

# THE CANADIAN MINING JOURNAL

VOL. XXXI.

TORONTO, March 1, 1910

No. 5

## The Canadian Mining Journal

With which is incorporated the  
"CANADIAN MINING REVIEW"

Devoted to Mining, Metallurgy and Allied Industries in Canada

Published fortnightly by the

**MINES PUBLISHING CO., LIMITED**

Head Office - Confederation Life Building, Toronto.  
Branch Offices Montreal, Halifax, Victoria, and London, Eng.

Editor:

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

**SUBSCRIPTIONS**—Payable in advance, \$2.00 a year of 24 numbers, including postage in Canada. In all other countries, including postage, \$3.00 a year.

Advertising copy should reach the Toronto Office by the 8th, for the issues of the 15th of each month, and by the 23rd for the issues of the first of the following month. If proof is required, the copy should be sent so that the accepted proof will reach the Toronto Office by the above dates.

### CIRCULATION.

"Entered as second-class matter April 23rd, 1908, at the post-office at Buffalo, N.Y., under the Act of Congress of March 3, 1879."

### CONTENTS.

	Page
Editorials—	
Editorials . . . . .	129
(1) The Canadian Mining Institute's Twelfth Annual Meeting . . . . .	129
(2) Hampton's Magazine and Mr. Bannell Sawyer . . . . .	130
(3) The Mining Society of Nova Scotia . . . . .	130
(4) Peterson Lake . . . . .	130
(5) Editorial Notes . . . . .	130
Forestry and the Coal Areas of the Yukon Territory. By D. D. Cairnes . . . . .	131
State Aid to Mining . . . . .	132
The Protection of Mine Timbers from Fungus . . . . .	133
Prospects of the Tye Copper Company . . . . .	133
Electric Storage Battery Locomotives in Hungarian Mines. By F. C. Perkins . . . . .	135
Advance Chapter from H. P. Davis' Handbook of the Cobalt District . . . . .	136
The Porcupine Gold Fields. By W. H. Spencer . . . . .	137
The Geology, Mining, and Preparation of Barite in Washington County, Missouri. By A. A. Steel . . . . .	138
Canadian Mining Institute—Western Branch . . . . .	143
Mining in Ainsworth and Slocan Districts. By E. Jacobs . . . . .	143
The History of Stevens' Copper Handbook. By H. J. Stevens . . . . .	145
Correspondence . . . . .	146
Canadian Patents . . . . .	147
Resolutions Adopted by the Canadian Commission of Conservation . . . . .	147
Personal and General . . . . .	147
Book Reviews . . . . .	148
Special Correspondence . . . . .	148
General Mining News . . . . .	152
Company Notes . . . . .	153
Stock Reports . . . . .	158
Statistics and Returns . . . . .	158

## THE CANADIAN MINING INSTITUTE'S TWELFTH ANNUAL MEETING.

The twelfth Annual Meeting of the Canadian Mining Institute will begin one day after this number of the Canadian Mining Journal appears. A large and representative attendance is assured. The number of visitors from the United States will be larger than usual. It is altogether probable that the sessions will be in all respects the most profitable on record.

In commenting upon last year's gathering in Montreal, we wrote thus: "In one respect the meeting that has just been concluded was an improvement on all preceding conventions. We refer to the fact that the proceedings were much facilitated by the presentation of papers in synoptical form. This saved time and made fuller discussion possible. Undoubtedly steps can still be taken in this direction. For instance, an inflexible time limit could be fixed for the presentation of any paper. Subjects foreign to the matter in hand should be rigidly excluded. . . . The custom of attaching consecutively numbered badges to all delegates has much to recommend it. An arrangement of this kind would obviate confusion and would provide an easy means of distinguishing members from non-members."

These remarks apply with equal force to-day. The discussions that follow the reading of papers are often of wider interest than the papers themselves. Not seldom, however, a speaker is permitted to ramble off into matters totally irrelevant to the subject in hand. It is hard for the chairman to correct this. The best preventive is the habit of putting one's remarks in writing first. Verbosity, unintentional or otherwise, is a cruel affliction. We hope, therefore, that no members will transgress in this respect.

Objectionable as long speeches are at any time, they are most intolerable at the Annual Dinner. On other occasions it is not impossible for the listeners to express their impatience. At the Dinner this, of course, is out of the question, and the offender gets off scot free except that he carries with him the undying aversion of those who have writhed under his eloquence. It is only fair to add that members of the Institute are not the worst sinners.

At the approaching meetings several questions of prime importance are to be settled. Among these are the formation of an independent professional society and the adoption of a new set of by-laws. Undoubtedly there will be much pother and some warm feeling. But it will be well to remember that diametrically opposite opinions can be held on nearly every question by equally competent and honest men. No harm can

result from open discussion, even if the atmosphere become tropic. Mischievous comes in when a clique or faction is used to railroad a measure through, even though the measure be a good one.

One word more and we shall cease preaching. The success of all arrangements rests not alone in the Secretary's hands, nor is it in the power of special committees to make everything go smoothly. Every member must do his share. Prompt attendance at each session is most desirable. Equally desirable is prompt compliance with the printed requirements issued by the Secretary. In short, the Secretary and the committees need all the assistance they can get.

The Canadian Mining Journal extends a warm welcome to all the visitors. Our sincere hope is that the coming Annual Meeting will be made exceedingly pleasant and profitable for one and all.

#### HAMPTON'S MAGAZINE AND MR. BANNELL SAWYER.

A magazine that appeals to the public for support must, tacitly or openly, accept responsibility for its advertisements. Hampton's Magazine stands sponsor for the exotic advertisements of Mr. Bannell Sawyer. That gentleman sells stock in the Cleopatra Mining Company, Ltd. "Messages" have been appearing from him in several numbers of Hampton's. This he declares to be his last—and for this mercy our gratitude is due.

Readers of Mr. Sawyer's effusions will be surprised to learn that there is no Cleopatra mine. There is a dubious prospect of that name. Moreover, Mr. Bannell Sawyer's advertisements are grossly misleading. Let us quote a gem from his latest announcement: "Foot by foot, yard by yard, our big compartment shafts are being driven down. . . . Very soon we shall tap at a depth of 100 to 150 feet the silver treasure that has been lying there for centuries waiting for the quick stroke of the drill to release it." This flower of imagination is surmounted by an ideal section in which the artist portrays two quaintly impossible shafts. These shafts penetrate successively "diabase formation," "Kewatin formation," and "silver level." Mr. Sawyer's diagrammatic geology is truly marvellous in its simplicity. Not less to be wondered at is the simplicity of those persons who purchase Cleopatra shares.

Incidentally, we do not admire the device to which Hampton's Magazine resorts. Instead of labelling such announcements as that of Mr. Bannell Sawyer plainly and simply, they are permitted to appear as a "supplement." This is manifestly cheap and nasty.

#### THE MINING SOCIETY OF NOVA SCOTIA.

Last year the annual meetings of the Mining Society of Nova Scotia and the Canadian Mining Institute were fixed for practically the same dates. Hence those who

would otherwise have attended both were forced to make a choice. This year, we are glad to announce, the meeting of the Mining Society of Nova Scotia is set for March 15th and 16th. This will give ample opportunity for western members to attend without foregoing the Toronto meeting of the Canadian Mining Institute.

It is appropriate here to urge upon mining men generally the desirability of attending the Nova Scotia meeting. Much can be learned of undoubtedly good business and professional openings in the Maritime Provinces. The journey itself is decidedly attractive, and the meetings of the society are most creditably conducted.

Mr. A. A. Hayward, the Secretary of the Mining Society of Nova Scotia, will cheerfully furnish information. Further notice will be found in our "Personal and General" columns.

#### PETERSON LAKE.

One result of the litigation between the Peterson Lake Silver Cobalt Mining Company and the Nova Scotia Silver Cobalt Mining Company is that the treasury of the former has been enriched by 160,000 shares of stock and contains \$58,000 in cash. Another result is that the Peterson Lake directorate is adopting a vigorous plan of development both on its own responsibility and, as has been done in the past, by means of leasing parcels of its territory.

A circular issued by the company will be found on another page.

#### EDITORIAL NOTES.

The freight rate on copper ore from Skagway to the Tyee smelter, Ladysmith, is \$1.46 per ton. The distance is about 1,000 miles.

One item that lends colour to the rumoured purchase of the Dunsmuir collieries by the C. P. R. is the fact that the latter corporation some time ago filed at Ottawa plans for the erection of large coal bunkers on the Indian reserve. However, the newspaper reports concerning the McKenzie-Mann activities have not been contradicted.

The terms of the new agreement under discussion between the employers and the colliery workmen of South Wales include some interesting new provisions. Among these is one requiring all men applying for work to be subjected to medical examination. This is thought by the employers to be a necessary safeguard against complications arising under the Compensation Act.

It is much to be regretted that the American Institute of Mining Engineers has seen fit to hit upon the first week in March for its annual meeting. That meeting is to be held in Pittsburg. Many of the members of the Canadian Institute are also members of the

American body. These members would have been glad of the chance of seeing Pittsburg under the auspices of the A. M. I. E. Unfortunately they can do nothing now beyond projecting their astral bodies into the circle illuminated by Dr. Raymond and his fellow-con-

spirator, Dr. Struthers. The incident is the more regrettable since the practice of the American Institute heretofore has been to hold its meeting during February. We hope that somebody's wrist will be well slapped.

## FORESTRY AND THE COAL AREAS OF THE YUKON TERRITORY.

By D. D. Cairnes.

(By permission of the Director of the Geological Survey Branch of the Department of Mines of Canada.)

So much has, of late, been said and written concerning the preservation of our forests, and the rapidly-approaching time when all the known deposits of coal will have become exhausted, that in treating of the forestry and coal areas of the Yukon, it will not be necessary to emphasize the vital importance of these natural resources for the welfare of the district; as they are quite as essential factors in the industrial advance of these northern and somewhat sparsely-settled districts, as they are of the more populous portions of the continent.

As extensive portions of the Yukon Territory, which embraces 207,076 square miles, are as yet but slightly or altogether unexplored, our knowledge concerning its timber is very imperfect, but as far as is known the district is generally wooded and the forest consists chiefly of 12 species, 8 of which attain the dimensions of trees, the others being possibly better considered as shrubs. These are white spruce (*Picea alba*), a black spruce (*Picea nigra*), balsam fir (*Abies subalpina*), black pine (*Pinus Murrayana*), balsam poplar (*Populus balsamifera*), W. balsam poplar, (*Populus trichocarpa*), aspen poplar, (*Populus tremuloides*), three species of birch and two of willows (*Salix*).

The white spruce is the most widely distributed and most useful tree in the Yukon, and is found of fine, to good, quality in all the valleys and lowlands. It makes a fair grade of lumber and is well suited for purposes of construction generally. It is seen at its best on the islands and alluvial flats of the main rivers, where it forms fine groves of merchantable timber, easy of access. The groves are small, as a rule, but the aggregate amount of good spruce timber which they contain is considerable. Here trees, measuring one to two feet in diameter, occur in most places and, in a few localities, individuals have been noted which measured three feet, and logs 60 feet long, with a diameter of one foot at the smaller end, can be obtained. Up the slopes of the valleys, the white spruce, under favourable conditions, continues to be a fine forest tree, but decreases in size near the heads of the rivers, where it generally does not exceed eight inches in diameter. In the Klondike district, timber only extends to 3500 feet above sea-level, but in some other portions of the Yukon it reaches as high as 4700 feet.

Balsam fir, which is, in places, as large as 18 inches in diameter, is next in importance to the white spruce, and occurs only in high valley bottoms and on mountain slopes, and appears to thrive best at about 1200 feet above the main valleys, decreasing in size above and below this elevation.

Black pine is fairly abundant in certain localities in

the southern Yukon, and occurs chiefly in swampy portions of the valleys on moss-covered slopes facing the north, and, in thin groves, upon dry benches bordering the rivers at 40 to 300 feet above the water. However, it is not an important forest tree, being generally only 4 to 6 inches and seldom over 9 inches in diameter.

The poplar grows on islands and alluvial flats of the main rivers, and is seen in all stages of growth, from a small shrub to a considerable forest tree. The aspen are found over a large portion of the Yukon territory and are especially characteristic of the dry, open grassy hillsides. Three varieties of birch have also been noted, two of which are in most places only poles, but the third (*Betula resinifera*) is sometimes 8 inches in diameter and has supplied a considerable portion of the fuel consumed in the Dawson mines. It is never tall, however, seldom giving a trunk that will produce two 16-foot lengths for fire-wood.

The most widely distributed shrub is the dwarf birch, (*Betula glandulosa*), which occurs chiefly on the higher hills and ridges above the timber line. Along the river banks, alder, willows, and brier-rose are abundant.

It will thus be seen that the timber of the Yukon is limited, but that there is, however, considerable, practically everywhere, except in a few localities where there has been a heavy drain upon it, such as in the vicinity of Dawson and along the river banks from Whitehorse to Dawson. But nowhere are the forests of the dense nature encountered to the south, as in British Columbia and in Eastern Canada. The thin growth is probably due to the permanently frozen ground just below the forest floor in most parts of the territory.

Concerning the mineral resources of this immense territory, our information is of a very fragmentary nature, and this is particularly true regarding coal, which naturally has received much less attention at the hands of prospectors than the precious metals. However, anthracite and bituminous coals and lignites have been found in the Jura-Cretaceous and Tertiary rocks of the Yukon Territory at numerous points along the Lewes and Yukon Rivers and their tributaries, particularly the Nordenskiöld, Klondike and Indian Rivers and Coal Creek; and three mines have been opened up and a certain amount of work has been performed in other places. However, the known occurrences of each are nearly all along the waterways, where the more detailed investigations have been made. In fact, very little prospecting has been conducted away from the main lakes and rivers, so that, in all probability, further exploration will show a considerable extension of the coal-bearing horizons.

The Sour Dough Mine is situated 12 miles up Coal

Creek from where it joins the Yukon river, 50 miles below Dawson. Here are a number of good workable seams of lignite, up to 12 feet thick, which have been worked to some extent, during the past few years, and from which a few thousand tons have been shipped to Dawson. There is also a 6-foot seam of good lignite about 20 miles from Dawson on a branch of Rock Creek, a tributary of the Klondike. Also some seams of coal have recently been reported to have been discovered on Indian River. These are all believed to occur in rocks of Tertiary Age which have an extensive development to the west and south-west of the above-mentioned localities.

The Tantalus mine is situated on the left of the Lewes River, 190 miles downstream from Whitehorse, and about midway between the latter and Dawson. At this mine three seams of bituminous coking coal have been developed, averaging perhaps, 7 feet, 6 inches, 6 feet, 6 inches; and 3 feet in thickness, which have been mined for several years and from which in 1907 nearly 10,000 tons of coal was shipped. Across the river from where the same measures outcrop on Tantalus Butte where seams of good, clean, coal, 8 feet 10 inches, 9 feet 10 inches; and 7 feet, have been prospected to some extent. These same measures, which are of Jura-Cretaceous age, were found outcropping for several miles to the north and south of Tantalus Butte and Tantalus, respectively, and are believed to be extensively developed to the south and southwest of the latter. From the Five Fingers mine on the right limit of the Lewes River, 16 miles below Tantalus, considerable coal was shipped some years ago, but since then the company has been chiefly engaged in prospecting and developing the property. The widest seam here is about 4 feet thick, and is a good bituminous coking coal.

A few miles southwest of Whitehorse several seams of anthracite coal have been discovered, two of which are 9 feet 8 inches and 10 feet 4 inches thick respectively, and which belong to the same geological horizon as the coals at Tantalus. Only a small amount of prospect work has been done here, but the measures have been traced several miles to the west.

Seams of lignite are also known to exist in the Kluane district to the west of Whitehorse, and prospectors report having found numerous valuable coal seams in this district. So, judging from the wide distribution of the coal-bearing formations, it is believed that extensive portions of this territory are underlain by valuable coal deposits, thus to some extent counterbalancing the lack of the forests with which nature has endowed other parts of Canada.

For more detailed information concerning the coals of the Yukon the reader is referred to the writer's reports on the Yukon Territory for the past four years, published by the Geological Survey Branch of the Department of Mines of Canada.

The following are a few analyses of Yukon coals:—

Locality.	Volatile Combustible Fixed			
	Water.	Matter.	Carbon.	Ash.
Sour Dough Mine, average of scowload . . . . .	14.46	33.94	40.52	11.08
Tantalus Mine, from adit where seam was 6 ft. 6 in. thick . . . . .	0.76	24.74	58.60	15.90
Tantalus Butte, surface average of 8 ft. seam . . . . .	13.64	31.83	51.84	2.69

Five Fingers Mine, 2 ft. seam . . . . .	5.95	40.46	45.16	8.43
Whitehorse anthracite average 9 ft. 8 in. seam . . . . .	2.15	6.01	69.86	21.98

### STATE AID TO MINING.

The government of Australia pursues a most enlightened policy in regard to the management of mining. During 1908 the following specific appropriations were made:—

Advances in aid of mining work and equipment of mines with machinery, £8445 16s. 5d.

Advances in aid of boring, £1038 3s. 7d.

Subsidies to provide crushing plants, £2076 5s.

Purchase of boring plants, £1596 9s.

Providing means of transport, £2001 17s. 2d.

Mining water supply, roads, cartage of ore, drainage timber tramways, developmental work below 100ft. level, £1338 6s. 11d.

Private crushing plants subsidies, £2075 5s.

The total is £18,573 3s 1d.

The subsidies given to private crushing plant owners are on condition that they crush for the public at fixed rates. Mr. A. Montgomery, the State Mining Engineer, has recommended for the last two years, that the Mining Development Act should be recognized and amended, so that guiding principles may be clearly laid down as to the sort of applications for assistance that should receive consideration and the terms on which State aid can be made available. The revenue received by the Government in 1908 in return for its expenditure on mining was:—By refunds on loans, £539 1s. 11d.; from sales of securities realized upon, £1559 14s.; miscellaneous sources, £1043 14s. 10d.; total, £3142 10s. 9d. During the same year £3836 14s. 3d. was written off on account of advances deemed to be irrevocable.

Advances under the head of "Pioneer mining" cover all mining work, including the purchase of machinery. It is stipulated, however, that the proposed operations must be approved by a professional officer of the department. The limit of any individual advance under this head is £1000 and the borrower must spend a like sum. Individual advances under "prospecting" are limited to sums of £300. In this case the borrower has to put up an equivalent of pound for pound in labour or material. On the erection of State batteries the capital outlay to the end of 1907 was £237,029. The profit and loss account for 1907 shows an expenditure of £92,973 and an income of £91,274, leaving a debit balance of roughly £1698 on the year's working. This includes the accounts of cyaniding slimes and tin plants all of which operated at a profit, but such profit was absorbed in the deficiency of revenue from the batteries, which in that year, totalled £8725. Altogether, the State spent £95,624 in the smelter business. The receipts, including the money for the sale of the plant, amounted to £81,690. So the business resulted in a direct monetary loss, but the Government consider that this is more than offset by the benefits accruing from their having opened up the Phillips River field and the consequent introduction of foreign capital.

The lowest price on record for copper during the past thirty years was reached in 1894, when the metal fell to 9 cents per lb. During that year also, the average price was lower than recorded during thirty years, namely, 9.43 cents per lb. The highest recorded price during the same period was 26.25 cents in 1907.

## THE PROTECTION OF MINE TIMBERS FROM FUNGUS.

From the Journal of the Canadian Mining Institute, by  
John Macoun, Dominion Naturalist, Ottawa,  
Ont. (Paper to be read at Annual Meet-  
ing, Toronto, 1910.)

There is nothing connected with the working of mines of greater importance than the protection of mine timber from rot. It is a matter concerning which little is commonly known. When so much depends upon the strength and stability of mine props, it is remarkable that at the present time practically no efforts have been made to lengthen the life of mine timber. Of the most destructive fungi, even science has not much knowledge. Many of them belong to the genera *Merulius* and *Polyporus*. *Merulius* is the commonest form of dry-rot, and attacks chiefly pine and fir. The name dry-rot carries with it a wrong impression, as dry wood is never attacked; damp, unventilated situations being most favourable to the growth of dry-rots. Well ventilated mines are to a very considerable degree free from fungus growths. In both the genera referred to—*Merulius* and *Polyporus*—the rot is caused by the mycelium which penetrate the wood, thus destroying it. The fungi themselves are often of large size, but the actual damage is done by the thread-like mycelium. The molds which are so frequently seen on mine timbers, most of which are of the family *Hyphomycete*, are not really injurious to the timbers; their natural habitat is on the surface of wet wood, and when the conditions are suitable they grow in mines, just as they do in our cellars, without any direct injury to more than the surface of the wood. It has been generally assumed that the treatment that has proved so efficacious in preserving railway ties, telegraph poles and fence posts might be used in mines; but this is not the case, and saturating the wood with creosote is not only expensive, but is not a sure preventive. Apart entirely from the great expense these methods entail, the conditions are so vastly different that it is more than doubtful whether the results of open air experiments are of much value when applied to deep mines.

