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#### AN INDICTMENT OF CONSERVATION.

In the course of a characteristic address, delivered before the American Mining Congress, Mr. Horace J. Stevens gave an unvarnished opinion of the conservation movement in the United States.

After pointing out first the inevitable tendency in copper mining towards commercial consolidation, Mr. Stevens proceeds to handle the conservationist. Not only does he wear no gloves—he goes so far as to adopt brass knuckles. Here is a specimen of his denunciatory eloquence: "The greatest present menace to the copper industry in the United States is a menace that is common to all branches of mining. The entire American industry is threatened by men operating under the names of progress and reform, . . . but who are political economists of the Stone Age, and first cousins, in mental capacity, to the Troglodytes."

Extravagant and intemperate as Mr. Stevens' invective may be, there is certainly a large degree of right on his side. For instance, the great Washoe smelter may be closed on account of the fact that the smelter fumes are damaging small tracts in the Federal forest reserves, timber that Mr. Stevens describes as being suitable possibly to furnish good lodge-poles for Indian tepees.

The most vital point, however, of Mr. Stevens' address refers to the Guggenheims. These much abused persons, at an expenditure variously estimated at from \$13,000,000 to \$25,000,000, built 195 miles of railway in Alaska to reach their Bonanza copper-gold mine. The gross value of both measured and probable ore reserves in this mine falls below \$13,000,000, and, according to Mr. Stevens, the largest net profits to be hoped for from the operation of the mine will not exceed \$5,000,000. Although the railway passes through regions that contain large and valuable deposits of bituminous coal, the Federal Government, acting on the advice of the conservationists, has prohibited the development and use of this coal. Hence the railway and the Alaskan settlers generally are compelled to use coal imported at high cost from British Columbia.

The Government's withdrawal of large tracts of oil, coal, and phosphate land is condemned with equal vigour. The next logical step, Mr. Stevens predicts, will be the withdrawal of iron, copper, lead, zinc, silver and gold lands—"a cleverly devised socialistic propaganda."

To the argument that the iron ore resources of the United States are being too rapidly depleted Mr. Stevens opposes the assertion that in a single county of Michigan there is more iron ore than any "professional

conservationist" has estimated to exist in the whole world.

The root of the whole evil is attributed to the fact that Congress has endowed the executive departments of the Government with power to promulgate rulings that have the force of law; the consequence being that the miner, although he may have complied with all known statutory requirements, may find himself arbitrarily deprived of his property by the officials of the forestry service. A Canadian analogy holds here in the case of the western coal lands that are administered by the Department of the Interior at Ottawa.

We have indicated enough to show the purport of Mr. Stevens' address. Whilst his language is far from being dispassionate and while his attitude does not remotely resemble the judicial, yet he voices a growing belief that many blunders and not a few political sins are being committed in the name of conservation.

### THE ENGINEER.

In a scholarly, polished, and eloquent address before the members of the Toronto Engineers' Club, President Falconer, of the University of Toronto, traced the evolution and the meaning of the profession of engineering. With apt allusions he illustrated the successive historic phases of the engineer's function. He was listened to with rapt attention.

Admirable in tone and in content as was President Falconer's address, there was, unhappily, one strange gap. He touched illuminatingly upon architecture; he glanced over the field of civil engineering; he referred to the electrical engineer; he mentioned the mechanical engineer. But never a word did he say of the mining engineer, whose profession is the very plinth of the whole science of engineering.

Now this was a very serious sin of omission. We do not particularly blame President Falconer. But we cannot refrain from seizing on the occasion to relieve our editorial chest.

President Falconer's historical allusions were numerous and apposite. He drew on Biblical narrative, and on the history of Greece and Rome. We marvel that in reading Holy Writ he could have missed the mining man. Time does not permit us to be specific. But President Falconer will, no doubt, remember having read of Tubal Cain, who, by implication at least, was a mining and metallurgical engineer. Is there not, also, in the book of Job, specific reference to mining? Chapter 28 is a lordly picture of mining. What, moreover, of Hiram, King of Tyre?

In fact, although sacred and profane literature is dotted with innumerable references to mining and the mining engineer, there is a singular convention on the part of orators and publicists to ignore them. The mining engineer is treated as a negligible quantity.

All the high eulogies bestowed by President Falconer upon the civil engineer were, no doubt, deserved. But

why overlook him who provides all engineers with his materials of construction? How would the railways, the canals, the buildings, the bridges, the ships, and every other product of human ingenuity be constructed had not the mining engineer, through centuries of laborious effort perfected the means of extracting ores from the mine and metals from the ore!

We suggest that President Falconer, as a salve to our wounded self-esteem, give us a stirring address on the mining engineer's relation to the world's history.

### AMALGAMATED ASBESTOS.

The decision of the directors of the Amalgamated Asbestos Corporation to default payment of the interest on their consolidated bonds, came as no surprise to the public. The earnings of the Corporation could not possibly provide for a 5 per cent. payment on \$8,000,000.

There is now no other recourse than financial reorganization. While the mines are in excellent condition, the market is certainly profoundly depressed. But even were the asbestos market active, there is little ground for thinking that reorganization of the Corporation's finances could be much longer postponed.

Those who followed the early history of Amalgamated Asbestos will be given ample confirmation of the belief that far too great a load was placed upon the Corporation by the promoters. But the blame rests not altogether upon the shoulders of the promoters; a large part of it belongs to those technical men who subscribed to the original overdone prospectuses.

There is little to be gained in recriminations. Nor is it either fair or proper for those newspapers that most avidly supported the promoters to assume a hostile attitude now. On the other hand, it is desirable that the directors of the Corporation be given every assistance in reducing its financial obligations to a rational level.

It may be mentioned here that the CANADIAN MINING JOURNAL will take no notice of anonymous letters. Several such, in which abuse has been heaped upon the Corporation, have reached our office.

### OFFICERS FOR THE INSTITUTE

Before January 1st, 1912, all nominations for offices in the governing body of the Canadian Mining Institute, must be in the hands of the secretary.

Circumstances make it more than ordinarily important that next year's President, who, it is assumed will hold office for two successive years, be a man of outstanding reputation. Not only must he have at heart the good of the Institute, but he must possess in large degree those qualities that spell popularity. As President he will have to undertake the onerous duties of chairman and of ex-officio member of numerous com-

mittees. He will be called upon to act the part of host, entertainer, adviser, and peace-maker.

In view of the fact that the summer of 1913 will be marked by the presence in Canada of a most formidable gathering of scientists, the selection of the presiding officer should be given much thought. The International Geological Congress will bring to Toronto some hundreds of geologists and mining men from many parts of the world. Practically all the leading spirits of the profession will gather here. In separate parties they will tour through all Canada.

In organizing and handling this large series of excursions, consummate care, tact, and business acumen will be required. And the bulk of this responsibility must be assumed by the President.

There is also another serious consideration. The Institute has undertaken, through a strong committee, to revise and codify the Dominion mining laws. This will be the largest feature of the coming year's work. If the President be not thoroughly competent to handle this complicated matter, if he be not conversant with the requirements of the case, then the battle for right legislation will be foredoomed to failure.

We urge upon the members of the Canadian Mining Institute the necessity of pondering long and well before casting their votes. Above all no nominations should be made nor should votes be cast for sectional or personal reasons. The Institute is striving to become a national body, and is, in some measure, succeeding. The good of the whole society must be considered first and solely.

#### THE SUMMARY REPORT OF THE MINES BRANCH FOR 1910.

From the Director's General Report, which precedes the special staff reports, we gather an outline of the work accomplished and begun during the calendar year, 1910.

Dr. Haanel asserts preliminarily that the labours of the Mines Branch are becoming more practical every year. As evidence of this he instances the large demand for the monographs published by the Branch.

Important amongst the new investigations begun during the year was the study of the building and ornamental stones of Canada. A summary of Dr. W. A. Parks' monograph on the building stone of Ontario is included in the present volume. But the strongest feature is the inception of systematic work on the character, handling, use, and storage of explosives.

Fuel testing, iron ore concentration, experiments in the reduction of refractory zinc ores, and magnetometric surveying are other activities of the Branch.

The preliminary reports presented in this summary cover a wide range of subjects. Iron ores, molybdenum ores, copper mining, mica deposits, peat bogs, etc., etc., are written up by members of the staff. In fact, the Branch appears to have taken stronger and deeper root and to have become imbued with a decidedly

vigorous spirit.

The CANADIAN MINING JOURNAL strongly endorses Dr. Haanel's plea for an adequate central office wherein all the technical staff of the Branch can be properly accommodated. It is to be hoped also that larger appropriations will be secured for the new Explosives Testing Station.

It is with some astonishment that we notice in the accountant's statement an item signifying that the sum of \$25,361.91 was a balance "unexpended and lapsed." The Branch will do well to spend every cent it can secure, and, if possible, run itself into debt. Its total appropriation for 1910 was only \$113,303.65. To carry out future plans on a becoming scale this should be multiplied by five. An unexpended balance in such a department is contrary to all precedent.

#### ELEMENTARY ECONOMICS.

A prominent mining man, in the course of an interview with the CANADIAN MINING JOURNAL, stated that he had twice or thrice offered to pay the price asked for certain prospects in Porcupine, on condition that he first be permitted to spend a considerable amount of money in investigating. In each case this offer was unqualifiedly rejected. The person in question was amply able to carry out any undertaking that appealed to him. He was not only ready and willing but anxious to be responsible for the preliminary development of any reasonably promising claim. But everywhere he found owners asking impossibly high prices and imposing impossibly rapid terms.

This is one general cause of the present decline of public interest in Porcupine. Another incidental cause is the suppression, or non-publication of Mr. Robbins' report on the Hollinger. Still another is the superfluous and glittering generalities that are being published about the Dome, ostensibly from headquarters.

On its own merits Porcupine must stand or fall. Assuredly it needs sane advertising. More assuredly it does suffer from indiscreet booming.

It is high time that the mine owners and operators of Porcupine get together and devise a practicable scheme of publicity.

#### THE MOLYBDENUM ORES OF CANADA.

Dr. T. L. Walker has added another monograph to his valuable contributions to the literature of Canadian ores. Under the auspices of the Mines Branch he has investigated the molybdenum ores of the Dominion and has presented the results of his observation in the latest publication of the Branch.

Dr. Walker visited most of the best known Canadian deposits. Of these he gives a list of twelve that appeared to him to be most promising. Quebec, Ontario, and British Columbia are represented in this list.

Molybdenum is one of the least exploited metals. Its principal ore, molybdenite, presents peculiar difficulties in any attempt to concentrate it. Concen-

trating tables do not give uniform results. Indeed, ordinary methods of milling have never, so far as we are aware, proved entirely satisfactory when applied to ores of molybdenum. The vacuum process appears to have given good results, but we doubt if the trials have been complete. Possibly dry concentration may prove effective. But there remains much for the investigator to do, and the field is inviting.

The world's production of molybdenum amounts only to a few hundred tons, and is subject to pronounced variation. Were the output larger and consistent there is no doubt that a steady and profitable market would be developed.

Of known Canadian molybdenite deposits, the most promising are in Quebec, Ontario, and British Columbia. The ores reported upon range in molybdenum content from 0.5 to more than 10 per cent. of molybdenum. The principal deposits occur in quartz veins, pegmatite dykes, and near the contact of limestone with intrusive granite or pegmatite. Prospecting for the mineral is not surrounded with the difficulties that characterize gold, silver, and other metals.

Dr. Walker concludes his monograph with the remark that development is often hindered by reason of the prohibitory prices asked by property owners. This is lamentably true.

#### A DEEP SHAFT IN WET GROUND.

A Montreal firm has been awarded the contract of sinking a 200-foot concrete shaft through sand, clay, and gravel at St. Albert, near Edmonton, Alberta. The details are interesting.

The coal lies at a depth of about 300 feet. It is overlaid by 100 feet of shale in which occur occasional seams of coal and sandstone. Over this is imposed a body of clay and very wet sand and gravel, 200 feet thick.

The attempt was made some time ago to sink an ordinary timber shaft. At a depth of 82 feet the work was abandoned. It was found impossible to hold the shaft and to take care of the water.

The proposed new shaft will be built of reinforced concrete from the surface to the shale. Here it will be completely sealed. Thus an absolutely fireproof and water tight shaft will be secured.

#### THE INSTITUTE IN PORCUPINE.

Every effort is being made to organize a strong branch of the Canadian Mining Institute in Porcupine. With this end in view a meeting is to be held at South Porcupine on December 16th. It is hoped that every mining man within reach of the place of meeting will attend this first gathering.

A few short papers are to be read on the evening of the 16th, after the regular business has been transacted. On the following day all who desire to do so may be shown over the camp.

Dr. Frank Adams, the President of the Institute, will be the guest of honour. Accommodation will be secured at the various mines for visitors who notify the secretary in time.

#### CHAS. A. STONEHAM & CO.

The exaggerated mining news items published by Chas. A. Stoneham & Co. have bred much mischief. One mining company has adopted the expedient of advertising in the daily papers the fact that it cannot be held responsible for any statements made by Chas. A. Stoneham & Co.

It would be a very wholesome thing if every mining company whose shares are listed on Canadian exchanges were to make a similar protest. Unclean parasites, and this describes the firm of Chas. A. Stoneham & Co., could thus be promptly choked to death.

#### A WARNING.

Several letters of enquiry regarding the Canadian Mining Record have reached our office. To set correct certain misapprehensions it is well that we state specifically that the Canadian Mining Record has no possible connection with the CANADIAN MINING JOURNAL. If we are not mistaken, the Record, which was published in Toronto, has ceased to exist.

#### EDITORIAL NOTES.

The Government of Western Australia employs one chief inspector and a staff of 18 men to control the storage and use of explosives.

A new mineral has come to light. An Ottawa paper announces that Mrs. Ella Rawles Reader, a lady who is supposed to be mining zinc on Calumet Island, has struck a vein of "plumbaganite." If Mrs. Reader evolved that euphonious name she deserves more than a little credit.

The writing of prospectuses is an art that can be acquired only by long experience. It is rarely that one sees a properly balanced presentation of facts and opinions. The tendency is, of course, so to use the engineer's report as to give a highly favourable view of any enterprise. A result is that many engineers are falling into the habit of making their reports serve the purpose of the prospectus. This is a lamentable tendency, a tendency that should be guarded against most rigidly.

Canadian orders, totalling upward of 50,000 tons of pig iron, have been placed in the United States. Deliveries are spread over six months.

Mr. Hugh S. de Schmid, reporting on the mica deposits of Ontario and Quebec for the Mines Branch,

Ottawa, lays stress upon the fact that the average unit value of Indian mica imported into Great Britain shows a maximum variation in five years of only \$119.44. On

the other hand the corresponding maximum variation for Canadian mica is \$691.97. This indicates the need of grading and standardizing the Canadian product.

## CORRESPONDENCE

Editor CANADIAN MINING JOURNAL:—  
Toronto.

Sir,—Since the publication of Mr. Hedley's most appropriate views in reference to the legislature of mining enterprises, I have been looking forward to your journal carrying this to some issue, but since the 1st ult. I note that it has not been further commented upon.

May I therefore be permitted to pass a short criticism on the subject, as through your journal I feel that something tangible may result?

In a condensed form, the proposal is to eliminate, as far as possible, the discreditable floating of mining propositions, wherein the subscriber to such company's stock has not reasonable assurance of

1st—Commercial ore.

2nd—Capitalization on sound basis.

3rd—Good management.

4th—Promoters' remuneration under control.

Before entering into a discussion on the foregoing, it will surely be agreed that the capitalization, and promoters' remuneration of most mining enterprises, are not directly within the province of consulting or advising engineers, I will, therefore, first deal with what vitally concerns the mining engineer.

The divergence of even expert opinion on an already developed mine is well known, so to even a greater extent would be the difference of opinion in the case of a prospect, or unproved arrears, but what irritates, is the publishing of reports by promoters when one probably knows, from actual experience, or other authentic reports, that the statements on the part of the promoter are not only misleading to the outside investor, but that there is little hope of commercial ore, and in some instances, mineral is non-existent except in traces.

To me, the blame is not entirely with the promoter, and a little closer co-operation on the part of mining engineers would, I think, be conducive to a better condition under this heading, and my personal views for a remedy are as follows:

That the branch members of the Canadian Mining Institute formulate a "Mining Bureau," separate to their membership to the Institute, such members to be consultants who are in no way connected with any mining enterprise, except in a professional capacity.

That under the name of "Mining Bureau," or some such title, the members would be prepared to examine and report confidentially for the endorsement, or otherwise, of the report submitted to them.

Such "Bureau" could not, of course, be formulated by the Canadian Mining Institute, but should be more or less a private organization, may be made remunerative, and its usefulness extended to the quashing of "wild-cats," as may be illustrated by Stewart and Steamboat Mountain, both of which were left for the Dominion Government to snuff out, but not until the public had invested to a large extent in each case.

I estimate that the advantage offered by such an institution would be readily taken up, by not only

those who are directly interested in mining, but also by the general outside investor.

There are naturally many points for discussion on such a proposal, but with judicious handling, there should be no insurmountable difficulties.

On the question of management, I think that your proposal to have provincial examinations for mine managers, would be a means whereby the investor may be assured that he has the opportunity of having a fully qualified man in charge, but what often occurs is the appointing of a person who has had no previous experience, but who is an ornament and friend of the promoters, but as promoters generally have the ruling power, a definite solution to prohibit this appears to be almost impossible, as by legislation, a company may be compelled to have a fully qualified engineer in charge, and yet such man may be subservient to the unqualified person appointed by the promoters.

As previously stated, it is hardly within the province of the consultant, or advising engineer, to attempt to dictate as to capitalization and promoters' remuneration, but with the innumerable legitimate and excellent opportunities for the investment of capital in mining, one naturally feels that we should endeavour to rectify the present evils, and thus add to the inducements, also to see that such investment should have reasonable assurance to become remunerative.

To many of the promoters there appears an incentive for the promoter to construct his company so that he may "usher the investor in on the ground floor" while he occupies the sub-basement, and while one cannot dictate to the investing public as to what floor they should occupy, they could at least be safeguarded by placing them in possession of the details of the structure, and to apply a remedy, I would suggest Dominion legislation somewhat upon the following lines:

That it should be unlawful for any company, syndicate, or trustee to issue privately or publicly, or use literature for the purpose of securing subscriptions for shares, which shall not have therein printed—

A. Capital of the company.

B. Title the company holds.

C. Amount of promotion appropriated, and whether in cash or shares, or both.

D. Amount of shares already issued and fully paid for.

E. Shares issued but not fully paid for.

F. Balance of shares in treasury.

Such figures and statements to be as entered in the books of the company at the time of publication, and the name of the secretary to be given with registered address of the company.

I do not see that any reputable company could object to comply with the above requirements, and as most public mining flotations for the development of a "prospect," or unproven ground, are more or less speculative, the public, with the facts and figures before them, would have more confidence in taking an interest.

In any event, it would prevent the sub-basement being occupied by the promoter, while the public are tenants of the ground floor, with no knowledge of any basement existing.

In conclusion, I consider that a great effort should be made to remedy the existing discrepancies, and

through closer co-operation amongst those of the profession, also through the medium of your journal, I trust progress may be reported.

