the mines.

The lake after which the field is named is about 45 miles long, and the northern half is divided into two large arms, known as North Bay and Northeast Bay. It lies across the boundary between the districts of Rainy River and Thunder Bay, and in 50 degrees north latitude. A spur line about six miles long runs from the lake to the Lake Superior branch of the Grand Trunk Pacific Railway, at W. O. Junction, about 154 miles from Westfort, near Fort William. The field is thus easily accessible, and when the Transcontinental main line is complete it will pass about three miles north of the lake.

Geology.

The rocks round Sturgeon Lake form an extremely complex igneous series of extrusions and intrusions. There are very few sediments in the area, and none of them form definite geological horizons. The only sediments recognized with certainty were a few patches of greywacke, arkose, and dolomite, the former being found in the open cut at the St. Anthony mine, the arkose at the Dawson and Shore mines, and the dolomite on Claim H.W. 705 and on Morgan Island. Besides these there are some masses of a fine grained gray gneiss or schist, which is believed to be partly sedimentary in origin. It is finer in grain, more granular in texture, and as a rule lighter in colour than the granite gneiss. It is similar to large areas of rock found by the writer in the Lake Savant area.

*From 20th Annual Report Ontario Bureau of Mines.



Key Plan showing position of Sturgeon Lake

The igneous rocks consist of granites and their metamorphic equivalents, gneisses, aplites, quartz-porphyrines, rhyolites, hornblende-syenites, diorites, diabases, basalts, gabbros, and porphyrites. Dr. W. G. Miller described boulders of nepheline-syenite which he found near East Bay, but we did not locate any of this rock in our work.

On the accompanying map a number of these rocks have been differentiated, but they are so intermingled that only the larger areas of each type could be laid down, and these areas often include small patches of the other rocks. There are represented a few small areas of agglomerate and breccia, which in some cases are crush-breccias and in others probably flow-breccias and agglomerates, the latter consisting of fragmental material ejected from volcanoes.

An attempt has been made to separate these rocks according to their relative geological age, but the only definite arrangement that can be made is on a purely lithological basis. There are no sedimentary rocks in the area which furnish definite geological horizons. The granite along the western portion of the field, designated the Sturgeon Lake granite because of its prominence in the area, is by no means typically Laurentian, and some of the quartz-porphyrines are older, some equivalent in age, and some younger than the great mass of the granite.

Many of the greenstones and schists, as well as the quartz-porphyrines, are typically Keewatin, but there are some greenstone dikes cutting the granite, and there are many masses of comparatively fresh-looking gabbro and diorite apparently much later than the older rocks of the area, and often cutting the quartz-porphyrines, which are younger than the oldest of the greenstones.

Age of the Granite.

The age and association of the granite is interesting because of the apparent relation between it and the ore deposits, and of the petrographic character of the rocks. This granite has usually been regarded as of Laurentian age and has been mapped as such by previous investigators in this region. It was found, however, that it is not typically Laurentian, as much of it is not gneissic at all and looks like a comparatively fresh rock. The eastern portion of it is porphyritic and in places grades over into quartz-porphyry. None of these features are absolutely opposed to the rocks being Laurentian, but they are not typical of rocks of that age.

It was at first thought possible to separate the granite along the west shore of North Bay, where some of it is metamorphosed to a gneiss and in places cut by numerous granite dikes from a younger porphyritic granite along the eastern portion of the bay, which contains few of these dikes. The work on the whole area, however, failed to show any means of doing this, and also indicated that the two types pass into one another by imperceptible gradations. In some places the granite has been locally more metamorphosed than in others, giving rise to the patches of gneiss, and the porphyritic phase seems to be due to differentiation influenced by the contact with the Keewatin greenstones.

The age of the numerous dikes of granite, felsite, and aplite, is doubtful. These dikes were first observed near the northern end of North Bay, where they cut biotite-gneiss and a fine-grained grey gneiss or schist, the latter probably of Keewatin age. It was thought that they belonged to the later porphyritic granite, but they were found to be connected with the main mass of the granite in the vicinity, and later, similar

dikes were found cutting the porphyritic granite on the east shore of the bay. Dikes of felsite and aplite were also found cutting the greenstones at considerable distances from the granite mass. The assumption that there are granites of two distinct ages in this area is supported by the fact that at Unaka, a station of the G. T. P. Railway a few miles east of Sturgeon Lake, there are distinct granite dikes cutting a typical highly metamorphosed Laurentian gneiss. In this case the granite had been folded and metamorphosed before the dikes were intruded, and this was thought to be the case on the northwest portion of Sturgeon Lake, but the pegmatitic and aplitic character of so many of the dikes suggested that they may have originated as a later phase from the same magma as the granite, in some such order as suggested in the next section of this report.

That some of the quartz-porphyry is older than the granite is shown at the St. Anthony mine, where the latter cuts a schistose phase of the former and that there is quartz-porphyry of the same age as the granite is shown by the gradation of one into the other. The small area of porphyry near the mouth of the creek draining Couture Lake cuts the granite and is therefore younger.

The large mass of hornblende-syenite along the east side of the narrows is younger than the greenstones of the region, and is a comparatively fresh rock, but beyond that nothing can be said about its age. It is not improbable that it is related to the Sturgeon Lake granite and of similar age.

As to the age of the dolomite, little can be said beyond the fact that it is older than the quartz veins which cut it in some places.

Regarding the age of the rocks of the area, it is the writer's opinion that there are basic rocks of ages varying from Keewatin to Keweenawan, quartz-porphyrines of Keewatin to at least Huronian age, and that the Sturgeon Lake granite is later than Laurentian and is possibly Huronian in age.

Vein Characteristics.

The veins are largely fissure fillings. They are, as a rule, very irregular, because the cavities were formed along contacts between different types of rock, along planes of cleavage and fissility in schists, and in igneous rocks by unequal cooling and torsion. In one case a considerable fissure was opened along a fault plane at the St. Anthony mine.

The gangue is predominantly quartz, although some calcite and siderite occur. The sulphides are pyrite, chalcopyrite, galena, zinc blende, pyrrhotite, and pyrolusite. The ores are largely free-milling. The upper portions of the veins, owing to oxidation and concentration, often show splendid specimens of free gold.

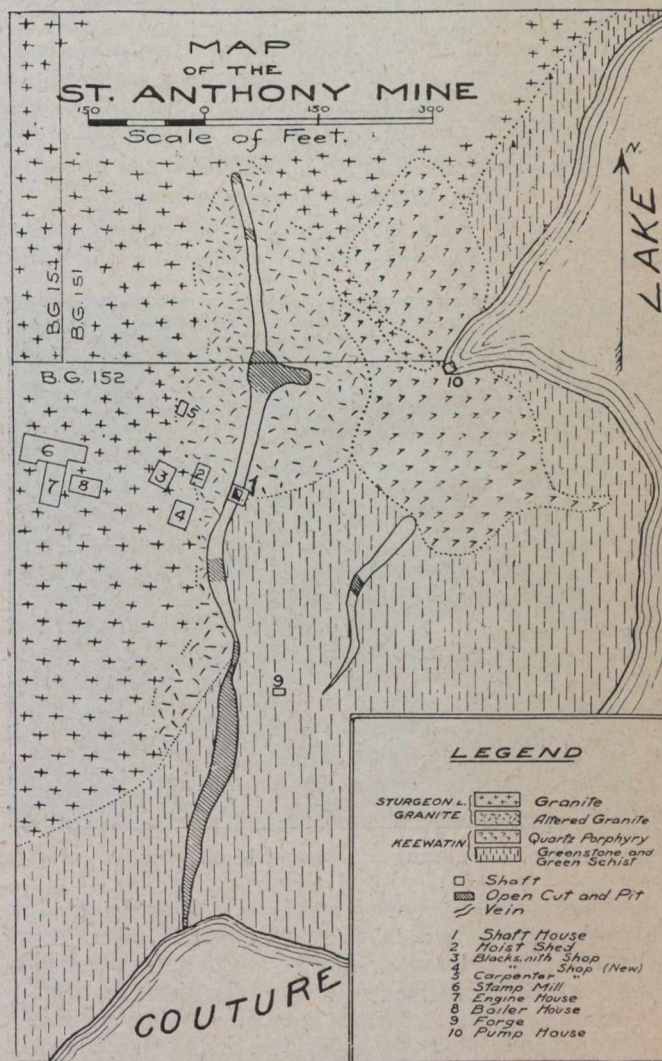
Four stamp mills have been installed in the region, but only one, that at the St. Anthony mine, has handled any considerable quantity of ore. This mine has produced a good deal of ore, but it is difficult to procure records of the quantity and value. Many shafts have been sunk and a great number of test-pits dug on more than 200 claims which have been recorded in this field.

AL 499.

On an island in North Bay covered by location A. L. 499, and not far east of the last property described, Mr. T. K. Barnard has sunk a shaft and stripped a number of veins. Mr. Barnard has been on this island for seven years, and his beautiful flowers and well-kept cabin deserve special mention. It is probably the best

kept and most attractive cabin owned by any prospector in the north.

On this island there is a contact between greenstone in the form of altered diabase, green schist, and quartz-porphyry, which in places becomes more like granite than quartz-porphyry, and may be regarded as a phase of the granite. The veins occur in the greenstone and schist, in the porphyry, and along the contact between the two. The quartz in most of the veins is dark and favourable looking, although one vein appears barren. One of these veins runs nearly across the island. A shaft 25 feet deep and 9 x 7 feet, has been sunk on a group of one large and many smaller veins. In the shaft there is a dike-like mass of porphyry, and there



is some evidence of a slip horizontally part way down the shaft, while at the bottom there is a mass of greenstone. As this greenstone is older than the vein, it has not intruded it, and although the vein may have pinched here it may reappear on either side of this mass.

There are many little stringers in the quartz-porphyry, suggesting that the fissures had been developed at the time of cooling and contraction of this rock. From one of these little veins some gold was panned, and the dark quartz from the shaft also showed fair values, but we did not find any visible gold, and the owner stated that it seldom occurred, although this property has had a local reputation for supplying unusual samples of free gold.