Acting under instructions from the Director of the Geological Survey, I visited several mines in the Rossland district in September, 1908, and was astonished to find that nothing whatever was being done there to protect mine timber from rot; and from what I have been able to learn from men familiar with Canadian coal mines, the conditions in these mines are even worse than they are in any other kind of mine, because—as I shall explain later—the timbers now in place in these mines may be preserved at a very small cost.

During the last thirty years I have spent many seasons on both the Atlantic and Pacific coasts, and the difference between the condition of the driftwood on these coasts and that found along our interior lakes attracted my attention many years ago. Members of the Geological Survey staff inform me, moreover, that the wood found along the shores of Hudson Bay, the Mackenzie Delta and Behring Sea is of the same character as that which has come under my own observation. Speaking generally, all wood found on the seashore is free from fungus rot, while that found along fresh water streams or lakes begins to rot within a year or two after it is left on the shore. The inference is plain. Some constituent in the salt water protects the wood, and when we remember that all fungi are produced from spores—microscopic in size—it is evident

that if these spores can be prevented from developing, fungus rot is impossible. Since my return from the field last autumn the Director of the Geological Survey has shown me a description of what is known as the Henry Aiken method of treating timber for use in mines. A full account of Mr. Aiken's treatment may be found in the Summary Report of the Geological Survey for 1908, and only the briefest summary need be given here.

In this process the timber is soaked in water, raised to a temperature of from 190 to 200 degrees Fahr., and contains enough common salt to form a thoroughly saturated solution. The timber should be free from bark, fairly well seasoned and thoroughly dry. Tests made in many British collieries have proved conclusively that this treatment is in every way a satisfactory one. In one mine the timbers, after being in place five years, were perfectly sound, and in another they had shown no sign of rot at the end of six years. What is even more noteworthy is an experiment made in Fifeshire. Two pieces of ordinary fir, 3½ inches in diameter and 3 feet long, both weighing 10 pounds, before being treated, were selected. One of the pieces was treated by the salt process and the other not. After being treated, it weighed 12 pounds. Both were taken underground and placed in a return air-course and after eleven months were examined and re-weighed. The untreated timber then weighed only 5 pounds whereas the treated wood weighed 12 pounds, or exactly the same weight as when it was put in. They were replaced in the mine and allowed to remain eleven months longer, with the result that the untreated timber weighed 6 pounds and the treated timber weighed 11¾ pounds. They were again replaced in the mine, and after an exposure of three years they were examined, and while the treated piece was sound, the untreated one was decayed. Such evidence as this must be considered as conclusive, and as the salt water treatment is inexpensive, there seems to be no good reason why all mine timbers should not in future be treated in this way. Timbers already in place might from time to time be sprayed with salt water for, while such treatment could not be expected to prove as efficacious as if the wood were soaked in brine, still it is reasonably certain that few fungus spores could develop on wood that was so treated. In coal mines where spraying is systematically done for the purpose of preventing coal dust explosions the addition of salt to the water used would entail very little extra expense. What is certain is, that when the greatly enhanced price of timber in recent years is taken into consideration, the cost of treating mine timbers with salt is insignificant as compared with the money that would be saved.

### PROSPECTS OF THE TYEE COPPER COMPANY.

During a visit to London, at the close of the past year, Mr. W. H. Trewartha-James, general manager of the Tyee Copper Co., Ltd., delivered an address at an informal meeting of the shareholders. Extracts are reproduced herewith:—

“With regard to your smelting industry, let me recapitulate the great advantages which give you such a commanding position in the smelting industry on the Pacific coast. You have, in the first place, a beautiful land-locked bay, which is also an important coaling station for the steamers of the Canadian Pacific coastal

trade and for the shipping generally, which plies along the Pacific coast. You have a valuable smelter site, consisting of some forty-four acres of land abutting on the sea, which I estimate is worth to-day, as an industrial site for a lumber mill, or any other industrial purpose, not less than £9,000. That asset is therefore one of considerable value, though it does not as yet appear in your balance sheet. You have a valuable contract, ensuring you a continual supply of coke and water—coke at a lower price than it can be obtained anywhere else on the Pacific coast—water to the extent of 1,000,000 gallons daily practically free. You have your own wharf, at which the largest vessels plying the coastal service can lie securely and discharge cargoes in bulk at the rate of from 80 to 100 tons per hour at all stages of the tide. The new furnace, now in operation, contains practically all the most up-to-date improvements in furnace work and you have the great advantage of being able to draw from the prosperous and rapidly-growing town of Ladysmith, in which your smelter is situated a competent band of workmen, both skilled and unskilled, at fair wages, with every facility and convenience for themselves and their families. We are not hampered by any restrictions or unduly severe regulations as to noxious fumes and furnace smoke. The municipality of Ladysmith, and the government of British Columbia recognize that industrial expansion is necessary, and they seek to assist rather than to hinder progress. As you know, the rapid growth of towns and populations tends to restrict in a remarkable way the available smelting sites on the American seaboard south of Canada. You have a geographical position which assures cheap freight rates on ore in both directions. The main traffic going north consists of goods, provisions and machinery, and the vessels are short of return freights, so that special rates are obtainable for ore cargoes southward bound to your smelter. We can carry ore from Skagway to Ladysmith, some 1,000 miles, in bulk for 6s per ton. Then again, going south, we have vessels laden with lumber and coal, which have to come back in water ballast unless they can bring ore. Thus we have a back cargo rate as far south as South America of 14s. per ton, and we are now in a position to compete for our share of that valuable and growing business. . . . . So far, I have, in dealing with the past and in bringing your knowledge down to date, confined my remarks solely to the facts as facts. The conditions upon which our future prospects depend are so complex, so liable to variation from causes entirely beyond our control, that you will fully appreciate the necessity for my restricting any natural enthusiasm I possess, and of giving my reasons for dealing with our prospects from a most careful and conservative standpoint. Mr. Daniel Guggenheim was recently quoted in New York as saying that the copper ore customs smelting business is the most worrying and ungrateful business he has ever been connected with, and I think my own experience makes me most frankly echo these same sentiments. Who could have imagined that your customs ore supply of 4,800 tons per month in 1907 would have fallen to 800 tons per month in 1908? And only by dint of the most strenuous exertions, and, I admit, with a full measure of good luck, has it been possible to get back to a normal basis of 50,000 tons per annum. I have already explained that I attribute this partly, not wholly, to the slump in the price of copper, and to the New York panic of 1907, which forced producing mine owners to close down, as the owners had no margin on which to continue operations. This will

show you, gentlemen, that our prospects are to some extent, dependent on the price of copper, and I do not believe there is any man in the world, be he never so wise, who can possibly give us any certain prognostications hereabout on which we can absolutely rely. My own opinion is necessarily largely formed by association with prominent Americans, who may, I believe, in the course of a few years, almost completely control the production of this important metal. In my opinion—I am referring now to what you have read about the great American copper combine in New York—we have to-day associated the best, the most powerful and the wisest men in the Western land in an effort to standardize and regularize the price of this product. I do not believe they intend immediately to put up the price of copper unless the relative proportions of consumption and production justify that course. I believe their object is to maintain a fair and regular price for copper, so that trade conditions shall not again be subjected to the extraordinary variations caused by the great fluctuations in the price, such as those which occurred in 1907, when copper fell from £115 to £55 per ton within a few months. I believe too, that this powerful American copper combination will ultimately attain its object. Now in London most of the best informed people I have met (there are a few notable exceptions) believe that the production of copper is, and will be for the next two or three years, largely in excess of demands. As I understand it, the Americans connected with what has been called "The Great Copper Combine" see their way clear to place in industrial circulation every pound of the heavy excess stock of copper, the existence of which we must freely admit. Trade conditions tend to become more normal, and money for investment appears to be freer out West than it is here, and so far as I am justified in expressing any personal opinion, I say unhesitatingly I expect a steady upward movement in the price of copper until a maximum of £70 per ton has been reached. The industrial developments on the Pacific Coast are progressing now so rapidly and by such leaps and bounds that when last year President Taft came to visit the Seattle Exposition, notwithstanding his close touch (through his statisticians and principal advisers) with all the facts and figures of that development, it was not until he had made his personal inspection that he realized what progress was being made, and this is what he is reported to have said: 'I see spring up on the Pacific coast a new empire, which will in the course of a few years dominate the commerce of the world.' This is a great thing to say, but that is President Taft's view and was expressed in public. Certainly in Canada and in America the trend of capital investment is most decidedly westward, and your industrial enterprise lies right in the path of that movement. It can hardly fail to benefit you. Our prospects, of course, also depend on your getting more ore contracts. During the past eighteen months, we have done well—indeed we have so far got more than our share of the business going on the coast, so that all I need say in this respect is that I see no reason why we should not continue to hold our own."

In the fifteenth century the world's annual production of gold did not exceed \$4,000,000. Since then it has increased one hundredfold.

# ELECTRIC STORAGE BATTERY LOCOMOTIVES IN HUNGARIAN MINES.

By Frank C. Perkins.

There are a number of mines in Austria-Hungary which have been equipped with electric storage battery locomotives of the unique construction noted in Fig. 1 and 2 and drawing Fig. 3, the batteries being

thoroughly reliable and are of no danger to the miners. They also have a radius of action without extensive overhead construction.

In the Hungarian Petrozseny mine there are 8 stor-

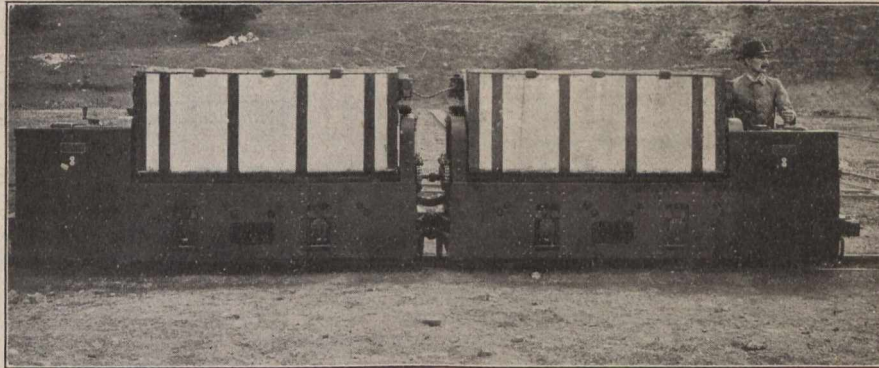


Fig. 1.

mounted on the top and being removable for charging. There is a special gearing provided with permanent rolls fixed in the top of the locomotive, which makes it possible to shift the discharge batteries and replace them with fully charged sets for the locomotive, with a minimum expenditure of labor and time.

age battery locomotives in operation, of the type shown in illustration Fig 4, each having a capacity of 12 horse power. These locomotives of the Zalgo-Tarjaner-Kohlen-Bergbau Aktiengesellschaft are operated in pairs. These double accumulator mining locomotives thus formed, have a total capacity of 24 horsepower and

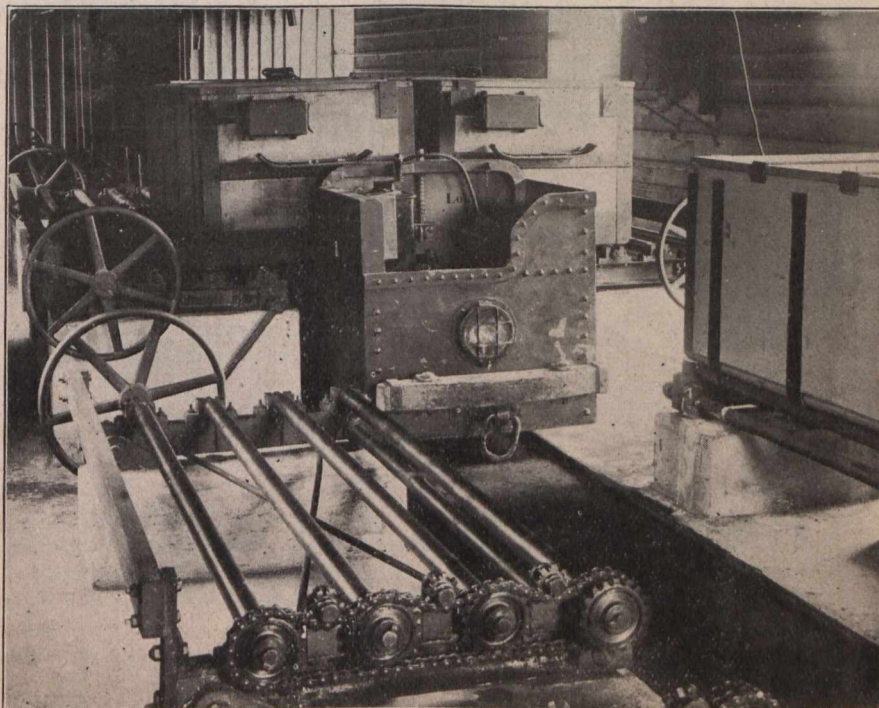


Fig. 2.

There is no doubt that the storage battery locomotives have some advantage over those operated by overhead trolleys or third-rail conductors. They are

are capable of hauling 40 cars without difficulty. At this mine there are 16 sets of batteries used. The Tudor type of cells are employed as built at Budapest by the

Tudor accumulatore Fabrik Akiengesellschaft. Each locomotive has 51 cells, with a capacity of 74 ampere hours each.

The largest Elektromontana storage battery mining locomotives usually installed in German mines are of 24 horse power and 32 horse power capacity and each locomotive is provided with two sets of batteries when un-

When two storage batteries are employed with the small locomotive, the cost is about 1200 marks, or \$300.00 per horse power while for the larger loco-

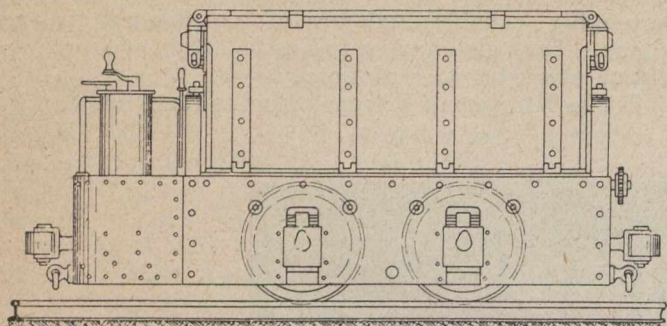


Fig. 3.

interrupted service is required, one of which is being charged, while the other is operating the locomotives.

The unique roller and chain arrangement on the locomotive frame and charging table, makes it possible to shift the batteries with very little difficulty. The batteries are seldom discharged more than 60 or 70 per cent of their capacity, and it requires for charging only

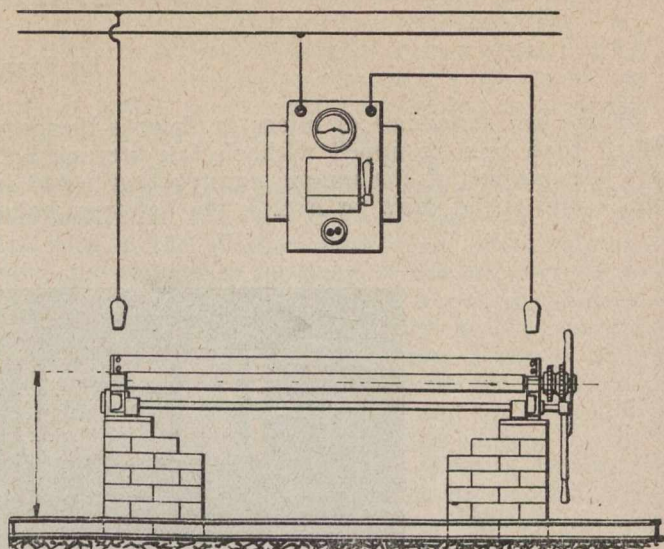


Fig. 4.

tives the cost is considerably less, or about 800 marks, equivalent to about \$2.00 per horse power.

It is maintained that the cost of operation for these

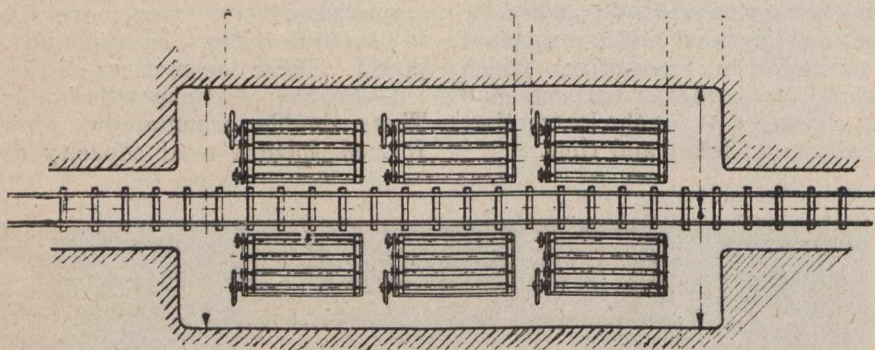


Fig. 5.

about one-third of the time usually taken for discharge in operating the mining locomotives.

When partially discharged, the storage batteries may be fully charged in about one and a half hours. The 20 horsepower mining locomotive is equipped with two independent sets of batteries of 90 cells each, having a capacity of 74 ampere hours, which are capable of giving 400 effective ton kilometers in normal service.

storage battery mining engines is from one-third to one-half the cost of animal power for similar service, and the current required is from one-quarter to one-third kilowatt hour per ton kilometer capacity. An advantage of these storage battery mine haulage equipments worthy of consideration is that no added weight is required for adhesion and the storage batteries supply all the necessary weight needed.

## ADVANCE CHAPTER FROM H. P. DAVIS' HANDBOOK OF THE COBALT DISTRICT.

### Production and Dividends.

The tables included in this volume give the production of the Cobalt mines to December 31st, the authorized and issued capital and the dividends paid by each company.

An analysis of these tables shows that forty-four mines have shipped in six years \*78,589.94 tons of ore,

which yielded \*\*62,500,000 ounces of silver of a gross value of \*\*\$33,304,260.00. The recorded sales of cobalt, nickel, and arsenic, bring the total up to not less than \$34,000,000.00. Of the forty-four mines which have shipped ore, ten contributed a total of less than 200 tons, and can hardly be counted on for further shipments. Seventeen of the thirty-four shipping mines have paid in dividends and in profits to private owners



a recorded total of \$17,101,504.82; adding to this the proceeds from ore sales by private owners before incorporation brings the total to not less than \$17,860,000.00

During 1909 twenty-eight mines shipped \*29,996.51 tons of ore, which yielded 25,000,000 (estimated) ounces of silver, of an estimated value of \$12,875,000.00. Of these twenty-eight shippers, twenty-six were public companies. Thirteen of these twenty-six companies, with a total issued capitalization of \$35,000,000.00, shipped 25,414 tons, or 85 per cent. of the total, and paid in dividends \$6,468,853.42, or 18½ per cent. on their issued capital at par.

To this must be added profits divided by two privately-owned properties estimated at \$600,000.00, making a total of \$7,068,853.42 paid in dividends and profits in the twelve months.

**Value of Ore Per Ton.**

	Average Value per Ton.	Average Price Silver per Ounce.
1904 .....	\$862.00	\$0.572

**Silver Production (Fine Ounces).**

Year.	World's			Montana.	Per ct.	Cobalt.	Per ct.
	Production.	United States.	Per ct.				
1904 .....	168,390,238	55,999,840	33.25	12,817,285	7.61	206,875	.12
1905 .....	157,339,962	56,101,600	35.66	13,454,700	8.55	2,451,356	1.56
1906 .....	158,313,445	56,517,900	35.70	12,540,400	7.92	5,401,766	3.41
1907 .....	159,456,333	56,514,700	35.44	11,129,600	6.98	10,023,311	6.29
1908 .....	203,186,370	52,440,800	25.80	10,356,200	5.09	19,437,875	9.51
1909 .....	*205,819,977	53,849,000	26.16	12,000,000	5.83	25,000,000	12.14

\*1909, estimated.

In 1904 Cobalt produced twelve one-hundredths of one per cent. of the world's silver. In 1909, five years later, Cobalt produced over 12 per cent. of the total world's production, placing Canada third in the list of silver-producing nations.

1905 .....	687.00	0.604
1906 .....	705.00	0.665
1907 .....	426.00	0.653
1908 .....	362.00	0.528
1909 .....	429.00	0.515
Average for 6 years	442.00	0.5895

The increase in value per ton for 1909 over 1908, in spite of the decrease in the price of silver was the result of the shipment of concentrates.

The average value per ton for the six years was \$442. Including all dividends and profits distributed, \$215 has been paid for each ton of ore shipped, or about 50 per cent. of the gross value of the production. The record for 1909 is even more remarkable. The average value per ton was \$429, while \$236 was paid in dividends for each ton of ore shipped.

The following table illustrates the rapid advance and increasing importance of Cobalt as a factor in the world's production of silver:—

Last year Cobalt shipped almost one-half as many ounces of silver as the United States, and more ounces than the combined output of Colorado and Montana.

\* Net tons as shown by T. & N. O. R. R. freight statements.  
\*\* Estimated for 1909.