Yours faithfully,  
"CONSULTANT," B.C.

## BOOK REVIEWS.

### GRAPHICAL SOLUTION OF FAULT PROBLEMS—

BY C. F. TOLMAN, JR., 43 PAGES — ILLUSTRATED — FLEXIBLE BINDING — PRICE, \$1 — PUBLISHED BY MINING AND SCIENTIFIC PRESS, SAN FRANCISCO, AND THE MINING MAGAZINE, LONDON—1911.

Few mining engineers have made a close and comprehensive study of ore deposits. To be of practical assistance to the engineer, Mr. Tolman has sketched the principles of the graphic representation and investigation of fault problems. No other phase of mining is so in need of definition.

Mr. Tolman introduces his subject as follows:—"A common occurrence in mining is to have a drift on the vein meet a polished wall, on the other side of which no ore is discovered. The life of the mine depends upon rediscovering the ore, but in many cases the vein is never found again. . . . Every man engaged in mining should be interested in fault problems."

To facilitate the study of faults, the author points out that a consistent record of all data pertaining to the ore body should be kept. The typical problems discussed in the book are selected from those given in the laboratory courses in structural geology at the School of Mines of the University of Arizona.

In Section II, the nomenclature of fault movement is outlined. Instead of "vertical," the term "normal" is used. In the measurements of fault movements, displacements, separations, throws, and heaves are illustrated diagrammatically. There follow sections on methods of projection, line and plane intersections, and several on fault movements.

The reader will find it necessary to furbish up his descriptive geometry before he can extract the meat from Mr. Tolman's work. This done, there is no question as to his deriving practical benefit.

## PERSONAL AND GENERAL

Mr. F. M. Passow, assistant superintendent of the Eustis mine, Quebec, passed through Toronto on November 21st on his way to Gowganda and Porcupine.

Mr. G. W. Rayner has returned from Northern Quebec, where he spent the summer prospecting. Mr. Rayner covered the Keekeek country, and the districts tributary to the Bell and Harricanaw rivers. During his travels Mr. Rayner met only two or three prospectors.

Mr. Frank C. Greene, a well-known coal mining engineer, is now general manager for the Graham Island (B. C.) Coal and Timber Syndicate, Limited, which holds coal lands situated on Graham Island, of the Queen Charlotte group, British Columbia.

Mr. Frank E. Elmore, of London, England, has been spending several weeks in British Columbia in connection with the experimental application of the Elmore Vacuum Process of concentration to the recovery of metals from local ores. Experiments are in progress at one place on mill middlings from lead-zinc ore and in another on low-grade copper ore.

Mr. Robert H. Stewart, general manager of the Consolidated Mining and Smelting Company of Canada, Limited, returned to his headquarters at Trail, B.C.,

early last month, after having spent a month in Ontario and eastern Canada.

Mr. H. H. Claudet, formerly of Rossland, B.C., who has been supervising experiments with one unit of the Elmore Vacuum Process plant on ore from the Hewitt-Lorna Doone mines, near Silverton, Slovan Lake district, is now superintendent of the Wakefield concentrating mill at which the experiments have been made for the Silverton Mines, Ltd., of London, England.

Mr. Elias Rogers, of Toronto, gave evidence last month before the British Columbia Tax Commission, then sitting in Victoria, B.C. In the course of his evidence Mr. Rogers urged the removal of the existing provincial tax of 15 cents per ton on coke.

Mr. J. A. McPhee, a graduate in mining engineering from the University of Washington, Seattle, State of Washington, is now engineer and surveyor at the Rambler-Cariboo mine, in McGuigan Basin, Slovan, B.C.

Mr. W. S. Rugh, for years in charge of the Le Roi Mining Company's office in Rossland, B.C., was last month the recipient of a valedictory address and souvenir presentation on the occasion of his leaving that town to reside on the coast.

## The New Minister of Mines for Ontario.



Hon. W. H. Hearst

The Hon. William Howard Hearst, K.C., who succeeds the Hon. Frank Cochrane as Minister of Mines for Ontario, is a barrister-at-law. He was born on February 15, 1864, in Township Arran, County Bruce, Ontario. His early education was received at public schools and the Collingwood Collegiate Institute.

In the year 1891, Mr. Hearst married Isabella Jane Dunkin. His family consists of two sons and two daughters.

For years Mr. Hearst has been a leading Conservative worker in Northern Ontario. On the formation of the Whitney Government he was appointed Government agent in connection with the Lake Superior Cor-

poration loan. This position he filled until April, 1908, when he resigned to contest the Sault riding.

It is gratifying to know that the Hon. Mr. Hearst has paid especial attention to mining law and to the mining industry generally. His experience in mining litigation has been varied and extensive.

The new Minister has always been an ardent champion of Northern Ontario. He is well fitted to carry on a constructive campaign of development.

In religion the Hon. Mr. Hearst is a Methodist. He has always been identified with philanthropic movements in his community.

### CALCITE VEINS.

Calcite veins, like quartz veins, have no essential connection with valuable ore deposits. Quartz and calcite are the commonest fillings of fissures, because these minerals are the ones most commonly deposited from circulating solutions. When these solutions contain valuable minerals as well, the resulting deposit is very large compared with the cases in which it contains workable ore deposits. In the Waitekauri mine

in New Zealand there was a large calcite vein of good value, but when the calcite vein junctioned with the quartz both veins lost their gold values, and no payable vein was again found.

In gas producer practice the fuel bed should not be operated at a temperature higher than 1,300 degrees C. High temperatures induce clinkering and in other respects lower the efficiency of the producer.

# An Account of the National Mine Safety Demonstration, held in Pittsburg, October, 30th and 31st, 1911

(Editorial Correspondence.)

At the invitation of the Director of the United States Bureau of Mines the CANADIAN MINING JOURNAL sent a representative to witness the First National Safety Demonstration held in Pittsburg on October 30th and 31st.

The whole city was "en fete," not on account of the Demonstration, but because the last day of October had been chosen as the date on which to celebrate the centennial of steam-navigation on the Monongahela and Allegheny rivers. This, fortunately, made it possible for President Taft to honour both the Demonstration and the Centennial.

Proceedings began at 9 a.m., on Monday, at the Bureau of Mines buildings in the Arsenal grounds, 40th and Butler Streets. Addresses of welcome, brief and to the point, were delivered by the Hon. Walter L. Fisher, Secretary of the Interior, Dr. J. A. Holmes, Director of the Bureau; and Governor John K. Tener. The Hon. Mr. Fisher referred to the notable work of the Bureau and promised to see to it that new build-

visitors. The crowd, separated into several continuous streams, moved continuously through each building and section. The marked courtesy and the unfailing patience of Dr. Holmes and his staff made it possible for nearly all of us to get a complete view of the buildings and apparatus.

At 2 p.m. on Monday the whole concourse was taken out to the Experimental Mine at Bruceton, about 12 miles outside of Pittsburg. Here the mine, which consists of two specially constructed converging tunnels, had been prepared for a large-scale explosion. One pound of coal dust per linear foot had been distributed on scantlings. Electric connections were laid, and after the crowd had walked through the mine, the lights were removed, and the first charge of permissible was fired. No coal dust explosion followed. Owing to a defect in the connections, the second experiment, in which black powder was employed, was not brought off until 5.45 p.m. Rain was falling and daylight had failed. Most of the crowd had moved down to the railway track about 400 yards from the entries. Even there the detonation that followed was almost overpowering. Vast tongues of flame issued from both portals. No more vivid and appalling illustration of what a mine explosion means could be imagined. Words cannot convey the magnitude, force, and magnificence of the phenomenon—therefore more words shall not be employed. It suffices to say that all of us were impressed beyond possible expectations.

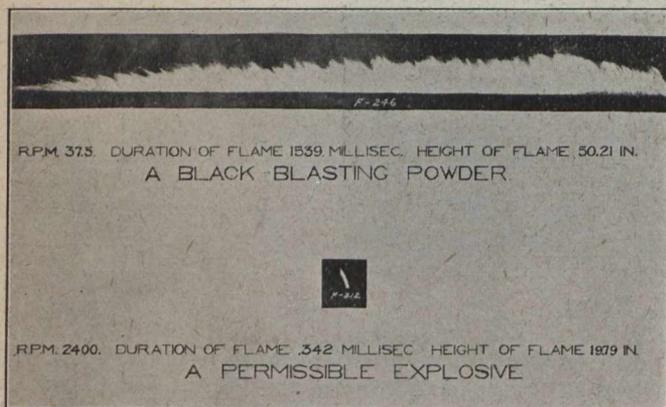
To give a clearer idea of the plan of the mine I append here a few notes from the official programme:—

"The Experimental Mine of the Bureau of Mines is situated near Bruceton, Pa., on the Wheeling branch of the Baltimore & Ohio Railroad and is in the Pittsburg seam, which at this point outcrops on the side of a hill about one hundred feet above the railroad.

"Object—The mine was opened primarily in order to study the phenomena of dust and gas explosions and to test various methods of preventing and checking explosions in progress under actual mine conditions, which requires repeated explosions under varied conditions.

"Plan.—The arrangement of the part of the mine which will be used for the explosion of October 30th is indicated on the map shown on opposite page. An outside steel gallery is of one-half inch boiler plate, 102 feet long and 6 feet 4 inches in diameter, is connected by a 20-foot movable steel section and a 20-foot concrete explosion-door section to a slant entry. This entry intersects the east entry or aircourse 192 feet from the end of the explosion door section. The entire slant entry, 70 feet of the aircourse, and 169 feet of the main entry are lined with reinforced concrete. Heavily reinforced concrete portals are built at the mouths of the gallery slant and main entry.

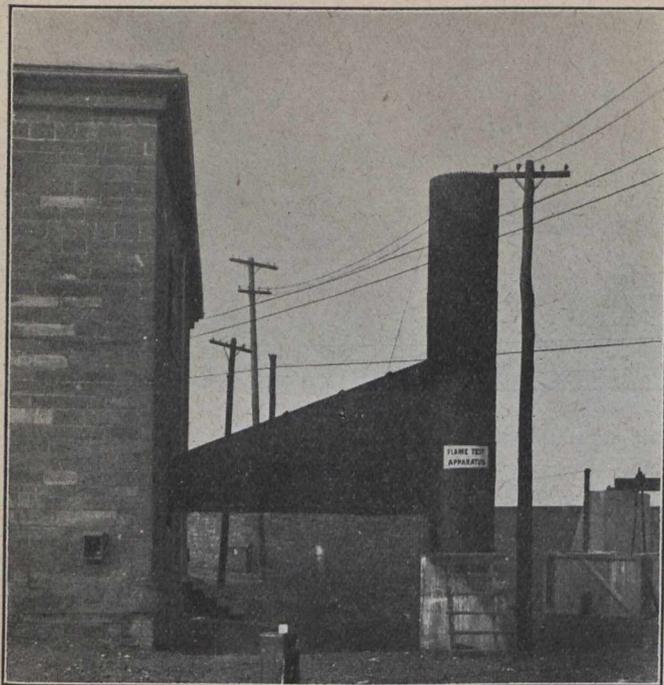
"Explosion Data.—One surface and four underground instrument chambers have now been constructed. The wires from the instruments in these stations pass through pipes behind the concrete lining to recording instruments in the observatory. Pressure var-



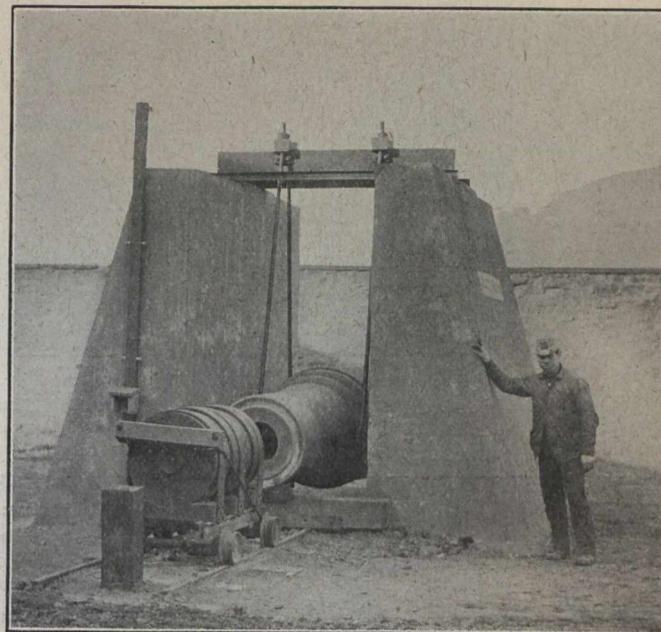
ings and equipment be furnished. Governor Tener, a fine specimen of manhood, spoke for the State of Pennsylvania. Dr. Holmes proffered a general welcome.

The morning audience, numbering perhaps 4,000, was made up of miners, operators, foremen, officials, and delegates from other States. Canada sent half-a-dozen or more representatives.

Continuous demonstrations were shown in the chemical and physical laboratories, in the boiler room, the fuel laboratory, the petroleum laboratory, the gas laboratory, and the explosives laboratory. The experiments included the sampling of gas, the breaking of incandescent lamps in an explosive mixture of gas and air, the smokeless combustion of low-grade, high-volatile fuel using mechanical stokers, the exhibition of apparatus for testing explosives, the briquetting of various fuels, the ignition of coal dust, and many other incidental tests. The gallery explosion of coal dust, using first a permissible explosive and then black powder was the feature of the morning. The ballistic pendulum, a device adapted from an antiquated piece of ordnance, was spectacular. Several rescue and Red Cross cars were on a siding and were examined by the



Apparatus for photographing the length of flame of an explosive.



Ballistic Pendulum

iations at the stations and velocity readings are taken by these instruments in conjunction with those at the observatory. Gas samples are taken by special devices at the instrument station.

**“Explosion Conditions.**—The mine is prepared for the explosions by placing coal dust on the floor of the steel gallery and on wooden shelves along the sides of the entries, which is exploded by firing a charge of black blasting powder (representing a blown-out shot) into the steel gallery.

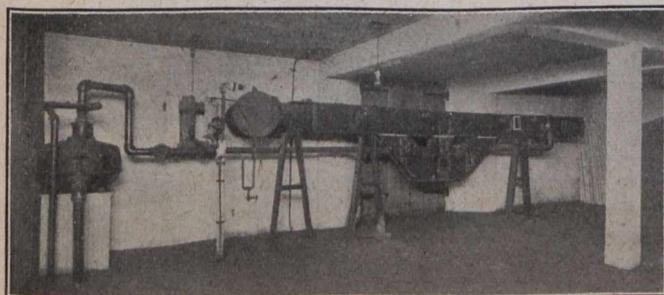
**“Gas Samples.**—Afterwards the entry doors are closed and men in oxygen helmets enter the mine through a slide door in the main entry door, to take gas samples, extinguish incipient fires and inspect the condition of the roof. Later, when conditions are safe, the fan is started and the mine cleared of afterdamp. Should it be necessary, timbermen then enter the mine to remove loose pieces of hanging rock and place temporary timbers. Afterwards records are made of the effects of the explosion.

**“Inspection.**—On October 30th experienced mining men among the visitors will be permitted to inspect the mine before and after the explosion, when it has been put in good condition.”

At sharp 9 o'clock on Tuesday morning a large crowd began to pour into Forbes Field, a baseball park opposite the Hotel Schenley. The capacious 3-storey steel grandstand was fairly filled. At the op-

posite side of the field was placed a large steel explosion gallery, from which battery wires were strung to the President's box in the stand. From 9 o'clock until 10.30 o'clock the time was occupied with exhibition and competitive tests between 40 First-aid squads of six men each. Ten “problems,” covering burns, wounds, gas poisoning, and electric shock were performed. Each team carried its own equipment. Coal companies from all over the United States were represented. The men were all miners, specially trained and chosen by local elimination trials.

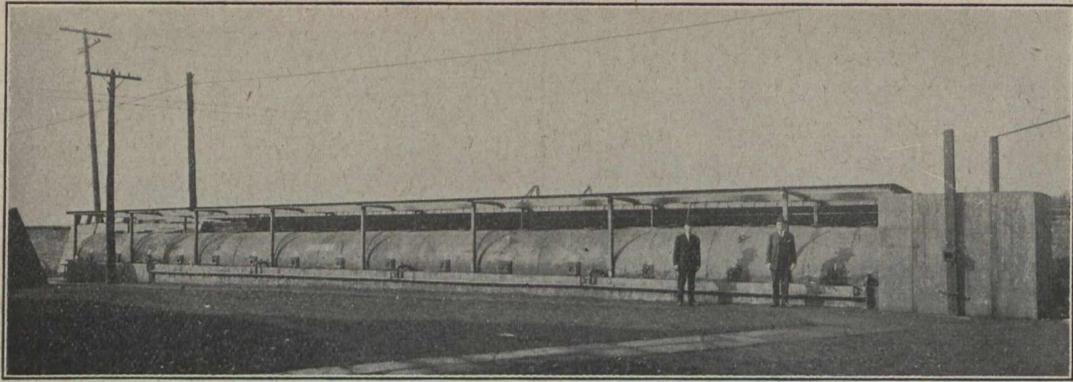
At 10.40 a.m., one-half pound of 40 per cent. nitro-glycerine, tamped with one pound of dry fire clay, was fired into the steel gallery. Only a dull concussion was heard, and no explosion of dust resulted. Twenty minutes later, a corresponding charge of FFF black powder, tamped with dry fire clay, was fired. The 150 pounds of coal dust that had been distributed through the gallery exploded with deafening effect. A flame many feet in length shot from the gallery mouth.



Gallery for testing safety lamps in the presence of gas.



Ballistic Pendulum in action.



Steel Gallery in which Coal Dust experiments are made.



An explosion of coal dust in the steel gallery.

A few minutes later, while volumes of dense brown fumes were still billowing from the gallery, a rescue party, equipped with various types of breathing apparatus, entered the gallery and effected the rescue of two dummies. Several squads of rescuers then performed a series of evolutions before the President.

One interesting experiment was conducted earlier in the morning. Mr. G. A. Burrell, an officer of the Bureau, entered a glass box, the atmosphere of which contained 0.25 per cent. of carbon monoxide (white damp). He took with him three canaries. While the gas had no effect upon the experimenter, all three of the birds began at once to show signs of distress. Af-

ter a few minutes they collapsed. Mr. Burrell stayed in the box for some minutes further. Later the birds were all revived by the application of oxygen.

At 11.30 a.m., President Taft presented the trophies. Speeches were made by Governor Tener, Hon. Mr. Fisher, and Miss Mabel Boardman. Miss Boardman represented the American Red Cross Society.

To the visitor it was a slight shock to hear Governor Tener declare that all the anthracite coal in the world came from Pennsylvania. Similarly it was a source of surprise when the Secretary of the Interior asserted that the United States led the world in mine safety work. This is so beside the mark as to need no comment.

\* \* \* \* \*

Too much praise cannot be bestowed on Director Holmes and his efficient lieutenants Messrs. Paul, Shields, Hall, Feehan, and Clement. The limited time at their disposal made it obligatory to crowd into one day and a half, events that could easily have been spread over a week. It was necessary, also, for the sake of impressing gatherings that numbered from two thousand to fifteen thousand, to make the demonstration spectacular. And it was spectacular. The whole effect was impressive, educative, and inspiring.