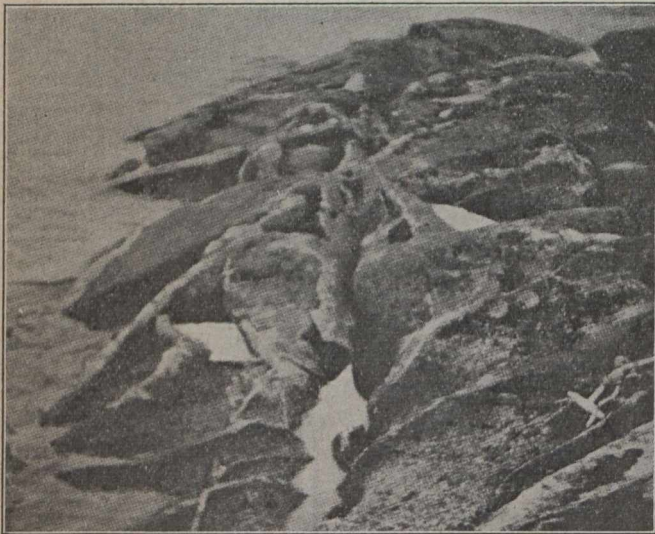
The Symmes Prospects.

On claim B.G. 139, on the shore of North Bay, there are three old camps, and near them some pits. W. G. Miller states in his report that there are two shafts on the Symmes property, which includes B.G. 138 and adjoining claims, about 25 feet apart, and that the southern one is said to be 22 feet deep and the other one 15 feet. He describes the vein as about 9 feet wide, occurring in granite, and consisting of dark quartz carrying iron pyrite, dark sphalerite, and occasionally visible gold. I could not get any definite information in the field regarding these properties, as some of the claims have been abandoned and the Coveney brothers have taken up and partially developed some of the others, which will be described under "The Coveney prospects."

Near the camps on B.G. 139 there are two pits about 100 feet apart and 7 to 10 feet deep on a large white quartz vein. The granite in which the vein lies in the upper portion of the pit as a sort of capping, is much shattered, and the vein is very irregular.

The Coveney Prospects.

On A.L. 497, a short distance from the southeast corner of B.G. 138, considerable prospecting work has



Acid granite dikes cutting arkose and biotite-granite gneiss.

been done by the Coveney brothers. They have sunk three pits, two of which lie near together, on a large irregular mass of quartz near the contact between porphyritic granite and Keewatin green schists. This mass of quartz appears to form a sort of capping from 1½ to 6 feet thick, due to solutions rising from many cracks in the shattered granite and spreading out along some horizontal line of weakness, probably between the greenstone above and the granite beneath, and then exposed by the removal of the greenstone by erosive agencies. The bottoms of the pits show very little evidence of a continuous vein. Where stripped, small dikes of granite are seen cutting the schist, and numerous stringers of quartz occur in both granite and schist.

The largest pit is in the form of a trench about 50 feet long, 10 to 15 feet deep, and 8 to 10 feet wide. Some of the ore taken from this pit was described by Mr. D. Coveney as containing the following assay values:

Silver	\$25 per ton.
Gold	6 per ton.
Copper	\$2 to 3 per ton.

One of the most highly mineralized specimens, taken by the writer and analysed by Mr. N. L. Turner, provincial assayer, showed the following values:

Gold	0.20 oz. \$ 4.00) per ton.
Silver	22.72 oz. (\$11.36) per ton.

The vein is fairly well mineralized with chalcopyrite and pyrite. The latter is sometimes in cubes one-half an inch in diameter, and in some places the pyrite has been dissolved, leaving cubic cavities in the quartz filled with iron oxide.

The contact between Sturgeon Lake granite and Keewatin schist runs nearly north and south in this vicinity, and about 100 paces south along the contact there is another pit on a large quartz vein. This pit is about 12 feet deep and varies in horizontal dimensions from 10 x 7 feet at the top to 6 x 5 feet at the bottom. There was a little water in the pit, and at the surface of the water the vein widens out to practically the full width of the pit. The upper portion of the vein is very irregular and is mixed with bands of schist. It strikes 160 degrees, dips 80 degrees W., and where stripped can be traced 150 feet up the hillside, where it either pinches out or is turned off in another direction by a change in the strike of the schist, which at this point changes in strike to a northeast direction. Throughout this 150 feet it keeps its width well, and the foot-wall is fairly distinct.

The St. Anthony Mine.

The St. Anthony mine is situated on claims B.G. 151 and 152, on the west shore of Couture Lake. The camps are located on B.G. 154 and 168 on St. Anthony Bay, a small indentation in the shore of North Bay of Sturgeon Lake. The camps, as well as some of the buildings at the mine, have been renovated during the past summer, preparatory to the carrying out of further development work at the mine.*

This property, which is by far the most important one in the district, was located about ten years ago, when it was known as the Jack Lake mine. It also goes by the name of the St. Anthony Reef, because of the idea held by some that its surroundings suggested a reef rising above the water of Couture Lake. It has been controlled for some time by the St. Anthony Mining Company, and was worked from the year 1903 until 1908, when it was closed down. During 1907 and 1908 Mr. J. Steele worked the mine under option. The present manager of the company is Mr. Arthur L. McEwan, to whom I am much indebted for his hospitality to us while working in the vicinity of the mine.

The buildings at the mine consist of a ten-stamp mill and amalgamation plant, boiler, engine, and shaft house, carpenter shop and blacksmith shop. The sulphide concentrates from the mill have been stored pending better shipping facilities.

The general plan of the mine and the geology in its immediate vicinity is shown on the accompanying sketch map. The mine workings consist first of an open cut extending almost north and south along the main vein from Couture Lake. This cut is over 300 feet long and reaches a maximum depth of 40 feet and width of 25 feet. The width varies from about 10 to 25 feet, and the greater portion of the material removed was milled. In the bottom of the open cut shaft No. 3 is found, and it extends 100 feet below the surface. About 220 feet north of this shaft No. 2 has been sunk and a drift connects the two shafts, most

Editor's Note: This report was written in the summer of 1910. The St. Anthony is now producing gold.

of it lying along the vein. At the bottom of No. 2 a crosscut runs west 30 feet to pick up the vein, and then a drift south 67 feet and another crosscut east to the north and south drift between the shafts. A crosscut is said to extend east 125 feet from the bottom of No. 2 shaft. The hoisting is done from this shaft, which is timbered.

From the west end of the 30-foot crosscut from shaft No. 2 a drift runs north 180 feet to an upraise known as No. 1 shaft, and from the opening a drift is said to continue further north 160 feet. No mine maps were available at the time of my visit, and these figures are compiled from several sources.

Besides the open cut there are on the surface a number of pits as indicated on the sketch map, but none of these are very extensive. The rocks in the vicinity of the mine consist of Keewatin greenstone, schist, and schistose greywacke, intruded by quartz-porphry, and the whole intruded by the later Sturgeon Lake granite. The granite in this vicinity is porphyritic and highly altered by hydrothermal action, where chemically active waters have acted on the rocks. The main vein runs in the granite close to contact for some distance, and then leaves the granite and extends out into the schists. There seems to be good evidence that when the granite cooled and shrunk, the adjacent rocks were broken and shifted so that a fissure could be filled with quartz and calcite. From the appearance of the walls on the sides of the open cut it looks as if the rock on the east side of the fissure moved north and that on the west side south. At the time this large fissure was formed countless smaller ones were developed, so that there is a zone about one-quarter of a mile wide, more or less streaked with quartz veins, and in places the walls of the main fissure become indistinct in the granite. In the walls of the veins the granite has been so altered that most of the feldspar has disappeared, and the rock has turned into a greenish-yellow protogine, consisting almost entirely of quartz and muscovite.

The gangue in the granite and schist is largely quartz, but some calcite occurs in both rocks and in greater proportion in the latter. Some siderite is also present where the vein cuts the schist. In the open cut in the schist, the walls are distinct, although the quartz is often distributed in narrow veins along the planes of cleavage, and the whole mass from wall to wall contained more or less gold.

The minerals in the gangue are free gold, pyrite, chalcopyrite, sphalerite, and galena. Beautiful specimens of free gold have been obtained from this mine. Much of the ore is free-milling, but with depth the sulphides appear more abundantly. The ore from the schists contains less sulphides than that from the granite, and this seems to be due to the greater ease with which oxidizing waters percolate the schists. The writer was informed while at the Athabasca mine, near Nelson, B.C., that similar conditions existed there where the ore occurs in porphyritic granite and schist.

No assays of the ore were made by the writer, but the manager states that much ore was mined which ran as high as \$85 per ton, and that there is still in the mine a good deal of ore which will average \$12 per ton. It is not unlikely that with depth the quartz veins will become less clearly defined in the granite, it being probable that most of these veins were formed in the outer and upper portion of the granite magma when it cooled, before the mass as a whole was completely solidified.

During the past summer new interest was taken in this property, and considerable work was done in the

way of putting up new buildings and making a start at development work by sinking in No. 3 shaft.

This property has been described by other writers, and references are given in this report in the section on the history of the field.

The English River Gold Mining Company.

On location B.G. 157 is what is known as the Dawson mine, now owned by the English River Gold Mining Company, and formerly controlled by the Sturgeon Lake Mining Company. Like the St. Anthony, it is situated near the contact between the green schists and granite, but instead of lying on the main contact, it lies on the contact between bands of schist and arkose cut by the granite. There are here a number of pegmatite dikes, in some parts composed of about half feldspar and half quartz, and in other parts consisting largely of one or the other.

The gangue is quartz, and the ore minerals found were galena, sphalerite, pyrite, and chalcopyrite. Good specimens of free gold are said to have been found, though we were unable to find any on the dump.

The workings include a shaft, open cut, and some pits, the former being full of water. The shaft is said to be 64 feet deep, and the open cut is about 70 feet long, 10 feet deep, and 5 to 6 feet wide. Much of the country rock is included in this width.

The buildings include a mill containing ten stamps and other equipment, but the mill has been long idle.

Prospects on Couture Lake.

There are a great number of prospects in the vicinity of Couture Lake, but it is possible to describe only a few of them here.

On the large island northeast of the St. Anthony there are some large quartz veins in schist. None of these have been developed, and Mr. Miller has already described them. One of these gave an assay of \$2.75 per ton in gold.

