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*Editor:*

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

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CIRCULATION.

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CONTENTS.



### CANADA'S ASBESTOS INDUSTRY.

There has just been issued by the Mines Branch of the Department of Mines, Ottawa, a 300-page illustrated monograph on the asbestos industry. This is a second and much more complete edition of a former volume issued in 1905. Mr. Fritz Cirkel is the author of both.

Under title, "Chrysotile-Asbestos—Its Occurrence, Exploitation, Milling, and Uses," Mr. Cirkel has endeavoured to review the whole Canadian industry in all its economic aspects, and to touch upon the production of the mineral in other countries.

In the first two chapters the reader is told of the general historical, physical, and geological facts relating to the Canadian mineral. The third chapter discusses the quarrying of asbestos. Here we note with approval the substitution of the word "quarrying," in place of "mining." Only one MINE of asbestos is worked. That is the well-known Bell mine at Thetford. All other workings are quarries. Mr. Cirkel predicts the continued use of both quarrying and mining, and expresses the belief that only the richer properties will employ mining methods. He asserts further, that mining will be conducted on approved rich ground. The chapter presents an interesting resume of general ore winning practice.

A very useful synopsis of milling practice is contained in the fourth chapter. Probably some of the illustrations could have been omitted with advantage. However, there is much important information given. The costs of construction, labour, and operation are set forth. Particularly noticeable is the marked diversity in the flow sheets of various mills. Standardization has not yet been nearly attained.

A conspectus of mining, milling, and marketing costs follows. Certain advantageous features of the Quebec asbestos regions are touched upon. The remarkable fact that there is no working quarry situated farther than 1½ miles from the railway line, is mentioned. As to the future of the industry, Mr. Cirkel believes that, although geographically the field is strictly limited, yet there are such enormous indicated reserves that there is little need of worrying. He quotes one instance to which we must take exception. In one Black Lake quarry, he asserts, there are 44,377,500 tons of asbestos rock in sight. Deducting 50 per cent. from this as waste rock, we have roughly 22,000,000 tons of mill rock left, or a supply sufficient to keep a plant of 4,000 tons daily capacity running for

more than twenty years. The exception that we would take to this statement relates rather to the form than to the matter. That there may be 44,000,000 tons of asbestos rock indicated between several present workings we do not doubt. But that this ore is literally, in an engineering sense, in sight, cannot be the case. It is, of course, quite justifiable for men who know the region to spend money upon the assumption that large intervening blocks of ore are homogeneous to the depth attained by the present workings. In fact, the probability of this being the case may be higher than in many instances where metalliferous veins are blocked out on three, or even four, sides. But it is quite incorrect to term such assumed reserves "ore in sight." This is, after all, a matter of terminology. It is, nevertheless, highly important to avoid even the suspicion of exaggeration.

A comprehensive descriptive directory of mines and prospects occupies the next forty pages. Then come chapters on foreign asbestos and commercial uses, and an appendix by Mr. Frederic Bacon on the testing of heat-insulating materials.

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We have sketched very meagrely the ground covered in this monograph. The book includes facts and data not otherwise obtainable. It is comprehensive and complete. The author has gone to no small pains to walk circumspectly. He has had an especially complex subject to attack. We believe that he has done his work creditably. The new monograph is a distinct improvement upon the first edition. More careful editing would have been well. But, all in all, the publication is to be warmly commended.

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## A MIDWINTER JAUNT.

Several weeks ago there appeared an item in the newspapers announcing that Mr. R. J. Flaherty had returned from Hudson Bay, and that he had brought with him the diaries, field-notes, etc., etc., lost during the previous summer by Prof. C. K. Leith. No further mention of the matter has been made.

As Mr. Flaherty's journey was remarkable in many respects, we shall present here a few details. A more complete description will appear later. Even the bare outline, however, is most interesting.

Mr. Flaherty, who is a very young man indeed, left Cochrane, a station on the Temiscaming and Northern Ontario Railway, on August 28, 1910, with one white companion. Moose Factory was reached by the Mattagami route on September 5. Here a boat was engaged and on September 7th Mr. Flaherty landed on Charlton Island. Not until the 25th, however, did he succeed in making arrangements to sail to Fort George. Eight days of sailing brought him there.

Further progress was now impossible. A long wait was necessary until travelling by dog-team became practicable. Finally, on December 16th, Mr. Flaherty set out for Cape Jones with no white companion. At Cape Jones he engaged two Esquimaux and a team of nine dogs. Despite bad ice conditions, he made Great Whale, the most northerly Company post on the east coast of Hudson Bay, on Christmas night. Two days were spent here in arranging with the half-breed in charge for another relay of Esquimaux and dogs. On New Years Day, Little Whale. an abandoned post, was sighted. It had taken five days to travel 70 miles. On January 4th Nastapoka Sound was reached.

After making a seven days' examination of certain of the Nastapoka Islands, Mr. Flaherty started on his return journey. While travelling with an Esquimaux family, a short stop was made at Little Cape Jones. In the igloo of an Esquimau entitled Husky Bill, a label much more pronounceable than the gentleman's native patronymic, Mr. Flaherty was astonished to see a very modern cross-section book. His curiosity was aroused. Upon inquiry he found out that the book belonged to Dr. C. K. Leith. Further, he discovered that Dr. Leith's dunnage bag had been picked up on the shore by Husky Bill's son, near Little Cape Jones, after being exposed to the weather for some months. He found the notes, etc., in perfect condition. The contents comprised diaries, geological notes and sketches, six fifty-dollar drafts, and $53 in cash. The Esquimaux gave up the bag without demur.

Mr. Flaherty now proceeded south; getting to Fort George on January 23rd. Since leaving that post he had covered about 600 miles under desperately adverse conditions. The actual time occupied was five weeks, which period included all stops and delays.

The return route to Moose Factory was made much longer than necessary as the Esquimaux refused to travel directly to Moose on account of the deep snow. So it was possible only to strike out for Rupert's House. An Indian dog-team was engaged here. Leaving Moose Factory on March 2nd, Mr. Flaherty arrived at Cochrane on March 14th. Thus between December 16th, 1910, and March 14th, 1911, he had covered 900 miles on ice and 200 miles on land.

The recovery of Dr. Leith's manuscripts and notebooks is an incident that reads like highly coloured fiction. No doubt that distinguished geologist had given up all hope of seeing his precious bag again. Incidentally, the story affords a pleasant illustration of the honesty of the unsophisticated Esquimaux. Apart, however, from this accidental piece of luck, Mr. Flaherty's performance as a sub-Arctic traveller is unusually noteworthy.

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Leading authorities, especially on the other side of the Atlantic, predict continued low prices for copper.

## THE RESIGNATION OF DR. R. W. RAYMOND.

No personality stands out more prominently in all the American mining world than that of Dr. Rossiter W. Raymond. For forty arduous years he has been an outstanding figure in the affairs of the American Institute of Mining Engineers. After filling the offices of vice-president and president during several successive years, Dr. Raymond was elected secretary in 1884. His annual re-election has been taken as a matter of course.

As secretary of one of the most important technical associations in the world, Dr. Raymond has performed his duties without fear or favour. In his capacity as editor of the transactions, he has been the moving spirit in collecting and preparing for publication a vast bulk of professional literature. All the periodical excursions of the Institute have been successful largely because of the zeal, courage, and initiative of Dr. Raymond.

The announcement that Dr. Raymond has resigned his position will be read with sincerest regret by his numerous Canadian friends. However, it is distinctly consoling to learn that Dr. Joseph Struthers is to be his successor. Dr. Struthers has long occupied the position of assistant-secretary. He is fitted in every respect to carry on the work of the Institute.

Nothing could be more fitting than that the Canadian Mining Institute should seek the opportunity of joining in any steps that may be taken to honour the retiring secretary.

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## "VALUES."

Our irrepressible contemporary, The Mining Magazine, is at it again. In the current issue of that invaluable periodical is a strong editorial objection to certain uses of the word "values" in mining engineers' reports. Academically, The Mining Magazine is right. Practically, it is partly right and partly wrong. And, decidedly, this kind of thing may be defined as "placing irritating emphasis on non-essentials."

Clarity of speech, of thought, and of writing is always to be desired. If the word "values" conveys to the reader a more distinct idea than does another word, then let us forget our feelings. If some other word is better, let us use it. Meanwhile we may note that no sufficient substitute has been suggested. Not even The Mining Magazine can offer a practicable synonym.

It is dangerous to carry very far the law of analogies. The Mining Magazine objects incidentally to the unhyphenated "footwall,' and takes as the ground of its argument the antithetical term "hanging wall," which is always hyphenless. What, then, can be said of the word "football"? Not even the hypercritical Mining Magazine would care to spell the word with an hyphen. Yet "foot-wall" and "football" are as closely analogous as words can be.

An end to this hair-splitting! It is well to be precise, exact, and accurate. It is not well to mistake the shadow for the substance.

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## FEDERAL MINING LAW.

Only a few mining men are aware of the debt of gratitude that the mining industry owes to the officers of the Canadian Mining Institute and to the committee, ably presided over by Mr. G. G. S. Lindsey, which is now urging the codifying by statute of the Dominion Mining Laws and Regulations.

Considerable progress has been made, and it is still hoped that a statute may be passed during the present session of the Dominion Parliament. If a statute is not passed, there will be compensation in the fact that the clauses of the Act will receive maturer consideration before becoming law.

The argument in favour of immediate action is extremely cogent. It is to be hoped that, before this session ends, the rights of mining men may be governed by laws enacted by Parliament, and no longer by Order in Council, or Regulations, or the arbitrary whims of the Minister of the Interior.

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## PLATINUM PRICES.

The prices of platinum are soaring. Recently, hard platinum reached the record price per ounce of $43, whilst the soft metal touched $41. Six years ago the pure metal was selling at $18.50 per ounce. Through the year 1906 the price of hard went up to $40. The market now declined until in August, 1908, prices had fallen to $20. Soon after this the rise commenced and has continued until the present. Within the last six months the advance has been most pronounced, amounting to practically $10.

One incidental cause of enhanced prices is the growing use of platinum in manufacturing jewelry. Another is the demand for the metal in making tips for the sparking plugs of automobiles. But probably the main factor is the closer control of the principal Russian sources of supply.

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## EDITORIAL NOTES.

In the course of a paper read by Mr. W. H. Prest, before the Mining Society of Nova Scotia, is given a list of 35 gold veins that have been opened in the province but on which little or no work has been done. In thickness these veins range from one inch to 2½ feet. Some of the smallest veins have been found to

be enormously rich. All of the veins mentioned have yielded assays exceeding one ounce of gold per ton.

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Rarely has the weather of April been so excessively cold. In the northern mining camps travel over the ice was possible until well on in April. In eastern Canada the weather has been more severe than it has been for many years.

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The appointment of Mr. R. B. Watson to the directorial board of La Rose Consolidated will meet with warm approval. The more voice given to technical men of Mr. Watson's type on the governance of large mining corporations, the better it will be for all concerned.

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The U. M. W. A. leaders have taken a strategic advantage of the western coal operators by applying to the Department of Labour for a conciliation board. The two representatives appointed by the Department could not agree upon a chairman. The Department, therefore, has taken matters in its own hands and has requested the Rev. C. W. Gordon, otherwise known to fame as Ralph Connor, to act as chairman. May we express the hope that Providence is giving Mr. Gordon an excellent chance to make amends for some of his recent novels.

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## PYRITE PRODUCTION IN THE UNITED STATES.

Mr. W. C. Phalen, in his remarks about pyrite mining in an advance chapter of the annual report of the U. S. Geological Survey, alludes to the fact that the tremendous production of sulphuric acid at Ducktown, Tennessee, has not injured the pyrite business.

The United States production of pyrite in 1909 was 247,070 long tons, valued at $1,028,184. Whilst this is an increase over the output of 1908, it is just about equal to that of 1907. It is worth noting that thirty years ago the quantity mined annually in the United States was less than 30,000 tons. The State of Virginia produces almost 50 per cent. of the total annual tonnage. California comes next with 50,000 tons. The balance is distributed between Alabama, Georgia, Massachusetts, New York, and from a few other states. The average reported price was higher in 1909 than before. It was $4.16 per ton.

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## PYRITE MINING IN VIRGINIA.

For 22 years the Cabin Branch pyrite mine, near Dumfries, Prince William County, Virginia, has been in operation. The ore is iron pyrite carrying rich streaks of chalcopyrite. The ore body ranges from 6 to 14 feet in thickness and dips 45 deg. to 60 deg., striking northeast and southwest. A single compartment shaft is sunk in the ore. This shaft is down 1,500 feet.

In mining, drifts are run from the shaft in either direction to the end of the ore body at intervals of 100 feet or less. A raise is then driven from the end of each drift to the level above, if it has not caved. If the ground about is treacherous, from 2 to 6 feet of ore is left as a pillar. The pillar is kept as light as possible. The raise is run about 20 feet wide. After opening up the raise a modified system of retreating-longwall mining is carried on. Beginning at the end of the drift the ore is mined back to within about 30 feet of the shaft in successive strips across the face of the stope from the drift below to the pillar above. One 4-foot to 5-foot hole loaded lightly with 40 per cent. dynamite breaks the ore from foot to hanging. The ore is mined by contract. Drill-runners, working two men to the drill, using light tripod machines and furnishing their own powder, caps, and light, can earn good living wages breaking the ore at 20 cents per ton. About nine-tenths of the ore is recovered.

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There are now no less than five branch banks in Porcupine. That should be enough to accommodate even a boom camp.

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Electrical power is to be generated at certain oil-fields in California and transmitted long distances for industrial purposes.

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Had the birth of such gold-mining districts as those on the Lake of the Woods, Ont., been postponed ten or fifteen years, it is highly probable that they would now be figuring prominently on our stock exchanges.

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For packing and transporting ore samples carefully made leather bags, constructed like large knapsacks, and fitted with strong locking devices, are by far the safest. While these bags are costly, they last for a long time.

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The British producers of aluminium no longer attempt to maintain high prices on a limited output. The combine went to pieces in 1908. Since then the policy has been to produce large quantities and to sell at moderate prices.

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Within certain limits the freezing process is most useful in sinking shafts in wet ground. But at great depths freezing is impracticable. Various other causes may militate against freezing. The process of injecting cement into the crevices that make the water is often the best means of checking the water.

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Cable reports have it that the new Bewick-Moreing flotation in London will be called the Ontario Porcupine Goldfields Development Company. The capitalization is to be £600,000. The chief purpose of the flotation is to acquire 50 claims in Porcupine. Hence the scheme is primarily to sell an option on undeveloped prospects.

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The failure to produce peat commercially in the United States is officially attributed to overenthusiasm, lack of technical knowledge, too little capital, and too much confidence in poorly designed and untried machinery. Both the peat in itself and the market are known to be alright. The total production of peat fuel is about 1,200 tons, valued at between $3.50 and $5 per ton. Unreported quantities of peat were used for such purposes as stable-litter, absorbents, and fertilizers. Much of this material was imported.

# CORRESPONDENCE.

Editor, CANADIAN MINING JOURNAL:—

Sir,—Your Nova Scotia correspondent has, on several occasions, made mention of the services rendered by Draeger apparatus in connection with the fire in the Albion mines of the Acadia Coal Company, March-April, 1910.

In your last issue, he quotes the report of Mr. Thomas Blackwood, Deputy Mine Inspector, as taken from the 1910 Report of the Department of Mines of Nova Scotia, wherein it would appear that all credit for saving this mine was due to the men and apparatus from Cape Breton. The facts do not warrant any such credit being given or claimed from the standpoint of services rendered either by these men or the apparatus. To all those who know the conditions and circumstances in connection with the fire, such claims are ridiculously absurd. The use of rescue apparatus (whether Draeger or other types) so far meets with approval that a station is now being equipped by the Acadia Coal Company; but after our experience with them at this fire we are fully assured that their uses are strictly limited. This fact was made manifest to every one who had anything to do with them at this fire.

The location of this fire and the conditions of ventilation, water supply, relation of pillar workings to seat of fire, mode of attack, provision for safety of men at seat of fire and total absence of fire damp in the district affected, if fully described, would refute these credit-claiming reports in the minds of all practical mining men. But the writer has neither the time nor the inclination to give an extended description of the above.

Briefly, the facts are as follows:—On the morning of the 15th of March, 1910, it appeared that the fire might pass a certain point where every effort was being made to hold it in check; and as men engaged at the fire were working in noxious gases, or were obliged to pass through fumes in order to reach this point, it was decided to request the Dominion Coal Company and the Nova Scotia Steel & Coal Company to send men and apparatus, and every credit is given to both companies and men for their prompt response. In the meantime a way was cleared over a heavy roof fall for the men engaged at the fire to reach same without having to go through the return air from the fire. From 2 p.m. to 5 p.m., March 15th, was the crucial time if there was any danger of losing the mine, which none of those having years of experience in like cases either admitted then or will now. A shift of men from the Allan shafts, headed by Mr. Simon Lott, came on duty at 2 p.m., and if credit is to be given to any one or to any number of men, the full credit belongs to this shift. Either of the other two shifts would have done precisely the same had they been on duty during this time. At 5 p.m. the fire was so far under control that changes in water supply were started to increase efficiency and insure a steady supply when needed, so that nothing was done in actual fire fighting from this time until after the arrival of men and apparatus from Cape Breton. On their arrival at the scene of the fire between 1 and 2 a.m. on the 16th, the connection over the roof fall had been completed and water supply was ready to be turned on. All hands approached the actual fire *without* apparatus, and, in fact, the first stream was turned on the fire by Mr. John W. Johnson, Mine Manager of the Nova Scotia Steel & Coal Company, who had kindly come on from Halifax to render any assistance in his power. As a matter of fact, the fire was considered so far under control, and the means of fighting were so complete, that the services of Cape Breton men were not required. This pertains to all but two—one from the Dominion Coal Company, the other from the Nova Scotia Steel & Coal Company, who were retained for some time. These men admitted to the writer, not once but several times, that the Draeger apparatus was of practically no use in the existing conditions other than to make the briefest examination a short distance ahead of the men (without apparatus) working at the fire. As we *actually loaded all the material out of the seat of the fire*, wetting with water as we proceeded, it can readily be understood by mining men that, unless it is for advertising purposes, there has been neither warrant nor occasion for the "full meed of credit" given and so unctuously taken. As stated above, the full credit belongs to our own employees. The writer's opinion, from long and varied experience in mine fires, is confirmed by officials and workmen in the Stellarton field, who, from boyhood up, have had to contend with mine fires—that too much may not be expected from rescue equipment.

Yours, etc.,
CHARLES J. COLL,
General Manager.

# BOOK REVIEWS

**TABLES FOR THE DETERMINATION OF MINERALS** BY MEANS OF THEIR PHYSICAL PROPERTIES, OCCURRENCES, AND ASSOCIATES — BY EDWARD HENRY KRAUS, PH.D., AND WALTER FRED HUNT, A.M.—254 PAGES — PRICE, $2 NET—MCGRAW-HILL BOOK COMPANY, 239 WEST 39TH STREET, NEW YORK, 1911.

The mineralogical tables that make up the bulk of this book are based mainly upon lustre and colour, streak and hardness being subsidiary. Two hundred and fifty of the most common minerals are classified into three groups—those that are very common, those that are common, and those that are not common but are important. The very common names appear in black capitals; the common, in light capitals; and the third group in lower case type.

In the introduction, the physical properties of minerals are very briefly outlined. Then follows an adequate glossary. Then come nearly 240 pages of tables. tables.