The JOURNAL hopes that when our own Mines Branch Testing Station is completed some such public exhibition can be arranged.



First Aid to the injured—bandaging for injury to jaw.



Interior rescue room Bureau of Mines Station.

# On the Mica Deposits of Ontario and Quebec.

Hugh S. de Schmid, M.E.\*

The summer season of 1910 was devoted to an examination of the principal mica regions of Ontario and Quebec; with the object of gathering material for a revised edition of the monograph on mica, issued by the Mines Branch in 1905.

While the chief purpose of the tour was to examine and report upon the mica deposits at present being worked, time was also devoted to an examination of old mines, with the object of collecting geological data bearing on the origin of the mica, and of compiling as complete a map as possible of the localities in which the mineral has been found to exist in commercial quantities. While it was found impracticable to visit every small surface pit from which mica has, in the past, been taken, all available information regarding such was collected, and will be embodied in the full report.

## Quebec.

Since the original monograph was published in 1905, new amber mica occurrences have been located and worked in Quebec, north of the districts covered by Mr. Cirkel's report, and it would appear that the mica-bearing region extends considerably north even of the area which had already been prospected.

In the Lievre River district, the most northerly workings are situated a few miles from Notre Dame de Laus, in the township of Bigelow, where Mr. W. Parker, of Buckingham, has carried on considerable surface work, and discovered extensive deposits of mica on range V, lot 52. The mica is a rather dark amber, and of only medium splitting quality.

In the Gatineau region the mineral has been mined as far north as range II, lot 28, of the township of Egan, where Mr. Joanis, of Maniwaki, has taken out several thousand dollars worth of fair amber mica.

Prospectors were met with in the vicinity of Pemichangau Lake, who reported favourable indications on ranges V. and VII. of the township of Blake.

The most westerly mica deposits which have as yet been worked in the area under consideration are situated in Litchfield and Huddersfield townships, where Messrs. Bowling Bros., of Thornby, and the Calumet Mica Co., of Bryson, have carried on some surface work.

It may be remarked that the mica bearing dykes (pyroxenites) are to be found cutting the Laurentian rocks throughout almost the entire district situated immediately north of Ottawa and the Ottawa River, and over an area of which the boundaries to the north, east, and west are as yet but poorly defined. The presence of these pyroxenite dykes, while indicative always of a possible occurrence of mica, does not necessarily imply the existence of a commercially valuable deposit. In some districts mica in quantity is to be found in pockets throughout the entire mass of such a dyke, while in others but scanty traces of the mineral are to be met with, though the rock, to all appearances, is identical in both places.

Owing to its occurrence in such sporadic fashion, mica is among the most uncertain, and, from a miner's point of view, one of the most disappointing of min-

erals to follow. Often when the indications of a continuance in depth of the deposit are most favourable, the fissures narrow down, and all traces of the mica are lost; on the other hand, seemingly barren rock will suddenly yield large quantities of high-grade crystals, which, however, may form only an isolated group, and be underlain by many feet of rock before mica is again met.

While it is not intended to assert that mica in quantity exists on every lot in the region between the Lievre and Gatineau rivers, the district is nevertheless so extensively traversed by pyroxenite dykes exhibiting traces of the mineral that the possible existence of deposits on almost any lot cannot be said to be precluded.

In addition to the localities mentioned, mica also occurs farther to the east, in Argenteuil county, Wentworth township, where several operators have mined on a small scale. The mica in the last-named district, as in the Saguenay region, Berthier County, still farther to the west, is chiefly of the muscovite variety.

## Ontario.

The mica-mining region of Ontario has not been extended by any new discoveries of importance since the publication of the last report.

The chief centres of mining activity are Sydenham and Micaville, in the townships of Loughborough and North Burgess, respectively. In the former district, the General Electric Company's mine — the old Smith and Lacey — still remains the chief producer, and employs an average staff of 35 men. The output and reserves of this mine play an important role in fixing the market price of the mineral, and the General Electric Company, which carries on its mining operations under the name of the Loughborough Mining Company, can be said to practically control the market.

The above company also owns various other mines in different parts of the country, chief among which are the Cantin mine, on lot 1, range IV., of South Burgess township; the Hanlon mine, on lot 11, range VI., of North Burgess; and the Chaibee mine, on lot 7, range A, of the township of Wright (Quebec). None of the latter mines were working when visited.

The occurrence of a yellowish, and rather brittle mica, whose composition and exact species have not yet been determined, in a highly metamorphosed rock in the Sydenham district, may be mentioned here as constituting a type of mica deposit in many respects dissimilar to the majority of occurrences visited. The deposit in question is at present being worked by Mr. J. Richardson, of Kingston, with an average staff of half a dozen men, and is situated on lot 1, range X., of the township of Loughborough.

The intrusive rock to which the mica probably owes its origin had not, at the time of my visit, been met with—the depth reached by the workings not exceeding 60 feet. The mica appears to have been deposited by pneumatolytic emanations from the igneous intrusion of some basic rock which did not reach the surface, but which will probably be met with at an inconsiderable depth.

Three beds, from 1 to 2 feet thick, of a reddish quartzite, are met with in the workings. These layers

\*Abstract from Summary Report of the Mines Branch, Ottawa.

contain no mica, and the rock in their immediate proximity is also practically devoid of the mineral.

The source of the mica is, in all probability, a basic laccolite.

A similar mica is also found on lot 5, range II., of Bedford township, this occurrence being almost identical with the foregoing. In this case, however, the country rock is limestone, belonging to the Archæan formation, and is of the normal white, coarsely crystalline type.

The association with the mica of secondary minerals such as vesuvianite, actinolite, garnet, etc., at both the above-mentioned mines, is interesting, and will be further described in the full report.

#### Qualities of Mica.

With the exception of some half dozen, all the mines and prospects visited, numbering over 200, were concerned with phlogopite, or amber mica deposits. The colour of the mica was found to range from almost black, in which case the resemblance to biotite was very close, to almost colourless; the very dark and the very light-coloured varieties being, as a rule, the poorest splitters.

The suitability of mica for electrical purposes depends essentially on two factors: (1) its degree of cleavage, and (2) its non-conducting properties. Consumers of the mineral seem to vary in their opinions, some preferring a relatively dark mica of medium splitting quality, while others refuse to take any but the light-coloured variety — on account of its apparent freedom from iron — though its cleavage may be much inferior to that of the dark-coloured.

Brittleness also is an important consideration with consumers, this being a fault which affects both the dark and the light micas.

With the advent, however, of mica-board manufacturing, brittleness has ceased to prove such a detrimental factor, since even the most brittle mica is sufficiently flexible in very thin layers ( $\frac{1}{2}$  to 1 mil.) to be used in the building up of mica plate.

Some manufacturers use both dark and light amber mica, and mix in a certain proportion of Indian white mica (muscovite) the resulting plate possessing, it is claimed, all the qualities necessary to the manufacture of electrical appliances.

#### Status of the Mica Industry.

The condition of the mica market, though inclined to show a slightly better tendency, towards the latter part of 1910, has not conduced to any great activity on the part of operators during the past few years. Some few of the larger owners are continuing to work, but practically all the smaller mines are idle.

A peculiar feature is, that while in the Quebec mica districts mining was declared to be unprofitable under present mining conditions, operators in Ontario, while admitting that prices were low, yet contrived to find a satisfactory enough market to enable them to continue working their properties, and even to consider the re-opening of mines which have been idle for some years. The cause of this divergence of opinion is difficult to arrive at, since wages and general mining expenses are, if anything, lower in Quebec than in Ontario.

Owing to this inactivity amongst mica-miners, fully 80 per cent. of the mines visited were found to be idle, and the pits more or less full of water, and consequently inaccessible.

Although in the past, Canadian producers have, for the most part, seemed to be content with the market

provided by the United States, shipments are now being made in increasing quantity to English consumers, and inquiries were often made during the past season as to names and addresses of buyers in the United Kingdom.

While appreciating the superiority of Canadian amber mica for electrical purposes, English and Continental manufacturers nevertheless still procure the greater part of the mica they require from India.

Subjoined are tables showing the amount of mica imported into the United Kingdom during the past five years from Canada and India respectively, and also the imports of Canadian mica into the United States for the same period.

TABLE 1.

#### Exports of Mica from Canada to Great Britain.\*

Calendar Year.	Tons.	Value.	Average Value. per ton.
1905 . . . . .	179	\$25,717	\$143.07
1906 . . . . .	167	58,735	351.71
1907 . . . . .	80	43,913	548.91
1908 . . . . .	156	81,050	519.55
1909 . . . . .	30	24,316	810.53

\*Compiled from Mines Branch statistics.

TABLE 2.

#### Imports of Mica into Great Britain from Canada.\*

Calendar Year.	Tons.	Value.	Average Value. per ton.
1905 . . . . .	130	\$24,349	\$187.30
1906 . . . . .	209	51,618	246.98
1907 . . . . .	88	51,497	585.19
1908 . . . . .	122	74,362	609.52
1909 . . . . .	34	30,749	904.38

\*Compiled from British Board of Trade Returns, 1910.

TABLE 3.

#### Imports of Mica into the United Kingdom from India.\*

Calendar Year.	Tons.	Value.	Average Value. per ton.
1905 . . . . .	901	\$369,506	\$384.50
1906 . . . . .	1,845	782,397	423.15
1907 . . . . .	1,778	672,532	378.25
1908 . . . . .	1,369	415,773	303.71
1909 . . . . .	1,302	480,042	368.69

\*Compiled from British Board of Trade Returns, 1910.

TABLE 4.

#### Imports of Mica into the United States from Canada.\*

Calendar Year.	Tons.	Value.	Average Value. per Ton.
1905 . . . . .	253	\$121,560	\$480.47
1906 . . . . .	539	328,991	610.35
1907 . . . . .	767	596,321	777.47
1908 . . . . .	172	140,166	814.92
1909 . . . . .	107	132,941	796.05

\*The Foreign Commerce and Navigation of the United States.

It will be seen that in 1905—the year in which the greatest quantity of mica during the quinquennial period in question was shipped from Canada to English consumers—this quantity was exceeded by the Indian shipments by more than five times; while in 1909,

the Canadian mica imports were only one forty-third of the Indian.

A comparison of Tables 2 and 4, showing the average value per ton of the mica shipped to the United States and of that sent to English buyers, discloses a rather remarkable difference of price; in one case (1905) the latter would appear to have paid \$336.80 per ton more for their mica than the Americans, while in 1909 the reverse is the case, the prices being in favour of the English consumers by \$14.48 per ton.

The accurate average price is not, however, claimed to be shown in the above tables; in fact, the figures given in the British Board of Trade returns, show discrepancy in the above tables; in fact the figures given months published by Canadian shippers amounting in one year (1906) to as much as \$104.73; the average price per ton, calculated from the British Board of Trade returns, being \$246.98; while the figure arrived at from the statements furnished to the Mines Branch statistical department was \$351.71.

A comparison of the figures given in Tables 1 and 2 will show how greatly these two sources of information vary in their statements both as regards tonnage and value.

The cause of the wide difference in value of the English and American shipments, given in the two tables—differences which render any sort of comparison futile—is probably to be found in the various grades of mica shipped to the different countries.

Shippers, being bound by no compulsory system of classification or grading other than may be agreed upon between themselves and the buyers, may, in one instance, forward a consignment of more or less roughly trimmed mica of comparatively low unit value, while to another purchaser only high-grade sheets are sent, the difference in value of equal weight shipments being accordingly very great, while both consignments would be similarly classed in the Trade Returns as "mica," without distinction as to quality.

It is worthy of remark that, while the yearly average unit value of the Indian mica imported into the United Kingdom in the five years shows a maximum variation of \$119.44, that of the Canadian mica similarly imported reaches the high figure of \$691.97 (mean value calculated from Tables 1 and 2).

The comparatively small difference in the case of the Indian mica is doubtless due to the standard quality of the mineral, which varies little in colour and general character (elasticity, brittleness, etc.) whereas the amber mica possesses all these attributes in greatly varying degree—its price varying accordingly.

It is due to the fact that the Indian mica can always be depended upon to be of the same standard quality, that buyers in the United Kingdom have generally preferred this variety to the amber, which can seldom be relied upon, even in a single shipment, to be of uniform grade and colour.

Canadian producers, while realizing this, yet appear reluctant to fall in with the wishes of the English market, and cannot agree to the request of prospective purchasers in the United Kingdom to furnish shipments which are uniform in quality with samples submitted by them.

There can be no doubt that, could a satisfactory system of sorting be devised and agreed upon amongst mica dealers, the market relations and conditions between Canada and Great Britain would be materially improved.

For the purpose of further emphasizing the discrepancy between tables calculated from returns furnished by shippers on the one hand and by Foreign Trade returns on the other, an additional table (5), of exports of Canadian mica to the United States, is given: the figures here given are taken from "Trade and Navigation."

TABLE 5.

**Exports of Mica from Canada to the United States.\***  
Average Value.

Calendar Year.	Tons.	Value	per Ton.
1905 . . . . .	351	\$150,767	\$429.62
1906 . . . . .	735	519,479	706.77
1907 . . . . .	468	372,798	796.58
1908 . . . . .	132	115,005	871.25
1909 . . . . .	325	229,689	706.74

\*Trade and Navigation.

The following table (6) gives the total annual production of mica in Canada for the same period:—

TABLE 6.

**Total Annual Production of Mica in Canada.\***

Calendar Year.	Tons.	Value.
1905 . . . . .	...	\$178,235
1906 . . . . .	574	303,913
1907 . . . . .	774	312,599
1908 . . . . .	436	139,871
1909 . . . . .	369	147,782

\*Mines Branch returns.

The fact that, in some cases, the total annual production falls short of the combined exports to Great Britain and to the United States for the year, is due to the practice made by some producers of accumulating large stocks of mica: these reserves, in many cases, remain on the mine, and so do not figure in the production returns.

\*At the present time, large quantities of mica are being held in reserve, which owners are not disposed to ship at current prices.

\*Editorial Note:—Since this report was written the market has become much stronger. It is now decidedly active.

**TREATMENT OF ELECTROLYTIC MUD.**

The mud is washed free from sulphate of copper, slowly dried in steel trays and then heated to a dull red to get rid of the tallow and alter the mechanical conditions of the graphite with which the starting sheets were originally coated. Before the practice of heating the mud was adopted in electrolytic refining in Australia, says Mr. G. H. Blackmore, it was found impossible to get the copper out of the mud except after days of boiling with sulphuric acid, and even then as much as 40 per cent. of it remained in the residue.

**QUARTZ IN TUBE MILLS.**

Quartz from the mine is now largely used in tube mills. It is an effective grinder, but does not make a good lining. In feeding a mixture of quartz and pebbles, the pebbles make up the lining, whilst the quartz stays in the charge, so that the advantages of both materials are gained.

# An Address on the Past, Present and Future of Copper

Delivered before the American Mining Congress, Chicago, on Wednesday, Oct. 25, 1911, by Horace J. Stevens  
THE PAST. •

The great copper industry of the present day is a thing of small beginnings. One century ago, in the year 1811, the world's production of copper was a trifle under 10,000 long tons, an amount smaller than was secured last year by any one of more than twenty different mines. During the present year the great Anaconda mine, of Butte, has produced, during nearly every month, as much copper as was supplied by all the mines of the world, in the entire year of 1811.

Fifty years ago, in 1861, the world's output of copper was but a trifle more than 100,000,000 pounds, a production that was exceeded, in 1910, by the Anaconda, American Smelters Securities Co., and Phelps, Dodge & Co. The production of the year 1900, the last of the nineteenth century, was just fifty times as great as that of the year 1800. Should the same ratio of increase be maintained during the twentieth century, the output of the year A. D. 2000 would be 24,318,150 long tons of copper, twenty-five times as much as the present production, and even a fifty-fold increase for the twentieth century would allow an average increase of less than four per cent., while the average annual increase, for the decade beginning 1900 and ending 1910, was almost exactly seven per cent., compounded yearly. Those who foresee a complete collapse in the copper industry would do well to give consideration to the actual figures of increase during the past. The copper industry does not move forward at even an approximately steady rate from year to year, but is given to advancing by great leaps, almost inevitably followed by periods of quiescence, or even of actual retrogression. High prices for the metal stimulate production, while curtailing consumption, and, as a direct consequence, output is increased, which decreases prices, which in turn brings about decreased production, due to the inability of small and weak producers to stand the strain of low prices. Decreased production again brings about high prices, and the cycle is begun anew. Much the same conditions existed in the American iron and steel industry for 50 years, until the formation of the United States Steel Corporation, which, while unable to prevent periods of depression, as its sponsors fondly hoped, has proven a wonderfully steadying factor in the iron and steel market, serving the purpose of a gigantic balance-wheel.

## GROWTH.

The growth of the copper industry is best shown by the following figures of the world's production, by decades, in long tons: 91,000 tons in the decade ending 1810; 96,000 tons in 1820; 135,000 tons in 1830; 218,000 tons in 1840; 291,000 tons in 1850; 507,000 tons in 1860; 900,000 tons in 1870; 1,189,000 tons in 1880; 2,373,000 tons in 1890; 3,708,000 tons in 1900; 7,390,000 tons in 1910. The influence of the electrical industry upon the consumption of copper is plainly shown by the figures since 1880. The production of the seventh decade of the nineteenth century was only 900,000 long tons, or a

trifle less than ten times the output of the first decade of the century, while the production of the last decade of the century, ending 1900, was more than forty times the output of the first decade, and was more than four times as great as that of the decade ending in 1870, only thirty years before. The output of the decade ending 1910 was more than six times as great as the output of the decade ending in 1880, and was almost exactly double the production of the previous decade ending in 1900. The production of copper by the world, amounting to approximately 7,390,000 long tons, for the decade ending 1910, amounted to more than three-fourths of the total world's production of copper for the entire preceding century.

Figures of production and consumption of any given commodity in universal use may differ from year to year, according to whether a surplus is accumulated, or a preceding surplus is drawn upon, but over long-term periods, production and consumption necessarily are the same, and, figured by decades, it is safe to say that the figures of production are practically the figures of consumption. At present there is a copper surplus, of which much is heard, but to show how comparatively unimportant the present surplus is, when compared with the figures of output for the preceding decade, it may be stated that the world's surplus of copper at the present time is slightly less than 300,000,000 pounds of finished metal, or a trifle under 135,000 long tons, an amount less than  $5\frac{1}{2}$  per cent. of the total production of the decade, and equivalent to only about eight weeks' supply of copper, at the present time measuring the supply either by productive capacity or by consumptive demand.