On claims A.L. 656 and 657 there are a number of pits and one shaft. These are controlled by Messrs. King and Frazer. The shaft is said to be 75 feet deep. The vein of quartz and calcite is about 8 inches wide, and has a pretty distinct hanging wall. It carries some nice specimens of visible gold. The vein can be followed over a portion of two claims, and although it is largely in green schist, it is closely associated with a narrow band of comparatively fresh-looking quartz-porphry, in which is some of the quartz, and some of it along the contact between it and the schist. The vein shows a tendency to break up into stringers in some places, and is small, although the quartz looks favourable as a carrier of gold.

To the north of the shaft, on some claims worked by Mr. Fawcett, are a number of pits on veins which in some places show visible gold. North of these claims there are a good many pits, most of which are of no interest.

On the west side of the lake, on claim A.L. 662, there is an old shaft at least 20 feet deep, containing a good deal of water. The vein is about 2 feet wide and dips 30 degrees west. It fills a fissure between a footwall of schist and a hanging wall of altered greywacke. The vein is mineralized with chalcopyrite, galena, sphalerite, pyrite, and a little pyrrhotite. A little free gold was found in some specimens of quartz believed to have come from the shaft.

Prospects Around Ouillette Lake.

There are a large number of prospects in the vicinity of Ouillette Lake, lying north of Couture Lake.

Many of these consist of little pits of no importance, but the Ouillette Lake Mining Company, with headquarters at Sault Ste. Marie, Ontario, has done much prospecting work on nine claims northeast of the lake. Outside of the two old locations S.V. 421 and 422, none of the claims has been surveyed, but they adjoin on the east and south.

One pit about 25 feet long runs across a mass of schistose diorite, and the rock is cut up with stringers of quartz. The gold carries considerable pyrite and pyrrhotite, and a number of specimens of free gold were seen.

In another pit about 15 feet long and 7 feet deep a mass of white quartz stringers about 10 feet wide may be seen lying along the hanging wall. The rock has about the composition of diorite. On the surface near this pit there is a quartz vein about 3 feet wide which may be connected with the mass already described. It pinches down to about 20 inches in a pit 10 feet deep.

On location S.V. 422 there is a pit on a large mass of quartz. The pit is about 14 feet wide, and the quartz extends almost across it.

On another claim a mass of stringers appearing on the surface unite in a pit to form a vein about 8 feet wide.

The rock in which the veins occur is largely coarse greenstone, the gangue is mostly quartz, and the other minerals in the vein chalcopyrite and pyrite. The veins in places form some of the largest in the region, and some of them carry gold, but they show a tendency to break up into small stringers or otherwise become irregular.

The Powell Property.

On the west shore of Northeast Bay, on Claim A.L. 701, there is a deposit locally known as the Powell property. Last summer it was developed for Mr. Beideman under the management of Mr. Atwood, who was formerly with the Douglas Mining Company. The workings lie on a vein, consisting of attractive-looking quartz, beginning near the lake shore and running a little west of south. There are a number of pits, and two of them were about 25 feet deep, but neither was timbered at the time of our visit. The rocks consist of a complicated mixture of quartz-porphry, grey schist, and greenstone, and the vein lies sometimes in one rock and sometimes in the other, and in places along the contact between the two. It varies in width from 2 to 15 inches, and frequently breaks up into stringers, especially at the contact between different types of rock. The quartz is well mineralized with pyrite and chalcopyrite, the latter frequently altered to malachite and azurite. We had no difficulty in finding good samples of gold at a depth of 20 feet. These gold specimens are doubtless due to the secondary enrichment process, as they occur in association with the secondary carbonates of copper.

Near the pits described there are a number of smaller ones on this same vein, which fingers out a little farther south.

Other Deposits on Northeast Bay.

On the long point running south, just west of the island covered by S.V. 414, Mr. George Day has staked a number of claims which have not yet been surveyed. On these claims there are some pits on irregular quartz veins in quartz porphyry and along the contact between the quartz porphyry and green schist. The quartz is often disseminated in the porphyry, and appears in places like veins filling cracks in a partially cooled molten mass, though the veins may be later im-

pregnations by hot solutions along lines of weakness. The rock is usually much decomposed along the veins, while the veins and rocks, especially near the fissures, are impregnated with iron pyrite, in some places with cubes one-quarter inch in diameter. In one place a beautiful specimen of gold was seen in a space left by the removal of one of these cubes, and in the oxidized and decomposed rock free gold could be found by panning. Gold in any quantity seems to be limited largely to the upper portion of the deposits, which have been oxidized, and it seems probable that a considerable amount of the quartz may have been collected into these veins by the partial decomposition of the surrounding rocks and the segregation of the quartz under the action of organic acids. The organic acids, no doubt, have had a good deal of influence in dissolving and concentrating the gold which would be freed from mechanical union with the pyrite by the oxidation and removal of the pyrite in the form of ferrous sulphate.

Many other small deposits occur in Northeast Bay, but they seem much alike and too numerous for description.

Prospects on Belmore Bay.

Since the year 1906 the region around Belmore Bay has attracted considerable attention, as there are many veins within about three miles of the lake. The Douglas Mining Company has camps on the east short of the bay and has sunk a couple of shafts. On claim P. 7 there is a shaft said to be 22 feet deep on a vein varying in width from 3 inches to 2 feet. A test-pit near by shows stringers running through the schist. On the same claim and 98 paces distant from the 22-foot shaft there is another one 73 feet deep on the same vein. The rock from the bottom of the shaft consists of grey to white quartz scattered through schist and mineralized with chalcopyrite and pyrite.

There seems to be little galena or zinc blende in this region, and the same can be said of the deposits on the northern part of Northeast Bay, while around Couture Lake and North Bay these minerals seem to be more common.

On what is called the Ruby property, owned by the Douglas Mining Company, there is a shaft said to be 30 feet deep on a mass of quartz stringers about 4 feet wide, in dark greenstones varying in composition from diabase to diorite. North of this shaft 100 feet and on the same vein is a pit about 22 feet deep where the vein varies in width from 3 inches to 2 feet. The veins run in a general northeast direction with the strike of the rock and with a dip 60 degrees northwest.

The gangue here is quartz of good quality and calcite. It contains pyrite and chalcopyrite, and specimens of free gold were seen in calcite and quartz.

The other company which has done much work in the vicinity of Belmore Bay is the Belmore Bay Mining Company, which owns a number of claims just east of the lake. It is said that the shaft near Mud Lake, where the camps are situated, is 260 feet deep, and very little ore came out of it. A three-stamp mill has been erected on the shore of the lake, but it did not run long.

Besides the properties described, there are many prospects unnecessary to mention, as most of them are pits on small veins or stringers and a description of one serves for almost all. The rocks in the area are mostly coarse greenstones, not as a rule very schistose, syenite porphyries, quartz porphyries, rhyolite tuffs, and plagioclase porphyries with very large phenocrysts

sometimes an inch in diameter. The veins are as a rule very irregular, frequently breaking up into stringers, pinching out or expanding to form masses several feet in width. The metallic minerals are predominantly chalcopyrite and pyrite, with considerable pyrolusite in some places.

Free gold was seen only on a few claims. Some of the veins are associated with aplite and felsite dikes. In one case an aplite dike cuts a syenite porphyry, and near it there are crystals of ilmenite. The rock has been brecciated, and the cracks filled with calcite, carrying chalcopyrite and pyrite. The ilmenite may have been developed as a contact metamorphic mineral.

On Morgan Island, just west of Belmore Bay, is a mass of rhyolite tuff in places, impregnated, especially near its contact with quartz porphyry, with calcium and iron carbonates, which are mineralized with copper and iron pyrites and galena. The tuff, in a band about 100 feet wide, is composed of angular fragments of rhyolite, and the whole mass is reddened by the alteration of the iron bearing minerals. This deposit has not been found to carry gold to any extent.

On East Bay are a number of abandoned prospects, and on the east side of the narrows about five miles below Sturgeon Lake hotel there is a pit on a vein of calcite. Associated with the vein there are besides calcite, apatite, tourmaline, hornblende, zircon, pyrite, and chalcopyrite and, it is said, values in silver.

As there are in the Sturgeon Lake gold field hundreds of pits, many of them of no importance and the majority of them having characters in common, it is impossible to describe them all, and it may be that some left unmentioned are as important as some of those described. An attempt has been made to indicate on the accompanying map the shafts and many of the pits, but many pits and strippings have necessarily been omitted, as it would require too much detail to plot all of them.

Economic Possibilities of the Sturgeon Lake Gold Field.

Having spent considerable time in studying this field it might be well for the writer to express, from a geological standpoint, his opinions regarding its future.

A study of the region shows that gold is widely distributed, and that one can locate a vein, small or large, in many parts of the area. These veins are, however, as a rule, very irregular and uncertain, not having been formed by any widespread movements which opened extensive fissures, but rather by cooling and shrinking of igneous rocks and slight movements along contacts and cleavage planes. The fissure at the St. Anthony is the only one which can be regarded as an important exception to this rule, and it is the only deposit which has given promise of really making a mine.

While this area has been remarkable for the large number of fine specimens of free gold, these have been the products of secondary enrichment and concentration, and are not likely to continue to great depths. With the absence of much free gold at depth, few of the veins show a sufficient increase in the sulphide ores to counterbalance the diminution of the free gold. As the region has for so long been exposed to erosive agencies, it is probable that much material from the upper portions of the veins has disappeared, and with it considerable gold. The low relief and the scarcity of streams are also against the possibility of valuable placers being found.

Much unprofitable work has been done in the area, partly because many of the prospectors lacked experi-

ence, and partly because, as already mentioned in this report, some men having charge of the work were doing it at the expense of others. While there are plenty of veins in the region, many mere stringers of quartz have been exploited without any justification, largely because the region is easily accessible and an attractive one in which to work. In the future those who wish to carry on proper exploratory work should profit by the experience of most of the other companies which have operated in the region, and not build stamp mills before they have enough ore in sight to justify such an expense.

Consolidated Mining and Smelting Co. of Canada, Limited

Managing Director's Report.

Trail, B.C., August 25th, 1911.

To the Directors of the Consolidated Mining and Smelting Co., of Canada, Limited.