## THE PORCUPINE GOLD FIELDS.

By W. H. Spencer.\*

The Porcupine gold district is situated about 30 miles west from the 222 mile post on the Temiskaming & Northern Ontario Railway. This means 222 miles north from North Bay on the Canadian Pacific Railway. Porcupine Lake, in Whitney Township, so far appears to be the centre of activity, and from the showings on the surface this district promises to be one of the great gold producing camps of the continent. Claims are being staked by the thousand and as the assessment work is being done the gold discoveries are very numerous. The best showings to date are in Whitney and Tisdale Townships. This is altogether on account of these being the first discoveries, and having so far most work done on them; but good discoveries are being made in Shaw, Mountjoy, Godfrey and Carman Townships, and in the Temagami Reserve.

There is said to be about 50 miles square of this gold-bearing country. The properties so far being operated are the Bannerman, Way, Griffin, and Foster claims in Whitney, the Davidson-Dobie and the Hollinger and Wilson in Tisdale. There are also some good showings in the Temagami Reserve immediately south of the Wilson and Hollinger groups. The McMahon group lying south of Lots 8, 9 and 10 in Tisdale con-

sists of six claims, and has veins from 2 to 10 feet wide showing free gold. The assessment work is now being done on this group, and on the completion of the work there is no doubt but this group will give a good account of itself. These claims are directly in the trend of the best showings in Tisdale.

The Hollinger has most work done of any in the southern part of Tisdale, and from the indications on this property there is no doubt that the ore will change into a sulphide with depth.

They have a shaft down about thirty feet, and are in a milky white quartz showing galena and free gold. This ore is very soft, and I presume an ordinary thousand-pound stamp would crush three tons per twenty-four hours without any trouble. The surface showings on the Hollinger and Wilson are quite spectacular, and will without doubt resolve themselves into large low-grade propositions. The Hollinger vein at the present showing is 125 feet wide and only one wall in sight. I presume the greater part of this ore will run below \$10, but with the rich ore used to bring the average up, it will probably make a milling proposition of \$12 to \$20 per ton. This will require large concentrating and cyanide plants. The present year will be required to

get in sinking and prospecting plants, and it will take another year before the permanent plants and machinery can be erected. This means that it will take two years from date before any returns can be depended upon.

There are large tracts of this country that are considered to be swamp, when in reality they are not. The country generally is low and rolling, with elevations perhaps 30 or 40 feet above the level of the water, but

the timber grows so thick that the sun never gets to the ground, and the consequence is that the moss becomes thick and holds the moisture, giving it the appearance of swampy ground, but by raking the moss away with a pick, rock is laid bare.

Again, the lowering of the Frederickhouse River by cutting away the falls, which has now been done, will drain thousands of acres that would otherwise be swamp.

## THE GEOLOGY, MINING, AND PREPARATION OF BARITE IN WASHINGTON COUNTY, MISSOURI.\*

Extracts from Paper Read Before the American Institute of Mining Engineers, Spokane Meeting, September, 1909.

By A. A. Steel, † Fayetteville, Ark.

Barite deposits are scattered over nearly the whole of Washington and adjoining counties, but the product is all mined from the areas indicated upon the sketch-map, Fig. 1, and is shipped from the stations of St. Louis, Iron Mountain & Southern Railway, between Blackwell and Potosi, from 45 to 60 miles S.W. of St. Louis.

The topography is for the most part gently rolling, with slightly graded streams, usually less than 200 ft. below the higher hill-tops. Along Mineral Fork and Indian Creek are some steep bluffs and cliffs, affording good exposures of the formation. Nearly all the rest of the area is covered to a depth of from 5 to 40 ft. with residual clay containing chert, barite, etc. This overburden greatly interferes with the study of the bed-rock which is exposed only at intervals in stream-beds, in a few barite pits and in those lead mines which have not been abandoned.

Present Condition of the Barite.—As the dolomite became dissolved the barite accumulated with the clay, flint, and other residual material. Commonly the barite is somewhat concentrated at a depth of from 2 to 6 ft., probably the lower limit of the disturbance of the soil by frost and other agencies. Above this, the clay contains an unusual amount of flint or chert uniformly scattered through it.

Beneath the first bed of barite the clay seems more undisturbed and the barite is scattered irregularly through it. Most of the slabs of barite have fallen over and are now horizontal, and there is likely to be a little more barite immediately above the bed-rock. The upper part of the weathered dolomite is soft and crumple and is often called sandstone. Some of the larger slabs of barite are dug from this until it becomes too hard. Near the bed-rock the barite is quite hard, more nearly translucent, and contains iron-stains only upon the surface.

Near the surface the barite is commonly not much softened, but thin layers of limonite are deposited in the cleavage-planes, along which the barite breaks up. When very dark and purplish this barite is sold at half price as No. 2, or "battle axe," on account of the difficulty of bleaching it. There is a little which is deep yellow all through. It was said that this stain was not

due to iron and could not be removed by sulphuric acid in the bleaching process, even by those mills which grind before they bleach. It cannot therefore be sold. Laboratory tests show that the stain is only iron and clay, and perfectly soluble in rather strong sulphuric acid. Frequently, quite a lot of barite of walnut-size is found near the bottom of the flint-zone.

In places, the lumps of barite adhere to a good deal of chert which probably once projected from the walls of the caves. Upon other specimens are shells of hard, dark limonite, called "metallic iron," and representing weathered marcasite. Both the flint and iron can be chopped off with a hatchet. The quartz crusts, called "mineral blossom," are so irregular and so frequently included in the barite that they cannot be chopped off, and reduce the grade to No. 2, because the resulting grit is especially objectionable in the barite floated for pigment. Where there is much mineral blossom, the barite is therefore not mined. A little barite which probably once contained strontium sulphate, is now very soft and dazzlingly white. It is sticky in the grinding mills and cannot be sold.

### The Mining Industry.

1. Amount of Barite Available and the Output.—The entire area is very irregularly supplied with barite, which is commonly mined in patches from 10 to 15 acres in size. The longest single patch is at Mineral Point, where the crest of a low ridge has been mined almost continuously from 50 to 300 ft. wide for a distance of half a mile. The barite, or "tiff," as it is called by the miners, is mostly mined from cleared farm-fields, which showed a little barite upon ploughing and were accordingly prospected. The patches are therefore most frequently upon the slopes of hill-sides, where the barite is likely to be exposed. There are probably several good patches in the woods which have not yet been found, although the country has been prospected for more than a century.

James Long, of Potosi, the largest and oldest shipper of barite, estimates that of the entire area of about 100 sq. miles, one-tenth is workable barite-land. The best fields have produced from 2,500 to 4,000 tons, which is probably only about one-half the barite they contain. The average field, under the present system of mining, yields about 600 tons per acre to a depth of 8 ft., of about 100 lb. per cubic yard, but it takes many

\* Published by permission of the Director of the United States Geological Survey.

† Professor of Mining University of Arkansas.

years to produce this amount, and very few fields have been anything like exhausted as yet. Upon this basis of estimate, the probable total yield, without a change in mining methods, will be about 4,000,000 tons, or more than a century's supply, if we count new discoveries equivalent to the amount already taken out.

Every little country store accepts barite in exchange for supplies, but it is all shipped through half-a-dozen contractors. The total amount shipped was given as 33,046 tons. Nearly all of this was first-class barite, and sold for \$4.35 per ton at the shipping point, or \$5 at St. Louis. In 1905 the price was reduced to \$4.10, at which it now stands. The royalty to the owner of the land is quite uniformly 50 cents per ton, but is 80 cents on one especially good field, and as low as 15 cents when very far from the railroad. The miners get as much as \$2.75 a ton when much cleaning is necessary, but usually from \$2.20 to \$2.50, and only \$1 a ton at Richwoods, from which the wagon-haul costs \$2.50. The haul usually costs from 25 to 50 cents a ton, and the contractor gets the rest. Farm-land containing barite in some of the fields sells at \$35 an acre, which is not much different from its farming value. Wild land, from which the best timber has been cut, is worth only from \$2 to \$8 an acre. Some land, next to the railroad siding, and all containing a little barite was bought at \$60 per acre. One ten-acre field near Potosi has yielded a royalty of \$200 per acre each year for 10 years, and a neighbouring field, which is supposed to be just as good, is still farmed and held in reserve. About 400 miners are supported wholly by the barite industry, besides those engaged in hauling, etc. So far as I could ascertain, these men do practically no farming, although it is so stated in the books.

2. Mining Operations.—A little barite is still produced from mines extending below water-level into bed-rock, but only when associated with enough lead to pay expenses. The small scale of this work, and the inexpensive farm plant form a striking contrast to the great mines at Flat River, a few miles east. Each shaft usually follows a vertical fissure until a cave is reached, when a drift only 3.5 or 4 ft. high is driven along the little horizontal stringer of galena and barite, which is commonly less than 6 in. thick and carries about 25 per cent. of the lead. Deposits having a cave above or below are naturally preferred, since the cost of blasting is reduced, and in addition large crystals of galena frequently occur on the surface, from which they are easily cobbled off. The little ore-streaks are followed as long as they nearly pay expenses, since they sometimes lead to large and profitable bodies of ore.

Most of the barite is dug from the residual clay. The common plan is to sink a pit, 3 ft. in diameter to a depth of from 6 to 9 ft., to the first lean clay below the upper barite-layer. The miner then selects the richest side of the shaft, which he digs out beneath the upper clay, which is rather barren for from 3 to 6 ft. below the surface. In this way, he "drifts" as far as he thinks is safe, usually from 4 to 8 ft. Up to this stage, all of the clay, flint and barite loosened is hoisted in a small bucket by a primitive hand-windlass; but the miner usually sorts out the barite, which he recognizes from flint only by its greater weight, since it is completely covered with tough, red clay. When the first drift is finished, all the waste from the new drifts is shovelled into it, and the miner digs other drifts wherever the ground looks good, so that the working soon resembles an inverted mushroom.

When the first hole is finished, another is started in the direction that looks the best, at such a distance that

the safe drift backward will just connect with the old workings and give a little ventilation. The second hole is exhausted as before, and a third one dug beyond. This plan produces a more or less regular row of pits, and gives rise to the theory of leads. When a lean place is struck the lead is said to have given out, and another row of holes is started, until finally they are scattered over an old field like the squares of a checker-board, and perhaps one-half of the barite is removed.

I have heard of no accident attending the mining, and since many of these holes remain open for many years, in spite of the rain, it seems probable that the length of the drift is not limited by safety, but rather by the distance reached by daylight, and the greater convenience of working near the shaft, which about balances the labour of sinking a new pit with the ordinary amount of covering. Owing to the tendency to imitate, the size is the same whether there is 2 ft. or 6 ft. of barren cover.

When the upper layer of barite has been exhausted, or the field is very rich, the pits are sunk deeper. In summer, when the ground is cooler than the air, the ventilation is poor, so that the pits are seldom deeper than from 15 to 18 ft. In winter they go to bed rock, or sometimes more than 30 ft. These deeper pits are often worked like the others. The more intelligent miners generally drive drifts from 4 to 6 ft. high for 8 or 10 ft. in three directions, and connect the ends so as to leave pillars. The roof is then caved or stoped upwards and the waste left on the floor. As the space fills up, and the old workings are approached, the area is decreased. The new pit is sunk so close to the last forward drift that but little drifting is required to make the air connection. The connection-drift is often stoped from the second shaft. By careful work, four-fifths of the area covered by the row of workings can be mined; but since the drifts are stoped wherever the ground looks poor, and the pillars are larger than the drifts, and the stopes decrease in size upwards, more than one-half or two-thirds of the ground is seldom mined. Since one row of pits is driven without regard to the others and a good deal of a pillar must be left between rows, at the best, only a small percentage of the barite is recovered. Indeed, so much is left, that I saw no field of pits which was said to be worked out.

As the price paid for mining increases, men will dig around among the old workings, in spite of the annoyance of striking old drifts, even where the pits have been sunk to bed-rock. This shows that much barite is lost between the pits. There is also a loss due to the irregularities in the surface of the bed-rock and the caving-in of unfinished holes by rain. Since the miner leaves the poorer parts, the loss of barite is not as great as the percentage of ground unworked. In a field rather carefully worked to bed-rock, it was roughly estimated that half the barite was lost.

While one man digs the barite, his partner or wife stays on top to work the windlass and with a small tomahawk-shaped hatchet cleans the barite of the clay, the worst iron-stain, and any flint that may adhere to it. In summer a rough sun-shade of branches is built.

Most of the clean barite is in lumps, weighing from 3 lb. (large fist-size) to 20 lb., and the finer stuff is thrown away, except near the railroad. Here the small pieces at the top of the barite pile are piled upon the ground, where the weather loosens some of the clay. This barite is later cleaned in a tumbling-barrel or "rattle-box" and shipped as second grade on account of the larger amount of iron-stain upon it. The rattle-box, shown in Fig. 3, is a strong box, 18 by 30 in. by 10

in. deep, with a slat bottom and the ends thickly studded with strong spikes driven through from the outside. On the sides are uprights of 2-by-4-in. pieces, forming legs 1 ft. long and handles 3 ft. long. From 100 to 150 lb. of small and thoroughly-dried barite is shovelled into the box, which is then rocked upon the feet by two men. When the end of the box strikes the ground, the barite is thrown forcibly against the spikes until all the clay is knocked off and falls through the slats.

The miners receive from \$1.60 to \$2.75 per ton for cleaned barite, and by working 6 hr per day a pair will usually earn from \$6 to \$7 in 5 days. Since they can live a week upon this amount, they seldom earn more than \$8 in a single week, and when a rich spot is struck they spend the time loafing and drinking up the excess earnings. When the ground is lean they work longer.

The miners are usually the most ignorant "gumbo French," and speak no language but their own French dialect, and therefore resist any change in the system of mining. Their scheme has the advantage of all "gopher" mining, that the minimum of barren material need be handled. When the over-burden is thick, this method is probably as good as any, if controlled by an efficient superintendent who would see that the pits are regularly spaced, except where there are real leads. The drifts could generally be higher and longer with advantage.

The Point Mining and Milling Co. installed a pneumatic cleaning pick and mechanical washer, and tried to buy un-cleaned barite at a lower price. By having one top-man for two diggers, the miners earned more money upon this basis; but they did not want to work in threes, and, according to the old arrangement, the top man has plenty of time to clean the barite. Therefore this machinery is not now used.

Some of the better farming land will not be released for barite-mining, since the pits and dumps ruin the land. Occasionally the top layer of barite in a small field is mined out rapidly and more systematically, and the miners are required to put the waste material into the pit immediately behind. When the larger stones are put in first, this mining improves the land.

In two or three cases fields having but little striping were mined by advancing a trench 6 ft. deep across them sidewise. This method gives much better recovery, and affords a good opportunity of placing the best soil on top and would be used oftener, except that it is hard to get the miners to work for day's pay, and constant supervision is required.

One large company, now bankrupt, wasted a good deal of money upon a traction engine and wooden-rail tramways for hauling, in competition with the Missouri mule in his own home. At the time of my visit, un-cleaned barite was mined by day-labour, the clay washed off in a patent trommel-washer, and then the iron and flint chopped off by hand. This system gave a considerable saving, even though the work was inefficiently managed. A little saving was probably due to the greater richness of the newly-opened field, but the method is hopeful.

At the Duffy farm a big company undertook to work for barite hydraulically. The exact arrangement of the sluices could not be determined. On the gentle hill-side above the reservoir is a pit 40 by 80 ft. and about 10 ft. deep to bed-rock. Everything seems to have been well constructed, but the method soon failed for lack of water and of fall to remove the tailings. A

little trouble also arose from the depressions in the bed-rock. There are but few places in this field where there will not be trouble with tailings. So it is apparently better to abandon sluices, hydraulic the material over a grizzly, pick out the barite, and remove the tailings by some sort of elevator. The tough clay is hard to handle by water, and labour is so cheap that labour-saving machinery may not pay.

The engineer of the Point Mining and Milling Co. was thinking of mining the residual soil with a steam-shovel, running it through a trommel to shake loose the clay, and carrying the refuse to the dump by belt-conveyer, from which the barite should be picked by hand. This system would be especially adapted to the thicker level deposits. The daily output would be very great, and a large crew of pickers would have to be organized, and there would be some expense in handling the tailings. Since much of the land will yield from 125 to 250 lb. of barite per cubic yard of soil, and the cost of mining uncleaned barite by present methods is about \$1.50 per ton, this system shows a margin of from 10 to 20 cents per cubic yard for handling by steam-shovel, which is not especially attractive. In localities where water is available, it might be better to treat the soil in a modified log-washer, and pick out the partly-cleaned barite.

In most places the best method of mining seems to be to strip the barren cover with plows and scrapers, and mine the rest with pick and shovel, as is done in Tennessee and in central Missouri, where the deposits are smaller and richer. It had not been tried in Washington County previous to 1905.

#### Preparation for the Market.

1. The Barite Mill at Mineral Point.—Previous to 1905, most of the barite of Missouri was prepared in the mill of Nulsen, Klien & Krausse, and some by J. C. Fink Mineral & Milling Co., both of St. Louis. The former has a department for making floated barite, resembling that of the new mill at Mineral Point, but a second-grade pigment is also made from unbleached selected barite. These mills are not in Washington County, and it seems better to omit a discussion of them, since they are similar to many other mills which have been previously described.

During 1904 the Point Mining & Milling Co., invested about \$150,000 for barite-land and what is claimed to be the largest wet-process mill in the United States. Its capacity is about 35 tons of finished product per 24 hrs., or allowing for delays, about 10,000 tons per year, the mill was designed by W. R. Macklind, who has kindly given me the following data.

The barite is weighed upon a platform-scale and shovelled into the ore-house, which has a horizontal air-drill with chisel point for cleaning the flint and iron from the barite when this is not done by the miners.

From the ore-house the barite is shovelled into an 11-by-16-in. Blake breaker below the floor, which reduces it to pieces of lin. size. It is then elevated to a 30-ton bin at the top of the room, whence it is taken to three modified log-washers in series, in which nearly all of the clay is removed.

The washed barite is wheeled across the floor to two Macklind "slip"-mills or modified arrastres, through which a large stream of water flows, and floats the fine barite over the edge of the pan. This milky water is raised to the top of the mill by a 4-in. centrifugal pump, and fed through a small screen into 12 iron spitzkasten, 4 by 4 ft. in size. The oversize is drawn off through

spigots at the bottom of each box and returned to the slip-mills. The fine barite overflows opposite the entering stream into one of 8 settling tanks, 7 by 9 ft. in size. The clear water is siphoned from these tanks and returned to the slipmill. The thick, cream-coloured barite mud, which contains but 25 per cent. of water, is drawn off through 4-in. plug-valves and a rubber hose to one of 20 bleaching-tanks on the ground floor below.

The required amount of 66 per cent. sulphuric acid is added, and the mass ignited and kept at the boiling-point by a jet of steam introduced through a lead pipe. When the barite becomes white it is drawn off through a plug-valve in the bottom, and raised by an acid-egg to the first of the three Macklind continuous decantation-washers, in which nearly all of the free acid is removed. From the bottom of the last washer the barite is drawn off to one of two settling-tanks, 2.5 ft. deep and 10 ft. in diameter. Here as much clear water as possible is siphoned off and the barite let down into a storage-tank provided with an agitator to keep the barite mobile, since it contains but 15 per cent. of water.

From the storage tank the barite flows to a Macklind continuous automatic drier. A screw-conveyor collects the pellets of barite below the drier and delivers them to a belt-elevator supplying a bin above a Williams hammer-mill which pulverizes these pellets. The product is packed in 100-lb. duck sacks, and stored in a warehouse of 3,000 tons capacity.

The mill is driven by an 18-by-36-in. 200-h.p. Fulton-Corliss engine, running at 75 rev. per min., and supplied with steam at 100 lbs. per sq. in. pressure, by two 72-in. by 18-ft. return-tubular boilers. There are a feed-water heater, duplicate feed-pumps, etc. A 35-kw. direct-connected Westinghouse unit supplies current for lighting the mill, and a Curtiss belt-driven compressor supplies the compressed air.

Besides the superintendent and office-man, there are 12 labourers at \$1.50 a day on the two shifts, two slip-mill men at \$2, one bleacher at \$2, two engineers at \$2.50, and two firemen at \$1.75, all working 12-hr. shifts. At the time of my visit the mill had not been operated long enough to get reliable data of costs and details of operation were being constantly improved. The cost of manufacture is somewhat high.

Much of the machinery is standard and need not be described. Each unit of the washer consists of a 12-in. screw-conveyor, 10 ft. long, inclined at an angle of 20°. The housing of the conveyor is arranged to hold the water-level high enough to cover two-thirds of the length of the screw. Above this the barite, while being stirred by the screw, is sprayed with about 25 jets of water, ½ in. in size, under a 45-ft. head. The edge of the screw-conveyor has a V-shaped notch, 1.5 in. deep, every 4 in., which allows a larger part of the fine material containing the most clay to flow back and be rewashed. At the lower end of the conveyor a strong jet of water washes the mud and a little of the finest barite over the edge of the housing. The barite is fed upon the lower end of the first conveyor and discharged from the top of the last one. These washers have a capacity of about 120 tons of barite in 24 hrs., and consequently are not operated continuously. Each unit requires about 40 gals. of water per minute.