Minerals with metallic lustre are dealt with in the first 67 pages. The colour sequence is thus arranged: dark gray or black; metallic white or light metallic gray; yellow; brass, bronze, or copper red; red, brown, or blue. To each colour several successive double pages are devoted. The horizontal headings are so devised that one sees at a glance the name, composition, crystallization, structure, lustre, colour, hardness, streak, cleavage, fracture, tenacity, specific gravity, characteristics, and associates of any given mineral. In the first column are included page references to the textbooks of Kraus, Dana, and Moses and Parsons. The remaining 179 pages are tables of minerals with non-metallic lustre, done in the same style as indicated.

We are decidedly impressed with the simplicity of the plan followed in designing these tables. The book is so clear and places so much proper stress upon the most immediately available means of distinguishing the different species, that it is bound to prove acceptable.

# THE QUARRYING OF ASBESTOS

Notes from Chapter three of the monograph "Chrysotile-Asbestos."*

The work of extracting the asbestos from the rock in which it occurs, and converting it into a saleable article, will be described under the following heads:

(1) The quarrying proper, that is, the blasting, separating the dead from the useful material, hoisting the same from the pits, and transporting it to the cobbing sheds or mills.

(2) The cobbing or dressing of the better qualities, that is, the separation of the fibre by hand from the adhering rock particles; together with the mechanical treatment, in mills, of all rock or fine material containing fibre; grading of products; and subsequent transportation of product over railways, and by shipping to the markets of the world.

It is important that all the different stages through which asbestos has to pass until it is a finished product, be treated separately; since these involve the entire expenditure from the winning of the crude material in the rock, up to final delivery to the consumer.

ADVANTAGES AND DISADVANTAGES OF OPEN-CAST WORK.

Nearly all the companies employ the method of open-cast work as the means for exploitation of asbestos deposits; for in spite of all its disadvantages—especially in severe winter weather—it has proved itself to be the most convenient and the cheapest method hitherto employed. Its advantages over underground work may be summarized thus:—

(1) Easier supervision.

(2) No trouble as regards ventilation the men are always working in the open air.

(3) Easier lay out of works in larger steps and stopes than is usually possible in underground works.

(4) No timbering is necessary.

(5) Complete extraction of all the asbestos encountered in the rock; no loss in the form of pillars.

The principal disadvantages of open-cast work are:

(1) The removal of all the waste rock resulting from dikes and barren zones of serpentine.

(2) Exposure of men to the inclemency of the weather: work is interfered with; amount of work done reduced considerably; or even stopped by bad weather.

(3) Curtailment of dumping ground on properties of limited extent.

However, recent experience in a prominent quarry at Thetford seems to demonstrate that open-cast work, under certain conditions, may be replaced by regular underground methods; and although all the difficulties in connection with their general application—such as we are accustomed to find in lode mining—are not wholly overcome, it seems reasonable to assume, that before long, the larger and richer mines, at least, may follow suit.

The question of underground mining has been taken up spasmodically by different companies in the district. At the "Union" quarry, some twenty years ago, a somewhat extensive tunnel was run during the winter from the foot of a hill and a shaft sunk in connection with it; but the results are not definitely known. In the old Broughton (Fraser) mine a shaft was sunk to a depth of 100 feet along an excellent asbestos vein near the contact with the slate formation, and it is reported that the results were satisfactory for the first 75 feet; but owing to the irregular character of the vein below that depth, work had to be abandoned. Seven years ago, the Bell Asbestos Company, sunk at Thetford, a roomy shaft in the western part of the property close to the King quarry; but this experiment was not successful, since the shaft went through an apparently barren zone, and little hope was entertained as to finding better conditions in the immediate environment.

For a long time after this experience, underground work was looked upon in the district as an impossibility It was affirmed in support of this contention that the asbestos pay shoots were distributed in a very irregular fashion; indeed so irregularly that no economic system could be brought into operation; and moreover, that due to this cause also, valuable ground, or perhaps pillars composed entirely of valuable deposits, would have to be sacrificed for the sake of safety. It was further maintained, that on account of the highly slippery condition of the serpentine, only narrow drifts could be run; otherwise a great amount of timber would be necessitated in order to support the ground so penetrated, and that, in consequence of this, the cost of extraction per ton of ore would be excessive. The underground work, however, inaugurated and successfully carried on by Mr. George Smith, M.E., at the Bell quarries, seems to demonstrate that not all of the contentions hitherto brought forward can be substantiated; indeed it has been shown, that after all not so much timber is used, in spite of the fact that all the drifts are very large, much larger than in any other class of underground mining. Further, the question of valuable pillars for the purpose of safety may be regulated to satisfaction, since the running of a system of approximately parallel drifts in different levels, admits of a thorough study of the ground preparatory to the winning of the mineral proper. As to the employment of timber in the drifts, it may here be stated, that the total length of underground work in the mines of the Bell Asbestos Company, is now 1½ miles, and the writer, who inspected these drifts twice, noticed very little in any of them. No accidents caused by a falling roof have occurred so far, for a rigid inspection is made almost daily of the workings. With increasing depth, however, conditions in that direction will probably materially change; the rock pressure will increase, necessitating, perhaps, heavy timbering, where to-day nothing of the kind is required.

The great advantage of this mining method over quarry work is the convenience with which the work can be carried on during the winter. In open works, to win the asbestos through ice and snow, and sometimes very cold weather, reduces enormously the working results; the drying of the ore, which is mixed most of the time with snow and ice, requires almost three times the amount of fuel needed at ordinary times; while the transmission of compressed air, and more especially steam, to the pit bottom, has its great difficulties. For this reason it is questionable whether

*Chrysotile-Asbestos, its occurrence, milling and uses; by Fritz Cirkel; issued by the Mines Branch, Ottawa.

it pays at all to work some of the quarries in severe winter season. As a matter of fact, if prices are not specially tempting, a number of them close down altogether.

One of the greatest hindrances in the way of economic open quarry work is the selection of a suitable dumping ground. Many mines which have little ground at their disposal, find considerable difficulty in solving this problem. In the early days of asbestos quarrying, when very little engineering skill was displayed, and little thought was given to projected efficiency, most of the dumps were placed quite close to the quarry, as was the case in most instances. This accumulated waste rock had to be removed, when it was found that the ground so covered contained large asbestos-bearing zones. To-day — in some of the quarries on ground specially bought for that purpose —long, horizontal, gravity tramways are built to remove the dumps as far away as possible.

The question of the disposition of the dumps is daily becoming of increasing importance; in fact some of the companies that formerly treated this subject as a secondary matter are beginning to give it earnest attention.

In underground mining excellent facilities for the placing of dead rock are afforded; since a system similar to the methods employed in wide lode mining may be introduced, whereby stopes can be filled conveniently with the debris. This would also secure safety against unexpected cave-ins, and would, in addition, greatly increase the general working economy of the mine.

However, taking into consideration all the advantages of both methods, together with their disadvantages, it must be said that the open quarry method remains the favourite of the miner, and will, doubtless, be retained as long as circumstances permit. Moreover, there seems to be no doubt that the application of the underground method — as introduced by Mr. Geo. Smith — will be confined only to such mines as work on approved rich ground, and the practical working sphere of which permits of gradual expansion. It will thus be seen, that in future the probability is, that the richer mines may employ the combined quarry and underground method: the one preferably for the summer season, and the other for the winter.

### Removal of Overburden.

The first operation in opening a quarry is the removal of the soil which covers most of the asbestos-bearing areas, which varies in thickness from a few feet up to 25 feet. In Black Lake, the crest and slope of the large serpentine ridge is for the greater part covered with a thin layer of humus, thus rendering prospecting work comparatively easy; the lower ground of this locality, however—the area between Black Lake and Thetford—is covered to considerable depth with soil, while at Thetford, the thickness of the overlying soil is, in some places, 15 to 20 feet. The removal of this soil for open quarry work is performed only in the summer time; the winter, on account of frost and snow, being too severe for this class of work.

The soil is generally cleared off with pick and shovel, and loaded into large dumping cars on trucks which are laid for this special purpose close to the work, and shifted when required.

Several of the larger Thetford companies employ steam shovels for this purpose.

### Quarry Work.

As a rule the quarries in the smaller mines have a very irregular shape: most of them following the trend of the asbestos-bearing zones; while the lean serpentine, or intrusive dikes, are left as pillars. In the larger mines, however, where the locations of the asbestos-bearing and lean rock, and the location and extent of intrusive dikes have for years been more fully studied, the quarries have, generally, a more regular outline: as at the King and Bell pits, Thetford; also at the large quarry in Danville.

At these quarries, no discrimination has been made between dikes, lean or rich portions of the serpentine; no pillars of any rock have been left, for the reason that these would only prevent mining with advantage towards depth. The shape of the quarries is rectangular: and while the outlines of the walls are not strictly in conformity with that shape, nevertheless the execution and the progress of the work in the pits indicates that a definite system has been followed in late years. The principal advantage of the system employed in these mines lies in the fact that, generally, a number of different zones—both lean and asbestos-bearing—are thus laid open, hence the work, also the supply of ore, can be regulated to better advantage according to requirements.

As a general rule, in all the larger pits the rock is taken down in a series of benches, stopes, and terraces, which vary in dimensions according to the size of each pit. A good illustration of systematic progress in quarry work is the long pit of the King quarry of the "Amalgamated Asbestos Corporation," at Thetford. This pit has a length of 1,350 feet, and an approximate average width of 350 feet. The height of the benches and stopes varies from 5 to 30 and 40 feet in the deepest part; while the length of the terraces varies between 50 and 250 feet.

### Explosives.

The great bulk of the dynamite used in the asbestos quarries contains 40 per cent. of nitroglycerine; the cartridges being, as a rule, 8 inches long, by 1¼ inches diameter, and are packed in boxes of 50 pounds, containing from 85 to 95 cartridges. The price is from 14 to 15 cents per pound.

### Effect and Cost of Hand-drilling.

Hand-drilling is still in use in the smaller quarries and prospects, also for block-holing.

As a rule, three men are employed with 1-inch octagonal steel, and six or seven pound hammers. The average capacity in hard serpentine or granite is from 15 to 18 feet per shift; and the cost per foot—including explosives—from 24 to 28 cents. In some of the mines block-holing is done by one man only; using ¾-inch steel, and three to four pound, short handled hammers. The capacity is from 7 to 9 feet per day, and the cost — including explosives — about 20 cents per foot.

### Effect and Cost of Machine-drilling.

In nearly all the quarries, machine-drilling is in vogue for the breaking of the rock in situ. The proper placing of the holes is a very important factor in obtaining the best results from blasting in asbestos rock. It is necessary that the operator have a thorough knowledge of the position of the strata, and the position and trend of cracks and fissures. To obtain

this knowledge, the intelligent miner examines the rock attentively, and carefully ascertains for each blast the position of any joints and fissures in the rock; to enable him to form a judgment as to the proper direction to be given to the hole, and the free sides available for the best results; but it happens, too often, that two miners will have different opinions as to the proper charge for a certain shot. The result is, very frequently, a waste of explosives, which sometimes assumes considerable proportions. Where the rock is massive, and the walls of the benches to be taken down vertical, the direction of the holes is vertical, or nearly so; and when the rock is much fissured, the holes have, generally, an inclined position according to the largest fissures and the bulk of the rock to be taken down.

When blasting benches having several free sides, the holes are arranged in rows, and they are as nearly as possible parallel with the largest free side, so as to obtain the deepest hole, and thus be able to use, relatively, the smallest quantity of explosives. In order that the charge may be as fully utilized as possible, due regard is given to the contour of the free sides and the longest line of resistance. The holes in this case are generally made vertical, so that the explosion will not have to lift the rock it breaks down, but will allow it to fall by itself, and thus gives less work afterwards in removing.

The depth of holes ranges between 8 and 10 feet, and in the case of exceptionally large faces, 12 and 15 feet. The charges of the drill holes vary, of course, according to the position of the latter, quality and quantity of rock as outlined above; but, as a general rule, in the course of ordinary work—where the faces are free on one side—from 0.45 to 0.5 pound of dynamite is used for every foot drilled.

The rock drills in use are mostly of the Ingersoll and Rand types, with 3⅛-inch cylinder, and a stroke of 6¾ inches.

### Electric Drills.

Lately, electric percussion drills have come into use; but many improvements will have to be made on the present design before their use will become general. Most of the manufacturers have adopted the following method: power is conveyed from an electric motor—which is placed either on the drill carriage, or in a box lying on the floor—to the drill by a flexible shaft. Compression springs are placed in the rear of the carriage; the drill carriage being released when the springs have been compressed to a certain pressure, and the drill is thrown forward by the force of the expanding springs. There are springs in front of the carriage also, which force the drill back after the blow has been struck; and there is the usual shifting arrangement, which comes into operation as the drill returns; by means of which, rotation is effected. In another form of drill—known as the box drill—air is compressed inside a cylinder forming the drill carriage; the drill being held in front and working in guides as usual, while the compression of the air is accomplished by an electric motor attached to the back of the drill.

In another percussion drill the following principle has been introduced: motion is communicated to the drill by means of a solid plunger, around which two coils of wire are fixed; electric currents passing into one coil, which, in receding, compresses a strong spiral spring in the rear. It is forced forward by the current in the other coil, aided by the force of the expanding spiral spring.

Electric drills in the asbestos quarries have several advantages over those actuated by steam or compressed air, especially in the winter time; since there is no loss through transmission, and the working effects are generally much higher.

For block-holing, little giant drills are used: the diameter of the piston is only 1⅞-inch, length of stroke 3⅝-inch, and depth of holes drilled from 1 to 2 feet.

The steel usually employed is octagonal in shape, 1⅛-inch in diameter for the larger, and ⅝-inch for the smaller drills.

The motive power for actuating rock drills is usually compressed air, or steam; but in utilizing the latter, there is a large loss from condensation in transmitting steam from boilers to the drills: especially in the usually severe winter seasons, when all the main pipes require to be covered with insulating material, which entails extra cost.

Compressed air has a great advantage over steam: the loss in transmission is small, hence the amount of drilling done is comparatively high. The operating results with steam drills are from 40 to 45 feet, per shift of ten hours. The total cost per foot—including power, labour, and explosives, at present prices of fuel—is from 15 to 18 cents; not including, however, wear and tear of machinery and interest on capital involved.

In nearly all the quarries the firing of shots is performed by means of electric batteries. There are a few instances where one-hole blasting is still in vogue. In support of this practice it is urged that not alone is a saving of explosives effected, but that the expense of picking them up is less; because the asbestos veins are less liable to be smashed to small fragments, and widely scattered.

The expenditure for explosives per ton of rock broken, in mines where the rock is of a solid, massive character, is 3 4/5 cents per ton; in mines where the rock is much fissured and shattered, as in the East Broughton mines, the cost is a little less.

Each pound of dynamite brings down, on the average, 4.25 to 5 tons of rock.

### Separation and Removal of Rock and Ore.

After the firing of shots, the broken material undergoes a hand-sorting process; which is different in every quarry, according to the grades to be produced, and the ground worked. Where no crude or hand-cobbed fibre is produced, all the rock containing fibre, together with the fines scattered all over the pit, is sent to the mill; but in quarries where the different qualities of crude are produced, the material to be treated comprises:

(1) The long asbestos fibre, and pieces of rock containing the same.

(2) The milling material, or rock, containing the shorter fibre.

(3) Fine material, and the scrapings of the pits resulting from blasting and breaking up the rock by means of sledge hammers.

(4) Dead rock.

The material specified in No. 1 is sent to the cobbing sheds, and the material indicated in Nos. 2 and 3 is sent to the mill: the fines going first, however, to the dryer.

If the bottom of the quarry is on the same level as the top of the dump, the removal of the debris is simple: the latter is loaded directly into dumping cars, or on a platform, and subsequently placed, by means

of a small derrick, on trucks, and then delivered to its destination; but in most cases where deep mining is going on heavy boom and cable derricks are employed.

### CONSTRUCTION OF BOOM DERRICKS.

Boom derricks are employed in only a few of the smaller mines, or where dumps have to be worked over again. Quarries of large dimensions do not, generally, admit of the successful application of boom derricks; on account of their very limited working radius.

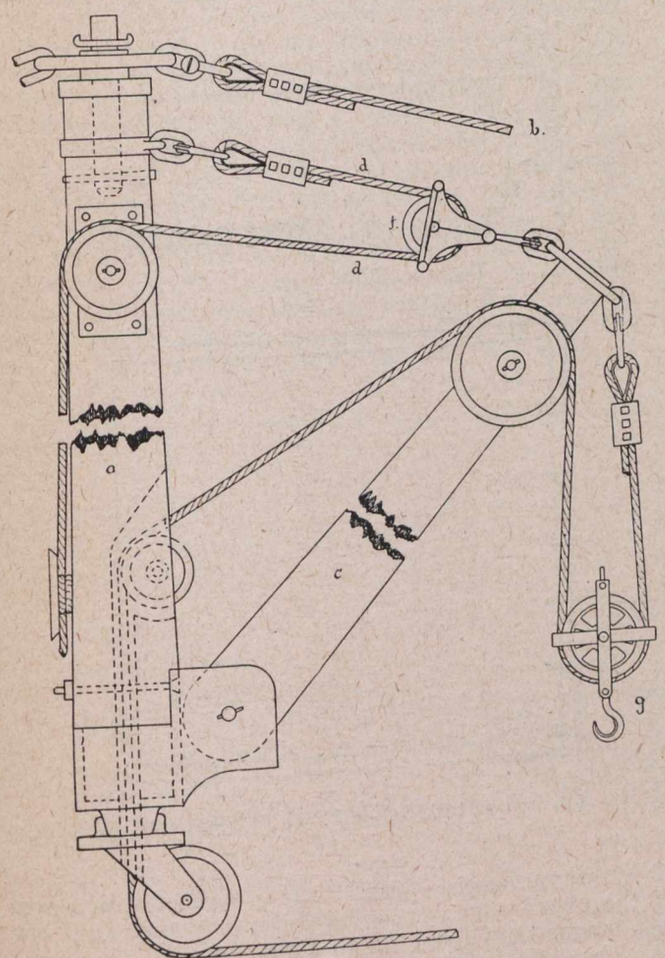


FIG. 19—Boom derrick.

A boom derrick (fig. 19) consists of a mast held in a vertical position by means of guy ropes or legs. To provide for the rotation of the mast about its vertical axis, the lower end of it is pivoted into a socket of the fixed bed-plate. A boom or arm is hinged to the foot of the mast immediately above the pivot. The farther end of the boom, which carries the load, is suspended from the top of the mast by ropes, which pass over pulleys to permit the variation of the inclination of the boom to the mast. The length of the boom is from 30 to 50 feet; its working radius is naturally limited and can hardly be extended more than 50 feet.

### CONSTRUCTION OF CABLE DERRICKS.

A cable stretched from the top of a well guyed frame or mast to some point across the working pit, along which the load is to be transferred, constitutes the main feature upon which the cable-derrick is constructed. A carrier suspended from the cable by a system of pulleys travels along the cable, and may be arrested, lowered to pick up the load, and rehoisted at any point between the limits of the cable.

The cables may span a distance of 400 feet, are made of crucible steel, and are from 1½-inch to 2-inch diameter: depending on the length of the span and load to be carried. The ropes for hoisting are from ⅝-inch to ¾-inch diameter.