Gentlemen,—I beg to submit the results of the Consolidated Company's operations for the year ending June 30th, 1911, including Balance Sheet, Profit and Loss Account, Production, and General Report.

Financial Statement.

Operations for the year under review show a net profit of \$202,278.29, after writing off depreciation on plant and equipment \$193,342.27 (as compared to \$175,502.60 for last year), sundry items including bad debts \$3,162.31, and charging to profit and loss \$438,354.54 expended on development of our various properties. The increase in depreciation is accounted for by the writing off of the Snowshoe equipment, the lease having terminated, and heavy depreciation on the St. Eugene plant, which is liable to close down at an early date.

Additions to plant and equipment during the year amounted to \$146,350.30, from which is to be deducted sales of plant to the amount of \$11,699.87, or a net amount of \$134,650.43. Increase in lands at the smelter is \$12,611.57, making the total charge to plant account.

Expenditure on account of the purchase and development of new properties amounted to \$217,613.90, which was provided for by the issue of new shares to the value of \$250,000.

This amount was expended in purchasing stock and bonds of the Fort Steele Mining & Smelting Company, and the Sullivan Mining Company, owning the Sullivan group at Kimberley; in the purchase of property surrounding the Sullivan; on the development of the Number Seven and Molly Gibson groups, and other small purchases.

The amount due to banks for borrowed capital has been reduced to \$584,031.95, a decrease of \$181,980.65 for the year.

Quotations for London Lead and New York Silver show slight increases over last year, the average being: London Lead, £12.953, as compared with £12.921 during the previous year; New York Silver, 53.696c., as compared with 51.948c.. Electrolytic copper was lower, averaging 12.337c., as compared with 12.981c. for the previous year.

Production.

The gross value of metals produced at the company's smelting works for the year was \$4,437,901, as compared with \$5,911,767 for the previous year, a decrease being shown in all of the metals. It will be noted that

there is an increase in the production of the Centre Star and Sullivan groups, that the Molly Gibson and Number Seven have entered the list of shippers, and that the remainder of properties show a decrease.

The large decrease in total production is due to the working out of the St. Eugene, dropping the Snowshoe lease, and to the fire in the Slocan a year ago, which closed down the Kaslo & Slocan Railway and caused a large decrease in shipments from that district.

In our Rossland mines, ore developed and shipments have about balanced. Although the tonnage developed is numerically less than for the previous year—194,000 tons, as against 245,000 for the year 1910—the average value of the ore developed this year on the lower levels is considerably higher.

In the Centre Star and Idaho mines no ore has been developed in the lower levels and but little work done, most of the development having been confined to levels

Year Ending June 30th, 1911.

	Tons Ore.	Gold in Ounces.	Silver in Ounces.	Lead in Pounds.	Copper in Pounds.	Gross Value.
Centre Star group	193,223	81,348	60,200	.....	2,318,456	\$1,980,112
St. Eugene—Ore	47,705	.....	.....	.....	.....	.....
St. Eugene—Cone.	7,708	.....	204,044	9,012,152	.....	429,044
Richmond-Eureka	3,168	.....	115,656	720,306	.....	87,638
Phoenix Amalgamated	2,244	46	379	.....	6,195	1,885
Snowshoe (leased)	85,627	5,335	22,450	.....	2,001,700	363,702
Sullivan (leased)	34,065	.....	258,376	14,187,354	.....	635,223
Number Seven group	1,776	445	20,052	49,674	.....	19,339
Queen Victoria	1,985	13	744	.....	59,210	7,977
Molly Gibson	733	.....	31,043	197,634	.....	23,435
Smelted.						
Trail Smelter	388,785	119,067	1,458,758	24,026,015	4,421,988	4,437,901

Production Beginning 1894 to Date.

	Tons Mined.	Gold in Ounces.	Silver in Ounces.	Lead in Pounds.	Copper in Pounds.	Gross Value.
Centre Star group	1,670,547	802,984	910,950	.....	30,557,473	\$21,488,745
St. Eugene—Ore	1,001,820	.....	.....	.....	.....	.....
St. Eugene—Cone.	187,833	.....	5,259,477	225,076,673	.....	10,394,520
Richmond-Eureka	11,126	.....	559,639	3,569,049	.....	422,286
Phoenix Amalgamated	2,493	53	423	.....	8,409	2,336
Snowshoe.....	605,719	41,328	160,428	.....	14,752,418	3,277,063
Sullivan	126,175	.....	1,040,369	52,840,751	.....	2,566,449
Number Seven	2,862	669	31,563	49,674	.....	30,447
Queen Victoria	6,189	49	3,947	.....	263,409	49,771
*Molly Gibson	733	.....	31,043	197,634	.....	23,435
Trail smelter	2,847,469	1,017,123	18,458,631	224,898,570	47,875,802	47,083,926

*For the year only; previous records not available.

Development.

The total amount of development work underground in the company's mines is about as follows:

	Feet.	Miles
Centre Star group	146,288.5	27.70
St. Eugene group	103,102.5	19.54
Richmond-Eureka	7,003.0	1.32
Phoenix Amalgamated	2,581.0	0.48
Molly Gibson	6,985.0	1.32
Sullivan	15,162.0	2.87
Number Seven	5,479.0	1.03

During the year 22,452 feet of narrow work and 38,757.3 feet of diamond drilling have been done, as follows:

	Drifting and Crossecting.	Raising.	Sinking.	Total.	Diamond Drilling.
Centre Star Group	11,290.5	1,803.0	290	13,383.5	25,622.3
St. Eugene group	2,223.5	1,469.0	24	3,716.5	4,346.0
Richmond-Eureka	667.0	295.0	...	962.0	.....
Molly Gibson	340.0	110.0	20	470.0	.....
Sullivan	1,322.0	431.0	45	1,798.0	8,789.0
Number Seven	1,977.5	98.5	46	2,122.0	.....
Total	17,820.5	4,206.5	425	22,452.0	38,737.3

above the 10th. In these a number of small ore bodies have been opened up and one or two larger ones of lower grade. The same is true of the Iron Mask.

The greater part of the new ore that has been found has been in the lower levels of the War Eagle. A winze sunk from the 12th level opened up ore to a depth of 150 feet and of a length at the bottom of 200 feet. Values of this ore are very good. The 10th and 11th levels are also producing a large tonnage of good ore.

In the St. Eugene group no new large ore bodies have been discovered and the ore reserves are practically depleted, being estimated at 6,000 tons. Enough ore is being found from time to time to keep the mine running at a small profit.

The Richmond-Eureka group continues to produce a small tonnage, though an estimate of the probable tonnage is difficult on account of the variable nature of the ore bodies. No large new ore body has been discovered.

A few tons were shipped from the Phoenix Amalgamated during the winter, but as the grade was unsatisfactory at the points where work was done, and as the price of copper was so low, it was thought advisable to do no more work there until conditions improved.

The Snowshoe lease has been abandoned, as it was no longer profitable, owing to low prices for copper, higher costs of mining, and conditions at the smelter which made the use of the Snowshoe ore no longer valuable as a flux.

The lease and bond of the Queen Victoria mine has been abandoned for the same reasons.

The Molly Gibson mine has commenced shipments and with about 14,000 tons of milling and shipping ore in sight and good prospects below the lower level, will, we hope, continue to be profitable.

Development on the Number Seven mine has proved disappointing, both as regards the continuity of the ore bodies and their grade. Work is now being done on the lower levels in an attempt to locate further ore bodies of good grade.

New Properties.

During the year the company has acquired a majority of the stock of the Fort Steele Mining & Smelting Company, Limited, owner of the Sullivan mine. The lease to the Consolidated Company expired on June 30th, and the Fort Steele company is now operating the property and shipping ore to Trail. The mine is producing between 2,500 and 3,000 tons per month of ore containing approximately, lead 20 per cent., silver 6.6 ounces.

Since the close of our fiscal year, arrangements have been completed with the liquidator of the Le Roi Mining Company for the purchase of all the property of the Le Roi Mining Company in Rossland. This property still has a large amount of low grade ore, and some prospects of finding ore of a better grade, and we believe that the purchase will be a profitable one.

Construction.

Construction for the year consisted mainly of the equipment of the Molly Gibson mine with an aerial tramway about four and one-half miles in length; repairs and improvements to the old tramway, which was badly damaged by snowslides; new bunkhouses at the mine; improvements in the mill; horses and wagons for hauling ore, etc.; finishing the equipment of the Number Seven mine, and increasing the roasting capacity of the smelter by the installation of two Dwight and Lloyd roasters; the purchase of lands near the smelter to protect us against claims for damage by smoke; sundry small improvements.

General Conditions.

The past year has been in many ways an unfavourable one for the company. The early part of the year was marked by the low grade of the Rossland ores

and limited tonnage, particularly in reduction of tonnage from the St. Eugene due to the working out of the principal ore bodies, and from the Slocan, due to bad forest fires and the consequent interruption of service on the Kaslo & Slocan Railway, which condition unfortunately still exists. Unfortunate weather conditions in the Crow's Nest Pass during the month of February, and interruption of coke shipments on this account, lessened the tonnage of the furnaces at Trail to a considerable extent, and finally, the present strike in the Crow's Nest Pass has lasted from the first of April until the present time, and has not only forced us to buy coke in Pennsylvania at greatly increased cost, but has, more or less, unsettled traffic conditions and increased our cost of handling material, such as coke and limestone, at the smelter. In addition we have been put to greater expense for coal supply. All these causes have made great inroads into profits for the year and account almost entirely for the reduction from last year.

With regard to the future, developments in the Rossland camp during the past six months have been favourable and give promise that this next year at least will be a profitable one in that direction, and there is good reason to hope for some time after that.

The loss of the St. Eugene tonnage has been serious, but will be partly overcome by the operation of the Sullivan, in which the mineral bearing area has not yet been thoroughly prospected. There seems, too, to be good grounds for the belief that new and profitable mines will be opened up in other parts of the Kootenay, and provided some means is found for the proper protection of the lead industry by the Dominion Government, either by a renewal of the bounty on lead when that bounty expires in about eighteen months, or by an adequate duty on lead coming into Canada, prospects for the Kootenay country are, on the whole, bright.

Considerable interest is being taken this year in lead properties throughout the country, and some promising prospects have been opened up. We have continued the policy of the Company of adding to our list of properties by keeping men in the field looking up such prospects this summer and hope that in this way we may be able to add to our tonnage of profitable ore.