The slip-mills were designed and patented by Mr. Macklind. Briefly, each mill consists of a tub of steel, 10 ft. in diameter and 3 ft. high, which is paved with carefully-cut blocks of Missouri granite. Over this pavement are dragged four granite blocks, roughly tri-

angular, 36 in. on a side and 18 in. thick when new. A heavy three-armed cap is clamped to the top. This cap has four holes about 6 in. apart along the leading side, and the dragging-arm is frequently changed from one to the other of these to change the direction of the drag and prevent corrugations in the bottom of the stone. Once in about 60 days the cap is loosened and the stone turned to present another leading-edge, which makes it wear evenly. At such times the bottom of the stone is rounded slightly. The stone should last for three years, but the wear on the bottom of the mill is about twice as rapid, and is, of course, greatest at the periphery. About once in two years the bottom will have to be raised or renewed.

Among the new features of this mill are an unusually heavy spider, and an arrangement of a weight and lever, like a safety-valve, by which any fraction of the weight of the spider can be transferred to the stones. This is adjusted to suit the different grades of barite. The weight-pin can also be lengthened to allow for the wear on the stone. The rest of the weight of the spider is carried upon a ball-bearing toe-piece raised above the water.

In the old-style mills, trouble was caused by the tendency of the charge to form a self-supporting ring between the stones, which would then rub upon the bottom and wear more rapidly, and even at times break the gear or spider on account of the rapidly-increasing load. In this case the mill had to be stopped and the ring laboriously broken by hand. Mr. Macklind corrected this difficulty by providing the main shaft with a ball-bearing collar, which can be raised 6 in. by steam or compressed air piston. This also raises the stones, and the water soon causes the ring to collapse. It seems that this difficulty would be avoided if the distance between the stones were made greater by decreasing their number or increasing the diameter of the mills, according to the Mexican style. Mr. Macklind's scheme, however, has the incidental advantage that when the stones are raised the spider can be easily revolved by hand for inspection or repairs or for cleaning out the mill. In starting up it can also be brought to its normal speed of 20 revolutions per minute by hand, so a simple positive clutch can be used on the gear.

When the mill is grinding properly, the stones tremble or chatter noticeably, and the gearing runs without noise. When one of the stones begins to rub on the bottom the groaning of the gear should be immediately noticed by the attendant, who then raises the spider for a moment. The mills should have about 8 in. of barite in the bottom, and the attendant sounds them with a rod to determine the need of more feed, but of course soon learns how rapidly to shovel in the barite. At 20 rev. per min. each mill has a capacity of from 15 to 18 tons per 24 hr., but generally 12 or 13 tons is ground, and this output determines the capacity of the entire plant. About 15 h.p. is required for each mill.

The water flows through this mill at the rate of 100,000 gal. per 24 hr. This large stream of water may be necessary to provide for an increase in the capacity of the mill, but since more than 40 h.p. is required to raise the water 45 ft. to the separating tanks, it does not seem to be as economical as increasing the number of mills. The number of spitzkasten was increased in order that the floated barite should be fine enough. It is said that this fine barite was examined with a microscope, and the largest pieces were small enough to go through a 300-mesh sieve. The stream is divided

equally among all the boxes, and enters through a fine screen to reduce the agitation. This screen also removes a few small pellets of clay and chips of wood. There is also a vertical screen in the middle of the box to prevent the formation of eddies.

The bleaching tanks are lined with three lengths of 36 in. sewer pipe without bells, and four special tiles form a cone-shaped bottom. They are made waterproof by an 8 lb. hard-lead covering on the outside. The hydrostatic pressure is resisted by oak staves and iron hoops outside the lead. The tanks are charged with 2 tons of settled barite, containing 25 per cent. of water, and a minimum of 240 lb. of 66 per cent. sulphuric acid is added. The acid is received in tank cars, and costs a cent a pound. It is run into a large steel storage tank, from which it is pumped by an acid-egg to an elevated lead-lined tank; thence it flows through lead pipes and valves to the bleaching-room on a level with the top of the bleaching tanks. Here it is handled and measured in a small lead-lined tank car. After the acid is added, steam is run into the bottom of the tank to agitate the mass and heat it to nearly the boiling point. At first, lead-lined iron agitators were used, but they wore out very rapidly. The tile lining of the tanks protects the lead from all mechanical wear, and it soon becomes coated with lead sulphate.

It requires about 45 min. to heat the mixture, and the best quality of ore can be bleached in from 6 to 7 hr.; but since there is plenty of tank capacity, the bleaching is always continued 12 hr. or more. If the bleaching is not finished in 12 hr., more acid is added; but it is unsafe to reduce the amount below 120 lb. per ton, on account of uncertainties as to the ore. No attempt is made to save the unused acid. To tell when the bleaching is complete, a 2 oz. bottle, full of barite, is compared as to colour with a standard sample.

The bleached barite is drawn off through lead-covered plug-valves in the bottom. The handling of this hot, thick, heavy, and corrosive material has proved very troublesome. It has been most successfully pumped to the washing tanks by a very heavy acid-egg.

These washers, designed by Mr. Macklind, consist of lead-lined iron tanks, 10 ft. in diameter, 19 ft. high, having a cone-shaped bottom. In a lead cup above the centre of the tank the bleached mud is mixed with a strong jet of water, and then distributed by a flat lead cone to the circumference of the tank and discharged upon baffle-plates. In the centre of the tank is a bottomless lead cylinder, 8 by 8 ft., inside of which the water rises so slowly that all the barite settles out, and only clear acid water is discharged to waste through a lead pipe at the surface.

From the bottom of the first washer the barite passes to a similar one 3 ft. lower. From this it goes to a third one still lower. Since, with this head, the heavy settled barite would not flow from the bottom of one tank to the top of the next, the current is maintained by a strong jet of wash water directed upwards in the discharge pipe. (A similar arrangement might be serviceable in elevating the thick barite from the bleaching tanks.)

All the acid should not be removed, or the barite will immediately turn a light yellow; the end-point used to be determined by a slight acid taste, but the washing is now continued until there is no taste, but the iron sulphate remaining in solution will give a slight blue colour with potassium ferrocyanide, thrown upon the last spreading cone. When this does not show, the quantity of wash-water is reduced. The reason for the

change of colour when no acid is present is not understood. This acid prevents the use of floated barite for weighting rubber and paper, but for paint it is not objectionable. If the settled barite mud at the bottom of the washer has 50 per cent. of water, this leaves about  $\frac{1}{8}$  lb. of acid to the ton of barite; if it has 100 per cent., which is more likely, 1 lb. to the ton will be left.

The wash-water is filtered through six sand-filters, 36 by 60 in., and is obtained from a small creek by a separate pump. The general mill supply is filtered only when very muddy.

The essential part of the Macklind drier is a cylinder of wrought iron pipe, 36 in. in diameter and 8 ft. long, revolving one and a half times per minute, and heated inside by live steam. Upon this cylinder the barite is dropped by a plate shaken 200 times per minute by a cam. The thick, settled barite mud is fed upon the shaker-plate in fine streams 4 in. apart through pin-valves from the feed-trough, which contains an agitator to prevent packing. The drops of barite falling upon the hot drum are soon dried and are scraped off by a plate after nearly a full revolution. This scraper leaves a thin layer of strongly adhering barite, which prevents discoloration from the iron. The live steam enters through a stuffing-box at one end, and the condensed water is drawn off through a siphon-pipe in the other trunnion and circulates through coils along the side of the housing, and dries whatever barite is spattered off by the boiling pellets.

To prevent the accumulation of air in the cylinder, some steam is drawn off through a straight pipe entering through the siphon and carried to the bleaching tanks.

The finished barite is tested for colour by putting a spatulaful upon a glass plate beside a standard sample, smoothing it down beneath a piece of paper, and comparing as to colour. It is then moistened with turpentine and again compared. In this way it shows as white as a standard sample of white-lead, which had a slight buff color, but not as white as good zinc oxide, which is blue in comparison. The product is tested for grit by rubbing it with a spatula upon soft glazed paper, which should not be scratched. Barite which contains flint will be apt to show more grit when floated, since the equal-falling grain of quartz is so much larger than the heavy barite. Barite ground between burr-stones gets grit from the mills. In the wet-process mill, in which the barite is ground before bleaching, hard iron or steel could be used in the mill and the pigment would be entirely free from grit if the barite contained no quartz.

Barite, on account of its prismatic cleavage, forms a "sliver" pigment rather than a granular one. These slivers mat together in the paint, and since barite is slightly harder than the other pigments, it forms a more durable paint. It is also entirely unaffected by weather, and does not dissolve like zinc, or blacken with sulphur like lead.

White-lead is said to saponify linseed oil. At any rate, after a few years, a pure white-lead paint will chalk and rub off, leaving the surface in good shape for a second painting. So far as known, zinc is not used alone, but if the paint contains too much barite it peels off and a second coat of paint will not stick. The mixture of white-lead and barite pigments is therefore better than either one alone. Some of the peeling may be due to inferior oil.

When barite is sufficiently ground it will spread well. The chief objection to it is its translucency and

lack of covering power. This deficiency is best corrected by zinc oxide, which has the greatest covering power. Some of the paint men therefore say that an equal proportion of the three pigments makes the best paint. The unfortunate feature is that usually good barite costs less than a cent a pound, while the other pigments cost 6 or 7 cents, so that much of the prepared paints contain too great a proportion of barite, up to 60 per cent.

Very little barite is now used in making fine book paper, since the weight of a book is no longer considered an advantage, and fibrous talc is used instead. Its use in rubber goods seems to be a trade secret.

For making barium salts a very inferior barite can be used, but most of this chemical manufacturing work is done in Europe. There would be a big demand for barium oxide for treating boiler water containing much calcium and magnesium sulphates, but it is not yet supplied cheaply enough in the United States.

### CANADIAN MINING INSTITUTE—WESTERN BRANCH.

The seventh general meeting of the members of the Western branch of the Canadian Mining Institute will be opened at Vancouver, British Columbia, on Friday Morning, February, 25, 1910.

Members are requested to rendezvous at the Hotel Vancouver at 11 o'clock on that morning, when the place of meeting will be announced and the business be commenced forthwith.

#### Business Agenda—

- 1—Reading of Annual Report of Secretary of Western Branch.
- 2—Appointment by Chairman of meeting of Scrutinizers to examine ballots for election of Chairman of Branch for the year 1910. Result of ballot to be announced before the final adjournment of meeting.
- 3—Routine Business, if any, at pleasure of meeting.
- 4—Reading of papers and discussion of these and other suitable subjects.

It is proposed to discuss several papers presented at previous meetings, also any other matter bearing upon the Mining and Smelting industries of the West that shall be brought before the meeting. The suggestion is made that mining for placer gold, copper, iron and coal being of particular interest in the Coast District, these

have the attention of the meeting. Members can easily make the meeting both interesting and useful by taking part in conversational discussions on such subjects. Expressions of opinion relative to the advantage or otherwise of gold recovered in Western Canadian mining districts being purchased by the Federal Government are also invited.

The provision of facilities for the early development of the mineral resources of Northern British Columbia is another important subject worthy of attention.

Ballot for Members of Branch Council—This will not be taken until after the result of the next Annual Election of Members of the Council of the Institute shall have been made known. Ballot papers will be sent to all members of the Western Branch next month (March) after it shall have been ascertained who of the Western members are members of the Council of the Institute and consequently ex officio members of the Branch Council. In this connection it is respectfully requested that if a ballot for Members of Council of the Parent Institute be taken, all Western Members will make a point of marking their ballots for the six Western Candidates and returning them to Montreal in ample time to be effective.

Finances—The Branch Council has been informed that nearly one-third of the Western Members are in arrears with their annual dues. Members are reminded that if dues be not promptly paid, the work of the Branch is hindered, since it is only entitled to a proportion of the moneys actually received by the Treasurer of the Institute, Montreal, from Western Members.

Please Note.—That all members of the Canadian Mining Institute in good standing residing in Western Canada and neighbouring parts of the United States are by virtue of such membership, also members of the Western Branch. Members are earnestly requested to make an effort to attend the ensuing meeting, and are cordially invited to contribute papers or notes on suitable subjects, and to take part in the discussions at the meeting. Non-members taking an interest in the objects and work of the institute will also be welcome, both to attend and join in the discussions on papers, etc., submitted.

E. JACOBS,

Secretary of Western Branch of the Canadian Mining Institute.

Victoria, B.C., February 1, 1910.

## MINING IN AINSWORTH AND SLOCAN DISTRICTS.

By E. Jacobs.

The total quantity of ore produced by mines in Ainsworth and Slocan parts of West Kootenay District in 1909 was approximately 150,000 tons, in the proportion of 104,000 tons from mines in Ainsworth division and 46,000 tons from those in Slocan. The larger producers in Ainsworth division were the Canadian Metal Company's Blue Bell mine, on the east side of Kootenay Lake, opposite the town of Ainsworth, 60,000 tons; the Whitewater and Whitewater Deep, 28,000 tons; and the Selkirk Mining Company's Cork mine, on the south fork of Kaslo Creek, 15,000 tons. There were fifteen other shippers, ranging from 320 tons down to only a couple of tons, the latter of dry ore rich in silver. In Slocan division, the Van Roi Mining Company produced

rather more than 28,000 tons; the Lucky Jim, 5,000 tons; the Consolidated Mining and Smelting Company's Richmond-Eureka and associated Summit mines, approximately 3,500 tons; the Standard, on Four Mile Creek, 3,000 tons; the Hope mine of the Ruth Mines, Ltd., group at Sandon (including both silver-lead and zinc concentrates), about 2,000 tons, and the Rambler-Cariboo in excess of 1,000 tons. The smaller shipping mines numbered 18 or 20, with an output of 668 tons for the highest down to half a dozen tons of high-grade dry ore for the lowest. The aggregate tonnage above shown does not agree with that appearing in other ore production statistics recently published, the reason being that in some instances the figures now given include

ore mined and not shipped, but stored for milling later when facilities for concentrating it shall have been provided at mines at present without them.

It will be noted that the information already given relates to less than 50 mines, but there are others upon which development work was done during the year which did not ship any ore. If the total number of properties upon which mining was done in 1909 be placed at 70, say 30 in Ainsworth and 40 in Slocan division, it will be well within the mark. Further, the total value of the mineral production in 1908 is on official records as: Ainsworth division, \$422,181; Slocan, \$676,580; total, \$1,098,761. The estimated value of that for 1909 is: Ainsworth, \$932,134; Slocan, \$1,073,080; total, \$2,005,214. The latter indicates an increase of 82.5 per cent. in total value, and this notwithstanding that the difference in average prices at which the respective calculations were made is against 1909 to the extent of nearly 14,600.

That there is a distinct improvement in the condition of the mining industry of Ainsworth and Slocan mining divisions is known to those who are well informed concerning the situation to-day, but it has over so long a period been the custom for those not possessed of the facts of the case to take it for granted that the available mineral resources of these parts of the West Kootenay district are practically exhausted, that the gradual yet substantial improvement in the position which has marked recent years has not been recognized by more than a comparatively small minority of the general public, even in the Kootenay district itself. However, production statistics should convince the most sceptical, so they are now quoted, and it should be kept in mind that, save for the year 1909, which have been estimated by the writer after careful enquiry and compilation, they are official, having been taken from the Annual Reports of the Minister of Mines for British Columbia. They are as under:—

Year.	Ainsworth.	Slocan.	Total.
1905.....	\$100,273	\$970,544	\$1,070,817
1906.....	268,111	532,228	800,339
1907.....	364,868	619,842	984,710
1908.....	422,181	676,580	1,098,761
1909 (estimated)	932,134	1,073,080	2,005,214
Totals for 5 yrs.	\$2,087,567	\$3,872,274	\$5,959,841

These figures show that in 1909 Ainsworth mining division more than doubled its highest previous year's record (that of \$440,545 in 1897), while those for Slocan are greater in total value than those of any other year since 1904. It should be explained that zinc and marble to a total value of about \$280,000 were included in the estimate of the value of the mineral production of Ainsworth division in 1909, but even after making allowance for these there remains an increase of approximately \$212,000 over the previous high record in total value—that for 1897. But since prices fluctuate year by year, the most satisfactory comparison is that of quantities of metals produced, and these are exhibited in the next following tables:—

#### Ainsworth Division.

Year.	Silver, Oz.	Lead, Lb.
1905.....	99,781	1,002,114
1906.....	165,915	3,173,353
1907.....	301,322	3,654,775
1908.....	314,142	4,790,216
1909 (estimated)	494,350	10,748,220

#### Slocan Division.

1905.....	1,045,948	5,399,330
1906.....	571,613	2,975,674
1907.....	590,998	4,305,826
1908.....	848,595	6,572,268
1909 (estimated)	1,005,603	6,297,897

The respective prices at which value was calculated for the several years were as under:—

	Silver, per oz.	Lead, per lb.
1905.....	57.33 cents	4.24 cents
1906.....	63.45 "	5.09 "
1907.....	62.06 "	4.80 "
1908.....	50.22 "	3.78 "
1909.....	49.00 "	3.80 "

To show the difference varying prices make, it is pointed out that the total value of the silver and lead produced in the Slocan in 1909 would be approximately \$225,000 more if calculated at the average prices for those metals obtained in 1906, which were the highest average prices in the five years under notice, than is shown as the result of the calculation at the average prices for 1909. This would appear to make evident the greater reliability of a comparison of quantities of minerals produced in different years rather than of values, since the latter fluctuate, as shown above.

#### Zinc Smelting Problem of Moment.

The early solution of the problem of how to utilize at profit the large quantity of zinc ore occurring in the Kootenay, particularly in Ainsworth and Slocan districts, is of much moment to local mine owners, for zinc is found in considerable quantity in most of the larger mines. Usually it is in association with lead, and in some mines there is also much iron. Indeed, so complex are some of the ores that the separation of lead, zinc and iron cannot be effected by the ordinary water concentration process prevailing throughout the district under conditions and on a sufficiently large scale to make operations in this connection profitable to mine owners. Hence the community of interest and unity of recent action in urging upon the Dominion Department of Mines the great importance of the Federal Government making provision for prolonged object of determining how the zinc ores of Canada can be profitably treated.

Several mining companies operating in the district under notice have already overcome some of the difficulties that earlier were in the way of the zinc content of their respective ores being made marketable, but there are many others, and among them numbers of owners of properties that, so far as yet developed, are comparatively small, whose mining operations are practically at a standstill consequent chiefly upon their inability to profitably utilize the zinc ores, or the zinc content of the silver-lead-zinc ores occurring in quantity in their mines. The chief exceptions are the Lucky Jim Mining Company, which possesses much zinc ore of such a nature as to admit of its being sent to the smelters without having to first be put through any concentration or separation process; the lessees of the Whitewater group; the Ruth Mines, Ltd., and the Van Roi Mining Company. These were the only British Columbia shippers of zinc ore or concentrate as a marketable product during the year 1909. It is probable two or three others will be added to the list in 1910, for both the Payne and Slocan Star have zinc-saving appliances installed in their respective concentrating mills, and it is hoped the Canadian Metal



Company's Blue Bell mill will also shortly produce a saleable zinc product as well as a lead-silver concentrate. The Van Roi Mining Company plans to make provision in the mill it is preparing to build and equip for separating the zinc from the other metal contents of ore from its Vancouver group of mines, and in doing this the management will have the benefit of the experience gained in operating the Wakefield mill on its ores, for the company worked that mill under lease during 1909, and is still operating it, until such time as the Silverton Mines, Ltd., shall require possession of it to treat ores from its Hewitt-Lorna Doone group, in which mine there is also much zinc ore.

The companies and mines named above are but a small minority of those deeply interested in the zinc ore treatment problem, the satisfactory solution of which would result in a transformation as regards the output of ore from Ainsworth and Slocan. That the difficulties now in the way of zinc ores being mined generally throughout the district will eventually be successfully overcome, those chiefly interested are hopeful of. Meanwhile developments of new processes and improvements in old methods of treatment are of almost universal interest to local mine owners, who expect that it will yet be profitable to turn to good account the zinc ores that have heretofore been found a detriment and a loss.

### THE HISTORY OF STEVENS' COPPER HANDBOOK

Written for the Canadian Mining Journal by Horace J. Stevens.

[Editor's Note.—The following sketch was written at the request of the Canadian Mining Journal. The Copper Handbook occupies a unique place in periodical literature. It is almost inconceivable that it is the product of one man's labour. This, however, is literally true. We consider the subjoined history inspiring and interesting.]

Like many other works of reference, the Copper Handbook had a small and most casual beginning. While I have lived in the Lake Superior district since boyhood, I did not locate in Houghton until 1894, and then, as I was writing about the local copper mines, I soon felt the need of reliable data regarding the local properties. This I found to be scattered through a great many different publications, with many a hiatus between. The best works of reference regarding the local mines were the annual reports of the Michigan Commissioners of Mineral Statistics, but this having been a political office, some of the commissioners neglected to issue annual reports, and the statistics were very incomplete.