Very exact figures are available regarding production, dividends, costs and metal prices of the mines of the Lake Superior district since the first production was secured, in the year 1845, the total output for that year having been only 24,880 pounds of finished copper. The total production of fine copper by Lake Superior mines from 1845 to 1910, inclusive, a period of sixty-six years, or two-thirds of a century, was 5,122,478,402 pounds, having a gross value of \$726,849,840, from which were paid dividends of \$182,824,770, the ratio of dividends to gross values for this entire period amounting to 25.1 per cent., and dividends, divided by copper production, show average dividend payments of 3.56 cents per pound. The average price received from all Lake Superior copper for this period of sixty-six years was 14.19 cents per pound, which, after deduction of dividends, leaves an estimated cost of 10.63 cents per pound for all years. By adding the figures of expenditures on unproductive mines, amounting to about \$60,000,000, the cost of Lake Superior copper would be made almost  $11\frac{1}{2}$  cents per pound, and by adding a further \$15,000,000 for assessments on mines that have since repaid in dividends the original assessments, the cost of copper would be made about 11.85 cents per pound, leaving a net margin of profit for the entire production of almost exactly two

cents per pound, plus the present aggregate value of the various active mines.

Omitting the production of mines that have not proven profitable, the average cost of Lake Superior copper, yielded by dividend-paying mines, has averaged about 9.5 cents per pound for all years, and the present cost of making copper by all of the producing Lake Superior mines probably is slightly above nine cents per pound. The actual cost of making copper in the leading producing fields probably is between nine and ten cents per pound at the present time. Some of the newer fields, which are skimming their cream, show lower costs, but it is difficult to see where the world will be able to produce its copper in years to come at an average cost materially under ten cents per pound, this figure excluding the limited production of badly planned and badly managed mines, which yield only a small fraction of the total copper output, but secure their metal at an average cost very much higher than the average cost of all mines.

For the immediate future, the supply of copper in sight is fully adequate, and no unduly high prices need be anticipated, but the figures clearly foreshadow another boom period, within the next two to four years, at which time the alarmists will be as badly scared, for fear that the copper supply is petering out, as they now are for fear that the production is so much greater than consumption that nothing but permanent disaster is in sight. Allowing an average increase of consumption of 7 per cent. yearly, the figure that has ruled during the first nine years of the present century, the world's requirements of copper will amount to approximately 1,650,000 long tons in 1920; 2,975,000 long tons in 1930, and 5,350,000 long tons in 1940—the latter named year, now only 29 years ahead, calling for a copper output almost six times that of the present rate. Twenty-nine years ago, or in the year 1882, the world's production of copper was 181,622 tons, or about one-fifth of the present output. Allowing for even a five-fold expansion during the next three decades to correspond with the five-fold expansion in the three decades past, the world's copper requirements in 1840 will be more than 4,500,000 long tons. Should the ratio of increased production and consumption remain at an average of seven per cent. for the balance of this century, the world would yield and consume in the year A. D. 2000, about 175,000,000 long tons of copper, a quantity of the red metal more than double the tonnage of the world's present production of iron and steel.

#### THE FIRST DECADE OF THE TWENTIETH CENTURY.

A survey of the progress made by the copper industry during the first decade of the twentieth century, now lacking only a few weeks of completion, shows no revolutionary changes, but does show steady and in some cases phenomenal progress, in nearly every division of the industry. In the matter of mines, the old districts of Butte and Lake Superior remain the largest producers, but Arizona, with a half-dozen important copper fields, passed Montana in output in 1908, though again taking second place in 1909. In copper mining, the most important development of the decade has been the making of the so-called porphyry mines, in which disseminated copper sulphides are mined from schistose or porphyritic country rocks. The development of such important new producers as the Utah Copper, Nevada Consolidated, Miami and others of this class, has alarmed many people, who jump to the conclusion that the so-called porphyry

mines must close down the older mines, developed on veins in Butte and other camps, and on the stratified trap beds of Lake Superior. There is no real occasion for this alarm, as the porphyry mines, while highly important, are not apt to be developed in large numbers. In fact, the entire western part of the United States has been scoured, by the keenest and strongest aggregations of capital in the copper business, for promising country-rock deposits, with a net result to date rather insignificant in the number of properties developed, though highly important in output secured already, and even more important in promise for future production. When the Mesaba iron range was opened, eighteen years ago, a similar wave of pessimism swept over the mine-owners of the older iron ranges in Michigan and Wisconsin, but time has proven that the high-grade ores of the Mesaba, capable of being mined by steam-shovel, at wonderfully low costs, are absolutely necessary in furnishing an adequate supply of ore to the iron and steel works of this country, and similarly it will be found, as time passes, that the production of the porphyry mines is absolutely essential in supplying the copper needed by the world at anything like a fair figure to the consumer. Processes of actual ore extraction have been modified and improved in many fields, with a resultant increase in safety to miners and decrease in cost of ore extraction. The steam-shovel has come to stay in copper mining.

Strange to say, copper mines, which are vitally interested in extending the use of copper, were somewhat slow in adopting electric power, but rapid progress has been made in this direction during the past decade, and all of the mines of Butte are now electrified, while there has been a great increase in the use of electric energy in the Lake Superior district. The constantly increasing use of hydro-electric power is now restrained, and further restraints are threatened by the conservationists. The newly adopted system at the Anaconda mine, in Butte, which combines the utilization of hydraulic, electric and pneumatic power, offers great possibilities of pliancy and economy, and the lead of the Anaconda is likely to be followed by many other important mines.

In ore reduction, material progress has been made in concentration, the very general adoption of Wilfley tables and similar devices permitting the saving of fines previously wasted. Hydraulic classifiers, settling tanks and a variety of ingenious devices for the saving of the uttermost mineral values, have aided in this work, and are now found in most important mills. Slimes, previously wasted, are now carefully collected in slumps and reworked; with an aggregate yearly extraction of many millions of pounds of copper formerly wasted.

Perhaps the most striking progress made during the past decade, in any division of the copper industry has been in smelting. No new principles have been adopted in either reverberatory or blast-furnace work, but reverberatories of a gigantic size hitherto unknown have been adopted at many plants, while even more striking progress has been made in the capacity of blast-furnaces. Ten years ago, a 300-ton blast-furnace was considered exceptionally large, and near the possible maximum size, but the Washoe works of the Anaconda Copper Mining Co., again blazing the way, now have two furnaces, each 56 inches by 51 feet in size, with a maximum daily smelting capacity of 1,800 tons each, and a third furnace that is 56 inches wide and 87 feet long at the

tuyeres, this mammoth furnace actually having smelted 3,100 tons within 24 hours. It has been my privilege to see this great blast-furnace with smelting in progress at the western end, while the eastern end was frozen, and repairs in progress within the bosh.

The past decade has been a further extension of the electrolytic process of refining, and the great bulk of the world's copper now is refined by electrolysis. In fact, very little finished copper, other than electrolytic, reaches the market, except from the Lake Superior mines, the product of which commands a premium by reason of its extra toughness and superior adaptibility to drawing and stamping. With depth, many of the Lake Superior mines have shown a marked increase in arsenic, and for this reason a considerable part of the Lake Superior copper now is refined electrolytically, and sold as electrolytic and not as Lake copper.

#### COMBINES AND MERGERS.

At various times in the past efforts have been made at copper corners, but these have proven uniformly unsuccessful. The first copper corner was by the Associated Smelters, of Swansea, and might be termed the original copper trust. The Associated Smelters, which flourished from 1840 to 1860, were arbitrary in their operations, buying cheaply, selling dearly, and zealously guarding their smelting processes. As a result of the very short-sighted policy of screwing prices of ore and matte to the lowest possible figures, while selling the finished product at the highest possible prices, with the ore producers aggravated by arbitrary charges for draft-age and moisture, and the further grievance of unfair assay methods, the mine-owners were led to build independent smelters at and near the mines, in most of the principal copper-producing districts, these effectually destroying the power of the Associated Smelters of Swansea as the arbiter of the copper industry.

The second attempt at a copper corner was made by the Société des Metaux, of Paris, under the leadership of M. Secretan, the Société des Metaux becoming, in February, 1887, one of the sixteen underwriters that organized the Syndicat Secretan, with a nominal capitalization of \$13,587,000. This syndicate contracted with the leading copper producers for their output, and speedily advanced the price of the metal to 17 $\frac{3}{4}$  cents, effecting an increase of more than 50 per cent. in price within one month. Consumption immediately declined to a low figure, and the Secretan Syndicate borrowed enormous sums to carry its rapidly accumulating copper from French, German, and English banking houses, the Comptoir d'Escompte of Paris alone lending the enormous sum of \$33,368,000 to the Syndicat Secretan. This corner broke early in 1889, after about eighteen months' existence, and in a single day, in the spring of 1889, the price of copper dropped from £70 down to £35 per long ton. About four years were required to clean up the wreckage remaining from this ill-advised corner, and put the copper industry soundly on its feet again.

The third attempt at a copper corner was made in February, 1889, by the organization of the Amalgamated Copper Co., which corporation maintained the price of copper, arbitrarily, at 17 cents per pound, until October, 1901, when an accumulation of 200,000,000 pounds of metal compelled a break that took the price of copper down to about 12 cents per pound, and about three years were required by the industry to recover from the effects of this corner.

The price of 26 $\frac{1}{4}$  cents per pound, reached in March, 1907, by Lake copper, was not the result of any corner, but came about through an ill-advised scramble by consumers, who feared that they could not secure the metal. As a result of the high price, consumption was curtailed sharply, in all directions, as happens inevitably under such unsatisfactory price conditions, and the copper industry of the world still suffers from the existence of a surplus of slightly under 300,000,000 pounds of metal, remaining from a surplus that, including both visible and invisible supplies, reached about 450,000,000 pounds at the end of 1909, since which time there has been a small but steady decrease in surplus from month to month.

The tendency in copper mining, as in all other branches of industry, is toward combination in ever-larger units. This tendency is based upon and governed by purely economic laws, and the laws of political economy are so much stronger than any law ever devised by a parliament, or any ukase ever promulgated by a deposit, that it requires no spirit of prophecy to forecast the ultimate outcome of the present clash between the laws of political economy and the laws of congress.

In the copper industry the great bulk of production now is furnished by about a dozen different interests. The Amalgamated Copper Co. has a productive capacity of about 300,000,000 pounds yearly, with an actual output last year of 223,808,546 pounds. The American Smelting & Refining Co., or Guggenheim interests, have a productive capacity only slightly inferior to the Amalgamated, with an actual output of 174,150,000 pounds in 1910, which figure will be exceeded materially this year. The production of Phelps, Dodge & Co. was 116,888,070 pounds in 1910, while smelter production, including custom ores treated, was 138,805,562 pounds, and the sales agency of this firm handled 194,138,696 pounds of copper last year. The Calumet & Hecla, with its subsidiaries, has a productive capacity of nearly or quite 150,000,000 pounds yearly. The Rothschild interests, controlling the Rio-Tinto of Spain, and the Boléo of Mexico, have a copper output of more than 100,000,000 pounds yearly.

The leading copper producers of the world are now operating under check, a 10 per cent. reduction in output having been put into effect in August of last year. Under the Sherman Anti-Trust law, this checking of production would be considered criminal, if it could be proven, yet the reduction of output was absolutely necessary in order to save the copper industry from a prolonged period of utter demoralization, during which scores of millions of dollars would have been lost by investors, and a quarter-million or more of working men would have suffered severely, many of them losing their jobs, and the remainder suffering severe cuts in wages. We have the authority of eminent statesmen, totally devoid of business experience, that the Sherman Act is a panacea for all ills of the body politic, yet no sensible business man would do otherwise, if he had the power, than to reduce production, at a time when a surplus product threatened not only the small remaining profits, but the very foundations of the copper industry. The issue thus is drawn very plainly between our present politico-criminal law, and all the laws of business and of political economy.

#### BUSINESS AND POLITICS.

I have no connection, direct or indirect, with any copper mining company or copper producer, except that, in

a general way, I have small business dealings with a great majority of the actual copper producers of this and foreign countries, hence I speak without personal prejudice, and not as the mouthpiece of any individual copper interest.

The greatest present menace to the copper industry in the United States is a menace that is common to all branches of mining. The entire American industry of mining is threatened by men operating under the names of progress and reform, whose slogan is conservation, but who are political economists of the Stone Age, and first cousins, in mental capacity, to the Troglodytes. The conservation experts of the forest service are systematically hampering legitimate mining operations throughout the Western States, and both law and justice are disregarded by these conservationists, while the federal departments affected are governed more by rulings than by law. Congress has made the very grave and dangerous mistake of endowing the executive departments of our Government with the power to promulgate rulings that have the force of law, and in some of the departments rulings have been put into effect that not only are arbitrary and unjust, but that also are absolutely illegal, yet the poor miner, who has complied with all the requirements of the law, is liable to see his property, to which he is clearly entitled, both by law and justice, taken from him by the officials of the forestry service, under the slightest pretext, and is denied access to or recourse by the courts. The most odious forms of despotism can show nothing worse, in this particular, than the hideous imposition under which honest miners are suffering in the Western States of our country.

#### ANACONDA AND THE GUGGENHEIMS.

The conservationists, many of whom might, with greater truth, be termed conversationists, would close the Washoe Works of Montana, the greater reduction plant in the world, with a monthly output valued at millions of dollars, employing thousands of men, and indirectly giving employment to tens of thousands of men, under the childish plea that the smelter fumes are injuring timber on the federal forest reserves—timber that, in a pinch, might furnish fairly good lodge-poles for Indian tepees.

The Guggenheims are the bogey-men with which the conservationists most frequently alarm the public. We have had it dinned into our ears, by innumerable patriots seeking office, and repeatedly set before our eyes, in every yellow newspaper and muckraking magazine, that "the Guggenheims are stealing Alaska." As a matter of fact, the Guggenheims control a copper mine in the interior of Alaska, that is a wonder in its way, yet which cannot be rated at more than a third-class property. The mine, the Bonanza, is a sort of copper-plated gold-brick, in that an interior core of limestone is surrounded by phenomenally high-grade bornite and copper glance. No competent mining man who has visited this property ever has estimated the amount of ore in sight, and safely to be inferred, as capable of yielding more than 100,000,000 pounds of finished copper, a total production equivalent to only one year's maximum output by any one of the six leading copper mines of the world. In order to get this ore out of a wilderness, the Guggenheim interests have built the Copper River & Northwestern Railway, a line of 195 miles length, variously estimated to have cost from \$13,000,000 to \$25,000,000. The gross value of all the copper contained in the Bonanza mine, taking the outside estimate of ton-

nage, is considerably less than the lowest estimate of cost of this railway, and the net profits derivable from the Bonanza mine, cannot, by the most liberal figuring, be estimated at more than \$4,000,000 to \$5,000,000. Instead of being commended for their enterprise and courage in building this railway through an Arctic wilderness, the Guggenheims are held up to public scorn as thieves and robbers. This railway cuts through workable beds of coal, but is prohibited, by the federal authorities, from developing or using this coal, and is compelled to import inferior coal from British Columbia at a cost more than double that of domestic coal if its mining were permitted. Not only does the railway suffer from this arbitrary action by the Federal Government, but the 50,000 unfortunate American citizens who live in Alaska are compelled to pay double or triple the price they should pay for fuel, through the efforts of the conservationists, backed by the Federal Government, to "save" the coal for some future use, at an indefinite date. It scarcely seems strange, in the light of this situation, that mourning was donned in Alaska when the High Priest of conservation reached that land, which the conservationists seem to consider a sort of penal colony. The conservation of our mineral, timber and power resources should be effected along legal and business lines, and not under the guidance of spiritualistic visions.

The reformers, as these gentlemen term themselves, are advocating the Government building and operation of railways in Alaska, and the Government ownership and operation of coal mines, which is state socialism pure and simple, and any man seriously advocating such a policy is a socialist, no matter what he may choose to call himself. It is further advocated, by the junior senator from Wisconsin, and his official and unofficial organs, that the Government also should buy the Copper River and Northwestern Railway from the Guggenheims. Doubtless the Guggenheims will be very glad indeed to sell their railway, which is threatened by tidal floods and glacial floods, with its principal bridge across the Copper River threatened by a glacier itself, but it is difficult to see where the long-suffering taxpayer will benefit by such a purchase.

The Federal Government already has withdrawn immense tracts of oil, coal and phosphate lands, and the next step in this cleverly devised socialistic propaganda will be to withdraw from entry, or inhibit mineral entries upon iron, copper, lead, zinc, silver and gold lands.

The pretext for past withdrawals is that our mineral resources are being depleted so rapidly that there is danger of their extinction, in the near future, unless administered by an all-wise and all-powerful central government, which can make no mistake, and can do no wrong. The figures regarding our natural resources, put forth apparently in earnest, by some of the leading conservationists, are so utterly ridiculous that it is impossible to regard them seriously. There is more iron ore existing in a single county, in my own State of Michigan, than any professional conservationist ever has estimated to exist in the entire world. This is made as a plain statement of fact, and those who think to the contrary are challenged to impeach the assertion.

The lawless actions of the forestry bureau, which is perhaps the most odious of our bureaucratic iniquities, have been of a sort to arouse the alarm of all thinking men who believe in self-government. Apparently it is the cunningly devised scheme of the leaders of the so-called conservation movement, to expropriate the public

lands, now held by the Federal Government in trust for the benefit of any and all citizens who will develop them, and hold these public lands for the sole benefit of the bureaucrats, who will enjoy the usufruct, through a carefully-planned system of leases, by which the water-power, forests, mines and arable lands will be leased, to corporations that are amenable to the benevolent control of the doctrinaires, and to individuals who can be terrorized to conform to the exactions of the bureaucracy. The opportunities for graft that are contained in such a system are almost inconceivably great, and comparing their claims with their actions, the conclusion is irresistible that the conservation movement, as now managed, is not a genuine effort to improve the condition of the American people, but a cleverly devised scheme to deprive the people of their landed heritage, and fix upon their necks the iron collars of serfdom, to the end that a more gorgeous and richly endowed bureaucracy may flourish upon the soil of what once was a free country.

It is said, and apparently with reason, that the spy system of the United States is now the finest and most extensive in the world, excelling even those of Russia and Turkey, heretofore the most progressive nations, in the matter of thoroughly organized espionage. We also have the benevolent activities of an attorney-general who is now vigorously prosecuting the kindling-wood trust. It is obvious that the shaving-paper combine and the office-towel monopoly had better watch out, for their turn may come next. Why does not the attorney-general prosecute the labour unions, which are trusts in the meaning of the Interstate Commerce law, existing in open defiance of the beneficent provisions of the Sherman Act? The answer seems obvious. The present activities of the United States Department of Justice, as it is termed, officially, afford a spectacle for gods and men.

Business throughout the United States is suffering from uncertainty—which has been accentuated, rather than decreased, by the recent decisions of the Supreme Court, which read into the Sherman Act a provision that only "unreasonable" restraint of trade should be punishable, under the terms of this Act. As Richard Olney justly remarked, this leaves the Sherman law about as clear as if Congress were to pass a law stating that only a "reasonable" tariff should be imposed, and leave the adjustment of all duties to the Supreme Court of the United States.