Management.

In conclusion I wish to express my appreciation of the hearty co-operation of those in charge of the various properties or departments as follows:

S. G. Blaylock, assistant general manager; T. W. Bingay, comptroller; A. J. McNab, superintendent of smelter; J. F. Miller, superintendent of refinery; M. E. Purcell, superintendent of Centre Star group of mines; Charles Biesel, superintendent of mines at Phoenix; C. H. McDougall, superintendent of St. Eugene mine; A. W. Davis, superintendent Molly Gibson mine; W. A. Cameron, superintendent of Richmond-Eureka mine; James Buchanan, metallurgist; John M. Turnbull, mining engineer; and W. M. Archibald, mining engineer.

Respectfully submitted,
R. H. STEWART, General Manager.

SPECIAL CORRESPONDENCE

NOVA SCOTIA.

Glance Bay: Dominion Coal Output.

The season of open navigation for 1911 is nearing the close. The outputs of the Dominion Coal Company during the past

summer were larger than for any previous continuous period. The total output for the six months, May to October, inclusive, reached about 2,125,000 tons, an average of over 354,000 tons per month. The monthly outputs were as follows:

May	352,119
June	367,014
July	369,930
August.....	387,927
September	324,342
October, estimated	324,000
Tons	2,125,000

In the months of September and October the output declined, but this was due to dulness in the coal market, and not to any diminution in capacity.

Unusually large storage banks were laid down in the early part of the year, but these have now been all lifted. So far as it is possible to judge the prospects for winter shipments indicate a slightly lowered output during the coming six months when compared with the shipments which were made last winter.

The disproportion between summer and winter outputs is every year growing less noticeable. In 1893, when the Dominion Coal Company was incorporated, the total output from November to May was only a little over 200,000 tons, and it was not until 1900 that this state of affairs became ameliorated. In the winter of 1910-1911 the output was approximately 1,800,000 tons, fully half the annual output. It is a far cry from 1893.

The term of the agreement between the P.W.A. and the Dominion Coal Company, by which the terms of the Shortt award were renewed for two years, expires at the end of this year. Negotiations have already been begun, and it is understood that the company has offered the men a renewal of the two years' agreement on exactly the same terms as before. It is to be hoped that it will be possible to renew this agreement, as it will mean settled and harmonious conditions for some time to come. This is particularly desirable in view of the large programme of capital expenditure which the Coal Company has undertaken, coupled with the dulness of the coal trade, and the persistent inroads on the St. Lawrence market which are being made by United States operators.

The season's programme of new construction is well advanced. The new Siemens-Ilgner electric hoisting engine for hoisting water from the International water-shaft, is in successful operation. The uniformity of the load on the transmission line is in marked contrast to the previous hoist, which was not provided with any compensating device.

At No. 2 colliery a large Walker fan is being put in position to serve as an auxiliary or emergency fan in case of breakdown of the present ventilating arrangements.

The coal-handling plant at No. 2 is running, and is expected to effect a notable economy. The large boiler plant at this colliery was designed for automatic coal-handling, and the addition made this year will complete the lay-out.

Delivery of the large electric hoisting engine for No. 14 colliery is expected early in the new year. No. 14 is getting 1,100 tons daily with the present inadequate hoisting engine, and may be expected to make a much better showing when the new hoist is installed.

Part of the framework of No. 15 bankhead is being erected. It is intended to have this bankhead in full operation for the 1912 season. The smaller colliery buildings at this mine will all be completed this season.

With the new electric hoist at International water shaft, the electric air-compressors at Nos. 12 and 14 collieries, and the bankhead at No. 14, in addition to the previous load, the central power station at No. 2 is being heavily drawn upon, and in view of the intention to install still more electric machinery at the Lingan collieries, it is expected that a large electric power station will have to be provided for the Lingan side. This will probably be undertaken next year.

The railway connection to the Birch Grove collieries has been somewhat delayed by lack of labour, but it is expected

that it will be finished before the winter sets in. Two sets of slopes are now being driven, one set at the point where the seam was originally opened, now known as No. 21 colliery, and a second set about half a mile away at the site of No. 23 colliery.

The rescue station at No. 12 colliery is completed. The equipment will shortly be provided, and in the meantime a few apparatus from the Glace Bay collieries will be sent over to No. 12, and training of the men in their use will be commenced.

The company is sending the superintendent of its main station to the National Field Day at Pittsburg which will be held at the end of October by the First Aid Societies. The proceedings should be well worth watching. Some day in the future it is to be hoped that in Canada also the First Aid movement will be taken up with the enthusiasm it deserves. Up to now there has been a decided lack of ambulance training among the Nova Scotian workmen in all trades, and many a death and mutilation has taken place which a little first-aid knowledge promptly applied might have prevented, to say nothing of the needless suffering which a lack of this knowledge entails.

Springhill.

The output for September was 31,000 tons. The daily output now averages 1,500 tons, and has on several occasions been near 1,600 tons, which is fully up to normal. A large amount of repair and cleaning-up work has been necessitated by the long idle time caused by the strike, but this is now about finished. A new air-compressor is being installed, and it is proposed to shear the coal in some sections. At the present time the coal is all hand-got, and no explosives are used. By shearing it is expected to get a larger product, and to effect considerable economy. Before very long much larger tonnages may be expected from Springhill. For October the output will be over 35,000 tons, at the present rate.

ONTARIO.

Cobalt, Gowganda, and South Lorrain.

During September the Crown Reserve Mining Company shipped 250,000 ounces of silver, and the total production for the first 9 months amounts to \$2,376,000 ounces. This month the company has shipped a car of 120,000 ounces to the Kingdom of Saxony.

Operations on the 150-foot level of the Savage have opened up a good ore body on the new No. 4 vein. The values in this vein are not as consistent as in other leads on the property, but the wall rock yields good mulling ore.

Dividend No. 33 has just been declared by the Temiskaming & Hudson Bay Mining Company. The 300 per cent. issue means a disbursement of \$23,283. This is the fifth dividend paid by the company this year. Altogether the company has paid 18,700 per cent., or \$1,451,307 on a capitalization of less than \$8,000.

The Temiskaming Mining Company has started to sink its main shaft to the 650-foot level. At the lowest level where crosscuts have been made, namely, the 575, there is one shoot of very rich ore. Where the diabase is encountered on this level, values cut out.

The Beaver Consolidated Mining Company has at length decided to build a concentrator treating low grade ore. The mill will have a capacity of 50 tons a day, and will differ from the ordinary practice in the Cobalt camp, in as much as two crushers a ball and a pebble mill, will take the place of stamps.

The shipments from the Cobalt camp for the month of September totalled 2,387.52 tons, which was a few tons lower than the previous month. Nineteen mines figured on the shipping list, contributing a total of 75 cars. While the tonnage shipped from the camp for the first nine months of the year is considerably less than that for the same period of 1910, the value of the ore is higher. It is estimated that the 12 months will

show an increase of at least \$1,000,000 above that of 1910, which, it must be remembered, was far ahead in production of any other year.

During September the Nipissing mined ore of an estimated net value of \$227,082, and shipped ore of an estimated net value of \$239,843. Favourable developments were encountered underground at veins 73, 148, and 123. Owing to the non-arrival of the big pump, hydraulicking operations for prospecting purposes will not be attempted until next spring. To develop that part of the conglomerate area lying near the Savage mine, a main working shaft is now being sunk. This will be used for the purpose of underground exploration.

One feature of the shipping list for the past month has been the re-appearance of the Drummond. The old workings at No. 1 shaft are now being cleaned out, and are yielding unexpectedly in low grade ore. Excellent terms have been made with the Denver smelter owing to the fact that the rock is highly silicious, and therefore very desirable as a flux.

The Lumsden Mining Company is opening up the Rochester under contract. The crosscut on the 300-foot level is now 200 feet from the Lumsden shaft. The intention is to cut several calcite stringers that were found at the edge of Brady Lake.

The annual meeting of the City of Cobalt Mining Company showed that there was cash in bank, \$31,954, with ore at smelter \$26,860, and metallies on hand and ready for shipment another \$2,000. During the year 292,694 ounces were produced from 392.04 tons of ore. All the old directors were re-elected. The management report the cutting of another small vein at the 265-foot level.

Porcupine, Swastika, and Cripple Creek.

Mr. Harold Kingsmill, who for about a year has been manager of the Rea mines, has resigned his position to go to Peru. While no successor has yet been appointed, the property will be controlled and developed by Mr. Williams, resident manager for the Bewick-Moreing Company in the camp.

The most important development in the Porcupine camp to date is probably the discovery of ore bodies 700 feet below the surface on the Pearl Lake claims. While no average assays are given, it is important to note that consistent values are to be found at this depth in the Pearl Lake field. Mr. G. W. Thompson, manager of the Pearl Lake property, wished to obtain some evidence of the value of the Pearl Lake claim before he proceeded to install a large plant. He, therefore, systematically prospected the ground with a diamond drill. No. 1 hole, which was put down vertically, and about the centre of the south claim, attained a depth of 800 feet. At 200 feet a small quartz stringer was encountered, but it carried no values. At 400 feet values were struck going up to \$18.80. It must be noted that in every case maximum assays are given. While the management may guess at the average values, they express natural reluctance to strike a mean at this stage of the game. At 644 feet the main band of mineralized schist intersected with rich quartz stringers, was entered. From this point down to 800 feet the drill cores showed more or less values. Assays ranged as high as \$58. No. 2 hole was put down 200 feet northeast of the initial boring. It was inclined at 76 deg. from the horizontal. The same small quartz stringer was struck and the upper band of mineralized schist was entered at 324 feet. Assays here ran up to \$21.40. The second band of ore was struck at 520 feet, and the drill remained in the same formation as far down as 768 feet, values ceasing at 744 feet. Assays ran as high as \$14. No. 3 hole is being put down in the southwest corner of the property. It will be continued to 1,200 feet. The ore bodies encountered are believed to be extensions of the Dixon system of veins, and it is calculated that on the Pearl Lake property they will vary from 67 to 120 feet of mineralized schist intersected by quartz stringers. Encouraged by the success of these operations, a main three-compartment shaft has already been commenced

at the centre of the property. It will be sunk to 400 feet at once. A crosscut will be commenced from there, and the shaft will be taken to 600 feet. Stations will be cut and exploration commenced at every 200 feet, down to the 1,000-foot level, as quickly as possible. At the present time the Pearl Lake is running its drills with air from the McIntyre, but the big compressor is on the ground, and when the motor and transformer arrive, will be at once installed and work will commence on a large scale.