Finding that there was no work published that would meet my requirements, I began collecting data for myself, and filing same in some sort of system. It occurred to me that a pamphlet, giving bare facts regarding the Lake Superior copper mines, would meet with favour, and the first man with whom I talked over this idea was the late Jas. B. Sturgis, of Houghton. Mr. Sturgis approved of the idea warmly, and suggested that I prepare and print a pamphlet, immediately, embodying this material. I did not feel, however, that the data at hand were sufficiently complete, and continued collecting and collating and filing material.

During the big copper boom of 1898-99, Messrs. Russell and Hornstein, of the Marquette Mining Journal, decided to print a pamphlet on Lake Superior copper mines, and requested me to prepare the historical and

statistical sections. I explained that I was too busy to attend to the matter, and furthermore would be absent, but Mr. Hornstein assured me that, relying upon my collaboration, they already had committed themselves to the printing of such a pamphlet, and in fact had sold about 15,000 copies, before bringing the matter to my attention.

By reason of old friendship, I prepared short historical and statistical summaries for the publishers of this book, writing under great disadvantages, in Boston, while my reference library and files were in Houghton. The publication issued by the Marquette Mining Journal bore the somewhat ambitious title of First Annual Review of the Copper Mining Industry of Lake Superior, making 189 pages, in demy octavo, set in brevier type, of which about 75 pages were written by me, this book being issued in the spring of 1899.

In 1900 I advised Messrs. Russell and Hornstein that I had been gathering matter for six years for a copper



J STEVENS.

manual of my own, and they advised me that they had no desire to issue another edition of the Annual Review of the Copper Mining Industry of Lake Superior, as that work had been sold mainly in quantities, to brokers and promoters. A few weeks later, Mr. Jas. Russell was appointed Commissioner of Mineral Statistics of the State of Michigan, and requested me to act as his deputy and prepare the annual report. This I did, arranging with Mr. Russell that the copper section of this report should be reprinted and copyrighted by myself, individually, as a separate book, and, this being done, the copper section of the report of the Commissioner of Mineral Statistics for 1900 became Vol. 1 of the Copper Handbook.

The exigencies of politics separating Mr. Russell and myself, as his deputy, from the pay-roll of the State of Michigan, after eighteen months only, although the usual term is two years, I prepared, without payment therefor, and Mr. Russell printed at his own per-

sonal expense, a second annual report to the State, but this had no connection with Vol. II of the Copper Handbook, which since 1901, has been an entity.

The first volume dealt with Lake Superior mines only, and its arrangement left much to be desired. Vol. II was put out in somewhat better form as to arrangement of matter, and the two chapters in Vol. I, devoted respectively to idle and active mines of Lake Superior, were consolidated, and, in addition, several short preliminary chapters were given, devoted to the history, chemistry, mineralogy and metallurgy of copper, with a glossary of common mining terms and a chapter devoted to the copper deposits of the world. There also was a chapter, of 13 pages only, devoted to leading foreign mines, and a chapter of 68 pages devoted to American copper mines outside of Lake Superior, while Chapter X included various statistical tables.

With the issue of Vol. III, the work was put into substantially its present shape, though the number of preliminary chapters has been added to since, and all copper mines were treated in alphabetical order, regardless of location. While this plan has serious disadvantages, on the whole it is considered the best system for presenting the descriptions of the various properties. In Vol. III the number of titles of mines was 2231, comparing with 6767 titles in Vol. VIII, the last edition.

The preliminary chapters have been re-written and amplified for several editions, but not for each successive issue, the preliminary chapters in Vol. VIII being the same as in Vol. VII, but the long chapters, devoted to mine descriptions, and that pertaining to statistics, have been re-written for each edition, with the exception of Vol. VII, issued in 1907, in which case the mine descriptions remained unchanged from the previous issue owing to the loss of about half of that year through an unfortunate combination of fire, sickness, surgical operations, and unavoidable absence.

As an average of nearly fourteen months has been required for each edition of the book, all of the work being done by myself, notwithstanding the general impression that I have a large number of assistants, Vol. VIII, dated 1908, was issued only May last, and, in order to catch up with the years, I find that it will be necessary to issue Vol. IX with merely a revision of the statistical chapter, and the addition of a short chapter giving descriptions of new properties, which will be about 1,000 in number. This will not be altogether a satisfactory book, but it seems the only way out of the unfortunate situation in which I find myself placed, as I cannot afford to allow an annual to miss a year's issue, and it will require nearly a year to revise completely the full mine descriptions. All old subscribers will be notified of the shortcomings of Vol. IX before its issue, as was done with Vol. VII, which, for reasons already given, was not up to the usual standard.

The annual average of the world's gold production jumped in the year 1721, and continued abnormally high until 1810. After the latter year it fell to the mark set before 1721. The annual average for the period 1701-1720 was about \$8,520,000. For the period 1721-1810 the world's production fluctuated between \$12,000,000 and \$16,000,000. During this period of 90 years the placers of Brazil were contributing hugely to the world's stock of gold.

## CORRESPONDENCE.

Editor The Canadian Mining Journal,

Sir,—In The "Journal" of February 1st, there was an unsigned article entitled "The Nickel Industry." It would deserve no attention except that it contained certain mis-statements identical with those made on January 19th, before the Mines and Minerals Committee at Ottawa. The Committee now knows that the statements were incorrect.

What is the motive that prompts such inaccurate statements? If accurate information about the industry is desired, it is not difficult to obtain, and will show that the world's annual consumption of nickel is not 18,000 tons; that there is not an agreement between producers to keep up the price of nickel; that the profits of the International Nickel Company are not and never have been \$3,000,000 per annum, and that there is not a combination or monopoly that prevents others embarking in the business.

The article in question indicates that there is some sentimental feeling for the Sudbury nickel deposits, but its false statements, whether made through ignorance or sentiment, are mischievous.

Yours truly,

A. P. TURNER, President,

The Canadian Copper Company, Copper Cliff, Ont.  
February 10, 1910.

Toronto, February 4th, 1910.

Editor Canadian Mining Journal, Toronto:

Sir,—It is with great pain and reluctance that I take up the pen to pass strictures on your evident lack of appreciation of the relative importance of accuracy as compared with piquancy of diction. But the divergences from "Reason's dusty way" are too frequent, and I feel I must call you back. In your last issue, February 1st, p. 67, the amount of land in arrears for taxes and subject to forfeiture in the Kenora and Rainy River District was given you as 86,779 acres, or 45% approximately (i.e., of the area in those districts subject to taxation), whereas the figures printed in that issue were 4,072 acres, or 29%. This is quite a noticeable difference. A glance at the statement published would show that it is incorrect and does not agree with the amount given before as the total area.

I think I know the reason; you have been influenced too much by the advice of the poet quoted below. Could you not in future strike a better balance between accuracy and fancy? The poem is by an unknown, and was suitably illustrated by a representation of a sage and a beautiful maiden, which you can no doubt picture to yourself. Personally, I rather admire your taste for showing a preference to the maiden:

Grau ging und grämlich der Verstand  
Den Weg der Theorie,  
Da nahm ihn lachend bei der Hand  
Die blonde Phantasie.  
Sie zog das Buch aus seinem Rock  
Und schüttelte ihr Blondgelock  
Und war so hübsch wie nie.

Er wollte ihr zürnen könnt' es nicht  
 Sie schien so wunderbar  
 Er sah ihr kindlich Angesicht,  
 Und strich ihr übers Haar  
 Und leichter rascher ward sein Schritt,  
 Sie zog ihn nach sie zog ihn mit  
 Bis er am ziele war.

This has been translated by Dr. Ellis as follows:—

With weary footsteps Wisdom trod  
 In Reason's dusty way,  
 When Fancy, with alluring nod  
 Once tempted him away.  
 Laughing, she snatched away his book,  
 Her golden curls she gaily shook,  
 Ah, who so fair as she!

Who could resist such winning grace?  
 Her beauty charmed his soul.  
 He gazed into the childlike face,  
 His arm about her stole.  
 And lo! his weariness was gone,  
 She led him up, she led him on  
 Till he had reached the goal.  
 Yours, etc.,

G. R. MICKLE.

**CANADIAN PATENTS.**

The following is a list of Canadian patents granted on Jan. 25, 1910, relating to mining and metallurgy, and furnished by Fetherstonhaugh & Co., 5 Elgin St. Ottawa, Canada, Russel S. Smart, resident, from whom all information regarding same may be obtained:

123345. W. H. Gregg, Cambridge, Ohio, safety apparatus for mine railway.

123360. A. R. Freedmann, Piqua, Ohio, shaft braces, The Pioneer Pole and Shaft Co.

123370. H. W. Bresler, Charlottenberg, Germany, processes of producing metallic tungsten.

123412. A. S. Dwight, New York, apparatus for roasting and suntering ore.

123428. W. Hancock, Township of Snowdon, County of Haliburton, Ont., composition of matter to be used for the purpose of a high explosive.

**RESOLUTIONS ADOPTED BY THE CANADIAN COMMISSION OF CONSERVATION.**

Resolution respecting waters and water-powers, adopted at the annual meeting, January 18-21, 1910:—

That in future no unconditional titles to water-powers should be given, but that every grant or lease of powers should be subject, among others, to the following conditions:—

- (1) Development within a specified time.
- (2) Public control of rates.
- (3) A rental with the power to revise same at a later period.

**Resolutions of Executive Committee.**

At a meeting of the Executive Committee of the Commission of Conservation on February 2, 1910, the following resolutions were adopted:—

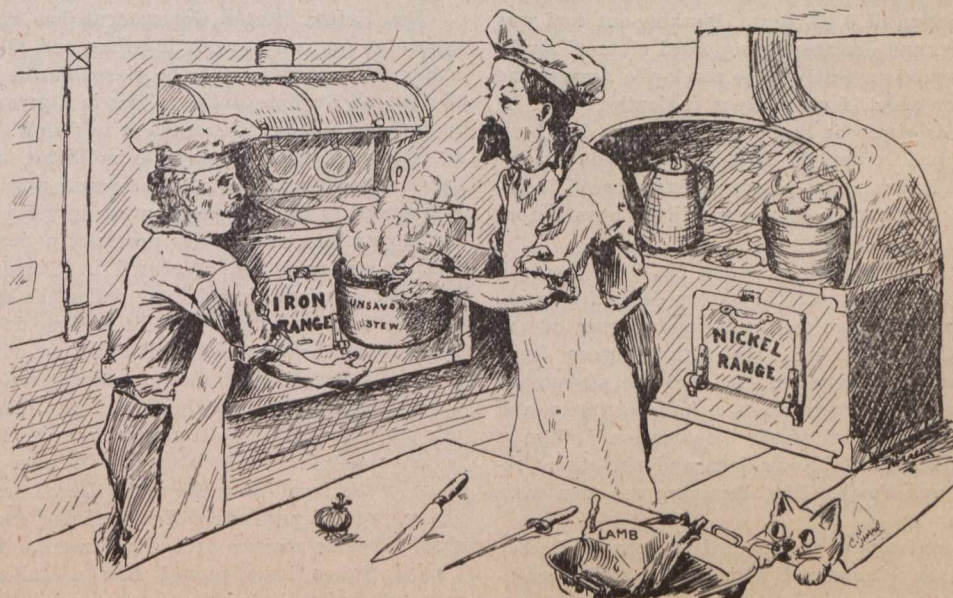
1. That a memorial be prepared and submitted expressing the opposition of the Commission to the proposition to dam the St. Lawrence at the Long Sault, or to any similar proposition involving the construction of a dam across the St. Lawrence.

2. That the meeting records its opposition to the export of power at Fort Frances being authorized by the Government.

**PERSONAL AND GENERAL.**

Messrs. Webb and Cooke, power specialists and industrial engineers, have taken offices at 338 Ellicott Square, Buffalo, N.Y.

Due to fast-increasing business, both the Chicago and Baltimore branches of the H. W. Johns-Manville Co. have outgrown their present quarters, and about March 1st both will move to new locations, with more room. The Chicago branch, now on Randolph Street,



PERSONAL RATHER THAN GENERAL.

will move to the four-storey-and-basement building at Nos. 27-29 Michigan Avenue, located in the block between South Water and River Streets. With 32,500 square feet of floor space, offices, store, and stock-rooms will all be under one roof, with ample room for all. A full stock of J-M products will be carried, thus assuring prompt shipments. The Baltimore office, store and warehouse will be located at No. 30 Light Street. Here the company will have considerably more room than before, and will keep on hand a large stock of J-M products, and will be in much better position than ever to give all orders prompt attention.

Mr. J. J. Harpell has returned to Harrow, England.

Mr. P. N. Nissen is in Toronto.

Mr. A. B. Willmott has moved from Sault Ste. Marie to Toronto, where he will have his headquarters for some time.

Mr. H. P. Davis is to address the Canadian Club, New York, on the evening of March 8th. The subject chosen is "The Development of Mining in Northern Ontario." Mr. Davis has arranged for a display of typical specimens from Cobalt, Porcupine and Gowganda.

#### BOOK REVIEWS.

**Metal Statistics, 1910.** Published by the American Metal Market Co., 81 Fulton Street, New York. Price 50 cents.

In this little annual are many useful statistics. Figures of production, price fluctuations, etc., are given for

iron, steel, copper, tin, spelter, lead, antimony, gold and silver. Many other serviceable data are included.

**The Mining Manual 1910.** By Walter R. Skinner. Price \$5. For sale by the Canadian Mining Journal.

We have given frequent notices of this invaluable manual. It is too well known to require more than brief mention for its new edition. Those of our readers who are unacquainted with the book will be surprised to learn that it contains particulars of 3,600 mining companies operating in all parts of the world.

To the consulting mining engineer Skinner's Manual is particularly necessary.

**The Colliery Manager's Pocket Book, Almanac and Diary for the Year 1910.** Edited by Allan Greenwell, editor of *The Colliery Guardian*. Published by the Colliery Guardian Co., Ltd., 30 and 31, Furnival Street, Holborn, London, E.C. Price \$1, \$1.25 and \$1.50, according to binding.

For forty-one years the Colliery Manager's Pocket Book has made its annual appearance. In addition to an almanac, a very convenient diary, cash account, blank memoranda pages, etc., etc., much general information and statistics are presented. On such subjects as rescue work, estimation of noxious gases, and other pertinent topics, special articles are given. Numerous working formulae, tables for calculations, surveying data, have been included. Careful editing and selection are apparent.

The exceedingly moderate price of the volume puts it easily within the reach of all. Its usefulness is beyond question. The imprimatur of the *Colliery Guardian* goes far towards assuring the merit of any publication.

## SPECIAL CORRESPONDENCE

### NOVA SCOTIA.

**Glace Bay, Feb. 15.**—The Dominion Coal Company's output for the first half of February amounted to 105,000 tons, being a daily average production of 8,800 tons. Banking-out coal was commenced in January, and despite the supposed state of strike it is expected to accumulate a fairly large stock-pile against the opening of navigation, which from present indications will be earlier than usual. The river ice in the St. Lawrence has been very light this year, and so far no drift-ice has made its appearance on the Cape Breton coast. Persons experienced in St. Lawrence navigation predict that the river will be open before the middle of April.

An accident which happened at Dominion No. 2 on the 14th proved once more the usefulness of the safety detaching hook. Owing to the loosening of a pin in the reversing gear of the Phalen man-engine, the descending cage with eighteen men aboard was dropped without proper control into the pit-bottom, while the ascending cage was drawn up into the head-frame, and safely suspended by the operation of the "butterflies." Two of the men in the cage sustained broken legs and six others received slight injuries and shock. The remaining ten men were uninjured.

The regular work of training at the Coal Company's Rescue Station has been seriously interfered with by the strike conditions, but the work has been resumed under the more normal conditions now existing. The company has just added to the equip-

ment of the station twenty of the Hubbell type electric hand-lamps. Lamps of this type have been in use at the station for about two years past, and have proved satisfactory and durable.

The United States Government has recently ordered that apparatus for rescue work in mines and all the accessories connected therewith are to be placed on the free list and exempted from all Customs duties. This is a precedent which it would be well for our own Government to follow. Under a special Order-in-Council the duty payable under the tariff has been remitted in several instances on mine rescue apparatus, but at present it is necessary to make payment of duty charges on imported rescue apparatus—and it is necessarily imported, because no such apparatus is manufactured in Canada. Rescue apparatus for work in mines should come under the same head as fire appliances for fire brigades, or life-saving devices for humane societies, but the Customs authorities do not take this view. It is to be regretted that the coal-mining industry of Canada has not a representative in the House of Commons, who could lay this and many other matters which relate to the welfare of the industry before our legislators. Of some learned professions, notably the legal profession, the Legislature contains a superfluity, but the profession of the mining engineer is conspicuous chiefly by its absence from Parliament. Recent events in the United States have proved how useful and necessary some form of oxygen breathing apparatus is after a mine explosion. In most of the civilized countries of Europe—and in some that

we might here regard as more or less uncivilized—the provision of rescue apparatus at coal mines is made compulsory by law. This is not yet the case in Canada, although several requests have been made of late by coroner's juries that the same rule should obtain here. However, it would seem that the least the Federal Government could do to encourage the provision of these very necessary appliances is to exempt them from Customs duties. Any doubts which may arise as to the necessity and usefulness of oxygen rescue appliances can easily be dispelled by a perusal of the recent report of the British Royal Commission on Mines, which deals with this subject.

Another matter which is more open to opinion is the question of Provincial certificates of competency for mine managers and under-officials. At the present time each coal-mining Province will recognize only those certificates of competency which are issued in that particular Province. The Nova Scotian manager who goes to Alberta must sit again for an Albertan certificate, and so in every other coal-mining Province. It is to be feared that in many instances the granting of Provincial certificates is not in accordance with the best ethics of the mining profession, and this is so well-known that it is not necessary to particularize. Would it not be possible to issue certificates of competency from a central examining board under the direction of the Federal Government assisted by the faculty of the large Canadian universities? The examination would be a rigorous one, safeguarded by the usual qualification of experience underground and proper technical training, and possibly the application of such a certificate would need to be supplemented by a certain length of residence in the Province where it might be used. The present rate of expansion in the coal-fields of the West is going to drain the eastern mines of qualified men, and at the same time there is reason to believe that the eastern mines will before long see a great development. The free exchange of competent men from one Canadian Province to another should not be hindered by Provincial laws, unless there is very good reason for them, nor should the exigencies of the moment be allowed to bring into disrepute the value of certificates of competency.

**The U.M.W. vs. the N. S. Coal Operators.**—Mr. J. R. Cowans, the General Manager of the Cumberland Coal and Railway Company, and Mr. Alex. Dick, the General Sales Agent of the Dominion Coal Company, were committed to the Supreme Court in Halifax on a charge of conspiracy to limit the facilities for producing coal in Nova Scotia, to lessen competition and to unreasonably enhance the price thereof. The suit was brought against the two gentlemen named by a nominee of the United Mine Workers of America, and the costs of the prosecution have been paid by that organization. The magistrate refused to make public his reasons for his decision. It is probably sufficient for the public to know that this prosecution was instituted by the U.M.W. against representatives of the two coal companies at whose works the U. M. W. have called a strike. It is interesting to note in this connection that Mr. Tom Lewis the President of the U.M.W., is said to have made the remark at the Toledo Conference that the miners of the United States must have higher wages, and that if the price of coal was too low to give the operator a working profit, the price of coal must be increased. This is good logic in the United States, and it is good logic in Nova Scotia. The organization which sanctions a special reduction in the wage scale of United States coal mines in order to enable these same mines to compete with Nova Scotian coal in the Montreal market, while at the same time it calls a strike in Nova Scotia for higher wages and shorter hours accompanied by the prosecution above referred to, would seem to be run more in the interests of the American coal operator than in the interests of the miner either here or in the United States.

## ONTARIO.

**Kenora.**—A meeting of the Prospectors' and Mine Owners' Association of the Kenora Mining Division was held on Tuesday, February 8th, at which a report of the By-law Committee was accepted. Amongst the new by-laws for the association the most important was that one making the dismissal of any member who made use of the association for wild-cat schemes compulsory. Its wording was:—

“Any member using the association for fraudulent purposes by false reports or otherwise shall be summarily expelled on a two-thirds vote at a special meeting called for the purpose.”

The next important was that which called for the election of members by ballot.

Formerly the nomination of an applicant was all that was necessary for membership; however, the members saw the necessity of preventing the admission of persons of questionable business morals and adopted this by-law requiring each application for membership to be voted upon before such applicant could become a member.

These two by-laws show that the association is determined by every means in its power to prevent any wild-cat schemes in this district.

Mr. R. B. Nickerson, Manager of the Laurentian Mine, has been to the Mikado and made an examination of the surface workings and as much of the inclined shaft as he could. In his opinion the prospects were sufficiently good to warrant the pumping out of the mine, which work has been undertaken and is now in full swing, so that the end of the week should see it completed. Another examination will then be made and if satisfactory, work will be commenced at once, as we understand the necessary capital has been subscribed.