This nation has been made great and prosperous by the initiative and enterprise of the individual, yet the theorists bid us throw aside the habits and course of conduct of centuries, and depend solely upon the initiative—God save the mark—of the bureaucrats. Why not speak out boldly, what all sensible and patriotic citizens are thinking, throughout this country? We are suffering from a most odious form of bureaucracy, fortified by an extensive system of paid spies, an organized clique, a clever press bureau, and the systematic support of that section of the press noted mainly for its dubious motives and devious politics. Some citizens with defective hearing take the clamor of this portion of the press, desirous of cheaper wood pulp, for the real voice of the nation. It is time that the yellow newspapers, muckraking magazines and purely political conservationists were told to stand aside, and permit the Federal Government to be run, once more, in accordance with law and common-sense. Some of the gentlemen who are preaching progress and conservation, have combined moral platitudes with business turpitude, and label their product as reform. In the name of progress they bid us turn our faces to the rear; in the name of conservation of our natural resources, for generations yet unborn, they forbid us to utilize the mineral, power and timber resources required for the needs of the present generation. Their plan of state ownership of mines and water-powers is state socialism, very thinly disguised. These men are enemies of the republic, who, under the specious cloak of declamatory patriotism, would rob us of our right to self-government.

Our worthy President takes the stand that because the Sherman Act is law it must be enforced rigidly, regardless of consequences. If this be the case, it necessarily follows that all federal laws must be rigidly enforced, regardless of consequences, and it would be interesting to learn why our Federal Government does not enforce, or even attempt to enforce, the fifteenth amendment to the Constitution of the United States, which reads as follows: "The right of citizens of the United States to vote shall not be denied or abridged by the United States, or by any State, on account of race, colour or previous condition of servitude." Is it possible that the Sherman Act takes precedence of the Constitution?

## The Slocan District of British Columbia

The condition of the mining industry of the Slocan district of British Columbia may be stated to be more promising now than for ten or more years past. This situation is not due to the prevailing prices of silver, lead, and zinc, which are the chief metals produced in the district, for yearly average market prices have been low for several years. Rather is the prospective early return to prosperity in several of the mining camps of the district due largely to results of deep-level development, these having shown that ore occurs at such depth as to assure the permanent and profitable working of some of its mines for a number of years, thereby encouraging the expenditure of much money in doing development work on a scale not previously carried out.

The notes that follow, while by no means fully descriptive of progress made and results being achieved, will serve to in some measure convey an idea of the advance made during recent years, and to indicate grounds for the confidence felt for the future of the silver-lead-zinc mining industry of the Slocan. The various mines are dealt with generally in the succession in which they occur, going easterly from Slocan Lake.

### STANDARD SILVER-LEAD COMPANY.

This company continues to make good progress with the development and equipment of its Standard mine, situated in Four-mile camp, near Slocan Lake. The water supply system has been completed, the compressor

installed, and started supplying air for machine drills in the mine, the concentrating mill completed and connection made with the water line for power purposes, and the aerial tramway given its preliminary run, conveying ore from mine to mill.

In the mine, the chief work of late has been the further development of No. 6 tunnel, which is 190 feet, vertical depth, below No. 5. In this adit zinc ore was encountered at about 1,800 feet from the portal; this continued for nearly 100 feet, when lead ore was met with. The tunnel was driven another 200 feet ahead, when it cut 8 feet of zinc ore, which was drifted on both ways for a short distance. Driving beyond this vein is still in progress.

From the 1,900-ft. point in the tunnel a turn was made to the left, following the lead ore. At 200 feet from the main tunnel the vein is about 12 feet wide, the first-class ore varying from 3 to 8 feet in width, the remainder being concentrating ore. The question of whether or not this shoot of ore is the downward continuation of the ore body occurring in No. 5 has not yet been determined. Later a raise from No. 6 to No. 5 will prove whether it is or not.

Work in the mine is now being done with machine drills instead of hand, as heretofore, consequently much greater progress is being made in doing development work.

#### SILVERTON MINES, LTD.

The development of No. 7 level of the Hewitt-Lorna Doone group is being continued. As far as it has been driven it has passed through three ore shoots. This adit is now in about 900 feet, and it has developed much ore, nearly all high-grade, and some of it very rich. Raises are being driven between Nos. 6 and 5 and Nos. 5 and 4. The distance between levels is 110 feet, vertical height, so that these raises will give 220 feet of connection between Nos. 4 and 6. A raise has already been made between Nos. 7 and 6, and another is being made between an intermediate (above No. 7) and No. 6. When the raises above No. 6 shall have been completed they will be used for passing ore down to that level, at the portal of which is situated the upper terminal of the aerial tramway from the mine to the Wakefield mill, and this will admit of doing away with the "baby" tramway from No. 4 down to No. 6.

No ore is being stoped at this mine, for the ore bins at both mine and mill are quite full, awaiting the completion of some repairs and renewals at the mill, prior to having another mill run. There is on hand more than 1,000 tons of clean picked milling ore—that is, with the high-grade ore sorted out for shipment to the smelter, and the waste picked out so as to leave the mill feed of a suitable grade for milling purposes.

Experimental runs have been made with the unit of the Elmore Vacuum plant recently put in at the mill, and it is understood that results have been encouraging. Some necessary adjustments of mill machinery have lately been made, preliminary to giving the Elmore process a further trial. The probabilities seem to be that the process will be found effective for the recovery of the zinc content of ore of the character usually treated at this mill.

#### VAN-ROI MINING COMPANY.

This company's concentrating mill is treating 125 to 130 tons of ore a day, and is producing two kinds of

concentrates, namely, silver-lead and silver-zinc. The tonnage of ore milled this year to date is nearly 25,000 tons. The mill is new, having been completed only last March, since the middle of which month it has been steadily operated.

Orebodies are being developed on three levels of the mine—those of both the main vein and the Beryl vein, which had opened later. It is expected that ore production will be well maintained from both veins, and that the year's output of ore and metals will be satisfactory.

#### MINES NEAR NEW DENVER.

The several mines already mentioned, while nearer to Silverton, are also within easy reach of New Denver. There are others in the near vicinity of the latter town, among them the Mollie Hughes and Apex, which are still being worked, and the Sweetgrass, California, and others that were operated earlier in the year, though at present inactive.

Mollie Hughes.—Negotiations were carried on by Vancouver men for some time with a view to acquirement of this mine, the quartz veins in which contain gold and silver. So far as information was received, though, no definite arrangements have yet been made to carry out this proposed transfer of the property. Meanwhile it has been worked on a small scale, and some ore has been extracted and shipped to the smelter at Trail.

Apex.—The Apex is situated on Silver Mountain, about a mile and a half from New Denver, opposite New Denver Canyon. Six men are taking out and sacking ore for shipment, and they have one carload ready. The vein has been stripped for 257 feet, and it shows ore stated to be of shipping grade, about 18 inches in width, along that length. The ore is what is known as "dry" ore, with fair-sized bunches of silver-lead ore intermixed. As yet the vein has not been proved deeper than 30 feet. An ore-house and blacksmith shop have been built, and men are now employed in erecting a house for the accommodation of miners and their helpers, of whom 10 to 12 in all will be working here through the winter. The Apex is owned by a company that some time since acquired this property with the Sunset above Cody, and other mining interests of the late George Hughes, one of the pioneers of the Slocan district.

Other Mines.—It is probable several other mines in the neighbourhood of New Denver were worked during the year, but no information was obtained concerning them during the brief time at disposal in that locality.

#### IDAHO-ALAMO GROUP.

About four miles up Carpenter Creek from New Denver, and rather more than a mile below Three Forks, the Alamo concentrator is to be seen, situated close alongside the Nakusp and Slocan Railway, from Nakusp on Arrow Lake, around by Rosebery, on the upper part of Slocan Lake, and thence by New Denver Canyon and Three Forks to Sandon. The disused concentrating plant and the ruins of an aerial tramway are standing monuments of the profitless expenditure of a large amount of money obtained from Great Britain and spent by a well-known English mining engineer, of whose management local miners have not a very high opinion.

It is stated that \$80,000 worth of ore was taken from one part of the Idaho mine, and that without reaching a depth of more than 40 feet. The statement was not verified, but is here given simply for what it is worth. However, this much is fact—that the property is now

under lease and bond to Thomas Avison, of New Denver, who is taking out ore on a small scale, and is confident he has a mine that will again come into prominence among the shipping mines of the district.

#### SLOCAN STAR MINES.

A commencement has been made to drive the long, deep-level tunnel at the Slocan Star mine, as recommended by Mr. A. G. Larson, M.E., of Vancouver, B.C. The organization and incorporation of the new company, formed for the purpose of acquiring the Slocan Star and Rabbit Paw groups of claims, situated near Sandon, was effected in October, and work under the new auspices commenced about the beginning of November. Mr. Oscar V. White, who has long been superintendent for the Byron N. White Company, hitherto operating the Slocan Star group, remains in charge of operations on the consolidated property.

Beside commencing to drive the long tunnel, the work of retimbering the old workings, fixing up the stones ready for the extraction of ore, etc. (in the ground, concerning which there was litigation that extended over years), has been taken in hand. Later an ore pocket will be put in below the new tunnel, and picking tables placed between that bin and the concentrating mill. It is expected that ore stoping in the older parts of the mines will be commenced early in the New Year, and that thereafter production will be resumed of both picked crude ore, for shipment to the smeltery, and of mill feed, for concentrating.

#### SEVERAL MORE SANDON MINES.

Beside the Slocan Star-Rabbit Paw group, there are the Ruth-Hope, Byron N. White, Richmond-Eureka, and Payne groups of claims, all in the vicinity of Sandon, though the last named is more than a mile away from that town, which is already benefitting, and will continue to do so in increasing degree, from the resumption of work on the Slocan Star and Payne mines after years of idleness on both.

Hope.—No recent particulars have yet been obtained concerning the Hope, but it is known development work is being continuously done in this mine, and sufficient ore is being extracted and shipped to provide for the payment of about 15 men employed.

Richmond-Eureka.—The Byron N. White property, formerly a part of the Slocan Star group, has not been worked lately, operations having been suspended last spring. But the Richmond-Eureka, which has been developing some of the same veins as occur in the Byron N. White group, has steadily continued both development and mining silver-lead ore for shipment to the smeltery at Trail. Latterly production has been on a smaller scale than some time ago, but the Consolidated M. and S. Co., owning this property, is continuing exploration for other shoots of ore, which it is expected will be opened when development shall have been sufficiently advanced.

Payne.—The deep-level development work to be done on the Payne is regarded as of great importance to the district, for if successful it will prove one more addition to the accumulating evidence that the ore shoots in the Slocan district live down to much greater depth than had previously been believed. Further, the fact that this important work is to be under the direction of Mr. W. E. Zwicky, of Kaslo, manager of the Rambler-Cariboo, on which property he did the pioneer deep-level ex-

ploratory work in the district (undertaken on his strong recommendation), induces confidence that if the Payne ore bodies continue to greater depth than has yet been explored in this mine, they will probably be found by Mr. Zwicky. It is intended to drive a cross-cut tunnel about 3,300 feet, starting from the Sandon side of the Payne Mountain, and cutting the vein at about 675 feet below the old No. 8 level of the Payne mine. Mr. George Clark is foreman, with 8 or 9 men under him. Camp buildings are being erected preliminary to commencing tunnel-driving.

#### RECO MINE, CODY.

Prospects are bright once again for the Reco mine, situated above Cody, Slocan. About 18 months ago driving No. 11 tunnel was commenced, thus to explore virgin ground. Only a small working was engaged, and these men have driven 630 feet, the last 180 feet having been in ore. Air being bad, they went back about 130 feet and commenced raising, to make connection through to No. 9, which they had already extended about 200 feet, to get beyond the oreshoot opened in No. 11. The raise will be 89 feet, vertical height, and about 110 feet on the incline. At 30 feet up there was between 18 and 24 inches of solid silver-lead ore. When this raise shall have been put through the extraction of ore will be undertaken, and thereafter there should be a good output made, with a prospect of its being maintained over a comparatively long period.

#### OTHER CODY MINES.

Other mines in the vicinity of Cody that are being worked are the Twilight, Noble Five group, Sunset, and Surprise.

Twilight.—The Twilight is owned by Harris and Kelly, of Sandon. The lower extension of the Reco-Goodenough vein occurs on this property. Last winter two leasers commenced to drive No. 2 adit on an adjoining claim, known as No. 1. At about 175 feet in from the portal the vein was cut, on Twilight ground, and it was drifted on 300 feet, when it was decided to raise to No. 1 adit, the portal of which is on the Slocan Sovereign claim. The vein is well-defined, and for 180 feet has been about 4 feet in width, but so far the good ore in it has been but a small paystreak, ranging generally from 2 to 4 inches, though once it widened to 18 inches. There have been three different parties of leasers working here, and several small shipments of ore have been made. A site has been surveyed for opening No. 3 adit at a vertical depth of about 100 feet below No. 2. Quartz, indicating the presence of the vein, has already been found in a creek. It is proposed to commence work on this new adit next spring.

Sunset.—On the Sunset, which has been opened on both the Cody and McGuigan basin sides of the mountain, No. 8 tunnel is now in about 1,300 feet. Ventilation being insufficient for the miners to continue driving, a raise is being made in the vein to the surface, a distance of 100 feet, for air. This raise was started at 400 feet back from the face of the adit. It is intended to continue working here throughout the winter; supplies to last until spring will be taken up to the mine before the snow shall become too deep for the pack train to reach the camp. No pay ore has yet been found on this level, only iron and zinc oxides. It will require the adit to be driven 300 feet farther to get under the long ore shoot already mined in levels higher up the

mountain. That shoot was 300 feet in length, and confidence is felt that it will also be found in No. 8, and of similar length.

**Surprise.**—The work of making the long raise from the 1,100-ft. level of the Surprise through to the bottom of the old workings, a distance of about 830 feet, approaches completion. It is expected connection will be made about the end of the year, after which work will probably be suspended until next spring, conditions being unfavourable for getting in supplies in the depth of winter. This raise is the longest in the Slocan district, and the work of making it has been tedious and extended over a lengthy period. However, Mr. Alex. Smith, who has persisted, notwithstanding that he has had many discouraging experiences in carrying on the work, has the satisfaction of knowing that the raise has passed through the best shoot of ore yet opened in this mine, and one that promises to give him and his partner good returns after the requisite provision for ventilation shall have been made. The deep level from which the raise has been made is an extension of one of the Last Chance tunnels, which was driven first in Last Chance ground, then through part of the Noble Five group property, and finally into the Surprise.

**Noble Five Group.**—An intended visit to the Noble Five was not made, owing to a heavy snowfall having taken place on the day the walk from Sandon was to have been undertaken. However, this much was ascertained two months ago, namely, that development work on the Deadman claim of the Noble Five group had resulted in the discovery of a shoot of silver-lead ore of excellent grade, not previously opened, and of a body of clean zinc ore of a percentage high enough to allow of this ore being shipped crude to the smeltery. It would appear, therefore, that in common with other mines in Cody camp, the Noble Five may be expected to again become a producer on a comparatively important scale.

#### THE RAMBLER-CARIBOO GROUP.

There have been between 40 and 50 men working all the summer and autumn on the property of the Rambler-Cariboo Mines, Ltd., situated in McGuigan Basin, which used to have its outlet at a point on the Kaslo & Slocan Railway, about equidistant between Whitewater and Sandon. Developments in the Rambler-Cariboo mine in recent years have done much to restore confidence in the mining industry of the Slocan district and to encourage mine-owners to undertake deep-level exploration. Since the big adit—it is nearly seven-eighths of a mile in length—was driven five or six years ago, and the old workings thereby drained, much development work has been done below the 800-ft. level, which was the lowest in the mine prior to driving the 1,400-ft. level. Gradually the downward continuation of the ore shoots has been demonstrated, until now it has been proved that the highest-grade ore yet found in quantity in the mine occurs on the 1,200-ft. level. Three ore shoots have been opened in the vein on this level, which has been driven 450 feet south from the main raise. The shipping ore in the first of these does not occur to as large a width as that in the second. The vein is big, in places up to 10 feet between the walls, but the ore in the first shoot is not nearly so wide as in the second, in the former ranging from 8 inches to 2 feet, while in the latter it runs from 1 foot to 5 feet of clean ore, with 2 to 3 feet of milling ore as well. No stoping has yet been done on either the 900 or 1,200-ft. level, but about 10 feet of ore has been stoped on the 1,000-ft. level. Shipment of ore

to the smeltery has been delayed by the state of the wagon road to Three Forks, the upper part having latterly been a snow road and the lower only suitable for hauling on wheels. Now that snow has fallen low down the valley ore-hauling to the railway will be undertaken. If the weather proves favourable for teaming, some 150 to 200 tons of first-class ore will, it is expected, be shipped to Trail during the latter half of November and in December. When the mine was visited on November 11, there was 50 to 60 tons of ore in the ore-house waiting for the snow to fall to allow of shipment. The erection of an aerial tramway down to the railway, and the building of a new concentrating mill alongside the track will be undertaken next spring. The machinery and equipment of the old mill will be used in the new building, for which purpose it will be taken from the old mill building, situated high up the mountain, to the new mill site, on Seaton Creek, at a distance of about 6,700 feet down the mountain side from the portal of the 1,400-ft. adit level.

**Extension Group.**—The Rambler-Cariboo Extension property consists of a small group of claims situated in the vicinity of the Rambler-Cariboo group. These were formerly known as the Adams claims. They are being developed from the main adit of the Rambler-Cariboo, from which a drift has been run on a vein cut by that level. Work was commenced by the Extension Company on October 1. It is intended to drift right through the property. The drift at this level will give a depth of about 550 feet.

**Rio.**—The Rio is at the head of the McGuigan Basin, about a mile from the old Rambler-Cariboo mill. The vein was cut by a cross-cut tunnel at 480 feet from its portal. Two shoots of ore have been found in the drift, but this level will have to be extended about 100 feet before it will be under the big showing occurring 150 feet above. Work is to be continued throughout the winter, for which purpose the necessary machinery has been taken up to the mine.

The Washington, situated on the Payne Mountain side of the basin, was worked by a few men during the first half of the year, but not latterly.

#### LUCKY JIM ZINC MINES.

No. 6 level of the Lucky Jim mine, near Bear Lake, Slocan, has been driven 1,134 feet. At 1,009 feet from the portal the lime dike was entered, but no zinc has yet been cut on this level in the lime, although the tunnel was advanced 125 feet in this rock. Drifting on the footwall of the lime dike is now being proceeded with, the expectation being that the ore will be found along this side of the dike. Two shifts of men are at work, and about 4 feet per day is being driven.

There is much ore available for stoping above No. 5 level, but none will be extracted until after the provision of railway transportation facilities, now in hand by the construction by the C. P. R. of a spur from the Nakusp and Slocan Railway, leaving this line at a point about one mile above Three Forks. Much of the grading has already been done, and Camp No. 3, within a mile of the Lucky Jim mine, is being established.

#### IN WHITEWATER CAMP.

Notwithstanding that in the summer of 1910 forest fire destroyed the concentrating mill at the Whitewater mine, and much else of the surface plant and buildings, Mr. John L. Retallack and his associates in this mining

enterprise, have prosecuted development work with renewed energy, chiefly in the deep of the mines, and, in small measure, in the upper part of the property.