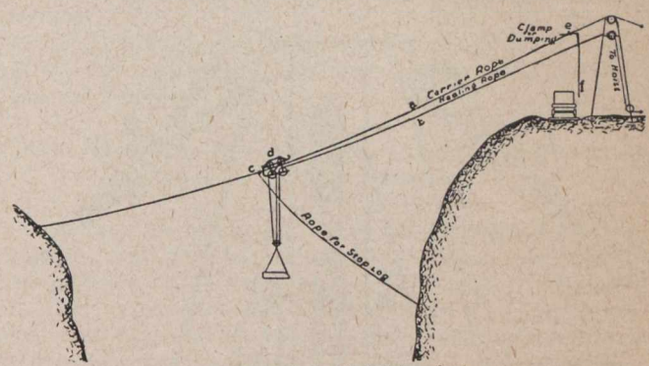


FIG. 20—Incline cable hoisting plant.

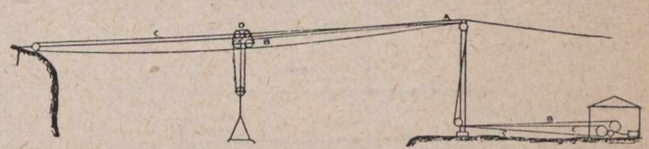

FIG. 21—Horizontal cable hoisting plant

The cable ways may be either inclined (Fig. 20) or horizontal (Fig. 21).

The cable ways may be either inclined (fig. 20) or horizontal (fig. 21). In the case of the inclined cable way the carrier is provided usually with one rope: the fall rope, which is also used as a hauling rope. To prevent the carrier moving along the cable when the load is raised, it is necessary that the angle of inclination of the cable be at least 30 degrees, to render the component of the force of gravity of the load acting down the cable of sufficient intensity to retain the carriage in position until the load arrives at the stop on the cable.

On stopping the carriage at any point on its upward journey, the load may be lowered and dumped, after which the carriage returns down the incline to the stop. It is generally necessary, however, to provide a bridle or link (e), pivoted to a wooden clamp on the carrier rope over the dumping point, which link is raised by a cord, (f), and dropped over the hook on the end of the carriage before dumping, and afterwards released to allow the carriage to return.

To obtain control of the carriage so that a load may be picked up or lowered at any point on the line, without shifting the stops on the carrier rope, a third rope or extra hauling or tail rope, ⅜-inch diameter, is required; which is attached to the carriage and wound in at the same speed as the fall rope after the load has been lifted, and by means of which the carriage may be restrained in its movement down the incline on the return trip, or made to stop over any point in its range of travel for loading or unloading purposes.

By making the hauling rope endless that is, by passing it from the carriage around the separate winding drum on the hoist and around a sheave on the farthest end of the cable way, the latter may be used in a horizontal, instead of inclined position. In some quarries the inclined, and in others, horizontal cable-

ways, with tail rope are utilized. Miners generally prefer the horizontal to the inclined cable-ways, on account of the ease with which the carriage may be stopped at any desired point from the hoist; while with the inclined cable-way a constant shifting of the stopping log on the cable rope is necessary.

The support for the cable consists either of a pyramid, constructed of four legs fitted and bolted securely; or of two legs held in vertical position by 7/8-inch guy ropes arranged in the manner illustrated in

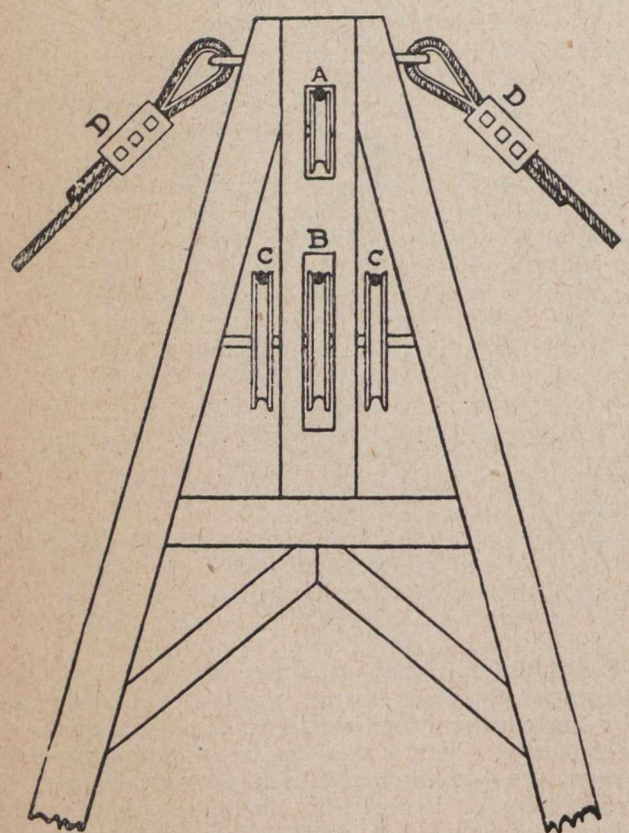


FIG. 22.—Two-leg support for cable derrick.

(A) Carrier rope. (C) Hauling ropes.
(B) Lifting rope. (D) Guy ropes.

fig. 22. On the top of these supports are placed the sheaves for the carrier and haul rope. It is claimed for the pyramid-shaped supports that they are very rigid, and strong, and do not require any guy ropes; while the two leg supports are of simpler construction and can be more easily removed.

Single mast supports were perceived in one mine; but they are exceptions to the general rule.

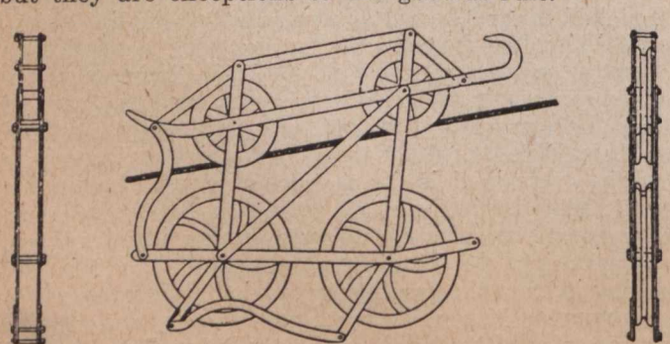

FIG. 23.—Carrier for cable hoisting.

The cable carriage (fig. 23) is substantially constructed of wrought iron, and is yet comparatively light. The running wheels are of cast iron, have flanges, and, as a rule, are provided with anti-friction bearings. The hoisting wheels are of cast iron, 18-inch to 24-inch diameter, in order to reduce the wear on the hoisting rope, and to enable the gin block to lower as freely as possible.

The boxes for hoisting are made of 2-inch hardwood, and hold, generally, from 16 to 20 cubic feet of rock, weighing from 2,200 to 2,500 pounds. The bottom is covered with 1/4-inch steel plate; while in some quarries the outside corners are covered and protect-

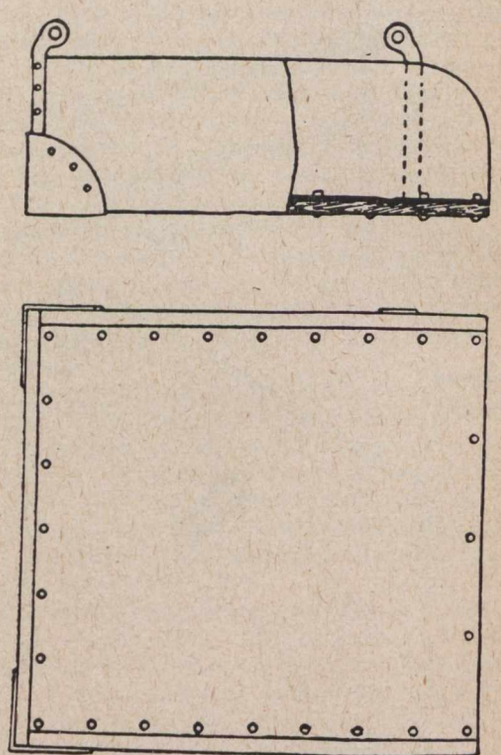

FIG. 24.—Construction of transport boxes.

ed by heavy flanges (fig. 24). It is claimed that a box of the above construction in ordinary work does not last longer than from six to eight months. One company has attempted to use boxes made of iron; but it appears that the experiment was not successful.

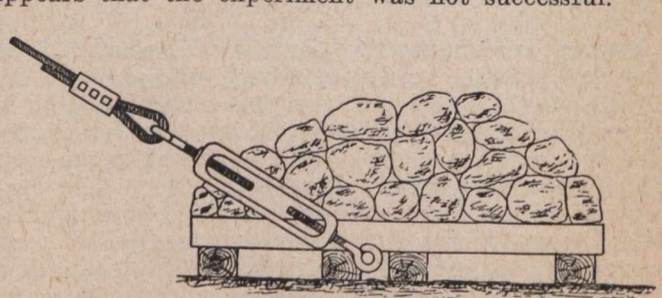

FIG. 25.—Anchorage of carrier rope.

The heavy cable is fastened at both ends, either to a system of heavy wooden legs loaded with stones (fig. 25), or to a large iron bar securely fastened in a drill hole in the solid rock.

For the purpose of stretching the cable from time to time, a turnbuckle is inserted at one end of the cable, in the manner illustrated in fig. 25.

### HOISTING ENGINES.

All hoists used in the district are of the double cylinder type, with reversible friction drums.

### EFFICIENCY OF HOISTING PLANTS.

The number of tons of rock which can be raised from a quarry by means of a cable derrick depends upon the depth of the pit, the distance to be hauled, and the capacity of the machinery. As a rule, however, the distance in nearly all the quarries does not exceed 400 feet; while the greatest depth so far attained is 185 feet. Taking these figures as a basis, and assuming the load to be one ton, and the capacity of the hoist 40 horse-power, an average of from 240 to 300 tons can be raised in a ten-hour shift. It must be understood though, that a cable derrick is used also for other purposes: for instance, the lifting and shifting of heavy pieces of rock in the quarry in order to clear the working face after blasting. On account of the work entailed through the separation of the useful from the dead material in the bottom of the pit, a cable derrick is very seldom used to its full capacity. In order, therefore, to provide for a steady supply of ore in all the quarries, a larger number of cable derricks than the regular output capacity indicates, are employed and stationed along the quarries. In illustration of this, it may be cited that one company treating about 300 tons of asbestos rock in the mill and raising for this purpose as an average 500 tons, has employed eight cable derricks.

### HAULAGE AND DUMPING.

The dumping cars in use are of two classes: (1) those hauled by men or by horses, and (2) those hauled by power. Dumping cars of the first class consist of a truck and a movable box, constructed for a 26-inch gauge, and holding from one-half to one ton.

The box cars for power haulage hold from three to six tons of rock. They are furnished with brakes and such mechanism as will permit the tilting of the box to both sides of the track.

The gauge of the latter is 42 inches. In all the larger quarries haulage is being done by small 10 and 12-ton locomotives; and it is claimed that not only is the cost of transport per ton considerably reduced, but that accidents are very few. The first introduction of these small locomotives was made by Mr. Geo. Smith, in 1895, who used in their construction two cylinders from an old hoisting engine, in connection with gearing motion.

The steel rails employed are of either 19 pounds to the yard, for light dumping cars; or 45 pounds, for mechanical haulage.

### GENERAL HOISTING AND HAULING ARRANGEMENT AND POSITION OF CABLE DERRICKS.

The position of the cable derricks is determined by the location and number of working points in the pit, and changes with the shifting of operations. Where the quarry is of rectangular shape, all the supports and hoisting engines are, as a rule, placed on one side of the pit; the former usually all on one row near the border of the pit, leaving, however, enough space for the passage of dumping cars. A good illustration of this arrangement is the large "King" pit of the Amalgamated Asbestos Corporation at Thetford. The derricks employed here are all of the tail-rope type; the cables being stretched nearly parallel at fixed intervals over the pit; while all the hoists — some of them are grouped together in one building — are stationed back of the supports.

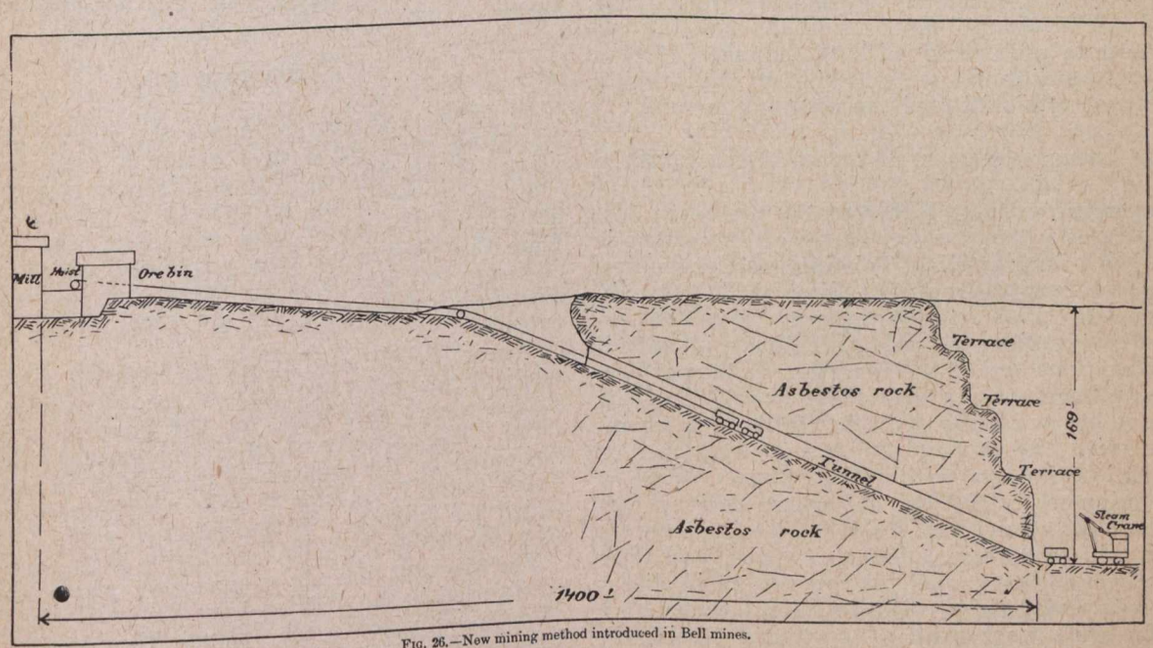


FIG. 26.—New mining method introduced in Bell mines.

In cases where the pits have an irregular shape, and curved outline, an effort is generally made to place the hoists and supports on one central spot, from whence all the cable-ways can be operated.

The tracks for the haulage of dumping cars are generally laid alongside, and close to the borders of the quarries. Generally, two tracks are close to each other; one for the loaded and the other for the empty cars.

In some of the mines the tracks are of an ascending grade towards the pit; allowing the loaded cars to descend by gravity for some distance to a shunting yard, where they are sorted and delivered to their destination.

An ingenious device for the disposal of the mill rock from the pits, the only one of its kind in the district, has been installed at the quarries of the "Jacobs Asbestos Mining Company," of Thetford Here the boxes coming from the pits by way of cable derricks are dumped in a system of ore pockets which empty into a pan conveyor below. The latter transports the ore directly to the ore bin of the mill. There are altogether installed 7 cable derricks with as many ore pockets. The conveyor has a total length of 325 feet, and consists of heavy steel pans 30 inches wide, each pan being reinforced by angle iron. Its velocity is 40 feet per minute.

The signalling from the pits to the hoists in shallow workings is effected by shouting; but where the pits are deep, and where the operations cannot be noticed by the engineer, boys are stationed at points of vantage on the border of the pit, who convey the signals either by electric bells or by means of a galvanized wire to a hammer which strikes a bell, the number of strokes indicating what is required.

Each engineer stationed at a hoisting engine marks the number of box loads he has hoisted during the shift, and the summary report of all the hoisting engineers' records must tally with the number of cars delivered at the different stations: i.e., at the cobbing shed, the dryer, the mill, and the dumping ground.

### Recent Improvements in Hoisting Appliances.

The suspended cable—which replaces the boom derrick in all cases where a wider range of operations is required—with its travelling, hoisting, and propelling lines, possesses many advantages. First of all, the main cable, suspended high over the quarry from the terminal towers, provides a roadway entirely independent of obstructions and of the condition of the surface. Having no other supports than those provided at the terminals, it has one clear span, hence there is no interference with the passage of trains, waggons, or other work carried on within the range. With a suitable equipment in the way of engine, sheaves, carriers, and skips, almost any kind of hoisting may be carried on with a certain amount of speed, and over a comparatively large range. It comes here in direct and successful competition with the boom derrick; for it does the same work with a substantial saving in operating expenses. Upon watching closely the operations of these cable derricks, however, we find that they also have their serious drawbacks; and this is more apparent the greater the quantity of low grade material handled. In order to work simultaneously at many points in a big quarry it is necessary to install quite a number of these cable-ways In one pit, measuring over 1,000 feet in length, twelve cableways are being operated, and this necessitates twelve different hoisting units; each consisting of cableway hoist, cable tower, two or three heavy cables, and other accessories. Moreover, the operating expenses; the permanent watch necessary to keep these units in good order to prevent any accident; the time lost by the men in the quarry—as is generally the case—in watching the arrival or departure of the hoisting skips; are all factors which, when considered in the proper light, tend to offset, to some extent, the apparent advantages that at first sight appear.

These negative facts are now recognized by engineers, hence efforts have already been made to do away, to a very large extent, with the cableways in cases where larger quantities of rock are to be handled, and to substitute a tramway service instead — where the location of the quarry permits of such a course. The "Bell" people, at Thetford, are the first to be credited with this innovation. When the present proprietors — Messrs. Keasbey & Mattison — took over the property several years ago, their manager, Mr. Geo. Smith, made a proposal to connect their great quarry with the mill: which was located at a distance of 1,100 feet, by rail through a tunnel, allowing at the same time a thorough exploration of a long stretch of virgin serpentine. This plan was at once accepted and executed, with the result that to-day all the rock, instead of being hoisted by cable derricks, is hauled in large 5 ton cars over a tramway through a tunnel to the mill. The advantages of this hoisting system are manifest, and need no further comment. There are a number of quarries in the district, the location of which permits the introduction of a similar tramway service; and although the initial expenditure of making a tunnel or open-cut in connection with the tramway may be high, yet the operating expenses are so low, compared with that of ordinary cable derricks, that the money invested may be considered well spent.

### Compressed Air.

In some of the larger mines the motive power for actuating rock drills and hoists is compressed air; generally supplied by straight-line air compressors.

In order to secure uniformity of pressure, and to get rid of the water, and impurities, the air is led from the compressor into a receiver, which is generally supplied with a safety valve, and pressure gauge, also a cock for letting off the water which gradually collects.

Where the distance of the pit from the air compressor is long—over 500 feet, a second receiver is installed about half way, for the purpose above indicated. The capacity of an air compressor is generally estimated by the number of rock drills it can supply. There are 3, 7, 14, and 20 drill, air compressors, all of which are employed in the asbestos region. The pressure usually produced for air drills is 80 pounds.

The straight-line air compressors which are extensively used in the district, have the great disadvantage of consuming too much steam. They are now being superseded by the duplex, compound steam-air compressors, which are constructed on more economical lines.

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The annual analysis book of the Lake Superior Iron Ore Association has just been issued. The list of analyses includes 283 ores. Michipicoten and Sudbury Canadian ores are listed. The former are classified for the trade as "Algoma," "Helen No. 1," and "Helen No. 2." Of the various groups of the Steel Corporation's ores only two show increases in iron content. These increases are partly or wholly due to reduction of moisture content. The remaining ores fall off slightly in iron percentages.