The report of a remarkable strike comes from Dryden, where an old prospector claims to have struck a four-foot vein heavily loaded with free gold. Several other claims have been staked on the same head and a good deal of work is going forward there at present.

**Cobalt.**—The big Temiskaming mill is practically completed and as soon as the power is ready it will start running. The rock-breaking end of the concentrator has been built next the head frame and is distant from the main part of the mill several hundred feet. The crushed ore will be transported to the concentrator by an aerial tramway, where it will be sized and then passed over the jigs. Some time ago a test was made on a carload of Temiskaming ore at the Trout Mills concentrator, and it was found that about 65 per cent. of the total silver contents could be extracted in the jigs. The management estimates that there is a year's supply of milling ore on the dumps and two years' supply in the mine above the 350-foot level. The shaft has now been sunk to a depth of 420 feet and a station is being cut at the 400-foot level. The vein dipped from the shaft to the east and a cross-cut will be run from the lower levels to cut it. Winzes have been sunk from the 300-foot level and the ore in the bottom is good. The annual meeting, which is to be held in Toronto shortly, will probably give rise to a good deal of discussion among the shareholders. Several large holders of stock in Buffalo have organized to send delegates to the meeting and have sent out circular letters to other shareholders asking them to organize in a similar manner and also send delegates. The object is to protect the interests of the shareholders and to obtain all the information possible about the affairs of the company. The low level that the stock has gone to lately has caused considerable uneasiness among its holders.

Several petitions have lately been circulated in Cobalt and the outlying districts with the object of trying to obtain a legal eight hour working day in the mines of Northern Ontario. It has been stated that few western miners would stay in this camp on account of the long hours worked. One or two of the mines work eight hour shifts, while several work nine

hours, but in the great majority of the mines a ten hour shift is worked. When these petitions have received a sufficient number of signatures they will be forwarded to the member for this district, who, it is expected, will bring the matter before the Legislature. For some time past there have been underground rumours of a strike among the miners next summer. This would be an unwise move on the part of the union, which is not in so good a shape as when the last strike was called. The Mine Managers' Association, which was responsible for the miners being defeated last time, is exceedingly well organized and can be depended on to put up a strong fight in the event of such a contingency.

Some time ago it was stated that the Buffalo had recommended work in an old drift that had been in the Keewatin when stopped. After a few rounds had been taken out the drift went through into the conglomerate again, and it was found that the Keewatin was simply an intrusion and that the valves reappeared in the vein in the conglomerate. Drifts have been run on the vein for over 200 feet in this new conglomerate area and the silver contents were found to be as high as ever.

During the month of January there was shipped from the Cobalt camp a total of 67 cars of ore, aggregating 2,054 tons. As compared with the same month the previous year, the shipments were about 400 tons less, but there are three more properties that are shipping concentrates, and this, though it cuts down the tonnage, raises the silver contents. One of the most interesting features of the shipments is the output from Gowganda, consisting of three cars, aggregating 92 tons. One of these cars, from the Reeves-Dobie, is stated to have been one of the richest ever shipped out of Northern Ontario. This district is beginning to make good and although it will never realize the extravagant promises that were made for it, a better attitude towards that country may be looked for. During the month the O'Brien shipped its first lot of bullion, amounting to 29,000 ounces.

The engineer sent up by the Dominion Government to look into the damage done by shooting out the falls in the Frederickhouse River, reports that navigation in the bodies of water affected is hopelessly ruined. Father Paradis, one of the pioneers in the country, cut through the falls in the river, and this caused the water in Frederickhouse and Night Hawk lakes to be lowered about eight feet. The engineer states that he does not consider the Dominion Government to be in a position to take any action in the matter.

As the result of a conference between the Mine Managers' Association of Cobalt and Mr. E. T. Corkill, provincial inspector of mines, it has been decided to petition the Dominion Government to order an inspection of all dynamite, fuse and caps used in the province. This action was determined by the alarming number of accidents that have been occurring in the mines. It was decided to petition the Dominion Government in preference to the Provincial as the former is in a much better position to carry out tests. A great many of the accidents from explosives can be traced to the use of gelignite. This blasting compound is entirely untrustworthy in cold weather as it is particularly sensitive when it is frozen. The advantage in using it lies in the fact that it is much more powerful than common dynamite and is comparatively free from noxious gases when exploded.

The Nipissing Company is again working its famous 49 vein that was at one time the wonder of the camp. Development on other portions of the property are also very satisfactory, especially at No. 64 vein, which is a continuation of one of the Hudson Bay's main producers. When this vein was first encountered it showed thirty inches of ore that would run 2,000 ounces. Although the vein as at present opened up does not show this width there is a large body of high grade ore that will aid materially in helping to swell the resources of the company. The Nipissing is in an enviable

position as regards resources, and has an immense territory, a large portion of which is as yet practically unexplored.

The Bartlett mines will be completely reorganized and work resumed in a short time. The stockholders who actually paid cash for their stock will be recognized, but others will not. This property will at last have a chance to make good, although it is handicapped by an excessive capitalization. When work was stopped the main shaft was down about 115 feet. The vein left the shaft at about 40 feet, and when the cross-cut was run from the bottom of the shaft to cut it the values were found to be very low. However, there are other good showings to be opened up and the rest of the property is practically virgin ground. The Blackburn mine has shipped another carload of high grade ore aggregating twenty tons. Negotiations have just been concluded for one of the most important options ever given in the Gowganda district. An English syndicate has taken an option on the Morrison claims, which are owned by the Northern Mining Company. The option is for only a fifty per cent. interest and the price to be paid if the option is taken up is \$200,000. The syndicate is to spend \$100,000 in developing the property, which has one of the most sensational surface showings in the north country. The present owners do not receive anything unless the option goes through, as the \$100,000 is to be spent entirely on the property.

In diamond drilling toward the Drummond boundary the Crown Reserve cut two new veins at a distance of 190 and 420 feet, respectively, from the No. 2 cross-cut. The core showed native silver and a large extent of mineralized area. The veins were cut about 150 feet below the surface.

The White Reserve Mine, in Maple Mountain, has cut veins Nos. 6 and 21 in a cross-cut at the 140 foot level. Another dividend of 300 per cent. has been declared by the T. & H. B., this making the second for the year. Up to date this company has paid a total of 15,700 per cent. on an issued capital of \$7,761.

**Porcupine.**—Interest in this district received a great impetus when it was learned that the Timmins had taken up their option on the Hollinger-McMahon properties in Tisdale township. The first payment of \$15,000 has been made and the total purchase price is \$300,000. Already a plant has been ordered consisting of two 60 horse-power boilers, two hoists, a five-drill compressor, drills, etc. The main shaft is down forty-two feet and a drift is being run on the vein which shows free gold at that depth. When the machinery is installed the shaft will be sunk to a depth of 100 feet before any work is done. The fact that this option has been taken up will have a very beneficial effect on the district and many sales have been reported. As a general thing, however, the prices at which the claims are held are ridiculously high, but in the spring a more normal state of affairs may be expected and more properties will probably change hands. Additional discoveries of free gold are being reported constantly, but in the majority of cases these rumours may be heavily discounted. A good deal of trouble has been experienced by prospectors on account of thieves stealing their supplies, which is a very serious matter in a country such as that. In some cases camps were broken into and everything portable stolen. Some provincial constables have been sent up lately and matters have much improved. By an order-in-council the Provincial Government has withdrawn all lands under Night Hawk Lake, Frederickhouse Lake and all the lakes adjoining the townships of Whitney, Tisdale and Mountjoy. The Government has also provided for a right-of-way for a branch line from the T. & N. O. should the conditions in Porcupine warrant it, and by an order-in-council the surface rights over a right-of-way 99 feet wide have been reserved.

#### BRITISH COLUMBIA.

**Rossland.**—The situation here remains about the same as it was as the year was ushered in. The mines are working stead-

ily and shipping an average tonnage with the possible exception of the Velvet, which cannot ship at present owing to the snow having melted from the road.

The report of the Le Roi Mining Co. for the fiscal year ending Sept. 30th, 1909, has come to hand, and shows a small profit despite the adverse conditions under which the property was operated for a period of the time reviewed. The amount of ore shipped by the mine to Northport smelter during the part of the year that it was operated amounted to 26,935 tons, which carried an average of .642 ounces gold, .33 ounces silver, and .85 per cent. copper. The report shows that the cost of mining, including depreciation on its large plant and considerable development, was \$9.21. Smelting and realization was \$6.02 per ton. It may be pointed out here that this is \$4 or \$5 higher than the average cost of mining at the Le Roi when working full force, and was caused by the property only being worked a part of the year and then not shipping heavily. For instance, in 1907 the figures ran \$4.04 and \$5.98 respectively. For the year in question £20,712 7s 1d was written off for exploration and development; £10,378 8s 4d for depreciation on machinery, plant, etc., and £2,935 13s 4d for sundry items, making a total of £34,026 8s 9d. The amount carried forward to the credit of profit and loss is £79,331 6s 10d, so there is a surplus of assets over liabilities of £29,758 6s 3d, and this is exclusive of mine and smelter. The Le Roi Company is handling a difficult and perplexing condition of affairs in a commendable manner, and it is hoped that the results of the energetic campaign that is being waged will be such that the company will be placed in a much better position than it enjoys at present. During the first five weeks of the year the Le Roi has shipped nearly 2,000 tons of ore to Trail smelter, and diamond drill exploration on the lower levels has been in steady progress—lately with two machines, one having been laid off a while ago. Two feet of \$85 ore has been opened up on the 600-foot level and a three-foot shoot on the 1200-foot level.

Work on the Mayflower, in the South belt, which is under lease, has disclosed some good shipping ore, and the lessees will make a small shipment to Trail smelter in the near future.

**Boundary.**—The ore shipments from the Boundary district are close to the 200,000-ton figure for the first five weeks of the year, the Granby, Mother Lode, Snowshoe, and Oro Demoro being the principal shippers.

At the Rawhide mine of the New Dominion Copper Co. good results are being obtained in the diamond drilling and preparations are now being made to begin shipping shortly. Buildings, crushers, conveyors etc., are being arranged so that the ore can be handled at least possible expense. It is proposed to do some diamond drilling on the Brooklyn mine of this company as soon as the work has been driven to the desired point on the Rawhide.

Permission has been granted to the liquidator of the Dominion Copper Co. to call a meeting of the creditors. The application of the agent of the New Dominion Copper Co. to have the liquidator discharged has been set aside. The application of the liquidator to be permitted to take action against the directors of the company in the Supreme Court of New York was held over. It is to be hoped that the affairs of the old company will in the end be equitably adjusted. It seems that the liquidator is doing all he can toward this end and just now is making good headway.

The B. C. Copper Co. is going to try and place a profit-sharing scheme before its employees, in an effort to do away with labour dissatisfaction. This plan is now being worked by several large corporations on this continent with success and it is thought that it would steady conditions locally to some extent. Stock in the company at a low enough price to warrant a good return on the investment may be offered, or else a sliding

scale of wages will be adopted, which will work to a finer degree than the sliding scale now in force, which only covers "abnormally unfavourable," "normally favourable," and "abnormally favourable" metal mining and marketing conditions. The Conciliation Board is sitting in Greenwood this week to adjust the existing difference between the company and its men. The annual meeting of the company will be held in a few days at Charleston, W. Va., when it is expected that action on several important matters will be taken and a probable change made in the directorate.

The compressed air plant is working at the Greenwood-Phoenix Tram. Co. tunnel and 22 men are employed. Driving will be continued now at the rate of about 12 feet per day.

**Nelson.**—It is rumored that something is likely to be done to further develop the rich iron deposits controlled by the Canadian Pacific Railway east of Kitchener. Over \$50,000 has already been expended on these deposits. Several Crow's Nest capitalists have had a steel plant in mind for this section of the country for a year or two, and it is highly probable that their plans will be realized at no late date.

One of the Spokane shareholders in the Sullivan Group Mining Co. is suing that company for the return of \$500 that he paid for stock in 1906. He alleges that the company's financial statement was fraudulently prepared, and that instead of having a cash deposit of \$9,000, an operating profit of \$138,000, and a net gain of \$102,000, that the company was bankrupt. The events of the last 18 months would appear to bear out this contention for the affairs of the company are in poor form. The mine is now being operated under lease and option to the Consolidated Co., and has shipped 435 tons of ore in the last two weeks.

At the convention of the Associated Boards of Southeastern British Columbia, recently held in Nelson, the following resolutions which affect the mining industry to a greater or less extent, were adopted: Government operation of telephones; that the Dominion of Canada purchase gold and silver for coinage from the Trail refinery on the basis that the United States purchases through its assay offices; that the Dominion of Canada coin silver dollars; for a uniform Canadian boiler inspection act; that the Department of Mines conduct experimental work toward determining the practicability of economical treatment of the zinc ore of this district; that the Provincial Government abolish the personal property tax.

Everyone who has ever had to handle some of the filthy one dollar bills that are circulating in this country is in favour of the coinage of silver dollars, and, of course, this would help the silver mines of the Dominion to some extent. Canada certainly should have a uniform boiler inspection act. The existing conditions are more or less of a farce, the thing having gone altogether too far in some of the Provinces. The regulations in British Columbia, and particularly in Alberta, not only work a hardship on the manufacturers but on the mine owners as well, and the general feeling in the matter among mining men of prominence here in the west is that the thing has got to be made uniform and rational.

**Vancouver.**—In view of the bright outlook for the Coast mines this year an American syndicate has taken over the old Van Anda smelter and will fit it up to treat a tonnage of 150 tons per day. A new oil-burning process is planned.

It seems a foregone conclusion that the Ingenica and Manson-Slate Creek districts are not what is generally termed "a poor man's district." Several hundred samples taken by one prominent hydraulic miner in that district show the ground to carry \$2.65 per yard and over, exclusive of values that might be contained in the black sand content.

It looks as though the coming spring and summer would see wonderful activity on Vancouver Island, the Queen Charlotte Islands, Portland Canal, Telkwa, Babine, and others of the new north-western districts.

## GENERAL MINING NEWS.

### NOVA SCOTIA.

**Halifax.**—The Dominion Antimony Mines, West Gore, Hants County, are being worked for English interests. The old dump is being concentrated. Little more than pumping is being done, so far as the mine is concerned. Picked ore from this property contains \$40 or \$50 in gold to the ton.

**Halifax, N. S., Feb. 18.**—The announcement was made at Glace Bay to-day that D. H. McDougall, Superintendent of Mines of the Steel and Coal companies, has been appointed assistant general manager from this date.

J. H. Plummer, President, and C. S. Cameron, Comptroller of the Steel and Coal Companies, left Sydney yesterday for Montreal, and will be absent about a week or ten days.

### ONTARIO.

**Port Arthur.**—Silver ore is being bagged at the Porcupine mine. Twenty men are working and more are to be hired immediately.

**Cobalt.**—Assessment Commissioner Frank Kennedy estimates the present population of Cobalt at 5,500, and in a statement of the town's finances, estimates the town debt at \$122,000; assessable property and income, \$1,484,376. The estimated revenue last year was \$58,887, expenditure, \$59,662. The total assets are \$1,554,000, while the taxes in arrears amount to \$25,000.

**Cobalt.**—The Watts property on Cross Lake have just completed another shipment of ore. It consisted of 21.6 tons of concentrates and high-grade, slightly richer than the average run from the mill.

**Cobalt.**—February 22.—In spite of the inadequate power at the Savage mine, two new veins have been cut in the last month's work and progress has been made in the process of converting the property from a prospect into a mine.

Two days ago No. 5 vein was cross-cut 26 feet north of No. 4, and some time ago No. 4 vein was struck in the first cross-cut run from No. 3 vein. Both veins have been opened up since the beginning of the year. All three veins, Nos. 3, 4 and 5, run parallel. No. 4 is 44 feet distance from No. 3, and No. 5 is 26 feet north of No. 4. At the 85-foot level, No. 4 is 2½ inches wide and No. 5 is about an inch wide. Both veins carry about 1,200 ounces average, and there is a considerable amount of milling rock on either side of the vein. As these two veins appeared on the surface, as merely fissures with no values, the discovery of ore in them at depth is very satisfactory. Four more fissures, identical with No. 4 and No. 5, appear on the surface, and under the circumstances, it is extremely probable that these will also make ore at depth.

The sorting plant at the Savage is completed and only waiting for the power. It consists of a jaw crusher, an elevator, a sizing trommel and for the fines, a Wilfley table, for the next two sizes, hand sorting tables. It is estimated that it will treat 75 tons a day and the tails will only run about 15 ounces.

### ALBERTA.

The annual meeting of the shareholders of the Western Coal and Coke Company, was held yesterday, when the following directors were re-appointed: E. B. Greenshields, Senator Mackay, J. B. Ferguson, Charles Fergie, H. A. Lovett, J. McConnell, G. B. Woods, J. N. Lake and J. E. Woods. The managing director, Mr. Charles Fergie, reported that development work was making rapid progress, and that the mine would be in a position to produce 800 to 1,000 tons a day by the end of the year, also that the coal was of excellent quality and had

recently been tested by the Canadian Pacific Railway Company on their engines with satisfactory results.

At the subsequent meeting of the directors, Mr. J. B. Ferguson who had held the office of president for the past two years, resigned the office owing to ill-health, and the fact that he would be somewhat out of touch with the head office, as he now resided at St. Catharines, Ont. Mr. Ferguson nominated M. E. B. Greenshields, who is largely interested in the company, as president. Mr. Greenshields was elected by unanimous vote, and Hon. Robert Mackay and J. B. Ferguson were elected vice-presidents. Mr. Chas. Fergie was re-appointed managing director.

### BRITISH COLUMBIA.

**Portland Canal.**—Mr. Joseph Perrault, a veteran prospector, has bonded the O. H. fraction in Portland Canal district to a Victoria syndicate for \$75,000. The property adjoins the group of the Portland Canal Mining Company. It is said to have several large ledges of silver-lead ore. The Victoria syndicate will start development work early next month.

**Victoria.**—Mackenzie and Mann have apparently worsted the C. P. R. in a move for the Dunsmuir coal mines. Before May 1st the mines in all probability will become the property of the Canadian financiers, who have developed such wide interests in this country in the past few years. A C. P. R. option has expired and now the other interests have but to make good to acquire the whole of the coal fields with the mines now working.

It is said that Mackenzie and Mann are backed up in this latest enterprise to which they have turned their attention by no less a financier than J. P. Morgan, and the alleged interests of J. J. Hill. To such an extent is Morgan allied with the proposition that it is said that the \$11,000,000 which Mr. Dunsmuir is to receive is to be paid over in actual cash.

The acquisition of the mines is to be followed by further extensions. The output is to be increased very materially just as fast as the work can be done. There is also included in the scheme of development on this coast, the erection of steel works which will provide for a considerable output from the mines, and at the same time develop the resources of the province.

The expenditure is further developing the mines and accessory enterprises will, according to the plans in view, represent an expenditure of an additional \$5,000,000 or more. At the present time Mackenzie and Mann are developing from small beginnings, a smelter near Port Arthur, on Lake Superior, a smelter, which those qualified to understand, say will be one of the best of its kind in America within a short time. The intention of the firm is now to enter the field on the Pacific coast and build up a vast enterprise.

Some months ago, in a newspaper interview, D. D. Mann stated that if no such works were provided here before he and his partner became factors on the coast, they would erect one. Apparently the opportunity has presented itself to this firm sooner than they expected, and the work will begin almost at once.

It has long been known that the C. P. R. was willing to acquire Mr. Dunsmuir's coal mines. It is believed, in fact, that that company regarded them as destined eventually to come into their possession. Procrastination on the part of the directors, however, although at times the dealings went so far as obtaining options, resulted in the prize passing from their hands and the acquisition of it by rival financiers.

**Phoenix, Feb. 8.**—The Granby mines at Phoenix, shipped 112,458 tons of ore to the Granby smelter during the month of January, which is the largest output of the mines in any one single month. This tonnage forced the ore receipts at the



Granby smelter up to the high-water mark of 115,084 tons, of which amount 2,626 tons were from foreign properties.

During the month of January about 108,000 tons of ore were treated at the Granby reduction works, an average of about 3,500 tons per day. Only six furnaces were in operation during the greater part of the month.

The ore receipts at Granby smelter for January were as follows: Granby mines, Phoenix, 112,458 tons; Snowstorm, Coeur d'Alenes, 958 tons; Belcher, Republic, 1,220 tons; Duluth, Toroda, Republic, 10 tons; Copper King, Republic, 53 tons; Ben Hur, Republic, 112 tons; Lone Pine, Republic, 21 tons; South Republic, Republic, 21 tons; Arlington Slocan, 20 tons.

## COMPANY NOTES.

### PETERSON LAKE SILVER COBALT MINING CO., LIMITED.

Toronto, Feb. 15th, 1910.