It is reported that the Seymour mine, operating in Larder Lake field, has ordered a small 10-stamp mill. The machinery, it is stated, is now on its way to the property, which lies on the Dane Road three miles from Larder Lake.

Spectacular ore is being obtained in the sinking of shafts on the Brydge claim in Tisdale, adjoining the Preston East Dome, and one claim south of the Dome. This claim has been purchased by Col. Stuart Weatherley, an Alaskan operator, who has called it the Little Pet Gold Mine. In a quartz porphyry formation, the gold is found freely in the wall rock, in a coarse state. A plant has been ordered for the property, air for one drill, and a hoist being supplied meantime from the Preston, and camp buildings are under construction.

The main shaft at the Swastika is now connected up with the 200-foot level. This will greatly facilitate the further development of the mine, and operations should now proceed at a much better pace. The new plant, lately installed, is working satisfactorily, and Manager Reddington is making an excellent daily record underground. There is no intention of building a mill other than the present small 5-stamp one, until considerably more ore has been blocked out.

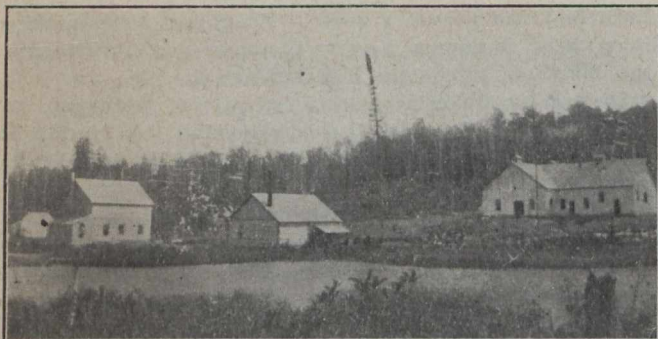
Mr. C. E. Watson has resigned his position as manager of the Dobie Mining Company, in order that he may give his whole attention to the development of the Plenaurnum. Some excellent results have been obtained this summer in the course of prospecting of the holdings of this Pearl Lake property. On its claims adjoining the Jupiter, the Plenaurnum has discovered the Jupiter's veins, both on the surface and underground, with a diamond drill, an excellent showing has been made on the shore of Pearl Lake near Bewick-Moreing's No. 1 camp, and near the old Armstrong-Booth camps a very promising vein has been uncovered. About 100 yards from the Jupiter east line, No. 1 shaft is being sunk, and it will soon reach a depth of 100 feet. This shaft is sunk on an extension of the Jupiter vein, which for a width of 20 feet showed values of \$20.90 to the ton. No. 2 shaft is being sunk on the edge of Pearl Lake near the Bewick-Moreing No. 1 camp. Mr. C. E. Watson has planned an extensive campaign of development, and once adequate power is obtained work will proceed very rapidly.

In addition to locating the rich Brydge lead on the Preston East Dome property, which will be reached by a crosscut from the No. 2 shaft, a spectacular showing has been uncovered on the north East Dome claim, just a short distance from the Dome line. In a dike of porphyry from 300 to 400 feet wide, many quartz stringers and seams exist, and free gold is found in these in a coarse state. The width of the paystreak has not yet been determined, and a large gang of men is engaged in stripping the vein. Cross-cutting westward at 90 feet in No. 2 shaft, a strong quartz vein 2 feet wide has been encountered, and eastward three parallel veins will be cut.

Work has been commenced by the Timmins-McMartin-Dunlap syndicate on the Dixon claim adjoining the McIntyre. The first few shots threw up some very spectacular ore and work is proceeding now with every confidence. The vein has been stripped for a distance of 900 feet and varies from 3 to 5 feet in width. In the railroad cut on the Dixon property, some beautiful specimens of quartz carrying much native gold have been found. The rock cut passes through the zone of mineralized schist, intersected by small quartz stringers, which in many cases are rich in native gold.

In the No. 4 shaft on the McIntyre at 180 feet, the vein has again been encountered. The vein left the shaft for about 80 feet, but has now dipped back again. Some very pretty specimens have been obtained.

Activity on the Standard Gold Mine has recently been confined to diamond drilling operations. Several thousand feet have been accomplished, it is reported, with satisfactory results. Nine buildings are being erected and everything got ready for an active winter campaign.



McIntyre Camp

The McEnaney is the first plant in Porcupine to be run by power from Sandy Falls, where the Porcupine Power Company has its station. The Porcupine Power Company has been prepared to deliver power since last July, but the fire has so retarded operations in the camp that no companies have been able to take advantage of it until recently.

A statement has been made to the effect that above the 200-foot level on the Rea, \$280,000 in ore has been blocked out. At a depth of 250 feet the vein carries the same values, and sinking is now being carried on to the 300-foot level. At a distance of 175 feet west of the main shaft No. 2 shaft is being sunk.

BRITISH COLUMBIA.

At the date of writing (October 14) no settlement of the matters in dispute between the executive of District 18, United Mine Workers of America, and the Western Coal Operators' Association appears to have been reached. Mr. John P. White, International President of the U. M. W. of A., has returned to the United States, after having spent a week or more in the coal mining districts along the Crow's Nest Railway, from Lethbridge, Alberta, to Fernie, B.C. Mr. Lewis Stockett, chairman of the Operators' Association, spent the latter part of this week in Lethbridge, following the holding of a convention there of some delegates from all the locals of the district affected by the strike. While no official announcement has been made as to the actual point or points upon which no agreement seems to be practicable at this time, it is freely stated in conversation in some of the towns most directly affected by the long-continued cessation of coal mining that the most serious bar to a settlement is the insistence on the part of the U.M.W.A. local executive on the retention of the check-off system where it has been in existence in the past, and the most positive refusal of the Operators' Association to grant it at any mine concerned in the settlement sought to be arrived at. It should be remembered that this is only what is said in the various towns along the Crow's Nest Railway—it is not an authorized statement of either side to the dispute. It is quite probable, though, that the Operators' Association is fully determined to deny the Union this advantage; on the other hand, it is equally likely the Union officials will hold out for it as long as there shall remain the slightest chance of their retaining it to the extent they have enjoyed it in the past, for without it, there would be much difficulty in collecting fees, dues, fines, levies, etc., from many of the workers. It is also freely stated that both sides are willing to ar-

range for an early resumption of work on the basis of what is known as the Gordon report—that is the report made to the Minister of Labour by the chairman of the Board of Conciliation that last summer heard much evidence bearing upon the various matters on which there had arisen divergence of opinion between workers and operators. There is a growing feeling that the local officials of the U. M. W. of A. will not much longer be able to hold together the great body of the workers in a determination not to return to work upon the terms the Operators' Association is willing to concede. There are two strong influences at work tending to weaken the hold of the Union officials on the men, namely, that 500 to 600 men are already at work in various mines in the district, and that the near approach of cold weather is bringing home to them the fact that they will at least be very much inconvenienced, if not caused positive suffering, by conditions which involve their being practically without money and without fuel. Doubtless the strike allowance made by the Union will keep them from starving, but it is very probable their condition, if they shall not be earning wages regularly, will be a trying one.

It seems to me, therefore, and this with a sincere desire to express an opinion without prejudice to the mine workers, that their sacrifice has been in vain, and that the Operators' Association is steadily gaining advantage, while the U. M. W. of A. is losing it.

Reviewing the position as it has during the last few days come under my notice, I find it to be about this: In the British Columbia part of the Crow's Nest district, the Crow's Nest Pass Coal Company has probably about 60 men doing development only; it is not mining coal. I have no information concerning Hosmer. At the Corbin mine, about 175 men are employed, more than half of them underground, and from 400 to 500 tons of coal a day is being shipped. In Alberta, there is practically nothing being done at the mines of the International and McGillivray Creek companies, at Coleman. The West Canadian Collieries, Ltd., is mining coal at its Blairmore mine, employing 50 to 60 men, and shipping about 150 tons of coal a day; but no production is being made at this company's Bellevue and Lille collieries. At Frank, the Canadian Coal Consolidated Company has men working, but how many and what the production of coal I did not ascertain. The Leitch Collieries, Ltd., is mining a small quantity of coal at its Passburg (south) mine. At its north mine (known locally as at Police Flats) much work has been in progress in connection with the erection of a coal washery, coke ovens, and other surface improvements. In all, at least 100 men are employed by this company, which number, however, is only one-third of what would be the working force under ordinary conditions. Coal was being loaded on railway cars at both mines when they were visited this week. At Burmis, the Davenport Coal Co. is operating its mine, but with both number of men working and output of coal below the ordinary. At Lundbreck two companies are operating, but neither on a large scale. Around Lethbridge, no large mines are producing coal. One company, which has put in an extensive surface plant, is as yet only doing development work underground, in the course of which it takes out about 150 tons of coal a day, and this is being shipped. Two small mines are together producing between 100 and 150 tons, which coal is sold for domestic use in Lethbridge. The present position is, therefore, that the larger collieries are doing little work, and that little development work or surface improvements. It should be stated that several of the smaller ones are working under agreements to pay whatever wages or rates shall eventually be agreed upon, when the Operators' Association and the U. M. W. of A. shall arrive at a settlement.