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In the oil fields of Galicia, Austria, there are now 135 producing wells, and 204 new wells are being drilled. The Austrian State Railways use oil exclusively. This provides a steady market.

# A PERSONAL NARRATIVE OF THE BELLEVUE, ALBERTA, RESCUE PARTY.

The following narrative has been submitted to us by an official who took an active part in the efforts made to rescue the miners entombed in the Bellevue colliery after the explosion last December. The narrative and covering letter were written for the purpose of correcting a statement that appeared in the CANADIAN MINING JOURNAL, February 1st, 1911, to the effect that the Draeger apparatus installed at Hosmer, B.C., were of the 30-minute type.

Our correspondent shows that this statement was only partly correct.

The lessons learned by the Bellevue experience are numerous. Not least important is the demonstration of the mischievousness of official interference. The narrative should be read with close attention.

## THE NARRATIVE.

On the 9th December, I was informed that there had been an explosion in the Bellevue mine of the West Canadian Collieries Company, Bellevue, Alberta, and that assistance had been requested. I was informed that there was a special train on the way from Fernie, to take the rescue party up to Bellevue, which is situated about 42 miles east of Hosmer.

After assembling a few men, we had three "Two-hour Type" Draeger apparatus, two "One-half-hour type," pulmotor, pump, spare cylinder of oxygen, and a supply of spare small cylinders for the "two-hour" type, with the necessary potash cartridges, packed up and put aboard the train. Accompanied by Mr. D. G. Wilson, manager Hosmer Mines; F. Alderson, fire-boss, Hosmer; and Mr. Fuller, secretary, we proceeded to Michel, where we picked up Messrs. Ashworth and Fraser, of the Crow's Nest Pass Coal Company. We arrived at Bellevue about 1.30 a m., after having to change all our apparatus from one car into another at Coleman, causing a delay of about 20 minutes.

It was about 11.30 p.m. when we received word in Hosmer of the explosion. I decided to take only the three apparatus ("two-hour type") owing to Mr. Ashworth having informed me that we would not require them. As Mr. Ashworth had investigated an explosion in this mine about six weeks previously, he informed me that he was almost sure we would not require the rescue apparatus. We had the apparatus taken to the lamp room, where I left it in charge of Alderson while I proceeded to the office to see if any of the mine officials were there. Not finding any of the officials, I decided to go into the mine, and, taking the apparatus, we proceeded in a car for some distance. Then, owing to some coal having blocked the way, we had to walk. At about one mile and a half we found the rescue party bringing out the bodies of twenty-one miners who were found near a leak in the high pressure line. At this point I found Mr. Powell, the manager, and, after introducing myself to him, I suggested that he send out to the lamp-room for the doctor in whose charge I had left the pulmotor, as it might be useful to try it on these men. I might mention that I left the pulmotor in the charge of the doctor as he had been instructed to stay outside. I also showed him the way to use the pulmotor.

Mr. Powell then asked if we could explore the level, so Alderson and myself put on the Draeger apparatus and started in. We had only gone about 500 feet when Alderson complained of something being wrong with his apparatus and I had to assist him back to the starting point. On examination I found that the nipple connecting the oxygen cylinder and the apparatus was loose and all the oxygen had escaped. Here I may state that I had been away from Hosmer for three weeks taking in the Mine Rescue course at Seattle, and had only returned that night; therefore, to make sure, every part of the apparatus was examined in the presence of Alderson and Wilson on the road coming to Bellevue. After a short rest, Alderson requested to be allowed to put on the other apparatus, and as he appeared to be all right, I acceded. We proceeded in the level about 2,000 feet, where we found eight miners alive around the high pressure charging station. I explained to these men that we would return and get the two "half-hour" apparatus and take them out.

Starting out we had only gone twenty feet when Alderson stopped and informed me that he would give one of the men his apparatus so as to allow the miner to go out. This I protested against, and informed him that it was not right. Still Alderson insisted on going back, and took his apparatus off, giving it to one of the miners, who accompanied me out. On arriving at the starting point, I informed Mr. Powell of how things stood, and asked that men be sent out to bring in the two "half-hour" set, also a further supply of potash and the spare oxygen cylinders for the "two-hour" apparatus. I then returned inside, carrying Alderson's apparatus,. This he put on and I gave mine to another of the miners, who accompanied Alderson out. On Alderson returning inside, he was completely exhausted and had the chin valve of his apparatus open, but was able to inform me that he had dropped my apparatus on the road in; also he thought that in the one he had on the potash cartridge was done. Assisted by the miners, I took the apparatus off and put it on to try it, and found that it was all right. I started for the outside and you can judge that the entombed men were in good condition when two of them accompanied me out for 15 or 20 feet to see if I was all right. I arrived at our starting point, and urged that some person go out and hurry up the apparatus I had sent for, and Mr. D. G. Wilson started out to hurry them up.

About this time A. McTuskey arrived, and requested to be allowed to go in. He having taken the course at Seattle, I consented, and he put on the "two-hour" apparatus and carrying also one of the "one-half hour" type which had now arrived, he started inside. About twenty minutes later McTuskey returned and informed me that the men were all down except the fire-boss. In reply to my question why he did not insist on the fire-boss taking the apparatus and bring him out, he informed me that none of the men could stand, much less walk. I suggested to Mr. Powell that a rope be sent for so that a man could go in and tie the men on and we could pull them out, and this was sent for. Realizing that through some cause the gas was being forced onto the men (these men had been inside for about eight hours) I then suggested that we extend a sort of life line of men and follow up as near as possible to try and grasp any chance of saving their lives. We started in, and Mr. T. Spruston, overman, Michel,


taking the lead, testing the air as he went, we succeeded in reaching the entombed miners. Only in the inside did Spruston detect any sign of $CH_4$, and then only a small cap. Having reached the entombed miners we started to haul them out (we had no stretchers). Spruston and myself pulled one man a considerable distance when Spruston got knocked out and left me. T. Mather, Michel, then gave me a pull with the same man and also left me, then, feeling pretty sick, I gave up and tried to make my way outside; but must have succumbed to the afterdamp. I was found afterwards and revived.

When this forlorn hope started in there were seven men inside including Alderson. I am glad to say that the conditions altered so that five of these men were rescued alive. What caused this sudden change in condition I am not certain. It may have been a cave. On the other hand, Mr. Wilson on going out to hurry up the supplies, found the trap-doors without any person in charge. One of these was propped open. Mr. Wilson requested the Inspector of Mines, Mr. Heathcote, to put some person in charge.

Reviewing the situation I might mention that the station at Hosmer has only been open since November 1st. There are practically no trained men as yet,* the intention of the British Columbia Government being that the inspectors would take the course in the Seattle Mine Rescue Station and that, with a suitable training station, corps of men could be trained. I had just returned from taking the course as I previously mentioned. A. McTuskey, previously mentioned, had taken about six lessons, while Spruston had taken two lessons. These two did not come up with the special train, but followed in another train, Alderson had been doing some training in Hosmer mines with the apparatus, therefore my preference for him. The incident of the first apparatus leaking I can only explain by the fact that when we arrived in the lamp-room at Bellevue it was crowded with men, and the appearance of the Draeger apparatus created quite a sensation, it being almost impossible to keep the men from inspecting and generally handling the apparatus. The pulmotor which I had left with the doctor was brought in, but was not tried on any of the twenty-one men, the reason being, so far as I can see, that the doctor did not realize the importance of the pulmotor. Afterwards Messrs. Wilson and Ashworth tried it on some men, but informed me later that it would not work. On the Monday following I was able to satisfy Mr. Ashworth that the trouble was that they failed to make an air-tight connection between the mouthpiece and the man's face. The pulmotor, I think, would have given a good account of itself, had there been a trained man there to handle it.

I might also mention that we have four "two-hour" type apparatus at Hosmer. One of these had been leaking, therefore I did not take it

I have not the least doubt but that if the change had not occurred in the ventilation we could have brought out the eight men successfully; and more, had there been a trained corps of men on the spot within a reasonable time, I believe a great many of the twenty-one men found dead at the leak on the high pressure line would have been saved, as these men all died of CO poisoning, and practically all had time to put on their clothes and take their buckets with them when they tried to get out.

It must be remembered that we were out of our own district, as Bellevue is in Alberta, and we could not assume the direction of affairs as we would have liked, and as is necessary for the successful issue of rescue work. As it was, we were only rendering volunteer assistance. We have, however, this advantage, that we learned some very valuable lessons. These are, not to depend on advice as to whether the apparatus is wanted or not, to treat every accident as the worst until we find different, and to make a more thorough inspection of the apparatus before it is taken into actual work. The necessity of having trained


*Editors Note.—This account was written early in February of this year.

men and attendants, with an appointed leader whose orders are to be obeyed, was proved. Sentiment should have no place in the work, as this leads to the loss of life, probably endangering the life of the whole party. Portable stretchers are absolutely necessary.

A portable station in a railroad car is also a necessity. The pulmotor ought to be in the charge of trained men, able to determine how far it can be taken inside, so that the men have not to be carried long distances for treatment.

Another point,—on making my second trip out I felt flushed and heavy. This I ascribed to putting the apparatus on inside, as, although there may be sufficient air to keep men alive, I question if there was sufficient good air for a person to take when putting on the Draeger apparatus. In other words, I objected to Alderson giving up his apparatus as I considered there might be some CO in it. My reason for doing the same thing after was that it looked selfish to keep Alderson inside taking all the risk.

Referring to the incident when Alderson returned inside, having dropped the spare apparatus and claiming that the potash cartridge was done, I think that the exertion of carrying the apparatus, probably in a great hurry, had exhausted his respiration bag and he had dropped the apparatus when he should have taken a rest.

I have tried to give you an account of our experience, and if there is any point that I have overlooked or is not clear, I shall be glad to explain the same.

The apparatus we have is the 1910 type.

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# CANADIAN MINING LAW

By J. M. CLARK, LL.B., K.C., Toronto, Canada.*

From the Transactions of the American Institute of Mining Engineers.

(Wilkes-Barre Meeting, June, 1911.)

For some years past, those interested in the development of the increasingly important mining industry of Canada, have urged the adoption by the Dominion Parliament of a federal mining law, which would have the force and stability of statutory enactment. At present, placer mining in the Yukon Territory is governed by the Yukon Placer Mining Act. All other mining under federal jurisdiction is governed by Orders-in-Council and Ministerial Regulations.

In the earlier stages of development, it is perhaps a matter of necessity that these important matters should be so dealt with; but it is now felt that the time has come when mining rights in the extensive regions under federal control should be put on a permanent basis, and that any changes required from time to time should be made only after full and open discussion in Parliament.

A short sketch will suffice to indicate how vast and varied the interests affected really are.

When the Dominion of Canada was instituted by the Imperial Statute known as the British North America Act of 1867 (which came into force by proclamation on July 1 of that year), it comprised only the present Provinces of Ontario, Quebec, Nova Scotia, and New Brunswick; but provision was made for the inclusion of Newfoundland, Prince Edward Island, British Columbia, Rupert's Land, and the North-West Territories. Subsequently Rupert's Land and the North-West Territories were acquired, the Crown Colonies of British Columbia and Prince Edward Island were admitted, and all the other British territories and possessions in North America, with the islands adjacent thereto, except Newfoundland and its dependencies, were annexed to Canada by Great Britain.

Canada, consequently, now comprises the whole of the northern half of North America, except Alaska, Newfoundland, and that portion of Labrador which constitutes a dependency of Newfoundland. All lands, mines, minerals, and royalties belonging at the time of the union to the several provinces of Canada (now Ontario and Quebec), Nova Scotia, and New Brunswick, are declared to belong to that one of the said several provinces of Ontario, Quebec, Nova Scotia, and New Brunswick, in which the same are situated or have their legal origin—subject, however, to any trusts existing in respect thereof, or any interest therein, other than that of the Province.

Each of the Provinces named has jurisdiction to make laws for the management and sale of its public lands, and of the timber wood thereon, and also as to property and civil rights in the Province.

With some exceptions, not necessary to be here specified, the same rules were made applicable to Prince Edward Island and British Columbia. But very different conditions and regulations obtain in the remaining parts of Canada.

Under the sanction of an Imperial Statute, the Dominion of Canada obtained a surrender of the lands and territories granted by Charles II. in 1670 to the Governor and Company of Adventurers Trading into Hudson Bay, known as the Hudson Bay Company; and Rupert's Land and the North-West Territory were consequently admitted into the Dominion as of July 15, 1870.

When the Provinces of Manitoba, Saskatchewan, and Alberta were formed, the lands, mines, and minerals, with slight exceptions, were not transferred to the Provinces, but remained the property of the Dominion of Canada, and subject to federal jurisdiction and control.

The proposed federal mining law must deal with the mines and minerals of these three Provinces, of all the Territories (including the Yukon Territory), and of certain areas of the older Provinces, principally the Indian lands and the railway belts of British Columbia. It must, therefore, deal with placer mining, coal, natural gas, oil, petroleum, gold, silver, copper, and the other minerals. The whole field must be covered and every problem of mining law solved.

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*Secretary's Note—Mr. Clark, an eminent Canadian lawyer, and joint author of the treatise on "The Law of Mines in Canada," has been requested by the Dominion Government to prepare a Federal mining law, and presents this paper, by invitation of the Council, in order to obtain, if possible, useful suggestions from members of the Institute.—R.W.R.

The framing of this general law is regarded by mining men as supremely important, not only on account of the great interests actually and potentially involved, but also because it is looked upon as the first step towards the unification of the mining laws of Canada. The vital importance of such completeness, wisdom, and practical convenience being presented by the federal statute as will recommend it to the several Provinces for voluntary adoption is therefore self-evident.

While the Dominion has no jurisdiction over the mining laws of the Provinces which own mining lands, it is hoped that the provisions of the federal law, by reason of their excellence and efficiency, will gradually be adopted by the various Provinces.

To paraphrase a famous saying, this must take place, not by reason of imperial power, but by the imperial power of reason.

In this connection, a striking instance of concerted action by independent jurisdictions may be mentioned. Some years ago, an exceedingly well-drawn Act, dealing with bills of exchange and promissory notes, was passed by the Imperial Parliament. The same Act, with slight changes, was passed by the Canadian Parliament, and by a majority of the State legislatures of the United States; so that it may now be said that this statute governs the greater part of the English-speaking world!

There is no reason why the members of this Institute should not take a useful and active part in obtaining for the mining world advantages similar to those which have been thus secured by the mercantile communities of Great Britain, the United States, and Canada.

At the present time, a discussion of the fundamental principles upon which such a mining law as is proposed should be based, and of the merits and deficiencies of such codes as that of Mexico, would be interesting and instructive, as bringing together, in useful form, the results of close observation and varied experience of the mining laws of the world.

There is no danger that any form of the so-called "apex-law" will be again introduced into Canada. That law was once copied, under the influence of miners from the Pacific States, by British Columbia, but was finally abolished April 23, 1892, since which date the rights of the holder of a mineral claim are confined, in British Columbia, as in all other parts of Canada, to the ground bounded by vertical planes drawn through its surface boundary lines. The vested rights of claim owners who had located their claims under former acts were protected; and the "apex-law," in British Columbia, as elsewhere, has given rise to costly litigation, which seems inherent in the system of extra-lateral rights.

There are, however, other important questions to be discussed; such as how adequately to protect the prospector, without at the same time introducing the danger of "blanketing"; the function of discovery in the acquisition of mining title; the most useful forms of working conditions, and the most efficient methods of enforcing such regulations. Last, but not least, the ever-present and ever-troublesome questions of taxation and royalties must be considered.

### Discussion.

Rossiter W. Raymond, New York, N.Y.:—It is satisfactory, but not surprising, to learn that there is no danger of the adoption in Canada of the apex-law with its extralateral right. I do not think that any community which has once experienced the evils of that system, and has escaped from them by abandoning it, would ever dream of returning to it. And British Columbia having had that experience, has doubtless furnished a sufficient object lesson for the whole Dominion.

Mr. Clark's hope that a federal law may be framed which will ultimately be adopted by the Provinces, is not chimerical. Not only the commercial instance which he cites, but the history of our United States law, encourages such a hope. That law prescribes a few conditions, leaving to local legislation freedom to ordain others, not inconsistent therewith. For instance, the form and the maximum dimensions of a mining claim and the minimum amount of annual "assessment work," are prescribed, together with a few forms of procedure; but smaller dimensions, larger amounts of annual work by possessory owners, and additional forms of procedure, may be imposed by local legislation or regulation. In many cases, especially during the earlier period following the adoption of the Federal law (1870), this freedom was abundantly used, and locators of lodes or placers were often obliged to do, for the maintenance of their possessory titles, a good deal more than the United States statutes required; but gradually the convenience of uniform conditions, working quietly, but continuously, like the pressure of gravity, had its effect; and, at the present time, the local regulations of mining districts have been largely superseded by State or Territorial statutes, which are, in the main, not only consistent, but identical with those of the federal law. Another illustration is the manner of making and recording a mining location upon the public domain. It may seem strange that the United States law prescribes nothing at all in this respect. It required the location to have certain essential features of shape, maximum dimensions, and relations to the discovery of a mineral deposit within its boundaries; but it does not require any particular form of record or proof of these fundamental requirements. Indeed, the United States Government does not to-day possess either records or maps showing what portions of its public mineral lands have been appropriated by valid mining locations, and, being held under possessory title, do not now belong to that domain. The explanation of this anomaly is historical. At the time when our government had to do something in order to define its relations with miners who were technical trespassers upon the public lands, those lands constituted, in the main, a vast unsurveyed wilderness. A theoretically perfect and properly guarded system for the record of mining titles would have been impracticable of execution; and Congress, therefore, did the best it could under the circumstances. The punishment of trespassers being neither desirable nor practicable, it legalized the trespass, and left the parties concerned to settle their relations to one another according to the local rules which they had themselves adopted in the several mining districts, or which might be established for them by local legislatures, subject to a few more or less elastic requirements established by the United States, as the real owner of the land. Meanwhile, the facts concerned were left to be proved by any kind of evidence, documentary or oral.

In my judgment, this action of Congress, though warranted under the circumstances so far as records of location, etc., were concerned, might and could have been remedied, when these circumstances had greatly

changed, by requiring records of location, etc., to be made in or officially transmitted to the United States local or general land office. But it is worthy of note that, without any such requirement, the effect of simple considerations of the certainty and safety of such records has brought about a general uniformity of local legislation, requiring them to be filed with the officers of courts or counties, who will be responsible for their preservation from mutilation or destruction. It is not yet the duty of such officials to give notice to the United States of such entries, affecting the title of the United States to its public lands; but that step may easily be taken. Meanwhile, this narrative of somewhat chaotic progress may encourage the belief that obviously wise and useful features of administration will, in the end, be adopted by communities upon which, when first promulgated, they are not legally binding. In other words, it is worth while for a federal government, like that of the United States or the Dominion of Canada, to frame a system of mining law for its own lands, which will commend the acceptance of its constituent States or Provinces in the administration of their own lands.