To the Shareholders, Peterson Lake Silver Cobalt Mining Co., Limited:

Gentlemen:—Since the last report to shareholders, made on November 27th, 1909, the Board of Directors under authority given them by the special meeting of shareholders of October 6th, 1909, have pressed on to trial the several actions that were then pending against the Messrs. Steindler and Mr. Jacobs and against the Nova Scotia Mining Co. After the trial of the first action had proceeded for some time the company's claims against the Messrs. Steindler and Mr. Jacobs were settled by the payment over by these parties to the company of \$50,000, together with \$3,000 towards the company's costs and by the return of 160,000 shares of stock to the treasury. This settlement of the matter was made upon the very strong recommendation of the presiding judge, who, in fact, assisted in it to the extent of acting as arbitrator upon the question of the amount of stock to be returned. Your directors were also much influenced in making this settlement by the advice of counsel. While it may seem a very modest return to be made to the company for the large amount of the company's stock that was improperly issued out of the treasury, yet your directors felt that it was their duty to give great weight to the consideration that too exacting demands would mean prolonged litigation involving retarded development and the risk of all the chances attending a battle through the courts. The settlement arranged has been carried out and your directors feel confident that while some individual shareholders may be disappointed who bought shares in the company in the expectation of a rapid rise on the market as a result of the litigation, yet the great body of shareholders who bought their stock on their faith in the company's property and who have continued to hold it in the expectation that with honest and competent management the shares would become intrinsically of much increased value, will agree that the action of the Board was in the best interests of the company and a business-like arrangement of a situation that gave serious concern to the many experienced and conservative men interested in the company's welfare.

The action of your company against the Nova Scotia Silver Cobalt Mining Co. was tried on the 20th day of January, 1910, and argued on the 1st day of February, 1910, and is now standing for judgment. The Nova Scotia Co. during the progress of the trial conceded their liability to pay to this company a 25 per cent. gross royalty instead of 25 per cent. net as had prevailed under the old management. This basis will apply to former shipments as well as to the future.

The result of the litigation apart from the claims against the Nova Scotia Co. is that the company will have a sum in the neighbourhood of \$58,000 in the treasury in cash and the return to the treasury of 160,000 shares of stock, making a total of shares in the treasury at the present date of 598,180 shares and 2,401,820 shares in the hands of the public. The treasury stock alone at the present market value would realize

to the company \$149,795, but the present management have not found it necessary so far nor is it their intention to encroach on this reserve.

Your president has, in view of the discovery of rich ore in the Little Nipissing lease (the vein of which has a strong indication of running into the Peterson Lake unleased lands), called for the sinking of a shaft on the island in the Peterson Lake Co. property midway between the shaft of the Susquehanna Mining Co. and that of the Union Pacific Mining Co., to a depth of 150 feet, and feels that in view of the latest developments that there is a strong possibility of finding the Little Nipissing ore body on sinking and drifting from this shaft and your directors now feel that it is time for the Peterson Lake Co. themselves to develop their own ground.

The Little Nipissing Mining Co. have uncovered a very rich vein, and on the first day of February last the Peterson Lake Co. shipped a car of ore consisting of 199 sacks of first grade and 509 sacks of second grade ore, which ore has been shipped to the O'Brien Smelter at Deloro, Ontario, for treatment. The Peterson Lake Co. are entitled to 25% of the gross proceeds from this car of ore and from all indications on this lease another car of ore will be ready within a very short time. A contract is at present in consideration for the shipment of a car of screenings the result of development on the Little Nipissing lease to a New York smelting firm, and this ore will be shipped in the name of the Peterson Lake Co. The Little Nipissing Co. have sunk their shaft to a depth of 165 feet and have made drifts covering a distance of 1,819 feet all at an expense of about \$62,186, which ultimately must enure to the benefit of the Peterson Lake shareholders.

The Susquehanna Mining Co., who are operating and developing block A, B, C, and D, Lot 14, of their leased ground in Peterson Lake have sunk their main shaft 200 feet and have done drifting in all 490 feet and have spent in the neighbourhood of \$37,058 up to this date, all of which must eventually enure to the benefit of the Peterson Lake shareholders.

The Kerry Mining Co. have done shaft sinking amounting to 393 feet and have done drifting work covering 1,187 feet and erected a plant, etc., all at an expense of over \$74,688, which also must enure to the benefit of the Peterson Lake shareholders.

The Gould Consolidated Co. have done about 200 feet of shaft sinking and over 200 feet of drifting, but at present, on account of the lack of power, have stopped their work, which will no doubt be resumed with more vigor when power is installed.

The Union Pacific Mining Co. have developed their leased ground by a shaft 148 feet, which must also enure to the benefit of the Peterson Lake shareholders. This Company are also waiting for installation of power.

The St. Anthony Mining Co. have sunk a shaft 200 feet and done drifting work about 25 feet, all at an expense of \$10,227, which must also enure to the benefit of the Peterson Lake shareholders. This company are also waiting for installation of power.

The Cobalt Leasers have done considerable amount of trenching and diamond drill work on their lease, all at a considerable expense, but have stopped work on account of lack of power.

In the Peterson Lake Co., as matters now stand, there are 2,401,820 shares issued out of a total capitalization of 3,000,000 shares. They are selling on the market at approximately 25c., giving a net market value of Peterson Lake property to-day of \$600,455. This divided by the acreage (213 acres) gives a market value per acre of \$2,819. The Nipissing Mining Co. have issued 1,200,000 shares which have a market value of over \$10 per share. At \$10 per share the value of the Nipissing property would be \$12,000,000, and having an acreage of 846 acres would give a market value of \$14,184 per acre. Since the Peterson Lake ground is almost entirely surrounded by Nipissing ground there is only one reason why this difference of \$11,365 per acre should exist between the two companies. This difference is no doubt due to the undeveloped state of the Peterson Lake ground. If Peterson Lake ground were developed as fully as the Nipissing ground there is a strong possibility that the two properties should have an equal value per acre. The undeveloped state of the Peterson Lake ground to-day is due to lack of proper management in the past and there is every reason to believe that the progressive campaign of development mapped out by the present Directorate will expose ore bodies equal to those in the surrounding properties.

The Consulting Engineer of the Company is constantly supervising the work of the Lessees and the interests of the shareholders are being protected to the fullest extent. The Directors consider that the leasing system, in view of the result in other mining camps, is the best policy to pursue in the initial development of the Company's large holdings, because of the fact that a small acreage is leased to individual persons on terms which make it imperative that the ground should be thoroughly prospected and developed which the company could only do at a great deal of expense.

The result of the leasing system is that your Company derive a royalty from any result of ore found of 25% and at the end of the term of the lease will have the property in its developed state turned over to them and all ore then remaining will become absolutely the property of the shareholders of this Company.

The Company has in all 213 acres of mining property of which a considerable portion is still unleased. That veins already discovered upon leased property will extend to the unleased portion is a reasonable expectation. There are also at other points on the unleased lands indications of value that appear to justify development and which it is hoped will result in valuable discoveries. It is the intention of your Directors with the funds now available to actively prosecute the work of exploration and development. With a practically assured income from various leases with only a slight outlay on the part of the Company this policy should commend itself to the most conservative shareholder and be a source of satisfaction to many who have waited a long time to see their faith in this property justified. Further reports will be made to the shareholders from time to time and with the support of the shareholders and a very moderate degree of good fortune the Directors will be able in the near future to put the Company on a dividend paying basis.

The President, A. F. MacLaren, and Directors, thank the individual shareholders for their support in the past and trust that their recent and future activity in the proposition will warrant the same support hereafter.

R. F. SEGSWORTH,  
Secretary-Treasurer.

#### TRETHEWEY SILVER-COBALT MINE, LIMITED.

**Editor's Note.**—The gross returns from ore for 1909 are reported at \$314,940.28; gross value of ore at smelters and in transit, (Dec. 31st, 1909), \$73,612.32; totalling, \$388,552.60. Deducing from this amount the smelter charges, freight and

cartage, and assaying and sampling charges—\$40,688.46—the sum of \$347,864.14 is left. Miscellaneous receipts bring this up to \$350,257.39. Operating expenses amounted to \$141,852.30; head office expenses \$6,697.45, (a creditably small item); directors' fees, etc., \$1,900—making a total of \$150,449.75.

The net revenue for 1909, therefore, was \$199,807.64. During the year one dividend of 10% and one of 15% were paid, in all \$244,545. A balance of \$91,302.93 remained at the credit of the Company on Dec. 31st, 1909.

#### DIRECTORS' REPORT.

Submitted to the Annual Meeting of Shareholders held in Toronto, on Wednesday the 23rd day of February, 1910.

The balance of the capital stock of the company previously unissued, amounting to 54,550 shares, was sold during the year at \$1.50 per share, realizing \$81,825.00, being a premium of \$27,275.00 over par. This fund, after providing for the building of a concentrating mill now in course of construction, and other capital expenditures in connection therewith, will leave a surplus for the general purposes of the Company.

#### Production.

The following shipments have been made during the year:

8 cars	First-class Ore to Copper Cliff,	weighing	453,211 lbs
2 "	" " " Deloro	"	120,689 "
2 "	" " " Thorold	"	130,078 "
25 "	Second-class Ore to Carnegie Pa.	"	1,594,249 "
	Total weight		2,298,227 "

Gross value of ore of all grades shipped	.....	\$388,552.60
Freight and treatment charges	.....	40,688.46

Net Revenue from sale of ore ..... \$347,864.14

#### Improvements.

The physical condition of the property has been materially improved during the year. In the rock-house an additional jig was installed, also dewaterizers; set of rolls; concentrating table, etc. An independent condenser and cooling tower have been added as auxiliaries to the power plant, whereby an increased efficiency has been obtained. All buildings have been painted and kept in good state of repair, so that the appearance of the plant on the surface has been greatly improved. A substantial machine and carpenter's shop has been built and equipped with machinery suitable for wood and iron work, operated by electricity obtained from a generator in the power house, which also supplies power to the pumping station at Sasaginaga Lake and for lighting the property on the surface and underground. The plant in the machine shop includes: Lathe of large size; press drill; bolt cutting and threading machine; double rip saw and crosscut saw; buzz planer and band saw. This machinery has been a very important factor in the construction of the concentrating plant, and provides an almost indispensable permanent equipment for the future economical operation of the mine and concentrator. An additional pump has been installed which will provide ample water for the concentrator and all other requirements. Precaution has been taken in the installation of the pipe line to provide a good flow system so that in case of fire the whole pressure from the pumps will be available; together with the flow from the tanks at the top of the mill. A transformer building is in course of construction in which the high voltage current delivered by the power companies to the camp will be stepped down to 550 volts before entering the mill.

#### Concentrator.

A modern mill of 100 tons capacity has been built, and a large portion of the machinery has been installed. This plant will be operated by electrical power, and will be completed as soon as the power companies are in a position to deliver power

for its operation, which will probably be during the month of April. The policy of your Directors in delaying construction of a concentrator until electrical power became available, will result in a very large saving in the cost of the Plant and in its operation. Inclined tramways have been erected to connect No. 2 and No. 4 shafts with the mill, so that ore hoisted at these points will go direct to the concentrator for treatment. It is expected that the quantity and quality of ore mined will be sufficient to run the mill at its full capacity without drawing on the ore now lying on the dumps, which will be held in reserve to supply the mill in the event of strikes or other unforeseen circumstances interfering with the operation of the mine. These reserves are sufficient to keep the concentrating plant in full operation for eighteen months, at an estimated profit of not less than \$1,000 per day.

**Development.**

No. 1 Shaft. A drift has been run during the year on the 100-foot level a distance of 340 feet, connecting with the workings on the same level at No. 2 Shaft. Connection between the two shafts has also been made on the 50-foot level, both of which drifts are in good condition for hauling a large tonnage of ore to either shaft.

No. 2 and No. 3 Shafts. A considerable amount of cross-cutting and drifting has been done from these points, exploring a large territory with very gratifying results. Work is now being carried on at three levels.

The total amount of underground work to date is as follows:

Drifts and Cross-cuts .....	6,558 feet
Shafts .....	596 feet
Raises and Winzes .....	845 feet

No. 4 Shaft. A double compartment shaft has been sunk to meet an upraise from a depth corresponding to the second level of the Temiskaming and Hudson's Bay Mine near the north end of the property. It is now being timbered and fitted with a cage road. During the development work which has been carried on at this end of the property, four veins have been met with, three of which are of high-grade; the total drifting thereon amounts to about 750 feet, with about 60 feet of up-raising. Assays taken from ore won while drifting showed values of from three to four thousand ounces per ton. It is interesting to note that the workings on the Temiskaming & Hudson's Bay Mine near the north line of this property are now down to 250 feet, and reported to be in good ore.

The development work conducted during the past year has demonstrated the fact that the veins on the property occur, for the most part, in the form of a net-work of small fissures in an immense zone of fractured rock, which has been more or less enriched in and near the cleavages by the deposition of native silver. The extent of this zone can only be determined as development work proceeds, but the work so far conducted at both ends of the property would lead to the expectation that the whole belt of conglomerate extending from the south line to the north line will be found to maintain the same characteristics. Should this prove to be the case an enormous tonnage of ore suitable for profitable concentration will be won from the property during the next few years. With the facilities now being installed a large and steady revenue may reasonably be expected from the occurrence of bonanza veins likely to be encountered as development work proceeds.

ALEX. M. HAY,  
President.

Toronto, February 10th, 1910.

A Dividend of 5 per cent., with an extra dividend of 5 per cent., has been declared on Kerr Lake. Books close March 1st, and open on March 15th.

**NOVA SCOTIA STEEL & COAL COMPANY.**

A meeting of the Board of Directors of the Nova Scotia Steel and Coal Company was held at the Windsor Hotel, Montreal, President Robert E. Harris, presiding. There were present Hon. Jas. D. McGregor, Vice-President, Hon. Robert Jaffray and Messrs. Robert Reford, J. W. Allison, Jas. McGregor, W. D. Ross, R. E. Chambers and Thos. Cantley, Second Vice-President and General Manager. The General Manager's report reviewing the business of the past year was submitted and showed that the volume of business was the largest in the company's history. The President submitted the statement of assets and liabilities and profit and loss account, and the directors report to the shareholders showing the profits for the year 1909 to be \$907,949, as compared with \$734,701.53 for the previous year, an increase of \$173,247.47. Another gratifying feature of the report was the fact that the sum of \$184,453 for premium and commission on the redemption of the old and for the new issues of bonds has been paid out of the profits of the year. This is regarded as a very satisfactory showing. Other features that call for attention are that cash in the bank is now \$207,029 and bills payable and cash advances are reduced to \$607,458, compared with \$999,109 last year. Thus there is almost half a million better showing than a year ago. This is made up of cash in the bank and reduction in bills payable. The balance carried forward to the credit of profit and loss account is \$336,807.38

The sum of \$362,653.27 has been expended during the year on capital account in the development of the submarine iron ore areas at Wabana and for improvements, plants, etc., elsewhere. During the early part of 1909 business conditions had not recovered from the depression, but in the latter part of the year the earnings of this company showed that conditions have attained their normal. The reorganization of the finances of the company authorized by the shareholders has been carried out. A new issue of \$6,000,000 5 per cent. first mortgage bonds and an issue of \$1,000,000 6 per cent. debenture stock were made; \$3,500,000 of the bonds and \$1,000,000 6 per cent. debenture stock were sold in Canada, and the two former issues of 6 per cent. bonds were paid off and cancelled. The balance of \$2,500,000 of the bonds remains in the treasury. No portion of the premium on the retirement of the old bonds nor of the commission on the new issue has been changed to property account. The regular dividend of 2 per cent. quarterly has been paid on the preferred shares. The directors have declared further dividends of 1 per cent. on the ordinary shares and 2 per cent. on the preferred shares, payable on April 15 to shareholders of record on March 31, 1910.

It is understood that three of the present Nova Scotia Steel and Coal directors will retire in a few weeks, to be replaced by Mr. Rodolphe Forget and two of his associates, who have been buying large blocks of stock lately. This means that Mr. Forget has won the representation on the board which he has been aiming for by the recent heavy purchases of stock made by himself and a group of his supporters,

**McKINLEY-DARRAGH REPORT.**

At the annual meeting of the McKinley-Darragh Mining Company held in Toronto, the financial statement as well as the statement of the physical condition of the mine, was one of the best presented to the shareholders.

The most interesting item of the report is the statement of the manager P. A. Robbins when speaking of the total output of the mine for the year. The total output of silver for the year was 1,297,530 ounces, which is equal to the entire production of 1906, 1907, and 1908, combined. It may be noted here that the total tonnage for 1908 was ahead of the tonnage for 1909, but during 1909 nothing but high grade and mixed concentrates have left the camp.

On the first of last year the company had only a small mill treating about twenty tons per day. This was increased to an eighty ton mill and later in the year additions were made to bring this up to 120 tons per day.

The annual report shows gross receipts from sales of ore and other sources in 1909 of \$639,442.03, including balance from the previous year of \$46,419.95. From this was paid out for operating expenses and improvements \$294,262.35, dividends aggregating \$224,493.03, leaving balance on hand at the end of the year of \$120,686.85. The balance sheet shows \$120,758.62 cash on hand, ore at smelters \$106,712.48 and ore at the mine ready for shipment of \$10,558.80, with current liabilities of only \$16,910.70.

At the present time mining is carried on only on a small scale at the Savage mine which is owned by the company. This claim is situated near the Gillies Limit on Cart Lake. The company is waiting for the power from the Montreal River to start up this mine.

Developments for the past year on this property have shown that considerable high grade ore has been blocked out. The annual report shows 755,000 ounces, which is a considerable improvement over the previous year's estimates. At the mine a large ore house has been erected containing crushers, jigs, tables, etc., and the company hopes to treat in the neighbourhood of twenty tons of its lower grade ore per day, recovering eighty-five per cent. by this method.

Underground work at the mine consists of a seventy-five foot shaft, known as No. 3 which is connected up on that level with its main shaft. Two veins underground show good native silver values, and very little exploration work has been accomplished. With the power from the Montreal River operating their workings, the management will immediately start a couple of drills on development work to look for new ore bodies, which are believed to exist in the neighbourhood of its workings.

At the McKinley-Darragh mine, at the south end of Cobalt Lake the company is working on four levels of the main shaft. Owing to the inadequate means of handling its ore until its new addition to its mill is in operation, the company has been confining its drills to prospecting work for the past few months. No stoping is being done, the ore for the mill being taken out in drifting on its ore bodies. It is estimated that underground blocked out, at the mine there is ore containing 4,973,000 ounces of silver. This like the Savage shows a big gain over the estimates given for the previous year.

At the present time Manager Robbins employs a force of over 100 men and six drills are operating underground.

#### SCOTIA REGULAR DIVIDEND.

The Nova Scotia Steel & Coal directors have declared the regular quarterly dividend on the common stock of 1 per cent., and 2 per cent. on the preferred stock, payable April 15 to shareholders of record March 1, 1910.

#### PORTLAND CANAL MINING COMPANY, LIMITED.

Extracts from proceedings of the Second Annual General Meeting of the Shareholders.

#### DIRECTORS' REPORT.

Your directors have to report that during the current year they entered into negotiations with a firm of underwriters, and the sum of \$100,000 was secured to the company in return for a block of the company's shares.

The above capital was required for, and is being used in the installation of a concentrator, aerial tramway, water power plant and for general purposes of the company.

The concentrator and power plant are well under way and will be completed at an early date if the snowfall is not excessive. Had normal climatic conditions prevailed during the past season, the plant would probably have now been complete, with the exception of a part of the concentrating machinery, which has not yet arrived from the manufacturers.

The concentrator has been termed a 50 ton unit, but as our ore will only require coarse concentration we expect to be able to mill about 100 tons every 24 hours. The Tramway, which is of the Bleichert type, is now about completed, and will be 8,500 feet in length and bring ore from the mine at an altitude of 2,100 feet to the concentrator in Beaver River Valley. It can be equipped to transport 200 tons every 24 hours and will be utilized for conveying all supplies from the mill to the mine.

Our water power is a splendid asset, and will be ample for all requirements when we multiply the capacity of our concentrator, and this we expect to do at no distant date. The water is brought from the head of a waterfall in a 2 ft. by 4 ft. flume along the side of a canyon, over a trestle 70 feet high, across Glacier Creek and along the mountain side to the mill, a total distance of 1,400 feet, the effective head being 100 feet. Owing to the fact that there was a large tonnage of ore in the mine available for stoping, and our camp facilities were being taxed to their utmost capacity to provide accommodation for tramway employees and others, it was considered inadvisable to carry on an energetic campaign in the mine during the summer.

No. 1 tunnel was advanced 110 feet to a total length of 180 feet, 35 feet of cross-cutting was also done in this tunnel, which, with the exception of a few feet, where purely local distorted conditions prevailed, may be said to be all in good ore. No. 2 tunnel is 124 feet in length, and, with the exception of a few feet of what might be termed low grade concentrating ore, is also all in good ore. No. 3 tunnel was advanced 65 feet to a total distance of 300 feet, and a raise and cross-cut connecting Nos. 3 and 2 tunnels was completed. At 280 feet from the portal of No. 3 tunnel a splendid body of ore was encountered, the development of which will be vigorously prosecuted this winter. This ore body is the downward continuation of that disclosed in Nos. 1 and 2 tunnels and carries the same or better values, native silver and argentite being fully as conspicuous as in Nos. 1 and 2 tunnels.