Formerly there were two companies engaged in operating this group of mines, namely, the Whitewater and Whitewater Deep, respectively. Then a syndicate leased the Whitewater and part of the Whitewater Deep property. Still later Mr. Retallack organized a company styled The Deep Mine, Limited, and this last-mentioned organization undertook important deep-level development and drove the main level, or No. 14, of the deep of the mines a distance of 2,000 feet. Afterwards raising to No. 10, of the Whitewater Deep, was commenced, with 540 feet on the incline required to be driven to connect these two levels. This raise was up about 100 feet when the last fire disaster, already referred to, compelled a suspension of work for the time being, for not only had the upper part of the mines lost practically all its surface buildings and plant, but the compressor plant of The Deep was badly damaged, the camp destroyed, and all other facilities for continuing work swept away. The crowning loss was that of transportation facilities, for the railway for several miles from Whitewater towards Kaslo was rendered quite useless, bridges and trestles having been burned and the track badly damaged. Eventually, though, communication by wagon road was provided, and materials and mining supplies were sent in, new buildings erected for The Deep Mine, Ltd., the compressor made fit for service, and underground development was resumed. Since then the main rise has been put through from No. 14 to No. 10, connecting with the latter at about 1,500 feet from its portal, and levels Nos. 13, 12, and 11, respectively, have been opened from the raise. These levels have been driven, together with various cross-cuts off them, in search of ore shoots, and this exploratory work is being continued, the object being to have the mine open and in a position to produce ore whenever railway transportation facilities shall again be provided. Meanwhile, ore stoping is being done in the upper mine by the John L. Retallack Co., so that two or three cars of ore may be sent out before deep snow shall make hauling impracticable at the high elevation at which the property is situated. This ore is to be hauled in sleighs to Sproules, and be sent by the Kaslo & Slocan Railway to Kaslo, for shipment thence to the smeltery. Telephone communication between the mine and Kaslo, over a distance of nearly 20 miles, is being established, so this means of communication will be available shortly.

#### CONCLUDING OBSERVATIONS.

The Slocan district is so extensive and the mining properties scattered over it so numerous that much more space than has been taken by the foregoing notes would be required to cover it exhaustively. There are many mines not now being worked that may be expected to again have attention and their ore deposits be opened. However, ample has been written to show that the district is steadily growing in favour with mining men, possessed of capital for the development work requisite to make accessible the large and valuable mineral resources of the district. Not only are there many mines within the area dealt with, somewhat briefly as regards details of individual properties, in the foregoing survey of the present situation, but there are as well numerous properties in both Ainsworth division, in eastern Slo-

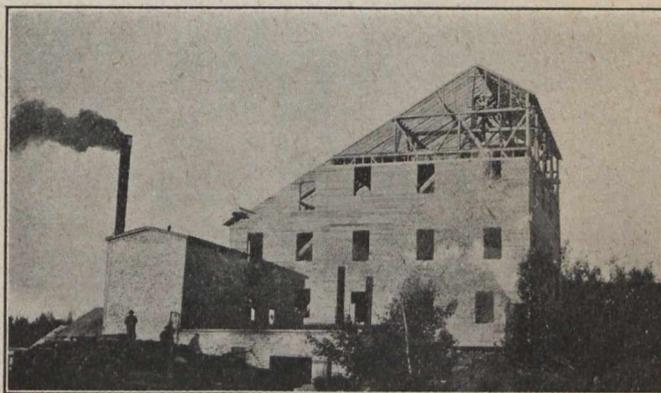
can, and Slocan City division, in the western part of the district, that are not here noticed.

There is little room for doubt that the district is making satisfactory progress toward a period of productiveness and prosperity in connection with its mining industry altogether beyond what a few years ago would have been regarded as possible. Its progress, if not spectacular, has been substantial, and fortunately thus far almost free from the malign influences of unprincipled promoters desirous only of "mining the public." It is to be hoped that mining on paper only will be sternly discouraged, and the best interests of the district and its mining industry be thereby protected.

#### THE NOVA SCOTIA MANGANESE COMPANY.

Through the courtesy of Mr. E. A. Saunders, secretary of the Mining Society of Nova Scotia, we are able to publish the accompanying photo. It represents the concentrating mill that has just been completed on the property of the Nova Scotia Manganese Company, Ltd.

The mine is situated in Lunenburg County, about 10 miles from tidewater, and 13 miles from the town of Windsor.



The manganese veins were discovered by Ernest Turner, of Mill Road, Lunenburg County. Associated with him at first were Dr. Henry Kane, Mr. E. N. Dimock, and others. A joint stock company was recently formed, and the work at present is being conducted in its name.

The main shaft is down 165 feet. To the west a drift has been run for 115 feet. High grade manganese ore, averaging 18 inches in width, shows continuously through the drift. Shipments of ore are being made to Trenton, near New Glasgow, where a glass-making establishment is situated.

#### CANADIAN MINING INSTITUTE.

##### Porcupine Meeting.

The following notice has been distributed to mining men throughout Cobalt, Porcupine, and Toronto:—

Dear Sir,—Under the direction of the undersigned committee, a branch of the Canadian Mining Institute for Porcupine is being organized, and a general meeting is called for the 16th December, at 8 o'clock p.m., at South Porcupine.

It is proposed at this meeting to elect officers for the year, and to organize the branch in as effective manner as possible. It is proposed to have a standing committee to obtain papers from the members, to arrange for monthly meetings, and to keep up the inter-

est in all ways possible. Rooms will be rented and furnished with magazines, books, maps, writing material and specimen cabinet.

After the business of the meeting is completed short addresses will be given by visiting members, and three or four short papers, dealing with sampling and other subjects of interest in this the initial stage of the development of the gold camp, will be read.

The meeting will close with a short musical program and refreshments.

On the day following, the guests and other members who desire, will be shown over the camp. Unique opportunities will be afforded of seeing the various showings of gold, and an opportunity seldom afforded of comparing the various finds in Porcupine.

We have been fortunate enough to secure the presence of a number of prominent members of the Institute, including Dr. Frank Adams, the president.

We trust that you will find it convenient to be present. Members advising this committee before the 1st of December will be afforded accommodation at the various mines.

Committee:—

C. E. WATSON.

H. C. MEEK.

C. G. CAMPBELL.

Address the Secretary, Box 514, South Porcupine, Ontario.

## Stock Value and Mine Value

By DR. A. C. LANE.\*

(Continued from last issue).

**Class B.—Explorations or failures. Average fluctuation factor 4, rarely under 2.5.**—On the other hand, if we take the remaining mines which sold below \$10 in 1901, we find that their fluctuation factor is rarely less than 2.5 and averages nearly 4, and that of the seventeen, seven were worth nothing if we compute their value in 1901 from the dividends and assessments since and their selling price at the end of 1910. Of the remainder, in only two was their value (similarly figured) more than the lowest price of the year.

**Comparison of prices with worth.**—Now what does this difference in range of fluctuation mean? And is this factor 2.5 anything but arbitrary? In order to determine this I have computed as best I might the actual worth of the mines at the date 1901, by discounting at 7 per cent. coming dividends, and their low selling price in December, 1910. This latter was pretty nearly the ratio of price at which those of them that were to go into the Calumet and Hecla merger were to be taken in. I then debited the assessments that have been called in the meantime, and when the amount of the assessments was greater than the positive amount derived above, I have simply written the word "minus" and assumed that the holder refused to pay indefinite assessments. I have given this for the year 1901 rather than 1899, but the deductions I shall draw will be equally applicable to 1899, and the worth will not materially vary except that all the cheaper Class B mines would have been worth at least 14 per cent. less on account of interest, and in some cases about \$24 less on account of assessments that were called in 1899 and 1901. But as some of the mines were organized in 1899 it seemed better to compare with a year when they were fairly organized, like 1901.

The lowest prices for 1899 were very much the same as the worths, and this is true for 1901 for the Class A mines. These were seasons of great prosperity and inflated prices. On the other hand, in 1903 and 1904 the worths are still within the range of the prices of the year; rather nearer the top in 1903, but just about half way down in 1904. In other words, the stocks

of the first class (A) vary about a 7 per cent. valuation—in boom times yielding a 7 per cent. average only if one buys at the very best prices of the year, and at the higher prices of the year yielding barely 4 per cent. It will be remembered that Lawson, in the days of "Frenzied Finance," used to say that copper stocks were coming to a 4 per cent. basis. On the other hand, in relatively dull times, as in 1903 and 1904, which were after all but "semi-panic years," one could easily obtain the stock on a 7 per cent. basis. If the very best prices of the year could be obtained the yield would be nearer 10 per cent., and at the higher prices of the year the yield would be considerably below 7 per cent.

**Meaning of 2.5 fluctuation factor, range from 10 per cent. to 4 per cent. yield. Limitations of activity.**—We can now see a possible meaning for value 2.5 as a limit to the fluctuation factor of this Class A. It may mean this, that in Class A the yield is approximately ascertainable in dividends, and when they are forced to such a value that there is only a 4 per cent. yield on them, or anything like it, there are very few who buy an uncertainty yielding no more than a certainty; and that, on the other hand, when they drop to a point where they yield 10 per cent., a lot of people who have private opportunities to invest at 10 per cent. in non-marketable securities, find it now worth while to invest in these stocks which have the added advantage of marketability and yield.

It may then be that this fluctuation factor, 2.5, represents the ratio between the 10 per cent. yield which will draw in the man who has the best opportunity for investment, and the 4 per cent. yield, which even savings banks will give.

**Reason for greater speculative value in Class B.**—The mines grouped under Class B, selling sometime in the year for less than \$10, are usually the explorations and failures. Most of the Michigan mines shares, while the par value is \$25, are put on the market marked initially \$8 to \$10 paid in, representing the land and the cash needed for development up to the point where it is seen whether a mill and heavy equip-

\*Professor of Geology, Tufts College.

ment is needed, in which case assessments are called. Consequently these mines will generally represent properties that have not in exploration found anything up to date, or old mines that are worked out or proved failures. If we go back to 1880 we find the same thing true. Very often a mine ultimately successful goes below the initial price at which it is put on, but the majority of those going below \$10 have never paid a cent in dividend. Taking the list in June, 1881, the total of the lowest selling prices of Class B was from \$37 to \$41. The value, judging from their dividends and selling price in 1910, was only something like \$12.45. On the other hand, the cost of a share of each of the stocks selling over \$10 would be \$384 or more, but would be worth discounting on a 7 per cent. basis their future dividends, \$581.50. In other words, the yield is more than 7 per cent., and very nearly the 10 per cent. which we have said might be expected from unlisted copper stock. This is due to the fact that the Calumet and Hecla are selling on a 7 per cent. basis referred to its current dividend without allowance for the increase which began in 1896. In 1901, though the Class B mines make a better showing (owing solely to the presence of Trimountain among them, where it did not belong that year, although it went below \$10 in 1899), their lowest prices sum up to \$67, but their dividend worth was \$74.16, of which \$19.75 must be assigned to Trimountain. I thought it right to include Trimountain to represent the fact that among these cheaper mines there is an occasional fair one. It is pretty clear, however, whatever figures one takes, that it is the lowest annual value of these cheaper stocks that is nearest the value measured by yield, and is sometimes a little less than that value, or sometimes greater. That value is given by two or three out of the fifteen or sixteen which will ultimately prove successful.

Clearly then, the increase in the fluctuation factor is very largely due to an increase in range upward, not an increase in range downward. It is an added value given by organized speculation. It is not an added value due to marketability. The higher priced copper stocks have that already. In figuring the worth of the Class B stocks on a 7 per cent. basis I have already allowed for that, if my previous contention that 7 per cent. is a fair yield for a listed copper stock is correct. If we could say that the average value is exactly the mean between the highest and the lowest prices (which it is not) we could say that the fluctuation factor made the stock worth two and one-half times as much as before.

It must be remembered, too, that these stocks are of relatively little worth per share, and the case is something like the difference between a celluloid and an ivory poker chip. The celluloid poker chip would be as useful as the ivory poker chip. The value as chips is not an addition in a given ratio to the value of the raw material of which the chips are made. Therefore, it might not be fair to discuss the "poker chip" or fluctuation value as though it were an addition in a certain ratio to the value of a stock. Indeed, the more expensive stock with less fluctuation costs more to carry to get a given profit by fluctuation. It might be fairer to consider it as the addition of a certain amount to the value of a stock regardless of its value otherwise. An average difference in price from high to low in these smaller stocks would be something like \$10 in 1899 to 1901, which were speculative years, whereas, in 1903 and 1904, the amount would be only

\$4. It might be fairer, then, to say that the value of activity was an addition on the average of \$2 to \$5 a share to the stock rather than to estimate it as a percentage of the whole cost of a share.

**Loss of fluctuation value in consolidation.** — This gives us the reason for the considerable protest made by smaller speculative mines like the La Salle, in going into the Calumet and Hecla on the terms proposed. Each share of the cheaper mines was assigned a part of a higher priced share. The prices at the time of merger were thought to be low, though they have been much lower since. Still they were values that were near the lowest for the year 1910. Assuming the ratio was fair enough if based on probable definite returns, but that the consolidation values were close to the low prices for the year, the smaller mines would have been reasonably sure to sell for two and one-half times more, and on the average for four times more, than their consolidation value; while the rise they might obtain in their high-priced share would not be nearly so much. As a matter of fact, however, the prices did not rise during the year 1911 (up to date).

#### **Effect of Struggle for Control on Value in General Slight.**

For the effect of the fifth factor, that is struggle for control, I have not been able to derive any average figures. Up to this point, I have been able to analyze fairly satisfactorily (at least to myself) the kind of effect and, to some extent, the amount of effect of various factors and the influence of organized speculation thereon. This last factor I can not at present isolate.

Buying for control is of two kinds. There is the slow, quiet, unostentatious accumulation when the real purchasers are so far as possible unknown. The effect of this, in as much as the people who are buying for control are generally well informed, might be expected to raise the lower prices rather than to increase higher prices. It is conceivable, however, that manipulation of one kind or another might depress prices while buying for control is going on.

The second type of buying is seen when a fight is on and a few shares are enough to give control one way or another. The Union Pacific panic price is the standard illustration of this. So far as I can judge in the Michigan field the highest and lowest prices seem much more closely correlated with other factors than with the struggle for control. It may be that the activity and wide range of prices in Osceola in 1907 was due to the struggle for control, though the high price for that year is, after all, only capitalizing the dividends of that year at 7 per cent. By this I do not mean to imply that the struggle for control does not have an effect upon prices. It simply implies that the kind of men who struggle for control are ordinarily so well posted in shrewd buying that their struggles hardly affect the annual range of the price. This is where a personal element may enter in the stock market and might not apply in other fields. The management of the Calumet and Hecla have a reputation which leads one to think that they would not put out false rumours to depress a stock that they wished to buy. On the whole, the effect of especial desire should appear in the average price.

#### **Conclusion.**

The net result of our essay is this, that organized speculation adds marketability and thus about 50 per cent. to the value of stock; and, in the cheaper

stocks especially, it increases the range of fluctuation and incidentally the average price paid for them, leaving the lowest prices of the year not far from the worth that would be computed for them (from their ultimate return either in depreciation or dividends, on the 7 per cent. basis which holds on the average for listed copper stocks), but raising the highest values so that they are about four times as great as the low and consequently increasing the average value very materially.

#### Application in Taxation.

There seems to be a curious application of our conclusions to the question of tax assessments, leading to a possible confirmation of them. If, in assessing a mine, it should be deemed fair that various mines should be assessed for taxation upon their yield, present or prospective, without regard to whether their stock was listed or not, or whether the stocks were in small units or large, as being matters which pertained to the stock rather than to the mine; then the value of a mine stock should be discounted by a factor representing the increase of value of the stock due to marketability or fluctuation. I do not say that this is so, but it is at least a curious coincidence that I find in the newspapers the following item: "The Board of Supervisors of Houghton County are said to grade the properties for taxation as follows: For undeveloped properties, 40 per cent. of the stock market value; for properties developed but not yet producing, 50 per cent. thereof; for regular producing and dividend paying mines, 60 per cent. thereof."

Now this 60 per cent. valuation for regular producing and dividend paying mines is about what (quite independently) has been found to be the ratio of a listed and a non-listed security of equal uncertainty. That the stock market value is very much more inflated for the undeveloped properties than the developed, is shown by the lower ratio at which their assessed valuation is taken. In fact, if we assume that the average value of the Class A mines (the average fluctuation factor being 1.6) would be found by multiplying the lowest price by 1.34, and that this will practically be the value on a 7 per cent. basis, of all the copper stocks, of which they make up over 90 per cent in value; and in the same way take the average value of the undeveloped properties as 2.4 times their low values, the ratio would be of the same order as the ratio 60 to 40. This ratio, 60 per cent. to 40 per cent., is merely a shrewd business man's general estimate of the relative value of such properties as compared with the stock market values from a mining man's point of view. But as the Board of Supervisors of Houghton County is to a very large degree composed of the agents and superintendents of the various companies, their estimate is well worthy of consideration.

It will be noticed that J. R. Finlay recently placed the Michigan mines for the State Tax Commission at \$69,815,000, although their average earnings, he says, were \$8,240,000. This, it will be noticed, is a return of about 11.6 per cent., and as the mines themselves have sold in the stock market in the year 1910, taking the average of the highest and lowest selling price, at \$130,365,047, the ratio thus found by the comparison of Finlay's value for taxation with the average selling value is about 54 per cent. Thus his estimate is only 10 per cent. to 20 per cent. less than our conclusions might lead to.

While such discounts from the selling value by assessors have often been considered dishonest (and have unquestionably led to dishonesty) yet so long as the basis of taxation is that of "cash value" (as in Michigan and elsewhere) some such adjustments are inevitable, for, as has been shown, the worth of a mine is often much less than the worth of a share multiplied by the number of shares just as the worth of a number of city lots is very much less than the price per lot multiplied by the number of lots. But it would carry me too far from the theme of this essay to follow this longer. The point to be emphasized is that there inheres in the stock a value created by organized speculation which does not inhere in the mine upon which the stock is based. As to whether all of this should be considered value, depends upon just how value should be defined. Upon this point economists differ, nor do I propose to thresh the question over. Whether the poker chip can be considered to have value in Ruskin's eyes is one question. That it is valuable as an article of commerce is beyond question, and ready marketability at least is a factor which can easily be seen to be of social value. The question of the reality of fluctuation value and of its use to the community as a whole is a more complex one. If such range of fluctuation is necessary in order to get the money with which to develop mining enterprises, which are particularly essential to modern progress, if it is necessary that in grouping together the shares in eight enterprises (of which only one shall be successful), the range of fluctuation must be such that the chances of return are one-quarter of what they should be on the chances of yield alone, such a fluctuation may be socially desirable; but organized speculation is hardly expected to be perfect, and the prospects of "paper" profits in "organizing" and "listing" companies seem excessive compared with those which may be acquired in developing the resources of the lands which serve as a basis for those companies. In fact, I was surprised to find how heavy the chances were against the cheaper copper stocks, and how relatively good a showing the more expensive stocks made. This conclusion is not to be confined to Michigan copper stocks, for it depends on general principles. Try it yourself in some other field. If the average yield of the cheaper stocks could be made to bear the proportion to their mean prices that obtains in the better stocks, so that in purchasing a number one might expect a 7 per cent. yield, although one's chance of success in any one stock might still be very low, it would seem that the money for new enterprises might be more easily gained and fairly rewarded. Greater care in listing may tend to this goal. It is possible that something of this sort is now being done in the tendency of the larger companies to continue as "going concerns," expending a certain amount of their capital in exploration here and there.

#### CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA.

The directors of the Consolidated Gold Fields of South Africa, Ltd., announce that the realized net profit on the year's operations, which is largely derived from dividends received on investments, after deducting debenture interest and all outgoings, shows a balance to credit of £792,883, from which the dividend on the first preference shares, accrued dividend

on second preference shares, an interim dividend of 2s. per share on the ordinary shares and French Government taxes, have been provided, leaving £487,003, which, added to £79,485 brought forward, leaves £566,488. From this the directors have made provision to the extent of £100,000 for the further writing down of the prices at which investments in the shares of crushing mines stand in the books of the company, leaving £466,488 available for dividend. In addition to the foregoing realized profit, the company's share investments (apart from any appreciation in value on properties and ventures) show, on current market prices, a further large unrealized profit. Investments stand in the books at average cost or under, and all shares are taken into account at prices below those current at the date when the accounts were made up. Certain changes in investments were necessitated by the formation of the Rhodesian and American Development Companies and realizations have taken place in Russian and other assets; otherwise the changes that have taken place in the company's holdings during the past year have not materially affected the general position or the nature of the investments. The directors recommend that a final cash dividend of 15 per cent. and a bonus of 5 per cent., both free of income-tax, be paid on the 2,000,000 ordinary shares, amounting to £400,000, and making, with the interim dividend, 6s. per share for the year, leaving £66,488 to be carried forward.

#### MODDER'S CIRCULAR SHAFT.

At the meeting of the New Modderfontein Gold Mining Company, held at Johannesburg in September, the chairman made the following remarks regarding the new circular shaft: "The sinking of a new circular shaft, which is another important part of the expansion programme, is proceeding very satisfactorily. The whole of the sinking equipment has been completed, and the shaft has so far been sunk to a depth of 588 feet, at a cost which compares very favourably indeed with the cost of rectangular shafts sunk on these fields. This shaft is being put down at a steady rate and with economy, but we are not attempting to break any records in sinking or to hurry the work unduly. We expect that it should intersect the reef towards the end of next year, which will fit in admirably with our programme. I might add here that your consulting engineer, Mr. Stuart Martin, in recommending the sinking of a circular shaft, had in mind several important points that, in his opinion, make for its advantage over a rectangular shaft. There is first the cost of sinking, which should show a considerable decrease. Then the cost of maintenance should be appreciably lower, as the circular shaft is walled, and there should be, therefore, none of the many troubles with the timbering which we meet with so frequently in rectangular shafts. Further, there are the questions of rapid hauling and ventilation, both of which, it is considered, are facilitated."

## Federal Commission to Investigate Mining

Following is an abstract of an article that appeared in the Nelson (B.C.) Daily News on November 22nd:

At one of the largest and most representative mining conventions ever held in British Columbia resolutions were passed here yesterday asking the federal government to appoint a commission to investigate thoroughly the various questions affecting the silver-lead-zinc industry and to create a separate portfolio of mines to be held by a minister who will devote his entire time to the work.

The meeting suggested to the government that the enquiry by the proposed commission might include the questions of a tariff on lead and zinc and the by-products of the two metals; of continuing the lead bounty at the expiration of the grant at present partly disposed of; of the granting of a bounty on zinc and of the offering of some reward to the person or persons inventing a process for the treatment on a commercial scale of the complex low grade ores of the Kootenays. Each of these suggestions found strong advocates at the convention, which was unanimously in favor of some form of protection for the industry.

A committee was appointed to investigate the various questions affecting the industry in British Columbia. The chairman of this committee is W. E. Zwicky, who will be glad to receive suggestions in writing affecting the industry from all interested in the subject. Such communications should be addressed to Kaslo.

Copies of the resolutions passed will be forwarded for an endorsement to the Conservative convention at New Westminster on Friday. As subjects for discussion he suggested the question of the continuance of the lead bounty; the present low duties on lead and zinc; the high United States tariff on the same metals

further experiments toward the solution of the zinc problem, and the appointment of a federal commission to enquire into the various questions affecting the industry. He suggested the selection of delegates to present any resolutions which might be passed by the convention.

James Johnstone said that he thought the question of expense should not be considered by the government in carrying on further experiments toward the solution of the zinc problem. If it cost \$300,000 or \$400,000 it would be a profitable investment. He offered the following resolution:

"In view of the partial success which has attended the work done by Dr. Haanel in Ottawa and Montreal during the past year toward the solution of this most important problem and in view of the fact that the money set aside by the late government for this purpose was insufficient to bring the work to a successful conclusion, this meeting does hereby urge the Dominion government to set aside a sum of not less than \$50,000 to be used for this purpose.

"And we do further recommend that an award of \$25,000 be offered any individual or company who shall perfect any process on a working commercial basis for the separation of zinc ores as found in the mines of the Sloean and Nelson districts of British Columbia."

E. W. Widdowson seconded the resolution. He thought the prize of \$25,000 should be awarded to any person solving the question, whether by a perfected old invention or a new.

#### Wants Tariff.

C. F. Caldwell thought that the greatest aid to the solution of the zinc problem would be adequate tariff

protection for the industry. By protection only could the permanency of the silver-lead-zinc industry be assured. Under present conditions the Canadian mine owner could not compete with the American competitor. He expressed an abounding faith in the mines of British Columbia. The lead industry affected every person in the Dominion, he declared. Mr. Caldwell said that he pleaded not for the operating properties, but for the prospects and mines which were idle. He described the present conditions as unhealthy and tending to make the high grade properties pay for the low grade properties, which, he said, could only be operated at a profit by a big smelting company.

"It takes bulldog tenacity and unfaltering courage to make a success of mining. The man who knows how to quit is no good in mining," declared Mr. Caldwell, who sat down amidst applause after urging an enquiry into the question by a commission.

The idea of the late government in making the grant of \$50,000, said L. B. Reynolds, was to obtain a knowledge of the research made into the metallurgy of zinc by private companies and inventors, but not made public.

#### Experiments Should Be Here.

J. P. Farrell said that the conditions of the mines of this district were peculiar to the Kootenays and that any experiments should be carried on in Nelson. Even in the Kootenays there were hundreds of different complications in the ores which varied to a remarkable degree frequently in different workings on the same vein. He advocated an adequate tariff on ores from the United States.

#### Urges Bounty on Zinc.

A. Gordon French told of what had been done in Australia toward the solution of the complex ore question. The problem was one of the most intricate and difficult problems in metallurgy. It was no problem for a student or for an entirely theoretical man. While in Ottawa, said Mr. French, he had been told that both Dr. Haanel and Dr. Ingalls had abandoned the problem.

Efforts to treat sulphide zinc ores with or without lead, by an electric heating process was a physical impossibility, declared Mr. French, who explained in technical terms his reasons for the statement.

With regard to the Nelson zinc plant, which was erected under his supervision, Mr. French said that the zinc was coming off every day. He would not, in any event, leave this country until he had completely solved the question on a commercial scale.

He advocated not only a bounty on lead but also a bounty on zinc. He thought there was a good market in Great Britain for all the zinc Canada could produce. Mr. French was not in favor of the offering of a prize by the government for the solution of the problem. If the bounty on zinc was given it should be seen that the bounty was proportionately divided between the prospectors and the smelters, who stood at the two ends of the industry. For the next 50 years the market for zinc and zinc pigment in Canada would be a growing one, said Mr. French. Zinc white could be produced very cheaply in this country. Another industry of importance which would grow out of the zinc industry was the manufacture of galvanized iron, he said.

The cheapness of electric power for the electrolytic process of zinc treatment was a great advantage offered by Nelson to the prospective builder of zinc plants, Mr. French said.

Oscar V. White spoke of the low price realized under present conditions for zinc.

In reply to a question Mr. French explained that from the silver-lead-zinc ores by his process he obtained the zinc and forwarded the silver-lead residue to a lead smelter. Another product of the process was black manganese di-oxide, an extremely valuable commercial product.

#### Would Protect Canadian Industry.

I. W. Bingay, explained that some lead products, such as tea paper, red lead, both manufactured products which might be made in Canada, were imported into the Dominion every year. He thought the Canadian manufacturer should be protected. The proportion of a duty on pig lead involved the whole schedule, as the manufacturer who used the raw material must be protected. Whether a tariff would be better than a bounty was a very deep question which should be thoroughly investigated. He advocated the appointment of a strong committee to prepare a case for the proposed federal tariff commission. It was not true that the lead bounty had not proved of benefit to the industry.

T. G. Proctor thought that one of the most important matters to be brought before the federal government was the formation of a department of mines with a minister with a portfolio.

#### Bonus for Zinc Smelter.

A. J. Becker, as an amendment to Mr. Johnstone's motion, suggested that the government pay a bonus to a local smelter of \$10 per ton of spelter produced up to 20,000 tons, or \$200,000. The motion was seconded by J. J. Fingland. It was explained that the object of such a grant of \$200,000 was to induce efforts to solve the problem. If there were several competitive smelters each was to receive the bonus as each ton of spelter was produced.

#### Should Sell Lead in Canada.

W. E. Zwicky thought that a protective tariff should be placed on lead and that a bounty be placed on zinc. This bounty, he said, should be divided between the producer and the smelter. Another point was that the Canadian producer should sell in Canada and not in free trade England. He urged that the government be asked to appoint a commission to go into the various questions affecting the industry.

M. Giegerich advocated a bounty on zinc and a tariff on lead.

Mr. Caldwell supported a duty on zinc, in order to build up a Canadian market, instead of a bounty.

C. A. Mackay was in favour of protection for lead and lead by-products. He thought a case should be prepared on general lines and presented to the government asking the appointment of a commission to investigate the questions of bonuses on lead and zinc, the tariff and a bonus to encourage efforts toward the solution of the zinc problem.

#### Suggestions for Government.

I. G. Proctor, who took the chair during the temporary absence of Mr. Starkey, appointed, on the suggestion of H. Giegerich, R. H. Stewart, C. A. Mackay, and A. J. Becker a committee to draw up a resolution on general lines on the question. This committee brought down the following resolution, which passed: "Whereas, there is at present no market available which will allow of the profitable mining and treat-

ment of zinc ores of Canada; therefore, be it resolved that:

"This convention of those interested in the mining of lead-zinc ores in southern British Columbia does strongly urge upon the government of the Dominion of Canada the necessity for

(1) "The provision of adequate protection on zinc and zinc products which shall lead to the establishment of zinc smelting or refining industries in the Dominion of Canada and enable the producers of zinc ores to market their ores profitably, whether by bounty on the spelter produced or by an adequate duty on zinc and zinc products imported into Canada, or by both;

(2) "That this convention urges that the Dominion government appoint a commission to enquire into the methods best suited to encourage and protect the said industry;

(3) "That the committee so appointed should consider the question of bonus or other reward to any individuals or companies who may devise and carry to commercial success works for the reduction and refining of the low grade zinc-lead ores of this country which are not at present amendable to the ordinary methods of zinc reduction;

(4) "That the commission should consider whether it is advisable to assist financially any person engaged in the working out of such process, provided such an experimental work shall show promise of being successful;

(5) "That copies of this resolution be forwarded to the Conservative convention to be held in New Westminster on November 24; to the honouroable the Minister of Mines at Ottawa, and to Mr. A. S. Goodeve, member for Kootenay."

**Investigation Committee.**

The following resolutions were also passed:

"Whereas, the present lead bounty has been of very considerable benefit to the lead mining industry; and

"Whereas, said bounty will expire on June 30, 1913; and

"Whereas, the Dominion government has stated its intention to appoint a permanent tariff commission; and

"Whereas, we, the assembled representatives of the mining industry, consider it advisable to petition for protection on lead and zinc, either in the shape of duty or bounty;

"Resolved, that this meeting elect a committee of six to investigate the situation, and to bring it to the attention of this commission; and also to ask the endorsement of the above by the British Columbia Conservative Association which meets at New Westminster on 24th November, 1911." This was moved by O. V. White, and seconded by James Anderson.

The committee appointed is W. E. Zwicky, O. V. White, A. J. Becker, F. A. Starkey, T. W. Bingay, and R. F. Green.

**To Create Portfolio of Mines.**

It was moved by W. B. Farris and seconded by James Johnstone, that the federal government be asked to create a portfolio of mines, the minister to devote his attention entirely to the industry.

A resolution urging the Dominion Government to appoint a commission to investigate in Kootenay the questions relating to the industry at the earliest possible date was moved by H. Giegerich, and seconded by James Anderson, and carried.

T. G. Proctor moved that the government be requested to inform the public what has been the result of the past year's zinc experiments. The resolution was seconded by W. E. Zwicky, and carried.

Votes of thanks were passed to Mr. Starkey for calling the convention, and to Mr. Beeston for acting as secretary.

In the month of September last there were 10,341 stamps and 241 tube mills in commission in the Transvaal. The total output of gold was 700,023 ounces, valued at £2,973,511.

At the Robinson Deep mine, on the Rand, the cost of ore broken during the month of August last was 6s. 0.3d. per ton where machines were used, and 6s. 11.5d. per ton with "hammer boys." The stopes ranged from 51.1 inches (handwork), to 59.9 inches (large machines).

**SPECIAL CORRESPONDENCE**

**NOVA SCOTIA.**

**Glace Bay: Dominion Coal Outputs, 1911 Season.**

The shipping season of 1911 has been a very successful one, and a comparison with previous seasons will show the advance in output capacity which the Coal Company's mines have made. The production for the period between the 1st of May and the 30th of November has been as follows, from 1906 onwards:

May-November, 1906	.....2,281,884 tons.
May-November, 1907	.....2,262,850 tons.
May-November, 1908	.....2,129,944 tons.
May-November, 1909	.....1,567,043 tons.
May-November, 1910	.....2,363,970 tons.
May-November, 1911	.....2,480,000 tons.

The 1911 season shows an average monthly output of 354,000 tons, a figure which is 18,000 tons greater than any previous average obtained during the shipping season.

The shipments to St. Lawrence ports were also larger than ever before, as may be seen from the figures following:

Shipments to Montreal and St. Lawrence ports.	
Season 1906	..... 1,126,387 tons.
Season 1907	..... 1,038,500 tons.
Season 1908	..... 1,311,490 tons.
Season 1909	..... 828,446 tons.
Season 1910	..... 1,146,300 tons.
Season 1911	..... 1,420,000 tons.

It will be seen that the St. Lawrence shipments are 110,000 tons greater than 1908, a year which broke all previous records.

As the Coal Company's profits depend very largely on the quantity of coal which can be mined and shipped in the season of open navigation, the operations of the season just closing should have a favourable effect on earnings.

Mr. Richard Kirkby, who has for the last three years filled the position of mining engineer to the Dominion Coal Company, has resigned and returned to his home in Scotland. Previous to Mr. Kirkby's departure the members of the South Cape Breton Mining Society tendered him a complimentary address, and presented him with a gold watch. It is generally regretted that Mr. Kirkby should have found it necessary, for purely personal reasons, to leave Cape Breton, where he had proved himself a capable mining engineer and a tactful official.

The Baum Wash Plant, which has been under construction at Sydney since the spring, is now well advanced, and all the outside and concrete work is finished. The machinery is on the ground, and it is confidently anticipated that the Wash Plant will be in full working operation by next June.

The railway branch to the Birch Grove Collieries is completed as far as the site of No. 21 Colliery, and the work of erecting the bankhead is commenced. The electric power transmission line is also completed from No. 2 Power House to No. 21 Colliery. Contracts have been let for the building of a number of miners' and officials' dwellings at Birch Grove, which it is hoped to complete before the spring.

Over 300 dwellings have been completed this summer at the Lingan Collieries, and contracts have been let for additional houses to be ready by the spring. A large hotel is also being erected by the company, for the accommodation of single men.

#### Springhill Mines.

Mr. J. R. Sharpe, who was the manager of the Cumberland Coal & Railway Company's mines at the time they were absorbed by the Dominion Coal Company, and has since been acting as district superintendent, has resigned his position. Mr. J. D. Maxwell has been appointed resident superintendent, the appointment being effective on the 15th November. Mr. Maxwell has been manager of several of the Coal Company's mines, and has recently acted as assistant to the mining engineer. It is understood that Mr. Sharpe has taken a position in the States.

#### Port au Port, Newfoundland.

A large amount of work is now being done by the Dominion Iron & Steel Company at their new limestone property in Port au Port Bay, Newfoundland. It is expected to have a fully equipped and producing quarry at Port Au Port for next season's limestone requirements. The Steel Company's consumption of limestone is very rapidly growing.

#### National Safety Field Day at Pittsburg.

The National Safety Field Day at Pittsburg on the 30th of October, appears to have been an unqualified success. The superintendent of the Dominion Coal Company's Rescue Station was present, and reports that representatives from all over the North American continent were gathered from points as distant as Seattle and the Canadian West, Alabama, and the isolated coalfield of Cape Breton. Every courtesy appears to have been shown by the officials of the U. S. Bureau of Mines to the Canadian visitors, and no restrictions were placed on the information available. The explosion of the experimental mine at Bruceton, by black powder fired into coal dust was about as convincing a demonstration of the possibilities of a dust explosion as one could wish to see, and if it struck a wholesome terror into those persons who deny the possibility of dust explosions without the presence of gas, it will have

served a useful purpose. It is said the mine before the explosion was so humid as to be almost at the saturation point, but nevertheless the explosion took place. The Mines Bureau, it is understood, are going to issue an account of the experiments conducted in the form of a Miners' Circular, which will be well worth reading. The publications of the U. S. Bureau of Mines now form a valuable series of reports and monographs, which, thanks to the courtesy of the U. S. Government, can be obtained by any Canadian who desires to use them.

Dr. Shields, the genial and energetic head of the Red Cross work in the U. S. mining districts, was also very ready to devote his time to giving information to the Canadian delegates. In this matter of first aid and ambulance training, the mining men of the States, although possibly tardy in recognizing the usefulness of such instruction, have taken hold in a manner typical of the American, and the greatest enthusiasm is being displayed at the present time. The progress of the work has in the past been greatly hindered by strike troubles, as was the case in the mining towns around Glace Bay, and it has taken some time to gain the ground which was lost. It is to be hoped that the threatened labour troubles for next spring in the Pennsylvania mines will not once again undo the work that has taken so long to do.

### ONTARIO.

#### Cobalt and Gowganda.

After lengthy trials, the Nipissing Mining Company has decided to build a concentrator. It will have a capacity of 200 tons and is to cost \$250,000. The various shafts of the big mine will be connected by an aerial tramway, which will pass over the lake. The cyanide process will be used. The mill will be built on Nipissing Hill and work on the excavations has already begun.

Since the meeting of the La Rose directors three important developments have occurred at the Lawson, the Fisher Eplett, and the Princess. At the Fisher Eplett a foot wide vein of quartz and calcite has been uncovered in which can be seen at various points patches of high grade ore. As the productive veins on the Beaver and the Temiskaming, adjoining mines, showed no ore of value at the surface, sinking operations will commence at once and will be pushed with vigour all winter. At the Lawson in an intermediate level an extension of the rich No. 8 vein has been encountered. It is now providing some of the richest ore ever found at the mine, and for 30 feet has averaged six inches wide. At the Princess a two-inch but very rich vein has been cut up in the stope from the 135-foot level, and also on the 135-foot level itself.