To this end, I think the first requisite is a survey of such lands. Apart from the mischievous extra-lateral right, the greatest cause of confusion and waste in those mining districts of this country which have been afflicted by our mineral land law, has been the lack of such public surveys as would permit the accurate definition of a mining location by reference to established landmarks. I do not know how far the Dominion has proceeded in the discharge of this public duty—one of the very first, in my opinion, which is incumbent upon any government worthy of the name. At all events, I hope that Mr. Clark's draft of a code will include provision for immediate performance of this work. Mining grants may have to be made in territory not yet surveyed; but this should be done under conditions which will secure their subsequent re-definition by reference to the lines of such a survey, and will permit the readjustment of their boundaries so as to conform, if possible, to those lines. This will be comparatively easy, if the boundaries of the original location be required to follow the direction of the future survey lines—e.g., to run N-S. and E-W. The purchaser or possessory tenant of a tract of mining land would never object to paying for a little more area here, or a little less there, in order to conform to this obviously convenient rule — provided, of course, he were not haunted by the fear of losing problematical "apex-rights" by any variation in his lines. Under our present United States system, the locator determines, as well as he can, the course of the "apex," which he fondly hopes he has truly discovered, and is bound to claim a rectangle covering that course—under penalty of losing some or all rights, both extralateral and intralateral, if later developments should prove him mistaken. It might be a hardship to him to be required to draw his boundary lines in particular directions; although I am inclined to think that, in the long run and in the majority of cases, the result would be advantageous to our mining operators, by reason of their greater security of title. I have had to do with a large number of mining litigations, and I can recall few lode claims involved in such cases from which the lode did not depart, at some point, across a side-line; so that I am inclined to believe that, even under the "apex-law," the boundaries of locations might have been required (with some modification or conditions as to length and width), to run N-S. and E-W., with real advantage to locator. Be this as it may, I see nothing to prevent the adoption by the Dominion of Canada of a provision so well established and so universally approved in the sale of public agricultural lands.

Next in importance to public surveys is the official classification of the public lands to be leased, sold, or opened to prospectors. This classification should be, in my opinion, final and conclusive. If the land in question has been sold outright, say, at the price of agricultural land, and the grant or patent of the government, conveying the full common-law fee simple to its contents, usque ad astra, usque ad inferos, has been issued to the purchaser, then the original official classification of it, as agricultural, should not be disturbed by proceedings attacking the purchaser's title, on the ground that it was or is, in fact, more valuable for mining than for agricultural purposes. The government should occupy, in this respect, precisely the position of a private seller. (Of course, actual fraud, to which the purchaser was a party, might be pleaded against his title, but to no further extent and under no other conditions by the government than by any private party wronged by such fraud. That is to say, the government should itself bring suit for the abrogation of its grant or deed; and the latter should not be open to collateral attack in any private suit.) In short, the purchaser of anything from the government is entitled, in justice as well as policy, to know just what he gets, and to be assured that he really gets it. The danger that, through an incorrect official classification, mineral land may be sold at a lower price as agricultural land, is entirely insignificant compared with the importance of giving a clear and secure title to purchasers.

On the other hand, lands may be granted for agricultural purposes, with a reservation by the government of the mineral rights. In this case, a previous official classification is less important. Yet I think it might well be required to protect the government against unnecessary administrative complications. Any land which is officially classed as "mineral," had better not be sold as "agricultural"; and, in any case it is best that in such transactions, as in private bargains, both parties should clearly know what they are doing. In leases of mineral rights, it might be urged that the government should be able to increase its requirements upon proof of unexpected value of the property. One obvious answer is, that such a change should be practicable, if at all, only after a term of years. But a more conclusive answer is, that the mining industry should be taxed upon its annual product or profits; and such a tax will take care of all unexpected prosperity, without disturbing the conditions of mining title. I feel bound to say, however, that nearly 50 years of observation and experience have inclined me to believe that the acquisition by private parties or corporations of the full fee simple of public lands, including the mineral right, is better in the long run, than any system of leasing by the government. If such a system should be deemed advisable, then the condition of the retention of title should be, not a given amount of annual "work," but an annual payment of money. The requirements of "assessment work," under our United States law, is delusive and useless. The required annual payment of a sum of money would be much more effective in preventing the retention of possessory titles (which are

practically, under our law, government leases) for speculative purposes.

The policy of requiring continued work as a condition of continued possessory tenure is not particularly harmful with regard to metal mines, especially when, as with us, the amount of such work is trivial; but the governmental leasing of coal lands for limited periods, and upon conditions of continual operation under penalty of forfeiture, is thoroughly bad. This idea has been suggested, I believe, by President Taft himself, whose sane and wise views of the general subject of conservation'' have won the approval of intelligent people. But I think he is wrong on this point. The operation of a colliery by a lessee is certain to cause the sacrifice of future to present interests; and the requirement that such a lessee shall keep going or lose his lease simply aggravates the situation. No governmental inspector could fairly require of a lessee the expenditure of a large sum of money which he might never recover, under an arrangement subject at any time to executive cancellation, especially if such expenditure were required, not for the safety of workmen, but only for the advantage of some future lessee; and the requirement of continuous operation as a condition of tenancy, would operate to favour that over-production which is the greatest enemy of ''conservation.'' At a recent meeting of the Institute, an eminent authority on this subject* read a paper advocating the shutting down by the government of coal mines that did not pay, in order to prevent the injurious over-production and consequent waste of coal. My proposition is, that such mines will be shut down by their proprietors without governmental interference, provided they are not forced to continue operations for some other reason, such as the danger of thereby losing their property altogether. In short. I think that, in all such questions, private ownership and liberty are likely to produce better results than governmental supervision; and that the best thing any government can do is to preserve order, enforce contracts, give to lessees or purchasers of its lands clear and valid titles, and then allow them the largest practicable liberty of enterprise and industry—reaping its own advantages, not from the extortion of a percentage of the anticipated results of speculative adventures, but from the consequent increased wealth of all its people and the fair taxation of that wealth.

I could say many other things upon the text which Mr. Clark has presented, but I trust the foregoing will incite other members of the Institute to offer suggestions which may be useful in his undertaking.

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*Edward W. Parker, The Conservation of Coal in the United States, Trans. xl., 601 (1910).

# EQUIPMENT AT PORCUPINE

The following list of equipment already installed, or about to be installed was furnished to the CANADIAN MINING JOURNAL by Mr. Alexander H. Smith, mining engineer, now resident in Porcupine. The list is not entirely complete, but it is nearly enough right to indicate the condition of affairs early in April. Hardly any more additions will be made until after the railway is complete. Any omissions that may be noted have, of course, been made unintentionally.

List of power plants, etc., Porcupine Gold District, April, 1911—erected or under construction:

1. Armstrong-Booth—Boiler, hoist, and drills.

2. Armstrong-McGibbon—3-drill Rand compressor, boiler, hoist, and drills.

3. Bewick-Moreing No. 1—5-drill Rand compressor, 6 drills, boilers, hoists, etc.

4. Bewick-Moreing No. 2—5-drill Rand compressor, 6 drills, boilers, hoists, etc.

5. Burns (Shaw)—10-stamp mill ordered with necessary equipment.

6. Crown Chartered No. 1—3-drill Rand, boiler, hoist, drills, one McKiernan-Terry shot drill.

7. Crown Chartered No. 2—Boiler and hoist.

8. Duncan Chisholm—One McK.-T. shot drill.

9. Dome—40-stamp mill, 1 Nissen stamp, cyanide plant, power plant, compressor, etc.—largest plant in camp.

10. Dome Extension—3-drill Rand, boilers, hoist, drills, one McK.-T. shot drill.

11. ''Foster'' West Dome—Compressor, boilers, hoist, drills, and 4 McK.-T. shot drills.

12. Foley-O'Brien—3-drill compressor, boilers, 2 McK.-T. shot drills, hoist, and drills.

13. Feldon—Reported 2 shot drills.

14. Hollinger—30-stamp mill, concentrating mill, 1 Tremaine steam stamp. boilers, compressor, hoists, etc.

15. Imperial—Boiler and hoist.

16. McEniney—Boiler, hoists, and drills.

17. Philadelphia—Boiler, hoists, and drill

18. Preston-East Dome—5-drill Sullivan compressor, boilers, hoists, drills, 2 Nissen stamps.

19. Pearl Lake—2 boilers, 2 hoists, 2 drills, one McK.-T. shot drill.

20. Goldfields Consolidated (''Rea'')—5-drill compressor, boilers, hoists, drills, one McK.-T. shot drill.

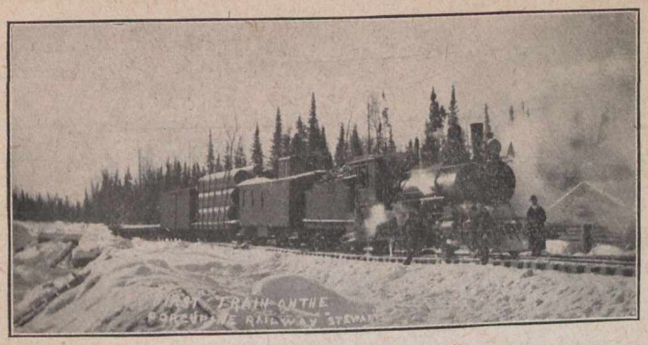
21. Standard—Boiler, hoist, 1 drill.

22. Scottish-Ontario—Boiler and hoist.

23. James Whalen—Boiler and hoist.

24. Vipond—Compressor, boilers, hoist, and one Nissen stamp.

In addition to the above, we have ascertained that four additional McKiernan-Terry shot drills have been installed on properties not mentioned in the list. These properties belong to Thor Warner, B. Babayan, Cobalt Townsite Mining Company, and Catlin Powell Company.

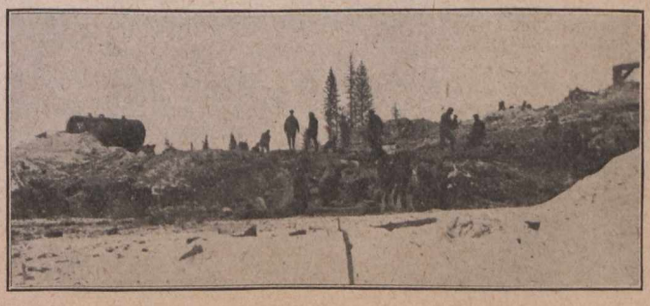


First Train on Porcupine Railway.

Mill and Power Plant at Vipond

Excavating for Mill at the Dome.

Boiler for Dome crossing Porcupine Lake



Excavating for Mill on Hollinger

# ONE VIEW OF PORCUPINE

From our valued contemporary, the Mining Journal of London, we reprint the following remarks concerning Porcupine. The tone of the letter, which was written by the Journal's New York correspondent, is sound and the criticisms appear not unduly harsh.

THE PORCUPINE BOOM—For the past twelve months romantic stories of fabulously rich quartz veins have been issuing from the wilds of Northern Ontario, and, unless all signs fail, the campaign of educating the public through the press will be sufficiently advanced in the course of the next two or three months to permit of the launching of the Porcupine boom.

When the Cobalt field was first opened up, engineers for the most part reported adversely on the camp, and many of those who reaped the advantage of the richness of these unique deposits were people who had little or no previous experience in mining, and who, by the fortunate investment of a few hundred or a few thousand dollars, became rich within a short period of time. The great richness of the ore veins at Cobalt, and the proximity of the camp to the populous cities of the eastern part of the United States and Canada, caused the wildest sort of excitement, and set up a standard of prices never before witnessed, except in the early days of the Comstock lode

Following the discoveries of gold-bearing quartz in Porcupine less than two years ago, it was quite natural that the first people to interest themselves in the camp should be the mine operators of Cobalt, only a short distance away. These immediately applied the Cobalt scale of prices to undeveloped mining claims, thousands of dollars being asked for swamp land without even an indication of mineral. The readers of the Journal are already familiar with the geology and general character of the deposits at Porcupine.

The greatest secrecy has prevailed regarding the results of development work that has been carried on in the Timmins and Dome properties. The enormous quartz outcrop at the Dome property, with its spectacular showings of free gold, stimulated the imagination of many people, and the vague statements — and contradictory ones, too—that have from time to time been published, have only served to enhance the mystery surrounding this supposed to be fabulously rich property. A few people, perhaps, are in possession of the actual facts regarding the value of the ore proved by the development work in the Dome. The high standing of the group of financiers who control this property lends colour to all the stories published, despite the fact that the owners have never made a public statement about the values disclosed by the development.

The Hollinger mines, belonging to Timmins et al, share equally with the Dome in the romance of Porcupine.

The publicity agents of the district have assiduously informed the interested world every time an engineer of note has come into the district in the past six months. William Frecheville's name was published far and wide as indicating the interest London financiers were taking in the camp. When the Consolidated Gold Fields of South Africa entered the field there was a blare of trumpets, and daily the press is filled with announcements of transactions which are supposed to indicate the great richness of the field.

Aside from the recently published statement by Mr. Timmins, as president of the Hollinger mines, there has been no definite statement made by anyone in authority as to the assay value of any of the ore opened up. The general character of the statements regarding the ore is that there are spectacular showings and rich development. As a matter of fact, the Porcupine deposits are by no means peculiar to that section of the world, but have been exploited with indifferent success elsewhere, and absolutely reliable information, based on results of sampling, indicate that most of the engineers who have visited Porcupine have turned the camp down.

According to the statement of Mr. Timmins above mentioned, on the Hollinger mine there have been some 1,400 feet of development work. Based on this meagre amount of development, it is stated that the average assay value of the ore is $49 per ton. According to the "Boston News Bureau," the Hollinger has $3,000,000 in sight in a high grade vein of quartz averaging 8 feet in width, which has been developed for 1,300 feet in length on the 100-foot level. Any estimate of ore reserves on the Hollinger must be taken with caution. There are only three shafts on the property on the main ore zone, one of which has not been sunk to the 100-foot level. Before any accurate estimate of ore reserves can be made, a great deal of additional work must be done.

Recently 100,000 shares of this company were offered at $3.50 per share, and the price has since risen to about $8, giving a market value to the property of $4,800,000. It is safe to say that the amount of development work done does not warrant any such valuation of the property, and in view of the meagre amount of information regarding the character of the ore deposits at Porcupine, $8 for these shares is unwarranted.

The people interested in the Dome property have a record of success behind them in the mining world, which should go a long way in reassuring one that the property has merit. If the statements regarding the developments of the Dome property are to be believed, according to the "Boston News Bureau," an orebody 600 feet long by 350 feet wide, having an average assay value of $10 per ton, has been opened up at the 40-foot level. An orebody of these dimensions would contain 600,000 tons for every 40 feet vertical in depth. At the present time a 40-stamp mill is being erected on the property, which may be expected to crush about 75,000 tons per annum. In other words, the 600,000 tons stated to exist above the 40-foot level will take about eight years to mine. Diamond drill holes are stated to have proved the continuation of values at considerable depth. An analysis of this situation leads to the inevitable conclusion that an orebody of such dimensions and value would be attacked in an entirely different manner, considering the experience and financial ability of the owners.

We have yet to learn that a mine valuer of standing had made a report giving values which may be used by the public as a gauge of the merit of the properties reported on. It is likely that the astute people who are interested in the Dome and Timmins properties are fairly well convinced that they have properties of merit, and they most certainly expect to make either out of the share market or the mines.

But this is a long way from proving that everyone or any of the other extremely numerous outcrops of the camp will prove of value; and a warning signal should be hoisted as a guide to the investing public that they must be careful lest they be bitten by the numerous flotations which are sure to come, and which will be placed before them in an attractive form inviting them to participate in the enormous wealth supposed to exist in Porcupine.

The history of gold mining in Eastern Canada has been one of uniform financial failure; and if for no other reason caution should be exercised regarding the Porcupine field until developments have reached such a stage as to indicate with absolute certainty the possibilities of the district, not only superficially but in depth. Lenticular bodies of quartz showing gold do not necessarily make paying mines

# PRODUCTION OF LEAD IN 1910

(In tons of 2,000 lbs.)

By C. E. SIEBENTHAL.

**Advance Statement of U. S. Geological Survey.**

| | 1909 | 1910 | P.c. increase |
|---|---|---|---|
| Production of primary refined lead | 448,112 | 470,380 | 5.0 |
| Primary lead available for consumption | 370,013 | 376,021 | 1.6 |

SMELTER PRODUCTION.

The refined-lead product can not be apportioned according to source of ore, owing to the fact that lead refiners treat smelted products whose origin may, as in custom refining, be unknown to them, the identity of the ore, and thus its original source, being preserved only as far as the smelter. Accordingly, the following table, showing source of lead smelted or refined in the United States, is based on smelter figures. It includes "pig lead" reported by all smelters using Mississippi Valley soft lead ores and "lead" produced at all other lead smelters in this country. The greater part of the product reported by smelters operated in conjunction with refineries is in terms of refined lead. A like part of the antimonial lead product is thus eliminated from the lead produced and appears only in the figures of production of antimonial lead. No lead ore from the United States was treated elsewhere during the period covered by the table.

Source of Primary Lead Smelted or Refined.

| | 1907 | 1908 | 1909 | 1910 |
|---|---|---|---|---|
| Domestic ore— | | | | |
| Alaska | ..... | 3 | 60 | 60 |
| Arizona | 2,340 | 1,464 | 1,465 | 858 |
| Arkansas | 15 | ..... | 14 | ..... |
| California | 854 | 515 | 937 | 1,160 |
| Colorado | 48,876 | 28,728 | 29,326 | 35,685 |
| Georgia | 2 | ..... | ..... | ..... |
| Idaho | 112,569 | 98,464 | 97,183 | 99,924 |
| Illinois | 498 | 363 | 273 | 262 |
| Iowa | 225 | 110 | 15 | ..... |
| Kansas | 1,798 | 2,293 | 2,764 | 1,308 |
| Kentucky | 75 | ..... | ..... | 50 |
| Missouri | 122,856 | 122,451 | 142,650 | 161,659 |
| Montana | 2,035 | 2,320 | 1,376 | 1,790 |
| Nevada | 3,380 | 3,796 | 4,698 | 2,195 |
| New Hampshire | ..... | ..... | 5 | ..... |
| New Mexico | 1,927 | 586 | 1,275 | 1,731 |
| Oklahoma | 404 | 1,409 | 2,268 | 1,805 |
| Oregon | ..... | 7 | 6 | ..... |
| South Dakota | ..... | 13 | ..... | 7 |
| Tennessee | 16 | ..... | ..... | ..... |
| Texas | 10 | 42 | 42 | 33 |
| Utah | 61,699 | 42,455 | 64,534 | 57,081 |
| Virginia | 82 | 13 | ..... | 87 |
| Washington | 281 | 391 | 115 | 311 |
| Wisconsin | 3,551 | 4,013 | 3,238 | 3,884 |
| Undistributed | 355 | 36 | 303 | 288 |
| Zinc residues | 1,318 | 1,290 | 1,641 | 2,049 |
| Total from domestic ore | 365,166 | 310,762 | 354,188 | 372,227 |
| Foreign ore— | | | | |
| Africa | 323 | ..... | 3,227 | 3,499 |
| Canada | 5,793 | 341 | 71 | 44 |
| Central America | ..... | 12 | 25 | 7 |
| England | ..... | ..... | ..... | 28 |
| Mexico | 36,749 | 38,729 | 69,100 | 70,159 |
| South America | 911 | 1,186 | 1,574 | 3,168 |
| Other foreign | 149 | 4 | 38 | ..... |
| Foreign base bullion— | | | | |
| Canada | ..... | ..... | 1,816 | ..... |
| Mexico | 32,924 | 57,489 | 27,006 | 31,648 |
| Total from foreign ore and base bullion | 76,849 | 97,761 | 102,857 | 108,553 |
| Grand total, derived from all sources | 442,015 | 408,523 | 457,045 | 480,780 |

REFINED PRIMARY LEAD.