Your directors have no hesitation in assuring the shareholders that they consider the property one of the most promising in British Columbia, and there is absolutely no doubt but that substantial dividends should be paid when the complete plant has been in operation for a reasonable period.

The directors all retire from office but are eligible for re-election.

Respectfully submitted on behalf of the Board of Directors.

C. H. DICKIE,  
Chairman and Managing Director.

#### PRESIDENT'S ADDRESS.

Gentlemen,—Before moving the adoption of the balance sheet a copy of which was mailed to each shareholder, I know it is expected that I will make a few remarks respecting our promising mining property. A brief synopsis of what we have accomplished in the north this season appears in the Directors' Report which accompanies the balance sheet.

Under the head of Mines and Concessions in the Balance Sheet the item of salaries, when compared to that of wages might occasion criticism, it should have been spread over the total expenditure, and comprised the sum voted at the last annual meeting for directors' remuneration and the salaries of the Secretary and Managing Director for the last thirteen months.

The item of travelling expenses was incurred entirely by the Managing Director and comprises the expenses incurred on seven trips to Stewart, which means over ten thousand miles,

some of these trips being very expensive owing to the fact that it was thought advisable to charter boats from Prince Rupert and Port Simpson in order to avoid delay, and as an effort was being made to keep in touch with both ends of our enterprise, the expense is justified.

The item also provides for the expense of two trips to Spokane, one to the Couer de Alene mining region in Idaho, and numerous trips to Vancouver and Seattle, all in the interests of the company.

After energetic but disappointing efforts extending over several months, your directors on March 13th last entered into an agreement with a firm of underwriters, the result of which gave us the sum of \$50,000, and an optional agreement was entered into for a further sum of \$50,000, which became practically available on August 16th last, and then and only then we knew we were able to carry out our contemplated installations. We have sold the underwriters 1,333,333 shares for \$100,000, or at the rate of 7½ cents per share, and the concluding payment from the underwriters is the supplementary item mentioned in the Auditor's Report.

At the time we concluded this agreement with the underwriters our shares were being hawked about for six and seven cents per share, and there was only a small demand for them at that figure, and had we been unsuccessful in obtaining this capital, would have inevitably gone to a still lower figure.

Since our financial troubles have been dispelled your shares have been steadily enhancing in value, and in view of our splendid assets, should continue to do so.

The underwriters had a long period of anxiety, and I believe regretted their bargain until the latter part of August, when owing to the fact that our property was attracting considerable attention largely because of our great faith in the property as displayed in the installation of our tramway and concentrator, share values began to have an upward tendency, and were in demand, then the underwriters, whose financial bravery meant success to our company, when comparative failure would have been our portion, for one season at least, commenced to see the dawn of success to which they are well entitled. As a direct result of our success in obtaining capital our property is now attracting more attention than any other on the coast, and justly so I believe.

You can readily understand that I would have been highly pleased to have been able to inform you at this meeting that our concentrating plant was complete, but despite strenuous efforts on our part this is not yet the case, but you will kindly bear in mind that we have been doing pioneer work in that country, and under exasperating physical and climatic conditions, but we now have matters well in hand. This matter has occasioned your directors more worry than it need cause you, for the value of your holdings has not been adversely affected, nor should they be in the future. All of the machinery for our equipment has been paid for and we have a substantial amount in the bank to our credit. During the past season a number of prominent mining men have visited our property, and I have yet to hear the first pessimistic report concerning it. Among those who have visited us have been Mr. Henry Martin, Mr. Vaughan-Rhys, Mr. Knobel (McKenzie and Mann's representative), Mr. Barclay-Bonthorne, Mr. J. L. Parker and Mr. Carmichael a copy of whose Government Report you have doubtless all read, and we have been assured that had we struck the ore in our lower tunnel before that gentleman had made his inspection, his report, admirable and optimistic as it is, would have been made stronger in favour of our property.

Your directors hope that at no distant date your concentrator will materially assist in the payment of dividends, for all ores on Glacier Creek can be advantageously concentrated, and admirably situated as we are, and with splendid water power, we

should build up an extensive and profitable concentrating business.

I am proud to say that our company has a reputation for fair dealing, which I hope may be maintained, and which is a valuable and effective asset in securing customs ore either for milling or smelting.

The plans and model we have here will give you an idea of our workings, and you must continue to bear in mind that the section we are at present exploiting, only comprises one-ninth of the length of the main ledge which runs through our property, besides we have the Gypsy ledge, which in itself may develop into a mine, and owing to the very favourable geological formation, and to the contiguity of adjoining prospects, it is highly probable that we may uncover other valuable outcrops when we have time to thoroughly prospect our holdings. When we struck the ledge in No. 3 tunnel the mineralization consisted solely of iron pyrites and quartz, no galena being then in evidence and I anxiously awaited the result of the first assay, as so much depended upon whether the iron sulphides continued to carry good values in depth.

The assay went in gold \$10.00, and silver \$40.00 per ton. In grinding up the sample, minute pellets of native silver were found disseminated all through the sample, and this thoroughly convinced me that the iron and the precious metals were deposited contemporaneously by ascending mineralizing solutions, and this formed a strong argument indeed for the probability of encountering Bonanzas or extremely rich chambers of ore in places in the vein where conditions have been unusually favourable for such occurrence.

After getting several feet into the ledge, galena and argentite came in, and the ore, a sample of which assayed in gold \$34.00 and silver \$54.00, to the ton, was just as strong, or stronger than in our upper workings, and the ledge had been proved 13 feet thick with the hanging wall not yet in sight, when I left camp.

To estimate the probable available tonnage of ore we now have, let us draw a line from the upper open cut to the face of our workings in No. 3 tunnel, then another at right angles out to the surface cropping, now this triangular piece of ground contains approximately 70,000 superficial feet of vein area, which is quite reasonable to suppose contains ore of the same quality as that exposed in our workings. It is a safe estimate that the ore will average 8 feet in thickness, and that 12 cubic feet will weigh a ton, this gives us 46,666 tons of available ore, if we have not overestimated it.

Taking into account the considerable tonnage of very high grade ore we have found in each tunnel, we may estimate the value of our ore-body to average \$15.00 per ton, on the basis as paid by smelters. The ore can be mined, milled, transported and smelted at a cost to our company, not to exceed \$5.00 per ton. As we have an ideal concentrating ore, we hope that 10% will cover values lost during concentration.

Accepting the above estimates as being conservative, and they are meant to be so, the net profit which would accrue to our company, from the ore contained in this triangular piece of property, is in round numbers \$400,000.

Suppose we convert this triangle into a rectangle and consider that the same conditions prevail as in the ground we are already familiar with, and there is no apparent reason why they should not be, we simply double our tonnage and profits, and gentlemen, when we have exploited this ground, we will have made only a very modest beginning towards garnering the wealth which is undoubtedly contained in our property, for I ask you again to bear in mind that the piece of ground upon which we have been basing our calculations, is only an infinitesimal part of our equally promising holdings.

Our Consulting Engineer, Mr. Elmendorf, made no exaggerated statement in his last report, when he said, "I have no fear

as to the amount of ore this vein will produce with proper development."

At our last annual meeting I did not place our property on as high a plane as I am doing to-day, for at that time although I was satisfied in my own mind that such would be the case, I was not absolutely certain that the high values would be found in depth, and might in a measure be due to surface enrichment or concentration. Since we have encountered the high-grade ore in No. 3 tunnel, at such depth from the surface, I am fully convinced that we have a magnificent mining property, and I have no hesitation in saying to you that I believe our shares are worth double the price they are now being quoted at, and I think they will go many times that figure, for we have surmounted our most serious obstacle and are now practically on the plateau of prosperity.

The thanks of our company are due the Provincial Government for the most generous and considerate treatment accorded the district.

On behalf of our Board, I beg to sincerely thank the shareholders who conferred a high compliment on the Directorate, and brought prosperity to the company by complying with our request and placing their shares in escrow, at the most critical period in the history of the company's affairs, time has as yet, I feel assured, only partly demonstrated the wisdom of your generous confidence in your Board of Directors. Now gentlemen, thanking you for your patience, I beg to move that the Report and balance sheet is hereby received and adopted. After the motion is seconded, and before putting it to the meeting, I will be pleased to make any explanations or answer any questions to the best of my ability to do so.

## STOCK REPORTS.

By courtesy of Warren, Gzowski & Co., Toronto.

### Miscellaneous.

	Feb. 21, 1910.	
	Bid.	Ask.
Amalgamated Asbestos .....	.33¾	.33¾
Dom. Coal, Com. ....	.84	.85
Dom. Steel, Com. ....	.70¾	.71
N. S. Steel .....	.80¾	.81
Granby .....	.90	.91
Consol. Smelting .....	.78	.80
Crow's Nest Pass .....	.85	.86

Nova Scotia .....	.36¾	.37
Otisse .....	.08½	.09
Peterson Lake .....	.25½	.25¾
Rochester .....	.19¼	.19¾
Silver Leaf .....	.09¾	.10
Silver Bar .....	.10½	.11
Silver Queen .....	.18	.20
Temiskaming .....	.54¾	.55
Trethewey .....	1.39	1.40
Wetlaufer .....	1.33	1.35

### COBALT STOCKS.

	Toronto, Feb. 21, 1910.	
	Bid.	Ask.
Beaver Consolidated .....	.32½	.33
Buffalo .....	2.17	2.50
Chambers Ferland .....	.37	.38½
City of Cobalt .....	.38	.39
Cobalt Central .....	.22½	.23
Cobalt Lake .....	.16	.16½
Coniagas .....	5.50	5.60
Crown Reserve .....	3.70	3.73
Foster .....	.23	.24½
Gifford .....	.14½	.15
Green Meehan .....	.08	.09
Great Northern .....	.10¼	.10½
Hudson Bay .....	.90.	110.
Hargraves .....	.40	.41
Kerr Lake .....	9.20	9.30
La Rose .....	4.53	4.55
Little Nipissing .....	.29¾	.29¾
Mckinl Dar. Savage .....	.83½	.85
Nancy Helen .....	.08½	.08¾
Nipissing .....	10.18	10.25

### New York Curb.

	Feb. 21st, 1910.	
	Bid.	Ask.
Boston Copper .....	.19¼	.19½
Brit. Col. Copper .....	.06¾	.07
Butte Coalition .....	.24	.24¼
Chino Copper .....	.13½	.13¾
Davis-Daly Cop. ....	.03¼	.03½
Ely Consolidated .....	.01½	.01¾
Gila Copper .....	.08	.08¾
Giroux Mining .....	.09¾	.09¾
Goldfield Consol. ....	.07½	.07¾
Greene-Can .....	.09½	.09¾
Harcuvar Copper .....	.54	.56
Inspiration Cop. ....	.08½	.08¾
Miami Copper .....	.23¾	.24¼
New Baltic Cop. ....	.12¾	.13
Nevada Con. Cop. ....	.22¾	.23
Ohio Copper .....	.04½	.04 3-16
Rawhide Coalition .....	.16	.18
Ray Central .....	.03¼	.03¾
Ray Consolidated .....	.21¾	.22
Union Mines .....	.02	.02½
Yukon Gold .....	.04½	.04¾

## STATISTICS AND RETURNS

### STATISTICS AND RETURNS.

Following are the figures of German consumption of foreign copper for the year 1909:.

Imports of copper .....	157,795 tons
Exports of copper .....	8,053 "

Consumption of copper ..... 149,742 tons

as compared with consumption during the year 1908 of 151,715 tons.

Of the above quantity 143,717 tons were imported from the United States. Reported by L. Vogelstein & Co., New York.

### TRANSVAAL GOLD OUTPUT.

The London secretary of the Transvaal Chamber of Mines is advised by cable from Johannesburg that the total gold out-

put of the mines of the Transvaal for January, 1910, amounted to 579,743 oz. for the Witwatersrand district, and 21,625 oz. for the outside districts, in all, 601,368 oz. fine gold, total value, £2,554,451, being a decrease of 3,619 oz. in weight and £15,371 in value, as compared with December, 1909. The production in December was 604,987 oz. of fine gold, with a total value of £2,569,822. The total production in January, 1909, was 615,113 oz. of fine gold, total value £2,612,836.

**GOWGANDA ORE SHIPMENTS.**

Feb. 12—Blackburn Mine to Copper Cliff smelter, via  
T. & N. O. Ry. . . . . 30 tons.  
Burke-Remey, to Chippewa (test shipment) . . . . . 2 tons

**COBALT ORE SHIPMENTS.**

Following are the shipments from the Cobalt camp for the week ending Feb. 11, and those from Jan. 1, 1910, to date:

	Feb. 11. Since Jan.1	
	Ore in lbs.	Ore in lbs.
Buffalo . . . . .	173,394	
City of Cobalt . . . . .	129,970	
Cobalt Central . . . . .	41,687	122,386
Cobalt Lake . . . . .		132,000
Colonial . . . . .		63,660
Coniagas . . . . .		180,742
Crown Reserve . . . . .	124,154	554,454
Drummond . . . . .		664,200
Hudson Bay . . . . .	62,365	62,365
Kerr Lake . . . . .	180,239	482,844
King Edward . . . . .		49,952
La Rose . . . . .	306,902	1,202,681
McKinley-Rar. . . . .		144,397
Nipissing . . . . .	129,080	1,101,472
O'Brien . . . . .	65,800	198,906
Peterson Lake . . . . .		49,600
Right of Way . . . . .		127,963
Temiskaming . . . . .		120,000
Trethewey . . . . .		65,000

Ore shipments for week ending Feb. 11 were 909,627 pounds, or 454 tons.

Total shipments from Jan. 1 to Feb. 11 were 5,625,986 pounds, or 2,812 tons.

The total shipments for 1909 were 30,098 tons.

**COBALT ORE SHIPMENTS.**

Following are the shipments from the Cobalt camp for the week ending Feb. 18, and those from Jan. 1, 1910, to date:

	Feb. 18, Since Jan. 1	
	Ore in lbs.	Ore in lbs.
Buffalo . . . . .	62,440	235,834
City of Cobalt . . . . .		129,970
Cobalt Central . . . . .	2,000	124,386
Cobalt Lake . . . . .		132,000
Colonial . . . . .		63,660
Coniagas . . . . .	63,415	244,157
Crown Reserve . . . . .	189,718	744,172

Drummond . . . . .	664,200
Hudson Bay . . . . .	62,365
Kerr Lake . . . . .	291,640 774,484
King Edward . . . . .	49,952
La Rose . . . . .	333,343 1,536,024
McKinley-Dar. . . . .	64,400 208,797
Nipissing . . . . .	264,311 1,365,783
O'Brien . . . . .	198,906
Peterson Lake . . . . .	49,600
Right of Way . . . . .	62,830 190,793
Temiskaming . . . . .	120,000
Trethewey . . . . .	62,000 127,000

Ore shipments for week ending Feb. 18, were 1,396,097 pounds, or 666 tons.

Total shipments from Jan. 1 to Feb. 18 were 7,022,083 pounds, or 3,479 tons.

The total shipments for 1909 were 30,098 tons.

**B. C. ORE SHIPMENTS.**

Nelson, Feb. 12.—Steady progress has been made all week in mining circles, as is shown by the high average tonnage got out. The silver-lead properties continue to ship in increasing numbers to the Trail Smelter, two new mines being on this week's list. Appended are details for the week and year to date:

**ORE SHIPMENTS.**

	Week.	Year.
Granby . . . . .	25,770	155,682
Mother Lode . . . . .	9,000	55,305
Oro Denoro . . . . .	350	1,620
Snowshoe . . . . .	4,592	23,040
Other mines . . . . .	...	120
Total . . . . .	39,712	235,767
Rossland—		
Centre Star . . . . .	3,722	22,443
Le Roi No. 2 . . . . .	693	3,408
Le Roi . . . . .	165	1,835
Velvet . . . . .	75	220
Other mines . . . . .	...	8
Total . . . . .	4,655	27,914
Slocan-Kootenay—		
Richmond Eureka . . . . .	115	670
Molly Hughes . . . . .	44	103
Mother Lode . . . . .	30	120
Eastmount . . . . .	31	94
Standard . . . . .	37	128
Hope . . . . .	19	19
Emerald . . . . .	117	432
Blue Bell . . . . .	133	540
Ferguson . . . . .	110	218
Sullivan . . . . .	359	794
North Star . . . . .	29	605
Yankee Girl . . . . .	358	1,204
St. Eugene . . . . .	488	2,611

Silver King .....	127	676
Rambler Cariboo .....	46	114
Jessie Bluebird .....	35	35
Whitewater .....	21	291
Other mines .....	...	967
<b>Total</b> .....	<b>2,099</b>	<b>9,621</b>

**SMEALTER RECEIPTS.**

Granby, Grand Forks .....	25,770	155,802
Consolidated Company Trail .....	11,391	61,035
B. C. Copper Company, Greenwood....	9,350	56,925
<b>Total</b> .....	<b>46,511</b>	<b>273,762</b>

**B. C. ORE SHIPMENTS.**

Nelson, Feb. 5.—The feature of the week in mining is the steadily increasing number of silver-lead shippers to Trail, the total for the Consolidated Company's plant for this week being the largest on record. The general mine output was well up to the present high weekly average. Appended are details:

**ORE SHIPMENTS.**

Boundary—	Week.	Year.
Granby .....	25,453	129,912
Mother Lode .....	8,022	46,305
Oro Denoro .....	350	1,270
Snowshoe .....	3,887	18,448
Other mines .....	...	120
<b>Total</b> .....	<b>37,712</b>	<b>196,055</b>
<b>Rossland—</b>		
Centre Star .....	5,586	18,721
Le Roi .....	323	1,670
Le Roi No. 2 .....	689	2,716
I. X. L. ....	8	8
Other mines .....	...	145
<b>Total</b> .....	<b>6,606</b>	<b>23,260</b>
<b>Slocan-Kootenay—</b>		
Van Roi .....	31	171
Ruth .....	29	57
Richmond-Eureka .....	167	555
Yankee Girl .....	303	846
Queen .....	19	93
Whitewater .....	67	270
Ferguson .....	65	108
Nugget .....	20	79
Banker .....	1	1
St. Eugene .....	598	2,123
Emerald .....	93	315
North Star .....	294	576
Central .....	38	38
Sullivan .....	359	435
Bluebell .....	33	407
Other mines .....	...	1,448
<b>Totals</b> .....	<b>2,117</b>	<b>7,522</b>

**SMEALTER RECEIPTS.**

Granby, Grand Forks .....	25,453	130,032
Consolidated Company, Trail .....	12,671	49,646
B. C. Copper Company, Greenwood .....	8,372	47,575
<b>Total</b> .....	<b>46,496</b>	<b>227,251</b>

**TORONTO MARKETS.**

**Metals.**

Feb. 23.—(Quotations from the Canada Metal Co.)  
 Spelter, 6 cents per lb.  
 Lead, 3.75 cents per lb.  
 Antimony, 8 to 8½ cents per lb.  
 Tin, 35 cents per lb. (market very active).  
 Copper, casting, 14¼ cents per lb.  
 Electrolytic, 14¼ cents per lb.  
 Ingot brass, 9 to 12½ cents per lb.  
 Feb. 23.—Pig Iron., (Quotations from Drummond McCall Co.)  
 Summerlee, No. 1, \$23.50 to \$24.00, (f.o.b. Toronto).  
 Summerlee, No. 2, \$23.00 (f.o.b. Toronto).  
 Midland, No. 1, (off the market).  
 Coal-Anthracite, \$5.50 to \$6.75.  
 Bituminous, \$3.50 to \$4.50, for 1¼ inch lump.

**Coke.**

Feb. 21.—Connellsville Coke, (f.o.b. ovens).  
 Furnace Coke, prompt, \$2.25 per ton.  
 Foundry Coke, prompt, \$2.75 per ton.  
 Feb. 21.—Tin, (Straits), 33.35 cents:  
 Copper, prime lake, 13.70 to 13.80 cents  
 Lead, 4.60 cents.  
 Electrolytic copper, 13.45 to 13.55 cents.  
 Copper wire, 15.25 cents.  
 Spelter, 5.65 cents.  
 Sheet zinc, 8.25 cents.  
 Antimony, Cookson's, 8.50 cents.  
 Aluminium, 23.00 to 25.00 cents.  
 Nickel, 40.00 to 49.00 cents.  
 Platinum, (ordinary), \$29.00 per ounce.  
 Platinum, (hard), \$34.50 per ounce.  
 Bismuth, \$1.75 per lb.  
 Quicksilver, \$50.00 per 75 lb. flask.

**SILVER PRICES.**

	New York	London
	cents	pence
Feb. 7.....	51½	23¾
“ 8.....	51⅝	23 11-16
“ 9.....	51¼	23 11-16
“ 10.....	51¼	23 11-16
“ 11.....	51¼	23 11-16
“ 12.....		23 13-16
“ 14.....	51½	23 13-16
“ 15.....	52	24
“ 16.....	51⅞	23 15-16
“ 17.....	52¼	24⅞
“ 18.....	52	24
“ 19.....	52⅞	24 1-16
“ 21.....	52	24