Similkameen.—In September the Hedley Gold Mining Company, owning and operating the Nickel Plate group of mines, on Twenty-mile Creek, and the 40-stamp mill at Hedley, paid

another dividend of five per cent. on its issued capital of \$1,200,000. This makes the third similar distribution of profits during the current year, the total for the nine expired months of which is \$180,000. It is gratifying to know that not only is the company's mining property continuing to look well in the parts from which a comparatively large output of ore has long been maintained, but there have been late developments in another part which are understood to have added fully \$1,000,000 worth of ore to the known reserves. About three months ago ore of good grade was found in the lowest workings, opened by what was known as Rodgers' tunnel, which was practically abandoned by an earlier management as unproductive, following the time when Mr. M. K. Rodgers had this adit driven and had satisfied himself that good ore would be found here. So little was this part of the property thought of by a later manager that work in it was stopped, and the tramway rails along the tunnel taken up. When, however, the property was acquired by the Hedley Gold Mining Company, a different working policy was adopted by the present general superintendent, Mr. G. P. Jones, who agreed with Mr. Rodgers concerning the prospective value of the lowest workings and proceeded to extend them. Since a shoot of good ore was entered, it has been developed and found to be 46 feet in width, while about 150 feet of drifting has been done in it, with the result that, as above-mentioned, a substantial addition has been made to the available ore reserves. This newly-opened orebody is well up to standard grade; indeed, it is understood that some of the ore contains gold to the value of \$15 to \$20 per ton. It is manifest, therefore, that the company will not experience any trouble in maintaining the average grade of its milling ore at the customary value of about \$12 per ton.

Observatory Inlet—The Pacific Metals Company, Ltd., of which Mr. J. L. Parker is general manager, a short time ago received advice from its mine foreman at the Red Wing mine, situated in the vicinity of Goose Bay, Observatory Inlet, that he had broken into more ore in the workings, the orebody having widened from about 6 feet to between 10 and 11 feet. The additional width of ore was described as being "fine ore." There had been encountered a cross lens of ore running at right angles to the vein. This cross lens is now being developed by driving on the ore west of the dike and towards the footwall. The assay value of a sample of this orebody, taken over a width of 6 feet, showed as follows: copper, 6.75

per cent.; silver, 4.45 oz., and gold, 9.06 oz. per ton. This is the third cross orebody found in the length of the tunnel so far driven. An average sample of 6 feet of ore on the strike of the vein assayed: copper, 4.12 per cent; silver, 2.35 oz., and gold, 0.02 oz. per ton. The estimated recoverable value of this ore, after allowing for the customary smelting deductions, is placed at \$7.70 per ton. Allowing for mining costs, \$1.50; smelting, \$2; and freight, \$1.50 per ton, there would remain an estimated net profit of \$2.70 per ton.

Vancouver Island.—Although the Tyee Copper Company's last fiscal year ended April 30, 1911, no information concerning the quantity of ore smelted in that year at its smeltery at Ladysmith, Vancouver Island, and the amount and value of the product, had up to October been published. The figures follow and, for purposes of comparison, also those of the company's two immediately preceding fiscal years:

YEAR ENDED APRIL, 1911.

	Tons.
Ore received at Ladysmith smeltery ...	46,521
Ore smelted at Ladysmith smeltery	44,817
Total value, less refining charges only	\$555,843.08
Total quantity of copper produced ..	4,242,246 lbs.

Corresponding figures for fiscal year ended April 30, 1910:

	Tons.
Ore received	41,530
Ore smelted	45,758
Total value, less refining charges only	\$575,468
Total quantity of copper produced	3,461,107 lbs.

Corresponding figures for fiscal year ended April 30, 1909:

	Tons.
Ore received	34,304
Ore smelted	29,550
Total value, less refining charges only...	\$327,270
Total quantity of copper produced	2,216,230 lbs.

It will be noted that the quantity of copper produced last year was 781,139 lbs. greater than in the year to April 30, 1910, and 2,026,016 lbs. greater than in the year to April 30, 1909, the latter being an increase of nearly 100 per cent. The management of the Tyee Copper Company may be congratulated on the progress made, especially as this was in the face of keen competition for custom ores and low average market prices for copper.

GENERAL MINING NEWS.

NOVA SCOTIA.

Sydney, Oct. 20.—President Plummer and the visiting directors of the Dominion Steel and Coal Company, spent the day at Glace Bay and the various collieries of the company, and returned to Sydney this evening. When seen to-day Mr. Plummer and the directors expressed themselves as thoroughly satisfied with the progress of the development work now under way at the mines, and conditions generally at their Cape Breton industries.

The directors were particularly struck with the great progress and development of the New Waterford district, where the company anticipate having at least from four to six new collieries producing coal by next summer. It is estimated that that total output from the mines of the company will exceed 4,000,000 tons and that there will also be a substantial increase in shipments.

The president and directors were accompanied by General Manager M. J. J. Butler, D. H. McDougall, Assistant General Manager, and C. S. Cameron, Comptroller of the Steel Company on tour of the collieries to-day.

The directors leave to-night for Montreal, only President Plummer remaining in the city for a few days to attend to important business which has piled up here.

As the result of an expressed desire on the part of Mr. Plummer on behalf of the company, the city will probably undertake the erection of a new hospital for the accommodation of city patients shortly, the present institution which is conducted by the company being entirely inadequate to supply the ever increasing number of patients seeking admission.

About twenty Italians who have been residing here for the past several years, left here yesterday en route for Italy with the intention of engaging in the present Turko-Italian war. They are believed to be the first party of Italians from the Maritime provinces to start for the scene of hostilities.

Halifax, October 17.—President Plummer and ten directors of the Dominion Steel Corporation, leave Montreal for Sydney, on October 17th, and will spend four days inspecting the steel plant and mines, leaving again Sunday night.

W. B. Perley, assistant to the president of the U. S. Steel Corporation, is in Sydney, but it is not known that his visit has any grave significance.

The directors' party consists of President Plummer, Sir H. Montagu Allan, Messrs. Gei. Caverhill, Wm. McMaster, Fred-eric Nicholls, W. G. Ross, J. R. Wilson, and Mark Workman, accompanied by Mr. Cameron, secretary of the company, and Mr. J. P. McNaughton, general sales agent. They leave at 7.30 to-night by the I. C. R.

Sydney, October 15.—The Dominion Coal Company has started the work of opening another new colliery at Lingan, near the scene of the mining operations conducted there about 30 years ago. It is not definitely known as yet when the new mine will be in a position to furnish a coal output, but the preliminary work will be started as soon as possible. It is the intention of the company to ship their entire output next year from Lingan direct. For this purpose the company will erect a new pier there and equip it with the most modern conveniences for the handling of coal and loading their steamers and vessels with as little delay as possible. The company is erecting a new bankhead at No. 15 colliery at Waterford and several large colliery buildings, which will be ready for business early next winter.

ONTARIO.

Cobalt, Oct. 16.—For the past year the McKinley-Darragh Company has had four drills at work on practically nothing but crosscuts on the Savage lot, and in that time vast changes have been made in the underground workings by the opening up of new veins.

One of the latest discoveries is No. 8, found some six weeks ago from No. 4 shaft. This vein runs along the foot of Diabase Mountain and the 150 feet of drifting that has been done has revealed a vein averaging two inches in width. The ore had been very patchy, some times being exceptionally high-grade, while in other parts it would be comparatively lean.

Kenora, October 18.—The Cameron Island mine, on Shoal Lake, about 35 miles southwest of here, is to be re-opened and developed.

B. M. Cameron, of Hamilton, and Frank Grew, of Toronto, representing a syndicate that recently purchased the property, have decided to put the plant into shape this winter and start actual mining early in the spring.

Cobalt.—Beaver directors, who have for some time been contemplating the erection of a concentrator to treat the low grade ore piling up on the Beaver dump, have finally decided to begin construction, and ground is being broken for this purpose. The mill will be constructed to treat fifty tons per day, and will be so designed that it can easily be increased if circumstances warrant the extension.

It is not expected that the construction of the mill will interfere with Beaver dividends. The mill will probably cost from \$30,000 to \$40,000, but the company had on August 31 last nearly \$60,000 in cash, and twice that amount coming to them from the smelters for ore shipped.

BRITISH COLUMBIA.

Ymir, October 19.—About noon yesterday fire was seen by the caretaker of the Ymir mine issuing from one of the buildings of the mine. He, at the time, was at the mill, about a half mile away. On arriving at the scene, all of the buildings were discovered to be on fire, and, being alone, and with the hose in one of the buildings, he could do little towards checking its progress.

The following buildings were totally destroyed: Blacksmith shop, cook house, dining house, two store rooms, boiler house, two cottages, and stables. The aerial tramway terminal building was saved by carrying water from the pipe line, but the

rest of the buildings, together with various mining tools, stores and other etcetera, were a total loss. The cause of the fire is at present unknown.

Loss is estimated at about \$20,000, which was partly covered by insurance.

Vancouver, B.C.—Mr. A. C. Flumerfeldt, of Victoria, was this week elected a member of the board of directors of Granby Consolidated Mining & Smelting Company, of Grand Forks and Phoenix. He will once more be in touch with its affairs, in which he formerly took a prominent part. For several years he filled the important position of assistant to the president, an office then filled by the late S. H. C. Miner, of Granby, Que., and resided at Grand Forks.

When Mr. Miner withdrew from the office, Mr. Flumerfeldt also resigned. Although Mr. Miner was credited with having sold most of his stock in the big company, it developed after his death that he was the second largest shareholder. Mr. Flumerfeldt is executor of the estate of the deceased millionaire.

Vancouver, October 24.—Mining properties in the famous Silver Lead section, Slocan district, valued at over \$2,000,000, were amalgamated by a deal concluded in Vancouver to-day.

The amalgamation is one of the most important moves made in British Columbia mining affairs for several years. It is the consolidation under a new company of the Byron, N. W., and John M. Harris mineral properties at Sandon, most noted of which is the Slocan Star mine, which, up to the time when its activities were suspended by litigation, had produced \$3,000,000 in silver, lead, and zinc.

UNITED STATES.

Butte, Mont.—The copper production of this district for the month of September was 1,200,000 pounds less than it was in August, as the following official figures of the Anaconda Company will show: Washoe smelter, 15,900,000 pounds; Great Falls, 5,400,000 pounds; making a total of 21,300,000 pounds; the East Butte smelter turned out 1,000,000 pounds, bringing the grand total for the district up to 22,300,000 pounds, as compared with 23,500,000 pounds in August.

Miami, Ariz., Oct. 20.—At the Miami all departments are running with a smoothness that is remarkable for a mine that is in its initial stages of operation. General Manager B. B. Gottsberger states that from 1,800 to 1,900 tons of ore per day are being mined and milled, with a daily production of about 82 tons of concentrates averaging 41 to 42 per cent. copper.