The following statement of the production of refined primary lead embraces all desilverized lead produced at works in this country, and the pig lead recovered from Mississippi Valley soft lead ores. The pig lead derived from Mississippi Valley ores and desilverized is shown separately. The antimonial lead reported by refineries is also given below. The original source of the ore and bullion affording this refined product is shown in detail in the accompanying table under "Source."

Production of Refined Primary Lead.

| | 1907 | 1908 | 1909 | 1910 |
|---|---|---|---|---|
| Desilverized lead | 284,432 | 265,564 | 296,891 | 301,223 |
| Soft lead | 99,948 | 101,013 | 118,801 | 139,318 |
| Desilverized soft lead | 29,809 | 29,856 | 32,420 | 29,839 |
| Total production of refined primary lead | 414,189 | 396,433 | 448,112 | 470,380 |

| | | | | |
|---|---|---|---|---|
| Production of antimonial lead | 9,910 | 13,629 | 12,896 | 14,069 |

PRODUCTION OF SECONDARY LEAD.

| | | | | |
|---|---|---|---|---|
| Pig lead | 9,990 | 7,840 | 17,872 | a27,354 |
| Lead in alloys | 15,508 | 10,443 | 33,040 | a24,533 |
| Total recovered lead | 25,498 | 18,283 | 50,912 | a51,887 |

CONSUMPTION.

In the following table "lead" includes all kinds—lead in ore, base bullion, pigs, bars, and old. The figures of domestic production are based upon returns by the smelters; all other figures are from the records of the Bureau of Statistics. Decrease by liquidation covers losses in smelting and refining in bond and other corrections. Warehouse stocks of bonded lead of foreign origin are given, but it has been found impossible to obtain at this time complete figures of domestic stocks. For this reason the result given below is "lead available for consumption." The "apparent consumption" of previous reports would be this quantity increased or diminished by the increase or decrease of domestic stocks during the year.

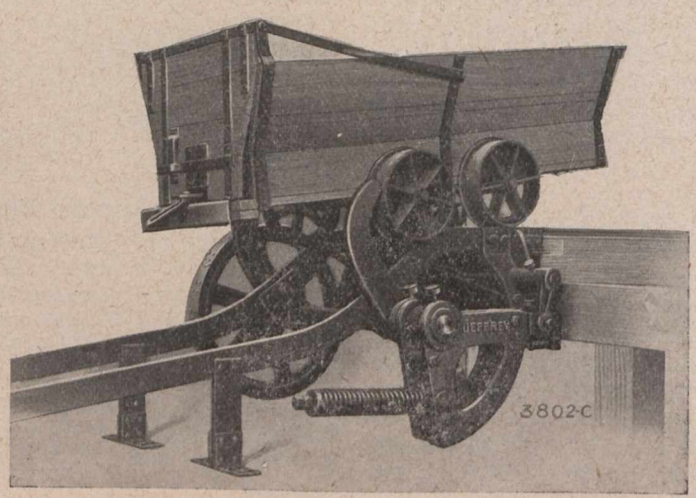
Consumption of Primary Lead.

| Supply: | 1907 | 1908 | 1909 | 1910 |
|---|---|---|---|---|
| Stock in bonded warehouses, Jan. 1 | 5,756 | 12,944 | 18,565 | 17,405 |
| Imports— | | | | |
| For consumption | 15,246 | 9,805 | 18,036 | 15,359 |
| For warehouse | 64,569 | 102,241 | 96,145 | 93,249 |
| Production from domestic ores | 365,166 | 310,762 | 354,188 | 372,227 |
| Total supply | 450,737 | 435,752 | 486,934 | 498,240 |
| Withdrawn: | | | | |
| Exports of foreign lead: | | | | |
| From warehouse | 51,447 | 76,857 | 86,077 | 69,786 |
| In manufactures, with benefit of drawback. | 8,268 | 9,254 | 4,796 | 8,800 |
| Decrease by liquidation. | 4,578 | 13,425 | 8,643 | 7,661 |
| Stock in bonded warehouses, Dec. 31 | 12,944 | 18,565 | 17,405 | 35,972 |
| Total withdrawn | 77,237 | 118,101 | 116,921 | 122,219 |
| Available for consumption | 373,500 | 317,651 | 370,013 | 376,021 |

aSubject to revision.

# JEFFREY-GRIFFITH DUMP

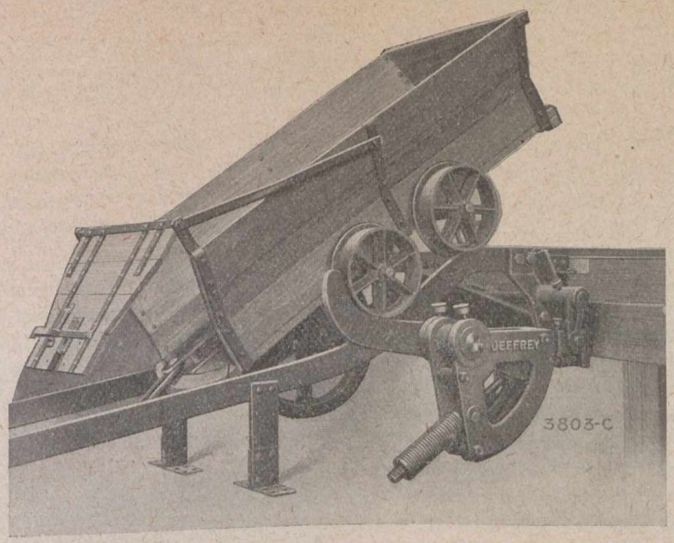
The Jeffrey-Griffith Patented Dump shown herewithillustrated in fig. 1, the jar being absorbed by the is one which has recently been developed As a cross-spring.
over car dump, it possesses features which make the
dumping or flow of the coal almost continuous in its Automatically the car assumes the dumping position
movement over the dump. No. 2, which is almost simultaneous with posi-



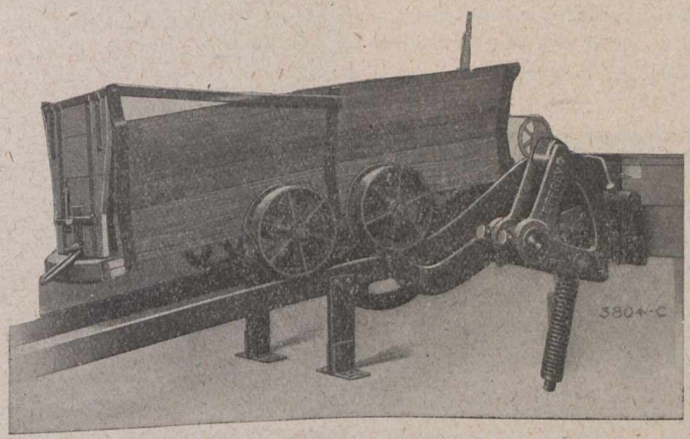

Entering.

This dump consists of two continuous rails to which are attached substantial horns, securely fastened to a heavy shaft; this shaft has a bell crank and quadrant with spring device securely attached to the one end, while at the other end is located a brake wheel and lever device for releasing the car after discharging its coal. In operation, the cars pass over the knuckle as tion No. 1.

After the coal is discharged, the car is released by means of a lever (the only work of the operator), which allows it to pass over the track as in illustration No. 3 by depressing the horns which automatically resume position for the next car. This is done by means of the spring, which is of sufficient strength to




Dumping




Releasing.

bring the horns into the receiving position together with the rotating action of quadrant by gravity.

Ten cars may be discharged over this dump per minute so that its capacity is only limited by the activity of the man required in its operation. Its continuous rails make stoppage of operation due to derailment of cars an impossibility and also insure less breakage of coal and less wear and tear on cars; its simplicity of design, operation and capacity, make it most desirable for large as well as small mines. Its large dumping capacity is due to the quick and continuous action of the dump, shorter movement of the cars and the increased safety in bringing loaded cars close to the dumping position.

This is the only dump where the car maintains continuously its natural position throughout the operation. There is no break of hinge in the tracks to cause derailment of cars and blocking of the coal consequent thereto. As this dump occupies less space than other cross-dumps, the cost of the tipple building to house same is correspondingly reduced; less help is required because of simplicity and ease of control.

## JAPANESE STEEL.

The Government-supported steel industry of Japan, upon which $15,000,000 has already been expended, is calling for $6,000,000 additional to put it in a sound position. The works, situated at Wakamatsu, were taken over by the Government in 1900. Large annual deficits have been recorded since then. In 1910 the deficit was $250,000. About 9,000 men are employed at the works and collieries. Three blast-furnaces, each of 150 tons daily capacity; two 10-ton acid Bessemer converters, 11 basic Siemens-Martin furnaces, 25 tons each; one crucible-steel plant; 13 rolling mills, etc., make up the plant. The iron ore used is imported from Korea. It contains from 50 to 60 per cent. metallic iron.

## CARBORUNDUM.

Carborundum, the artificial abrasive, is manufactured by fusing a mixture of pure granulated coke, pure glass sand, and sawdust. Residual coke from the distillation of petroleum is used. Sawdust is added to make the mixture porous and to prevent decrepitation due to the explosions of carbon monoxide produced during the reaction. The reaction between the sand and the coke produces carbide of silicon, or carborundum. The Carborundum Company, Niagara Falls, N.Y., uses 10,000 electric h.p. continuously. The carborundum crystals are crushed under manganese rollers and the crushed product is treated in a bath of sulphuric acid to dissolve the particles of steel that have been cut from the rolls. This treatment has been more effective than cleaning by magnetic separation.

# SPECIAL CORRESPONDENCE

## ONTARIO.

### Porcupine.

Unless immediate steps are taken there will be a very serious epidemic of typhoid in Porcupine this summer. There is at present no water in any of the settlements except from wells, and, as analysis has shown, many of these have been contaminated. Golden City, the site that the Government sold, has good water in Bobbs Lake and arrangements should at once be made to pipe it over, the Government contributing. In the meantime, the sanitary inspectors are doing all they can to prevent the accumulation of refuse and are compelling the carting away and burning of all refuse, but without pure water these precautions are not likely to prove effective against an epidemic. Pipes are being laid from South Porcupine to Porcupine River for a temporary supply of water. With the promise that Porcupine now has of permanency, no time should be lost in obtaining water from the Matagami River. The Hollinger gold mine, a certain centre of mining activity, is within two miles, and there will be camps strewn all along the seven miles into South Porcupine.

West Dome Formerly Foster, Ferrodolomite

According to recent discoveries on the Hollinger, the other veins parallel to the one developed are likely to prove up well. Two crosscuts have been run from the 100-foot level of the main vein and in both places where a parallel vein has been cut the ore body has been found to be both large and quite as rich as on the developed lead. Good results are announced from the 200-foot level also.

Owing to the very late spring much machinery and supplies that would otherwise certainly not have reached Porcupine till after breakup have been taken over the winter road and will be installed and working before they could have been taken in under last year's conditions. There should not be more than two months between the final breakup of the winter trails and the running of the first train over the T. & N. O. line.

The property of the Haileybury Silver Mining Company in the Township of Deloro has been sold to M. T. Rowland, of Arizona, for a company. Work will commence right away.

It is stated that the option on the Ross veteran property on the east side of Porcupine Lake has been given up. A considerable amount of diamond drilling was done on this property to test it up by an English company.

Work on the Imperial Gold Mining Company's property in Porcupine has been resumed after a month's cessation, while the plant was being installed. The main shaft has been sunk 50 feet and the first work will be to crosscut to the vein. Development work on the Apex Porcupine gold mines, near the West Dome, has been commenced. Stripping will be continued and test pits sunk on the veins until machinery can be brought in.

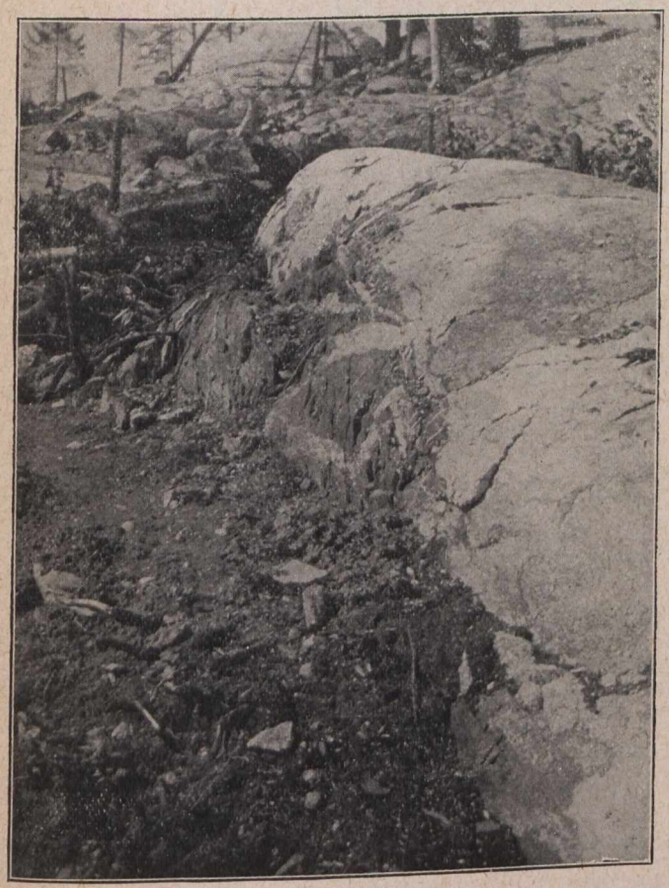
Several finds of free gold have been made recently in Godfrey Township, near the west boundary. The latest is on what is known as the Futunda syndicate of Montreal, where specks of gold have been found in the quartz at a depth of six feet.

While there is not a single shaft sunk yet on any of the hundreds of claims staked in the Keekeek country, 60 miles northeast of Haileybury, and little prospecting done, there is a very considerable amount of interest. Several pioneers, including Sam Le Roy, have good assays from wide veins of

quartz, and there is no question but that there will be much activity between the Quinze and the Transcontinental during the summer. The mining laws of Quebec have been so amended that it is much easier now for prospectors. The manager of the Great Lakes Dredging Company at Port Arthur is now working the James claims with a good force of men. Last summer the staker, Thomas James, opened up some very pretty free gold showings in a narrow vein.

Following a find of free gold to the west of Fort Matchewan, on the Montreal River, a considerable amount of staking has ensued. Isolated prospectors have been finding gold in this section for years, but it was not until Porcupine showed a tendency to make good that much attention was paid to it.

With the Terry shot drill the veins on the Dobie and the Rea properties have been cut recently. The Rea ore taken from 200 feet looks very promising, and the greater part of



Quartz Mass on the Dome.

the payments have now been made. On the Dobie, the drill has just entered the vein and the result is said to be satisfactory to the owners.

The West Dome, being developed under the direction of Mr. Weiss, has also found its vein at depth. The cores in this instance are considered quite satisfactory.

**Cobalt, Elk Lake, Gowganda, and Other Silver Fields.**

The Nipissing is now operating a mill on its own property for the reduction of its high grade ore. To date it has produced from the amalgamating and cyanide process specially adapted to Cobalt ores by Mr. Chas. Butters and Professor Clevenger, 307,690 ounces, and is getting an extraction of something like 98 per cent. from 2,000-ounce ore and upwards. Experiment is now being made to see if the process cannot be adapted to the treatment of low grade ores.

At Elk Lake, the Beacon Consolidated Mines is now installing a plant. The company has the Cleaves claims and has a shaft sunk 70 feet.

The March production of the Nipissing was of an estimated value of $185,332, while ore shipped amounted to $90,400. The Nipissing has produced to date $571,750, and has shipped $421,257 for the first quarter of 1911. This came from 1,260.50 tons, and ounces contained were 1,089,106.

The Crown Reserve has just declared the usual monthly dividend of 5 per cent., payable May 15. The statement shows an increase in the surplus, which now reads over $698,000. The Crown Reserve has now paid over $3,006,981, or 150 per cent., in dividends in May.

The Temiskaming Mining Company showed a surplus of $377,165 in its quarterly statement just before the 3 per cent. dividend was paid. This will amount to $70,000. Excellent ore is being raised at this date from the 575-foot level of the mine.

The Beaver has now entered the field of Cobalt dividend-payers, at the last meeting in Toronto declaring for a disbursement of 2½ per cent. on $2,000,000. The mill building project has been allowed to lapse until more ore has been blocked out.

At a meeting of the Temiskaming Mine Managers' Association, Mr. E. T. Corkill, Provincial Mines Inspector, was presented with a handsome chest of silver. Mr. Corkill has been identified with the camp ever since it was a camp, and has always been popular.

The Badger and the Bailey have entered the shipping list during the month. The Badger has not made a shipment previously; the Bailey not for some years in its own name.

An overheated stove in the office of the Green Meehan mine set that building ablaze and it was burnt to the ground. It is isolated, and no damage was done to the rest of the property.

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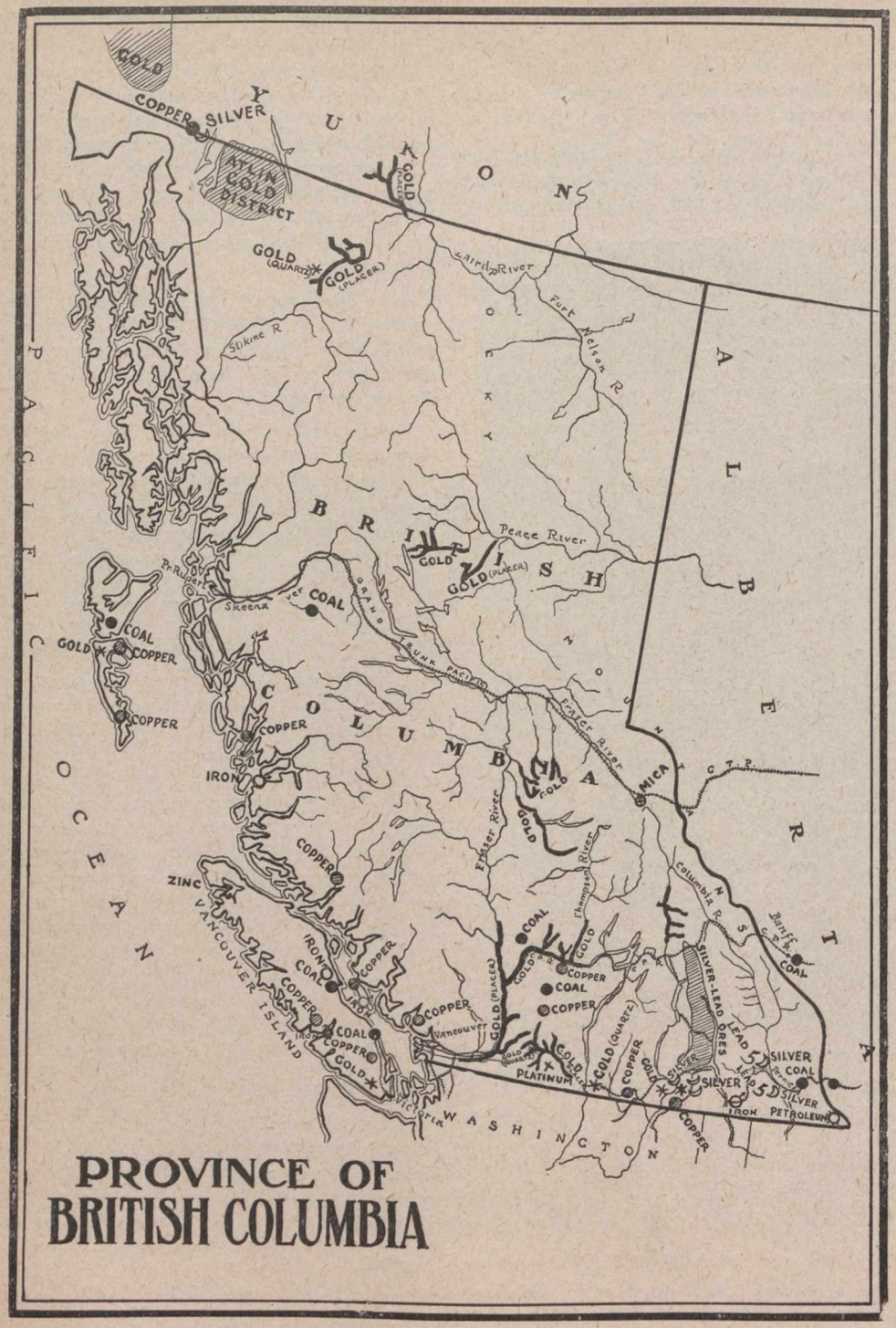
## BRITISH COLUMBIA.

Reports from the placer gold mining districts of the province continue to show a general expectation of a larger recovery of gold this year than last, consequent upon there having been a heavier snowfall in the winter of 1910-1911 than in that of 1909-1910. In some of the placer mining districts much will depend upon the weather of late spring and early summer. If warm weather shall come early and cause a speedy melting of the snow, the gravel-washing season will not be nearly so long as under weather conditions favourable to a gradual exhaustion of the water supply extending well into the autumn. The hydraulic miners who operate on an extensive scale are prepared to move a considerably larger quantity of gravel than in recent years, besides which two or three hydraulic leases will be worked that have not been among those that have contributed to the production of the last few years if of any at all. There are several new mines in the Cariboo and East Kootenay, both of which districts may be expected to recover more placer gold during the ensuing season than for some time past.

The lode mining industry may also be expected to show a larger total of production this year, if there shall not be any serious interruption in mining and smelting as a result of labour difficulties in the Crow's Nest regions of southeastern British Columbia and southwestern Alberta. So far as lode gold, from stamp milling, is concerned, there should be a substantial increase in production, for the capacity of the Hedley Gold Mining Company's 40-stamp mill at Hedley, Similkameen, has been increased and auxiliary steam power, for use when the water power is not available, has been provided, so that it is likely the year's total tonnage of ore put through the mill will be larger by 5,000 to 10,000 tons, in which case the value of the production from this property will be greater by between 60,000 and $120,000. In Nelson mining division, too, an appreciably large increase may be looked for, both from mines within a few miles of the city of Nelson and those in Ymir and Sheep Creek camps. Much of the lode gold re-

covered each year in the provinces is from ores that are smelted, so the returns from these will materially affect the year's production of this metal. An early agreement between coal mine operators and their employees and a resumption of coal mining and coke-making without much delay will prevent a cessation of smelting at the copper reduction works. Most of the copper ores smelted in the province contain more or




less gold and silver in association with copper, so that the production of all three metals is smaller when the smelteries have to be closed for two or three months of the year. However, there is still room for hope that suspension of smelting operations will be avoided, so it is yet early to anticipate lessened production on this account. As a partial set-off to possible loss from the Kootenay and Boundary districts, there is reason to look for a larger production of copper ores in the Coast district this year than last, for the outlook for the Britannia mine, on Howe Sound, is reported to be brighter, while an increased output from Texada gold-copper mines is expected, consequent on the Tyee Copper Company having leased the Van Anda group there and undertaken development work that will probably result in a return to old-time productiveness of the Cornell and Copper Queen mines, at Van Anda. Meanwhile the Marble Bay mine, in the same locality, continues to steadily produce a fair tonnage of ore of good grade, with promise of maintaining its output for a long while. Two or three mines higher up the British Columbia coast should be productive this year, and so add to the total tonnage of the Coast district as to make it higher than that for last year.

The quantity of ore mined in British Columbia for its silver

content only is not considerable, that containing both lead and silver being far larger. Both these metals should be produced in greater bulk this year from ores mined in Slocan district and, as compared with last year, from East Kootenay also. A small increase in silver and lead ores may be expected from Nelson mining division, and in less degree from the south belt of Rossland camp. Portland Canal will likely be a producing camp this year, and it is possible a little silver-lead ore may come from the Skeena district, occurrences there of ores containing silver and lead having been tested with encouraging results. Reverting to the Slocan district—the prospects for at least half a dozen producing mines here are decidedly promising. The Rambler-Cariboo is prominent among the mines of the district. The Kaslo "Kootenaian" lately published the following information: "Superintendent Zwicky, in his monthly report to the directors of the Rambler-Cariboo Company, states that he has suspended shipment of ore until such time as the road shall again become passable for waggons, and as a consequence he is devoting all his energy to development work. In only one heading is he working in ore; that is the drift on the 1,050-foot level, where he still has as handsome a face of ore as ever was seen in the mine. Every ore-bin and other convenient place of storage is now full of ore. He is cross-cutting on the 900 foot level and drifting on the 1,200-foot. The latter working has to be extended several hundred feet to reach the downward extension of the oreshoot already developed on the 700, 800, 900, and 1,050-foot levels. As soon as he shall have sufficient power he will begin work on the 1,450-foot level, which has to be pushed ahead about the same distance as the 1,200-foot to reach the orebody. As the Rambler-Cariboo Company has received assurance that the Canadian Pacific Railway Company will build from Three Forks a branch line to serve the Rambler-Cariboo and Lucky Jim mines as early as the weather will permit of railway construction being undertaken, he is only awaiting the location survey of the line to begin work on a tramway from the lower tunnel to the new site to which the concentrator will be removed from its present location. The last smeltery returns received were those from two cars of Rambler-Cariboo ore shipped early in the month, which netted $2,087 and $2,030 respectively."

About Sandon and Cody there are Slocan mines that are expected to do better this year than last. While the Richmond-Eureka group will probably maintain its excellent ore-shipping record, its near neighbour, the Slocan Star group, is understood to have mapped out for it a season's work that should result in a larger output of ore than it has made for several years. The Ruth-Hope group, too, also near Sandon, is regarded as likely to do well this season. In the vicinity of Cody, the Reco is reported to be again in ore containing a high silver value, the Noble Five group is stated to be in a position to resume production, and the Surprise may have its old and new workings connected before the year shall close, in which event, with much improved ventilation to allow it to be done, stoping may be undertaken. The deep-level development work done in the Surprise mine constitutes one of the most important features of mining in the district during the last two or three years. It has proved the occurrence of shoots of ore down to a depth of 1,100 feet, and has also encouraged others to explore for ore at deeper levels than they had previously done. The Sunset is another Cody mine in which development at depth has been in progress, and it is hoped that this will eventually result in a return of dividend paying days, so that mining in the Sunset may again be profitable.

From time to time information has been given concerning the several mines about Four-mile Creek, near Silverton, in which important developments have taken place and which have been proved to contain large bodies of ore. These are the Standard, Van Roi, and Hewitt-Lorna Doone groups. The showing of ore of shipping grade in the Standard has attracted much attention, for it is one of the largest ever opened in the Slocan. The Standard Silver Lead Mining Company, organized to acquire this property, has arranged to put in a 10-drill compressor plant, erect and equip a 100-ton concentrating mill, and construct an aerial tramway from the mine down to the mill site on Four-mile Creek, a distance of 8,400 feet. The compressor has been ordered from the Canadian Rand Company, together with a Pelton water-wheel, six Rand machine drills and accessories, and other plant. The Van Roi concentrator is reported to have been started in April; as much ore has been developed in the mine, the mill run should be continuous for quite a long time. The managing director of the Silverton Mines, Limited, owning the Hewitt-Lorna Doone group, is expected to arrive from England soon, and thereafter to decide whether or not to considerably increase the output of the Hewitt mine. The Enterprise and Eastmont, on Ten-mile Creek, have both been doing underground development, which is reported to have resulted encouragingly, so that these mines should be among the year's ore producers.

Ainsworth division has not made any considerable production of ore since, first, the closing of the Blue Bell mine early last year, and, next, the destruction by fire in the summer of 1910 of the Whitewater concentrator. Work has been continued on the Whitewater group, including the Deep. The Utica, situated between Whitewater and the south fork of Kaslo River, is stated to have an excellent showing of ore, to deal with which the erection of a concentrator is projected. Several mines in the vicinity of the town of Ainsworth are looking well and promise a larger production of ore this year. In the Lardeau, the recent finding of more ore has been reported from the Silver Cup, near Ferguson, and the outlook for the Beatrice, a silver-gold-lead property situated on the Fish River of one slope of the Lardeau mountain ranges, is regarded as good.

Coal mining is active in the Coast, Nicola, and Similkameen districts. At the time of writing little coal is being produced in the Crow's Nest district, for only one colliery has its men at work mining coal, namely that of the Corbin Coal & Coke Company, which has an agreement with the United Mine Workers of America covering a period to expire on May 8. If by that time no arrangement shall have been made for the operation of the other collieries of the district, the Corbin mine will have to stop producing, pending the completion of negotiations for a general resumption of work at all the collieries. Much might be written concerning the expansion of the coal mining industry of British Columbia, and the consequent increase in production of coal, but just now space restrictions prevent this being done. For the present, then, all that will be stated is that the industry certainly is being developed to an extent indicating a much larger annual production of coal as the years shall pass.

# GENERAL MINING NEWS.

### NOVA SCOTIA.

**Halifax**—Prospecting for gold and tungsten is more active this spring than for some years. At Waverley, 13 miles from this city, the scheelite property that belongs to Mr. H. C. Borden and his associates, is showing up in a most promising manner.

fax county at least three gold mines have changed hands.

Port Hood—The collieries of the Port Hood Richmond Railway Coal Company are being again worked up to capacity. During the winter nothing but development work was done, and the mines were put in much better shape than before. The two steamers belonging to the company have been placed in commission and a very active summer is looked forward to.

## ONTARIO.

Cobalt—The power siege in Cobalt is over. All the big mines taking air from the Cobalt Hydraulic Company are working full capacity again. The other company—the British Canadian Power Company, expects to start compressors next week.

Toronto, Ont., April 14—One of the officials of the T. & N. O Railway states that they have every expectation of handling freight and passengers to Porcupine before July 1. But they could hardly see their way to giving in the meantime partial service by rail to Frederickhouse River and thence by launch on the river. By the 18th they will have the steel to the river, ten miles from the main line. There will be 10 miles of navigation from where the steel crosses the Frederickhouse on the way to the gold camp.

Porcupine, Ont., April 18.—In the crosscut from the main vein at the 100-foot level of Hollinger another vein now shows in the face. It is 6-foot wide of quartz. This crosscut is near No. 1 shaft, and about 100 feet away from the other crosscut tapping the same vein.

## ALBERTA.

Frank, Alta., April 14.—At the meeting of the Executive Board of District 18, United Mine Workers of America, held here yesterday, that body decided to comply with the request of the Minister of Labour that they apply for a board of conciliation, and after sending a short wire to the department stating that they had decided to do so, they followed it up with an application at length, which was filed late this afternoon, and a copy given J. D. McNiven, Fair Wage Officer.

The official telegram is as follows:

"Hon. W. L. MacKenzie King, Minister of Labour, Ottawa —Without prejudice to our case in any way, and acting in accordance with your apparent desire to have the machinery set in motion at the earliest possible moment, to establish a board under the Industrial Disputes Investigation Act of 1907 to investigate matters in connection with the failure to renew the agreement between the Western Coal Operators' Association and District 18, United Mine Workers of America, we hereby make application for such board to be established. While believing that at all times we have acted strictly in accordance with the laws of the Dominion, we realize that it is the desire of the Government to have this matter thoroughly investigated and we are desirous of extending co-operation to this end, as we firmly believe that there can be no permanent peace in the mining industry of this country until the wage questions are settled on a basis of equality."

The parties to the dispute are the Western Coal Operators' Association, composed of the following companies: The Crow's Nest Pass Coal Company, Hosmer Mines, Limited; Corbin Coal & Coke Company; International Coal & Coke Company; Western Canadian Collieries; Canadian Consolidated; Hillcrest Collieries, Limited; Leitch Collieries, Limited; Alberta Railway & Irrigation, Limited; H. W. McNeill & Company, Limited; Bankhead Mines, Limited; and District 18 of the United Mine Workers of America, representing the organized employees of the aforementioned companies to the number of about 6,000, who ceased work at the expiration of the agreement of March 21, 1911.

"The United Mine Workers of America are contending for a substantial increase in wages and the elimination of irregularities that exist in contract rates, day wages, scale, hours of labour, and general conditions. The attempts to arrive at a settlement are embodied in the minutes of the joint conference that was held in Calgary during March last and which will be attached to the formal application. If it will be acceptable to the department, we will set forth our claims in full, together with formal applications as soon as it is possible to do this, and forward copies to the other party as well as to the department. The name of the person suggested by ourselves as representative is Mr. A. J. Carter, of Fernie, B.C."

"(Signed)—W. B. Powell, President; C. Stubbs, Vice-President; A. J. Carter, Secretary; J. E. Smith, J. D. Jones, D. McNabb, W. Lees, members of the Executive Board of District 18, U.M.W. of A."

All the members of the Executive Board were present, and the decision was unanimous. Mr. McNiven has with him all the necessary forms for filling in names and dates, so that the mine workers, having named Mr. Carter as their representative on the Board, it remains for the operators to act quickly in making their choice so that no more time is lost in getting the Board to work.

Satisfaction is expressed in all quarters at the action of the mine workers to-day.

Vice-President Stubbs stated that in taking this step they were actuated merely by a desire to have the disputed questions between the operators and miners permanently settled. Had the operators in making their offer of arbitration, acted upon an open fair basis at Calgary, the miners would gladly have accepted. That not having been the case, they had met the Minister of Labour in his request for an application for a Conciliation Board, which gave both sides an equal chance in the choosing of a board.

## BRITISH COLUMBIA.

Phoenix, April 14.—Although the strike in the Crow's Nest Pass coal mines, if prolonged, may cause a cessation of operations with the Granby Company, such an occurrence is not looked for, according to F. M. Sylvester, assistant to General Manager Jay P. Graves.

The Granby Company has sufficient coke on hand to keep the entire battery of furnaces at the smelter in operation for about six weeks, or by running five furnaces, operations could be continued till the middle of June.

The coke consumed represents about half the smelting costs of Granby ore, so that the freight charges on coke from more distant collieries prohibits the consideration of such a move at the present price of copper.

Asked concerning the Hidden Creek mine, Mr. Sylvester stated the development work continues with gratifying results, and it is altogether probable that the Granby will exercise its option which expires in the course of a few months.

The Granby is also looking for the development of a valuable producer in the claims recently bonded on Copper Mountain, at Chesaw, which are now being explored with the diamond drill. The ore is largely copper and iron, and the property will be convenient to the company's smelter.

At the Cliff mine, Rossland, the Granby has a force of 15 men at work, and it is expected regular shipments will be commenced during the summer.

Nelson, B.C., April 17.—It is reported that J. T. Hillis and Dr. A. R. Baker have purchased a controlling interest in the famous Nugget mine, in Sheep Creek, and that new management will install a cyanide plant and stamp mill.

# COMPANY NOTES

**Abstract of General Manager's Report, Nipissing Mines Co.**

April 1, 1911.

David Fasken, President, Nipissing Mining Co., Ltd.,
Toronto, Ont.

Dear Sir,—I beg to submit report of operations for the year ending December 31, 1910.

**Shipments in 1910.**

| | Dry Tons | Gross Ounces Silver | Net Value |
|---|---|---|---|
| High Grade Ore | 1531.792 | 3,999,580.48 | $2,018,152.21 |
| Low Grade Silicious Ore | 4834.3315 | 1,008,357.79 | 427,069.68 |
| Concentrates | 319.12 | 296.490.55 | 145,805.27 |
| Nuggets | 13.6865 | 293,349.79 | 151,294.07 |
| Total | 6698.93 | 5,597,778.61 | $2,742,321.23 |

**Average Assay of Shipments.**

| | Oz. Silver Per Ton. | Cobalt. | Nickel. |
|---|---|---|---|
| High Grade Ore | 2611.04 | 9.35 p.c. | 6.72 p.c. |
| Low Grade Silicious Ore | 208.58 | | |
| Concentrates | 929.08 | 6.46 p.c. | 2.68 p.c. |
| Nuggets | 21433.51 | | |
| Average of total | 835.62 | | |

**Summary of Shipments, 1910.**

| | |
|---|---|
| Dry tons shipped | 6698.93 |
| Gross Ounces Silver Contained | 5,597,778.61 |
| Gross Silver Value | $2,991,891.09 |
| Average Price received per oz. cents. | 53.447 |
| Cobalt paid for—pounds | 167,532. |
| Received from sales of Cobalt | $ 16,109.89 |
| Gross Silver Value plus Cobalt paid for | 3,008,000.98 |
| Smelter Deduction, Treatment and Freight | 265,679.75 |
| Net Value received from Ore Sales | $2,742,321.23 |

**Cost of Producing Silver.**

Based on production of 6717.26 tons containing 5,548,651.91 oz.

| | | Per Ton Shipping Ore. | Per Oz. Silver |
|---|---|---|---|
| Mine Operation— | | | |
| Trenching | $ 23.385.75 | | |
| Development and Exploration | 185,370.32 | | |
| Stoping | 85,388.41 | | |
| Ore Sorting and Loading | 27,944.13 | | |
| Jigging | 1,340.76 | | |
| Sampling Shipments | 15,641.83 | | |
| Assaying and Engineering | 8,777.06 | | |
| Administration and Office | 20,143.64 | | |
| Boarding House and Camp Maintenance | 21,457.65 | | |
| Insurance and Taxes | 82,111.74 | | |
| General and Legal Expense | 20,662.76 | | |
| | $492,224.05 | $ 73.28 | $.0887 |
| Concentration | 45,872.95 | 6.83 | .0083 |
| Depreciation | 32,325.22 | 4.81 | .0058 |
| Marketing Ore | 279,169.61 | 41.56 | .0503 |
| Corporation, New York Office and Travelling Expense | 20.057.71 | 2.98 | .0036 |
| | $869,649.54 | $129.46 | $.1567 |
| Less Rents and Interest | 52,668.85 | 7.84 | .0095 |
| Total Cost of Production | $816,980.69 | $121.62 | $.1472 |

**Marketing Expense on Production.**

| | | |
|---|---|---|
| Gross Value Silver plus Cobalt paid for | | $2,984,084.19 |
| Value of smelter deduction on silver | $130,268.26 | |
| Treatment charges | 67,301.49 | |
| Freight | 67,122.42 | |
| | | 264,692.17 |
| Net Received from Ore Sales | | $2,719,392.02 |
| Assayers, Metallurgists, Smelter Representatives, Ore Insurance, etc. | 11,277.42 | |
| Commission to European Agent | 3,200.02 | |
| | $279,169.61 | |

**Profit on Production.**

| | |
|---|---|
| Gross Value of Ore produced | $2,984,084.19 |
| Total cost of production | 816,980.69 |
| Profit on production | $2,167,103.50 |

**Total Shipments to December 31, 1910.**

| | Dry-Weight, Lbs. | Gross Ozs. Silver. | Net Val. Rec'd from Smelters. |
|---|---|---|---|
| 1904 | 124,659 | 32.13 | $ 23,887.52 |
| 1905 | 939,373 | 753,153.90 | 471,666.61 |
| 1906 | 4,019,494 | 2,214,821.60 | 1,421,655.54 |
| 1907 | 4,804,426 | 2,239,551.89 | 1,234,492.35 |
| 1908 | 7,009,998 | 2,893,031.44 | 1,364,478.03 |
| 1909 | 12,825,169 | 4,646,869.21 | 2,180,407.02 |
| 1910 | 13,397,860 | 5,597,778.61 | 2,742,321.23 |
| .... | 43,120,979 | 18,345,238.78 | $9,438,908.30 |

**Dividends Paid.**

| | By Nipissing Mining Co. Ltd. | By Nipissing Mines Co. |
|---|---|---|
| 1905 To Syndicate | $ 300,000 | |
| 1906 To Syndicate | 100,000 | |
| To Nipissing Mines Co. | 500,000 | $ 480,000 |
| 1907 To Nipissing Mines Co. | 880,000 | 840,000 |
| 1908 To Nipissing Mines Co | 740,000 | 720,000 |
| 1909 To Nipissing Mines Co. | 1,370,000 | 1,350,000 |
| 1910 To Nipissing Mines Co. | 2,122,500 | 2,100,000 |
| | $6,012,500 | $5,490,000 |

**Development.**

The usual amount of development and exploration was done through eight shafts and two tunnels. Two new shafts, No. 127 and No. 141, were sunk to explore veins in the Keewatin.