Cripple Creek, Colo., Oct. 20.—Checks have been mailed out for the regular quarterly dividend of 2 cents a share by the Portland Gold Mining Company. The new mill at the Portland mine treated 29,559 tons of low-grade ore during the three months ending September 30th, at a net profit of \$33,110.78, according to a statement accompanying the dividend checks. The total net profit of the company from the mill during the first nine months of this year was \$100,939.16.

Duluth, Minn., Oct. 23.—The ore rate on the two Iron Range roads of the United States Steel Corporation will be cut to 60 cents a gross ton within the next 30 or 40 days. The announcement of the proposed reduction came to-day from President William A. McGonagle, of the Duluth, Mesaba, and Northern Railway, later confirmed by President Frank E. House, of the Duluth and Iron Range Railway.

The present rate on iron ore is 80 cents per gross ton from all Mesaba range points to Duluth. The rate covers all shipping points on the Duluth, Mesaba, and Northern Road and all the Mesaba range points on the Duluth and Iron Range Railroad. From Tower the rate is 90 cents to the docks at Two Harbours, and from Ely it is \$1.

STATISTICS AND RETURNS

COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending October 20th, and those from Jan. 1, 1911, to date:

	Oct. 20. Ore in lbs.	Since Jan 1. Ore in lbs.
Badger	55,200	
Bailey	40,000	
Barber	6,000	
Beaver	64,479	1,465,937
Buffalo	62,427	2,154,971
Chambers-Ferland		1,086,900
City of Cobalt		663,980
Cobalt Lake	64,700	3,585,090
Cobalt Townsite	104,000	1,089,420
Colonial		183,410
Coniagas	125,390	3,442,153
Crown Reserve	61,200	1,951,980
Drummond	120,000	2,622,480
Green-Meehan		60,000
Hargraves		161,100
Hudson Bay		1,194,340
Kerr Lake	60,070	2,173,670
King Edward		40,000
La Rose	66,500	6,023,078
McKinley Darragh	175,089	5,334,438
Nipissing	127,649	4,876,667
O'Brien	63,800	1,210,958
O'Brien, M. J.		47,000
Peterson Lake, Little Nip.		58,430
Provincial		151,950
Right of Way	59,800	1,191,805
Silver Cliff		106,680
Standard		102,813
Temiskaming		1,348,452
Trethewey	53,040	1,118,020
Wettlaufer		117,232

The shipments for the week were 1,208,140 pounds, or 604 tons, against 580 tons last week.

The shipments from Jan. 1, to Oct. 20, were 42,361,798 lbs., or 21,180 tons.

B. C. ORE SHIPMENTS.

The ore shipments for the week ending October 14th totalled 17,085 tons, and the smelter receipts were 14,704 tons. For the year to date the shipments were 1,302,545 tons, and the receipts were 1,175,036 tons. Following are the returns:

Rossland Shipments.

Centre Star	3,699	157,709
Le Roi No. 2	463	22,414
Le Roi No. 2, milled	300	12,300
Le Roi	531	12,926
Other mines		457

Total

Boundary Shipments.

Mother Lode	4,600	243,583
Rawhide	3,327	33,446
Jackpot	331	21,416
Athelstan	198	6,614
Unnamed	690	5,813
Other mines		630,692

Total

Slocan-Kootenay Shipments.

Molly Gibson	31	860
Van Roi, milled	800	30,649
Molly Gibson, milled	300	39,000

Sullivan	247	15,481
St. Eugene, milled	420	21,876
Richmond-Eureka	58	1,879
Silver Cup	31	414
Rambler-Cariboo	60	1,387
Queen, milled	420	17,010
Granite-Poorman, milled	250	10,260
Nugget, milled	110	4,510
Second Relief	25	108
Knob Hill	93	3,945
Ate	41	41
Alix	10	10
California Clipster	12	12
United Copper	36	36
Other mines		7,697
Total	2,946	155,175

B. C. Copper Co.'s Receipts.

Greenwood, B.C.

Mother Lode	4,600	243,583
Rawhide	3,327	33,446
Jackpot	331	21,416
Athelstan	198	6,614
Unnamed	690	5,813
Other mines		10,652
Total	9,146	321,524

Consolidated Co.'s Receipts.

Trail, B.C.

Centre Star	3,699	157,709
Sullivan	247	15,481
Le Roi No. 2	463	22,414
Le Roi	531	12,926
Richmond-Eureka	58	1,879
St. Eugene	128	5,971
Silver Cup	31	414
Rambler-Cariboo	60	1,387
Second Relief	25	108
Queen	61	524
Knob Hill	93	3,945
Van Roi	32	1,186
Molly Gibson	31	860
Ate	41	41
Alix	10	10
California Clipster	12	12
United Copper	36	36
Other mines		38,196
Total	5,558	263,099

DOMINION STEEL.

The Dominion Steel Company's output for September was as follows:

Pig iron, 22,300 tons; steel ingots, 27,290; blooming, 23,705; rails, 16,575; rods, 3,365; coke, 39,300. Total shipments, 22,000.

The rod mill is on a single shift.

TORONTO MARKETS.

October 26.—(Quotations from Canada Metal Co. Toronto):

Spelter, 6.50 cents per pound.

Lead, 4.25 cents per pound.

Antimony, 7 to 9 cents per pound.

Tin, 43 cents per pound.

Copper, casting, 12.85 cents per pound.

Electrolytic, 12.85 cents per pound.

Ingot brass, 7 to 12 cents per pound.
 October 26.—Pig Iron (Quotations from Drummond, McCall and Co., Toronto):
 Summerlee No. 1, \$23.00 (f.o.b. Toronto).
 Summerlee No. 2, \$22.50 (f.o.b. Toronto).
 Midland No. 1, \$19.00 (f.o.b. Toronto).
 Midland No. 2, \$18.50 (f.o.b. Toronto).

GENERAL MARKETS.

Coal, anthracite, \$5.50 to \$6.75.
 Coal, bituminous, \$3.50 to \$4.50 for 1¼-inch lump.

Coke.

October 24.—Connellsville Coke (f.o.b. ovens):
 Furnace Coke, prompt, \$1.50 to \$1.55 per ton.
 Foundry Coke, prompt, \$1.80 to \$1.90 per ton.
 October 24.—Tin, Straits, 42.00 cents.
 Copper, Prime Lake, 12.50 cents.
 Electrolytic Copper, 12.50 cents.
 Copper wire, 13.50 cents.
 Lead, 4.25 to 4.35 cents.
 Spelter, 6.30 cents.
 Sheet zinc, (f.o.b. smelter), 8.00 cents.
 Antimony, Cookson's, 8.00 cents.
 Aluminium, 19.00 to 19.50 cents.
 Nickel, 40,00 to 45.00 cents.
 Platinum, ordinary, \$46 per ounce.
 Platinum, hard, \$48.50 per ounce.
 Bismuth, \$1.80 to \$2 per pound.
 Quicksilver, \$46 per 75-pound flask.

SILVER PRICES.

	New York. cents.	London. pence.
Oct. 6	52½	24¼
" 7	52½	24¼
" 9	52¾	24⅝
" 10	52½	24¼
" 11	52¾	24⅝
" 12	52¾	24⅝
" 13	52½	24¼
" 14	52½	24¼
" 16	52¾	24¼
" 17	52¾	24¾
" 18	53⅛	24½
" 19	54	24⅞
" 20	54¾	25⅞
" 21	54½	24⅞
" 23	54	24⅞
" 24	54½	24⅞

SHARE MARKET.

(Courtesy of Warren, Gzowski & Co.)

PORCUPINE STOCKS.

American Gold	...	...
Apex	.16	.16½
Coronation	.03¾	.04
Nor. Exploration	off	3.60
Dobie	1.25	1.30
Dome Ex.	.74¾	.75
Foley-O'Brien	.65	.72
Rea	2.58	2.62
Holinger	11.30	11.35
Monita	.14	.17
Pearl Lake	.46	.46½
Central	3.62	3.70
Imperial	.11½	.12¼
Northern	1.00 bid	...

Tisdale	.07½	.08
Preston East Dome	.28½	.28¾
Standard	.21½ bid	...
Swastika	.34	.35¾
United	.04	.04¼
Porcupine Gold	.44	.45
West Dome	1.10	1.25
Crown Chartered	.42½	.43
Eldorado	.12½	.13
Gold Reef	.16	.20
Porcupine Canada	.90	1.00

COBALT STOCKS.

	October 23rd.	
	Bid.	Ask.
Bailey	.02½	.02½
Beaver	41¼	.42½
Buffalo	1.40	1.90
Chambers-Ferland	.11½	.12
City of Cobalt	.09	.10
Cobalt Lake	.27¾	.28
Coniagas, x div.	6.10	6.30
Crown Reserve	2.95	3.00
Great Northern	.12	.13
Green-Meehan	.01¾	.01½
Hargraves	...	...
Kerr Lake	2.70	2.90
La Rose	3.95	4.00
Little Nipissing	.02	.02½
McKinley Darragh	1.80	1.85
Nipissing	7.60	7.75
Nova Scotia	.09	.11
Peterson Lake	.06¾	.07¼
Right of Way	.07	.08
Rochester	.02¼	.02½
Silver Leaf	.02½	.03
Temiskaming	.38¾	.39
Trethewey	.50	.65
Wettlaufer	.78½	.79

NEW YORK CURB.

Braden	4⅞	5
B. C. Copper	3¾	4
Butte Coalition	15¼	16¼
Ely Central	.01	.02
Ely Consolidated	¼	¾
First National Copper	1⅞	1¼
Giroux	3⅞	3⅞
Greene-Canadian	6¼	6¾
Inspiration	...	...
Nevada Hills	2⅞	2⅞
Ohio Copper	1¼	1¾
Ray Central	1⅞	1⅞
Union Mines	½	¼
Yukon Gold	3¾	3½
Goldfields Consolidated	4½	4⅞
Nevada Consolidated	16¾	16½
Miami	19¾	19½
Granby	...	60
Con. Mining & Smelting	40	44½
Davis-Daly	¾	1
Con. Arizona	⅞	¾
Rawhide Coalition	...	...
Ray Consolidated	14⅞	14¼
Chino	20½	21
Chino	...	...
New Baltic	...	...
United Copper	1½	2