The former is in the northeast corner of the main property near the O'Brien; the latter is near the Gillies Limit in the extreme southwestern corner. The developments have not been very favourable in either.

The work was distributed as follows:—

| | | |
|---|---|---|
| Drifting | feet | 4,480 |
| Crosscutting | feet | 1,913 |
| Raising | feet | 1,054 |
| Sinking | feet | 567 |
| Total | feet | 8,014 |
| Stoping | cubic yards | 9,810 |

**Surface Prospecting.**

The trenching gang worked six and a half months during the season of 1910. An average of 61 men dug 31.7 miles of trenches to an average depth of 2.7 feet. The work was confined largely to the central area which had already been prospected.

Three veins were found in the conglomerate and eleven veins in the Keewatin. No. 134 to No. 147 inclusive.)

The most important of these is vein No. 141, which is now being developed by a shaft; other veins that were worked are No. 143 and No. 145.

In addition to trenching, some prospecting was done by an hydraulic jet.

A small centrifugal pump already on the property was put in operation as an experiment and the bedrock was washed clean over an area of several acres.

The results showed that it would be feasible to operate such a plant on a large scale, so that during the coming season a turbine pump capable of delivering 4,800 gallons of water per minute, under a head of 415 feet, will be installed. It will be run by a 700 h.p. motor.

**Present Surface Condition.**

| | Total Acres. | Partly Prospected. | Unprospected. |
|---|---|---|---|
| Conglomerate | 429 | 306 | 123 |
| Keewatin | 176 | 166 | 10 |
| Diabase | 241 | 16 | 225 |
| Total | 846 | 488 | 358 |

**Concentration.**

The custom plant of the Nipissing Reduction Company, Limited, has continued to treat the low grade ores of vein 63 with the following results covering the period from December 31, 1909, to December 31, 1910:

| | |
|---|---|
| Dry weight concentrates ....tons | 13,537.4805 |
| Silver contents ore ....ounces | 400,479.63 |
| Average assay ore ....ounces per ton | 29.58 |
| Weight concentrates produced ....dry tons | 326.431 |
| Silver contents concentrates ....ounces | 314,105.80 |
| Average assay concentrates ...ounces per ton | 962. |
| Net value of concentrates | $153,893.55 |
| Profit of Nipissing Mining Company | $108,020.60 |

**Jigging Plant.**

A change has been made in the marketing of the low grade silicious ores, a large tonnage of which has heretofore been sent to the smelters.

The run-of-mine is hand-sorted on picking tables fitted with a one-inch or larger screen; the undersize, which was formerly shipped, goes to a small jigging plant where it is classified and jigged, the tailing going to the custom concentrator. The slime and very fine sand are shipped to the smelters, as it was found uneconomical to concentrate them, but this product constitutes only about 10 per cent. of the whole.

**Reduction of High Grade Ores.**

A small plant has recently been erected at the mine, to test on a working scale, a process originated by Mr. Charles Butters for the treatment of high grade Cobalt ores.

It has been the earnest desire of the company to find a method by which the silver in the first class ore could be extracted economically and shipped as bullion without going to the considerable expense of erecting the usual smelting plant. To this end, a great many processes have been investigated and some have been tried on a small scale

The results so far in the new plant have been most encouraging; bullion is now being shipped and it is confidently believed that the undertaking will be a success.

**Ore Reserves.**

The following estimates of developed and partly developed ore include high grade ore only; the large tonnage of mill rock on the dumps and in the mines is not covered by the estimates:

| | Oz. Silver. | Gross value at 50c. per oz. |
|---|---|---|
| Vein 63 | 762,250 | $ 381,125 |
| " 64 | 924,080 | 462,040 |
| " 73 | 2,127,850 | 1,063,925 |
| " 80 | 1,384,100 | 692,050 |
| " 86 | 40,000 | 20,000 |
| " 100 | 723,600 | 361,800 |
| " 122 | 591,000 | 295,500 |
| | 6,552,880 | $3,276,440 |

**Results of the Year.**

The results for the past year have been most gratifying; both production and profits have exceeded those for any similar previous period. Notwithstanding a production of over five and a half million ounces of silver, enough additional ore was developed during the year to fully replace the large output.

The cost of producing silver was reduced from 16.39 cents to 14.71 cents per ounce.

Silver was sold for an average of 53.447 cents per ounce, compared with 51.547 cents in 1909.

The net profit after deducting expenses of every kind was $2,167,103.50; this is 72.6 per cent. of the gross value of the ore produced.

Very truly yours,
R. B. WATSON,
General Manager.

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In its annual report shortly to be issued, the Nipissing Mining Company will announce that a process has been perfected whereby all high-grade ore from Nipissing and La Rose will be reduced to bullion in a plant which has been erected and has already produced 300,000 ounces in silver bars this year. The process will be modified to treat low grade ore.

## ONTARIO GOLD FIELDS LEVELOPMENT COMPANY.

It has been announced by cable that the Northern Ontario Exploration Company has incorporated a new development company for the purpose of dealing with its interests in the Porcupine district. The new company is registered under the name of the Ontario Gold Fields Development Company, with a capital of $3,000,000, in 600,000 shares of $5 each. The issue provides for a working capital of approximately $450,000, in addition to the plant and machinery laid down during the last two months by the Northern Ontario Company, estimated at $50,000. This will give them, at the disposal of the company, half a million dollars.

The directors are: Cyrill Wanklyn, chairman; W. B. Lawson-Johnstone, Hon. Frederick Carson, Charles Algernon Moreing, David Richards, managing director of the Northern Ontario Exploration Company; D. A. Dunlap, of Toronto; and Charles Hart, of Montreal. The latter two represent the Timmins-McMartin group.

The Canadian public will have the advantage of a resident committee in Canada comprised of Noah A. Timmins, president of the Hollinger Gold Mines; Hy. L. Timmins, and John McMartin. Messrs. Bewick, Moreing & Company will become the general managers. The bankers in London will be Messrs. Robert Lubbock & Company, and in Canada, the Canadian Bank of Commerce. The secretary and officers will be located at 20 Copthal Avenue, London.

Mr. Lovell, who will be the technical manager, resident in Canada, will arrive in the course of the week.

## REA CONSOLIDATED.

At a meeting of the Rea Consolidated Gold Mines, Limited, the following board of directors was elected: Charles P. Hill, president Hillcrest Collieries, president; Directors—W.

W. Butler, vice-president and general manager Canada Car & Foundry Company; D. Richards, of London, Eng., Canadian representative of Bewick, Moreing & Company; Thomas H. Rea, of Chicago; Henry Lockhart, Jr., New York, manager Mines Finance Company; John B. Holden, barrister, is acting secretary as well as director; L. C. Thompson, Montreal. The capital is $1,000,000, in 200,000 shares of $5 par value. 20,000 shares are held in the treasury, and $100,000 in cash. The company has 321 acres in Tisdale. Up to April 6th, $70,000 has been expended in working and equipping the property. The board of directors have entered into a contract with Bewick-Moreing & Company, to act as managers of this property. Large blocks of stock are owned by a Montreal syndicate, the Mines Finance Company, and the Consolidated Gold Fields of South Africa.

### CONIAGAS DIVIDEND.

Coniagas directors have declared a quarterly dividend of 6 per cent., and an additional bonus of 3 per cent., payable on the 1st day of May, 1911. This is the same as the last previous payment in January.

### DOBIE MINING COMPANY.

The Board of the Dobie Mining Company is as follows: Frank C. Armstrong, president; E. P. Earle, vice-president; D. Lorne McGibbon, Hon. Wallace Nesbitt, and Samuel Dobie, directors. The authorized capital is 300,000 shares of $5 par value; 60,000 shares are held in the treasury. The Dobie Mining Company will start operations with $100,000 cash and 60,000 shares of stock in the treasury. Of the 240,000 shares, 220,000 shares were given to the owners in payment of the property; 20,000 shares were purchased at $5 a share by the Tisdale Mining Company to provide $100,000 for development purposes; 60,000 shares of stock remain in the treasury. Underwriting of 120,000 shares is offered at $4 a share.

# STATISTICS AND RETURNS

### COBALT ORE SHIPMENTS.

There were new shippers on the Cobalt list for the week ending April 14th, namely, the Badger, of South Coleman; and Bailey Cobalt, of Giroux Lake. Shipments for week and year in pounds of ore follow:

| | Ore in lbs. April 14. | Ore in lbs. Since Jan. 1. |
|---|---|---|
| Badger | 55,200 | 55,200 |
| Bailey | 40,000 | 40,000 |
| Beaver | ..... | 595,243 |
| Buffalo | ..... | 746,990 |
| Chambers-Ferland | 64,000 | 384,900 |
| City of Cobalt | 66,000 | 362,280 |
| Cobalt Lake | ..... | 1,315,000 |
| Cobalt Townsite | ..... | 280,740 |
| Colonial | 42,000 | 42,000 |
| Coniagas | 126,800 | 1,355,890 |
| Crown Reserve | 66,000 | 659,520 |
| Hargraves | ..... | 41,100 |
| Hudson Bay | ..... | 185,930 |
| La Rose | 87,000 | 1,359,700 |
| Kerr Lake | 120,200 | 961,808 |
| King Edward | ..... | 40,000 |
| McKinley-Darragh-Savage | 51,600 | 1,711,660 |
| Nipissing | 79,700 | 1,900,460 |
| O'Brien | ..... | 401,710 |
| Peterson Lake (Little Nip) | ..... | 58,430 |
| Right of Way | ..... | 318,260 |
| Silver Cliff | ..... | 183,180 |
| Standard Cobalt | ..... | 44,813 |
| Temiskaming | ..... | 503,612 |
| Trethewey | ..... | 326,030 |
| Wettlaufer | ..... | 60,022 |

| Bullion shipments during week: | Ounces. | Value. |
|---|---|---|
| Nipissing, 72 bars | 72,243 | $36,850 |
| Buffalo, 15 bars | 12,800 | 7,000 |
| Kerr Lake, 2 bars | 2,000 | 1,008 |
| Total, 109 bars | 87,043 | $44,858 |

### OUTPUT OF ROSSLAND ORE.

The Consolidated Mining & Smelting Company of Canada, Limited, ore receipts at Trail smelter for week ending April 15th and year to date, in tons:

| | Week. | Year. |
|---|---|---|
| Company's mines— | | |
| Centre Star | 4.398 | 55,100 |
| Snowshoe | 1,849 | 25,355 |
| Sullivan | 578 | 10,106 |
| Richmond-Eureka | 50 | 760 |
| St. Eugene | 132 | 2,070 |
| Other mines | 943 | 22,303 |
| Total | 7,950 | 115,694 |

### COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending April 21, and those from Jan. 1, 1911, to date:

| | April 21 Ore in lbs. | Since Jan. 1. Ore in lbs. |
|---|---|---|
| Badger | ..... | 56,200 |
| Bailey | ..... | 40,000 |
| Barber | ..... | 6,000 |
| Beaver | ..... | 595,243 |
| Buffalo | 58,400 | 868,010 |
| Chambers-Ferland | ..... | 384,900 |
| City of Cobalt | ..... | 362,280 |
| Cobalt Lake | 123,200 | 1,438,800 |
| Cobalt Townsite | 62,100 | 351,840 |
| Colonial | ..... | 42,000 |
| Coniagas | 63,170 | 1,410,060 |
| Crown Reserve | 118,600 | 778,130 |
| Hargraves | ..... | 41,100 |
| Hudson Bay | ..... | 185,950 |
| La Rose | 311,930 | 1,671,630 |
| Kerr Lake | 120,000 | 1,081,898 |
| King Edward | ..... | 40,000 |
| McKinley-Darragh | 118,890 | 1,823,450 |
| Nipissing | 146,130 | 2,046,590 |
| O'Brien | ..... | 401,710 |
| Peterson Lake (Little Nip) | ..... | 58,430 |
| Right-of-Way | ..... | 318,260 |
| Silver Cliff | ..... | 106,680 |
| Standard Cobalt | ..... | 44,813 |
| Temiskaming | 65,090 | 568,702 |
| Trethewey | ..... | 326,030 |
| Wettlaufer | ..... | 117,232 |

The shipments for the week were 1.087,510 pounds, or 543 tons.

The shipments from Jan. 1 to April 21 were 15,066,028 pounds, or 7,533 tons.

## SILVER PRICES.

| | New York. cents. | London. pence. |
|---|---|---|
| April 7 | 53 | 24 7/16 |
| " 8 | 53⅛ | 24½ |
| " 10 | 53⅛ | 24½ |
| " 11 | 53⅛ | 24½ |
| " 12 | 53¼ | 24 9/16 |
| " 13 | 53⅛ | 24½ |
| " 14 | 53⅛ | .... |
| " 15 | 53 | 24 7/16 |
| " 17 | 53 | Holiday |
| " 18 | 53⅛ | 24½ |
| " 19 | 53⅝ | 24 11/16 |
| " 20 | 53¾ | 24¾ |
| " 21 | 53⅝ | 24¾ |

## GENERAL MARKETS.

Coal, anthracite, $5.50 to $6.75.

Coal, bituminous, $3.50 to $4.50 for 1¼ inch lump.

### Coke.

April 21—Connellsville Coke (f.o.b. ovens):

Foundry Coke, prompt, $2 to $2.15 per ton

Furnace Coke, prompt, $1.60 to $1.65 per ton.

April 21.—Tin, Straits, 42.45 cents.

Copper, Prime Lake, 12.25 to 12.37½ cents.

Electrolytic Copper, 12.00 to 12.10 cents.

Copper wire, 13.75 cents.

Lead, 4.47½ cents.

Spelter, 5.55 cents.

Sheet zinc, (f.o.b. smelter), 7.25 cents.

Antimony, Cookson's, 9.45 cents.

Aluminium, 21.00 to 21.50 cents.

Nickel, 40.00 to 45.00 cents.

Platinum, ordinary, $41.50 per ounce.

Platinum, hard, $43.50 per ounce.

Bismuth, $2.00 to $2.10 per lb.

Quicksilver, $48.00 per 75-lb. flask.

## SHARE MARKET.

(Courtesy of Warren, Gzowski & Co.)

### Miscellaneous.

| | April 20, 1911. Bid. | Ask. |
|---|---|---|
| Dominion Steel Corporation | 58¾ | 59 |
| Nova Scotia Steel | 97¼ | 98 |
| Crow's Nest Pass | .. | 74 |
| Granby | 30½ | .. |
| Consolidated Mining & Smelting | 40 | 45 |
| Amalgamated Asbestos | 11 | 13 |
| Black Lake Asbestos | .. | 14 |

### Cobalt Stocks.

| | | |
|---|---|---|
| Bailey | .04⅞ | .05 |
| Beaver Consolidated | .40 | .40½ |
| Buffalo | 2.20 | 2.25 |
| Chambers-Ferland | .13¾ | .14½ |
| City of Cobalt | .19 | .20 |
| Cobalt Central | .07 | .08 |
| Cobalt Lake | .19 | .20 |
| Coniagas | 6.50 | 7.00 |
| Crown Reserve | 3.18 | 3.25 |
| Foster | .05 | .07 |
| Gifford | .05¼ | .05½ |
| Great Northern | .18⅝ | .19 |
| Green Meehan | .03½ | .03¾ |
| Hargraves | .17½ | .19 |
| Hudson Bay | 97.00 | 105.00 |
| Kerr Lake | 6.15 | 6.35 |
| La Rose | 4.52 | 4.65 |
| Little Nipissing | .03⅝ | .04 |
| McKinley | 1.59½ | 1.61 |
| Nancy Helen | .02 | .03 |
| Nipissing | 10.50 | 10.75 |
| Nova Scotia | .10½ | .11½ |
| Ophir | .15¼ | .16 |
| Otisse | .01½ | .02 |
| Peterson Lake | .08⅞ | .09¼ |
| Right of Way | .10 | .10½ |
| Rochester | .05¼ | .05½ |
| Silver Leaf | .04 | .04½ |
| Silver Queen | .02½ | .04 |
| Temiskaming | .70¾ | .71 |
| Trethewey | .89 | .95 |
| Wettlaufer | .92 | .93 |

### Porcupine Stocks.

| | | |
|---|---|---|
| Apex | .18¼ | .19 |
| Porcupine Canada | 1.10 | 1.12 |
| Porcupine Central | .55 | .58 |
| Dobie | 3.10 | 3.20 |
| Dome Extension | .53 | .53½ |
| Hollinger | 9.70 | 9.80 |
| Monita | .25 | .30 |
| Preston | .34 | .35 |
| Pearl Lake | .53 | .54 |
| Porcupine Imperial | .14 | .20 |
| Porcupine Tisdale | .08½ | .09 |
| Swastika | .53 | .54 |
| United Porcupine | .05 | .09 |
| Vipond | .54¾ | .55¼ |
| Standard | .35 | .37 |
| West Dome | 2.00 | 2.04 |
| Coronation | .35 | .38 |

### New York Curb.

| | | |
|---|---|---|
| Brit. Col. Copper | 05⅛ | 05½ |
| Butte Coalition | 16½ | 17½ |
| Chino Copper | 21⅞ | 22⅛ |
| Davis-Daly Copper | 01⅜ | 01½ |
| Ely Consolidated | ¼ | 5/16 |
| Giroux Mining | 05⅞ | 06 |
| Goldfield Consolidated | 06 | 06⅛ |
| Greene-Canadian | 06⅛ | 06¼ |
| Harcuvar Copper | ... | ... |
| Inspiration Copper | 06⅞ | 07 |
| Miami Copper | 18⅜ | 18½ |
| New Baltic Copper | ... | ... |
| Nevada Con. Copper | 17½ | 18⅝ |
| Ohio Copper | 01⅜ | 01½ |
| Rawhide Coalition | 3 cts. | 3½c. |
| Ray Central | 01 7/16 | 01 9/16 |
| Ray Consolidated | 15⅜ | 15⅞ |
| Union Mines | ⅛ | ¼ |
| Yukon Gold | 03⅞ | 04 |