This month the Cobalt Provincial mine has shipped a car of 1,200 ounce ore taken from the stope at the 100-foot level. In the winze below the 200-foot level the ore has come into the vein again unexpectedly, and this new development in part counteracts the disappointment of not finding values in the Savage veins when they were cut.

Operating profits at the La Rose mine for the month of September amounted to \$94,779. During the month there were produced 313,501 ounces, having a gross value of \$164,000. The production for the first nine months of the year shows that 2,751,946 ounces have been mined, while total expenses amounted to \$536,868, leaving a profit of \$916,765.

#### Porcupine, Swastika, and Other Gold Areas.

It has been officially announced that the stamps in the Dome mill will commence to drop on January 15th, unless unusually severe weather is encountered and other unexpected and abnormal difficulties. It is generally believed in camp that even with the Dome's superb organization it will tax its

powers to the utmost to carry out the undertaking in so short a time. The most spectacular streak in the Golden Stairways will be lifted out and sent down to the Parliament Buildings at Toronto as an exhibit. A shaft is now being sunk to cross-cut this vein at 100-foot levels. It has already been ascertained by means of the diamond drill that the ore body does go down several hundred feet, and the shaft will be put down to the 400-foot level before any systematic attempt is made to block out ore. Owing to the very resolute manner in which the reconstruction of the mill has been pushed, it is probable that for the first two or three months the mill will be ahead of the mine. During the first month only \$6 ore will be run over the plates, so that in the event of any adjustments as little loss will be incurred as possible.

It is stated that diamond drilling operations have been attended with the greatest success; what was hoped before has now been proven. In all, eighteen holes have been put down and average 800 feet to the hole, and an area of almost a thousand feet has been covered.

The staff has at length been enabled to move into the new camp buildings out of the tents which have been occupied ever since the fire.

The Temiskaming Mining Company, of Cobalt, has acquired a controlling interest in the North Dome mine from C. S. Beardsley, of Cleveland; P. Kirkegaard, and the North Dome Company. Bert Wolfram will succeed Chris Nelson as mine captain in the Temiskaming mine interests, and it is expected that a very vigorous campaign of development will be undertaken this winter. On the surface the veins appear as small and rich, but when the conglomerate capping is removed they open out to considerable ore bodies rich in sulphides and showing here and there free gold. So far little work has been done underground since the fire. A compressor adequate for the development of the mine is on the ground, but has not as yet been set up.

So satisfactory has been the development of the Deloro claims of the Dobie Mining Company that two shafts will be sunk at once on the vein to discover what there is below. The ore on the surface is quite spectacular.

A prospector named W. Milton Yorke, states that there are good showings in quartz veins on the Hurricanaw River about 75 miles to the north of the Transcontinental Railway. The Transcontinental Railroad is left at a point 150 miles east of Cochrane. Until the river freezes over solidly the trail is impracticable.

Twenty-one dividends have now been paid by the Crown Reserve, making a total of \$3,626,061 to date, or 215 per cent. on capitalization. A dividend of \$88,440 is paid monthly.

The new Pullman service to Porcupine will come into effect in the first or second week of December. The terminus for the present will be South Porcupine, but as the steel is laid, the rock cut finished round Pearl Lake, and the new bridge over Pearl Lake built, it will be moved south to the Timmins townsite. For the present two switches will be laid for the convenience of those mines wanting to get in machinery at once. There will be an enormous rush of supplies to this point directly they are laid.

At the 100-foot level and about 50 feet from the shaft, the Davidson vein has been cut by the Crown Chartered, who now has the property. So far the hanging wall of the vein has not been reached, though 30 feet of quartz and schist have been run through. It is probable that in a few weeks Consulting Engineer R. B. Lamb will make a report, and this will be eagerly awaited.

The new ten stamp mill at the McIntyre has been ordered. Until further tests have been made as to the nature of the

ore it is not proposed to instal the cyanide treatment. The Vipond mill has also been ordered and will be installed without delay. Crosscuts are now being run on the Vipond to cut the No. 2 vein at the 200-foot level, and also to catch it at two points on the 100-foot level. Until the big compressor is installed only one drill is available, and progress is necessarily slow.

The American Eagle Mining Company in Munro township has just shipped two 50-ounce bricks of gold to New York. Earlier in the year the Gold Pyramid shipped 70 ounces, so that the record for Munro township for this year is already 170 ounces. Both these mines have small mills and have been working some time.

At the 300-foot level the Rea Consolidated mines have forty feet of almost solid quartz in their vein. At the 200-foot level it averaged between four and six feet wide. Some time ago above the 200-foot level ore blocked out on four sides was reckoned at \$280,000. Since then the 300-foot level has been reached and the vein found to be much wider than at any other point in the mine. Also, on the surface another lead has been found to outcrop for several hundred feet, showing free gold at various points.

On the Lucky Cross property at Swastika the new compressor has been started and work at the new shaft will now be pushed forward at a much more rapid pace than formerly, when only hand steel work was possible.

This week the 20 stamps at the Dr. Reddick mill commenced to drop again. The only other property to resume work on any scale in the Larder Lake field is the Goldfields, which now has the Harris Maxwell, the Proprietary, and the old Indian. There is stated to be a quantity of \$10 ore above the 80 foot level at the Dr. Reddick which will be milled right away. The Harris Maxwell is at present confined to putting in an electrical power plant to develop the various properties.

The Dixie syndicate, holding the Newman Mancha Johnston claims in Deloro has sold its interest to a Toronto and Boston syndicate, who will float a three million dollar company and start to develop forthwith.

#### BRITISH COLUMBIA.

About the middle of November announcement was made to the effect that the negotiations between representatives of the Western Coal Operators' Association and District No. 18, United Mine Workers of America, respectively, had been completed and that the proposed agreement between the parties would shortly be submitted to the coal miners and other employees in the several districts concerned for their ratification, this referendum to be carried through with as little delay as possible. It was stated that an agreement had been reached upon most of the matters regarding which there had been differences of opinion, an exception having been that of the minimum wage to be paid to workers, which question is to be arbitrated later. It is hoped, therefore, that work will be resumed in the larger mines before the end of November. There is little probability, though, of there being any considerable quantity of coal produced during the few remaining weeks of the current year.

**East Kootenay.**—The Sullivan mine, situated near Marysville, is now the largest producer of lead ore in British Columbia. Its output for the expired eleven months of the year has reached a total of between 16,000 and 17,000 tons, which quantity has been shipped to the Consolidated M. and S. Company's smeltery at Trail. There is available in this mine a very large tonnage of ore, but much of it has a zinc content, as well as lead, which makes it unsuitable for reduction under similar conditions to those admitting of the profitable utiliza-

tion of ore in which lead is the chief constituent. Whenever it shall be found practicable to treat the zinc ore at a profit, there will be developed here one of the largest zinc-lead mines in Canada.

**Ainsworth**—The Consolidated M. and S. Company has arranged for the acquirement of the No. 1 mine, situated in Ainsworth camp. This mine has for some years been worked on a small scale by Mr. H. Giegerich and associates, and though its output of marketable ore has not been large, it has generally paid working expenses. There appears to be a prospect of work being resumed at the Blue Bell mine, across Kootenay Lake from the town of Ainsworth. A proposal to again operate the mine and concentrating mill has lately been having the consideration of the directors of the company, the headquarters of which is in Europe, but at the time of writing no advice has been received of their decision, if yet arrived at. In another part of Ainsworth mining division, some 12 to 15 miles from Kaslo, up the line of the old Kaslo & Slocan Railway, is situated the Utica, a property stated to promise a large tonnage of ore, whenever arrangements shall have been made for working it continuously and milling facilities shall have been provided for concentrating that part of the ore not of sufficiently high grade for shipment to the smeltery in its crude state. Mr. Chas. F. Caldwell is endeavouring to obtain the amount of money requisite for placing the Utica on a permanent milling and shipping basis.

**Nelson Division**.—In Nelson mining division, the Granite-Poorman gold mines, five miles west of the city of Nelson; the Molly Gibson silver-lead mine, at the head of Kokanee Creek, about 20 miles in the opposite direction; the Emerald lead mine, in the vicinity of Salmo, and the Queen gold mine, in Sheep Creek camp, are the chief producers of ore as the year draws to its close. Several other properties, in different parts of this division, are also being worked, but in some cases with only a small output being maintained or with development work being carried out and no ore being mined. On the whole the year's production of metals has been less than was expected it would be, yet since substantial progress has been made in the direction of providing for an increased output in the future, the situation is not unsatisfactory.

**Rossland**.—The Consolidated Mining and Smelting Company's Centre Star group is keeping up its output, which will probably be for the calendar year 1911 about as much as for the company's fiscal year to June 30, last, namely, 193,000 tons. Little publicity is being given to information indicating the conditions prevailing at these mines, but it is understood in the camp that the War Eagle mine, especially, is looking well, much ore containing a comparatively high gold value having been found, while other mines of the group, including the Le Roi, which has been added, are contributing materially to the generally good results that are being obtained from these mines as a whole. The Le Roi No. 2, Limited, is also making gratifying progress, recent deep-level developments having proved the existence in the lower levels of the Josie mine of considerable quantities of ore of good grade. The general average value of the ore extracted from the mines of the Le Roi No. 2, Ltd., continues to keep up well, being closer to that of earlier years. The year's production will show a total of about 45,000 tons of ore, of which about three-fifths will have been shipped to Trail as crude ore and the remainder put through the company's concentrating plant at the mine with results that add appreciably to the profit-earning capacity of the mine.

**Slocan City**.—While there is not nearly so much activity in the several camps in mining in Slocan City mining division as in some other parts of the Slocan district, mining is being carried on in several camps. On Ten-mile Creek, both the Enterprise and the Ellis Silver Mining Company's Eastmont mine are being worked. In the former the ore developed during re-

cent months is not of so high a grade as it was expected would be found in the lower levels opened latterly, but it is hoped there will be an improvement in this respect before long. No information has been obtained of late as to progress at the Eastmont, but it is known work is still being carried on, and preparations were being made early in November to haul ore to the landing on Slocan Lake, for shipment thence to Trail. Other properties on which work was being done are the Lily B. and Meteor, both situated in the vicinity of Springer Creek. Shaft-sinking constitutes the development work in hand on the former claim. In the past the Meteor has been a shipper of high-grade silver ore, and it is expected it will continue to make a production of a similar class of ore.

**Trout Lake Division**.—On the Winslow, a gold claim situated a few miles from Trout Lake, Mr. Bruce White has driven a tunnel between 200 and 300 feet, and has cut a gold-bearing vein. Recently work was stopped for the winter, snow being deep in the locality during winter months, but next spring development will be undertaken on this property. The Silver Cup, in Ferguson Camp, continues to make shipment of high-grade ore to Trail, though its tonnage for this year has fallen somewhat short of that of several earlier years. Little else in mining has been reported from this part of West Kootenay, notwithstanding that there are many good showings of ore that appear to be well worth developing.

**Golden Division**.—The Vancouver organization that, under the name of the Mt. Stephen Mining Syndicate, is operating the old Monarch mine, near Field, on the main transcontinental line of the Canadian Pacific Railway Company, has done much development work, and made many surface improvements, the latter including the erection and equipment of a concentrating mill, putting in a pipe line to convey water to a Pelton wheel for operating mill machinery, and a compressor, installation of an auxiliary steam power plant for use when water power shall not be available, erection of an aerial tramway and establishment of a telephone system, from mine to mill, and building houses for the accommodation of miners, etc. Much underground work has also been done to develop the big body of lead ore occurring here. Altogether considerable activity has been shown, and the prospects are that the old Monarch mine will next year become productive to a degree that will show the enterprise and confidence of the syndicate to have been well warranted.

**Boundary**.—The Argo Mining and Tunnel Company, of Greenwood, is driving a 6 by 7-foot tunnel to cut several veins outcropping on the surface of the hill, more than 300 feet above the present face of this adit. It is believed that one of the bigger veins will shortly be cut. It is proposed to continue driving until a distance of 1,000 feet from the portal shall have been reached, by which time the face of the tunnel will be about 600 feet below the surface. Thus far only stringers of ore have been cut, but it has been known all along that it would be necessary to drive more than 600 feet before the first of the larger veins could be reached. The work is being continued with the expectation of soon reaching ore in quantity.

**Similkameen**.—The British Columbia Copper Company has commenced prospecting work on the large group of mineral claims in Voigt's camp, Copper Mountain, near Princeton, described in the Canadian Mining Journal of August 1 (p. 493). A newspaper story to the effect that the price agreed upon should this property be purchased under the bond, is \$2,000,000 is a flight of imagination, as is also the statement that other expenditure provided for will bring the total up to \$3,000,000. The price named in the bond is only about one-fifth of \$2,000,000, while but a limited amount has been appropriated for prospecting and development work. If sufficiently encouraging results shall be obtained, most likely development work will be continued, but not otherwise.

**Coast District.**—The most important metal mining in progress in the Coast district is that at the Britannia Mining and Smelting Company's Britannia mine, in New Westminster mining division, and the further exploitation of the Hidden Creek group, by the Granby Consolidated M. and S. Company. During the autumn up to more than 300 men were employed on the

Britannia, and within 50 or 60 of that number at Hidden Creek. Coal mining developments on Vancouver Island are also important. Information from Hazelton district, Skeena River, indicates the opening of promising shoots of silver-lead ore there.

## GENERAL MINING NEWS.

### ONTARIO.

[Editor's Note.—The following is editorial comment that was written too late to insert in the proper column. It is none the less important. If any of our readers think that we have been unfair we shall be glad to hear from them.]

Toronto, Nov. 24.—There appeared in the Toronto Globe of this date certain extracts from an article in The Boston Commercial. Mr. George L. Walker, the editor of The Commercial, is the author of the article, and his subject is Porcupine.

From his own account Mr. Walker went to Porcupine to find out whether the camp is or is not a bubble. The net result of his visit was that he came away satisfied that Porcupine has a "big future." A few sentences here will show the tenor of Mr. Walker's remarks.

He points out that for work done there are surprisingly many gold showings of commercial value. Diamond drills have disclosed "free gold" (by which is meant "visible gold") to a depth of 800 feet. He refers to the Dome as having several million dollars of "profits demonstrated"; and to the Hollinger as having about 100,000 tons of ore actually in sight.

Both of these statements are undigested. There is no room for guessing and less cause for knowing that the Dome has some millions of dollars in profits developed. In fact, the Dome management has made public nothing to indicate this. Moreover, the Hollinger, if we may gather anything from the announcements of its directorate, has much more than 100,000 tons in sight. To put it briefly, there is no more foundation for Mr. Walker's conclusions than there is for the wildest vision of the cub reporter.

But with Mr. Walker's strictures on financial and promotion methods we are fully in accord. After scoring the futile schemes of floating the average "claim," he expresses the belief that Porcupine's future depends upon underground exploration, and upon the development of large tonnages of ore that will yield from \$1 to \$3 net profit. Porcupine, to succeed, must be organized much more conservatively. Working capital must be enlarged, and promoters' first profits must be cut down.

Mr. Walker's remarks would have been immeasurably stronger if he had left out specific references that weaken his argument, and tend to throw discredit upon his ability to observe without bias.

Ottawa, Nov. 22.—The first organized demand for higher protection for the vested interests was presented to the Government to-day by the representatives of all the steel and iron companies in Canada. The conference lasted over two hours. The companies applied for a renewal of the bounties on pig iron as a provisional expedient to be effective until the tariff could be revised.

The discussion was almost entirely confined to this application. The question of aid by bounty to steel rods will be dealt with at another time.

The Government gave the steel men a sympathetic hearing and asked for statistical information. The members of the Government who heard the deputation were: Premier Borden, Finance Minister White, Minister of Customs Reid, Minister of Trade and Commerce Foster, Minister of Railways Cochrane, and Postmaster-General Pelletier.

Among the men on the delegation and the companies represented were J. H. Plummer, of the Dominion Steel; T. Cantley, of the Nova Scotia Steel; T. J. Drummond, of the Soo Company; Cyrus Birge, of the Steel Company of Canada, Hamilton; R. Hobson, and R. J. Mercure, representing the Deseronto Blast Furnace and the Atikokan Iron Company.

The Government was urged to take up the whole case of the iron and steel industry in Canada, and after thorough consideration to give it the aid by bounty or tariff protection to which it was found to be entitled. The steel men assured the Government that the industry in Canada to-day is at a disadvantage, compared with its competitors in other countries. There should be something done before an examination of the situation could be made. To relieve the immediate situation it was urged that there should be a restoration of the bounty on pig iron.

While the Government gave the steel men no promise beyond careful consideration of their application, the general belief is that something will be done. That is the feeling which the steel men have themselves, and it is shared by most members of Parliament.

### QUEBEC.

Mr. R. M. Aitken, of the London house of Kilcat & Aitken, arrived in Montreal on November 20th, in connection with the contemplated reorganization of Amalgamated Asbestos.

"We hope," he said, "to get matters in such shape that the representatives of the bondholders will soon be able to get together and discuss plans for the future welfare of the company. I feel sure that the American, Canadian, and English representatives, when they meet to talk things over, will be able to work in harmony and will decide upon an arrangement that will put the company upon its feet again."

Montreal, Nov. 20.—One of the most important meetings ever held by the directors of the Dominion Steel Corporation was held this afternoon at the Bank of Commerce. The president, Mr. J. H. Plummer, occupied the chair, and the directors present were: Sir William Mackenzie, Sir Montagu Allan, William McMaster, George Caverhill, Sir Henry Pellatt, Senator Cox, Senator MacKay, Senator Dandurand, J. R. Silson, W. D. Matthews, and F. L. Wanklyn.

After the meeting the following official statement was given out: "The chief subject considered by the Board of the Steel Corporation to-day was the recommendation of the president that the Steel Company should not continue to provide for the expenditure on its new plant by the sale of bonds, which were

authorized in 1909, of which about \$6,000,000 is still held in the treasury, but that capital should be obtained by the issue of preferred stock of the Corporation.

"The Coal Company has also entered upon important extensions, which will increase its fourteen producing collieries to twenty, and require greater facilities for transportation, etc. The capital required by that company can also be obtained through the Corporation.

"The advantage of this means of financing is that it avoids the increase of fixed charges and leaves the Steel Company with a large reserve of unissued bonds of established market value. Nothing definite was done with regard to making the issue, but the board decided that, under proper conditions, this would be the best method of obtaining capital for the building of the various plants. Its ultimate effect would be to interest people in London, and probably in Paris also, in the stocks of the Corporation, and it would put the latter in a position to take care of the future capital requirements of the subsidiary Company on good terms.

"Provision will be made for the exchange in due course of the preferred stock of the Coal and Steel Companies for the Corporation preferred, on an equitable basis; with an established market for the new security in Europe. Such an exchange would benefit the present holders.

"The Company has been asked to give certain rights as to common stock in connection with the sale of the new preferred. Whenever that point may be reached it is not unlikely that this may lead to considerable investments in the common stock abroad. In any case, it is the interests of the common stock holders which the Board have most in mind. The whole object of the policy of extension, which is being vigorously pursued, is to increase output, decrease cost, and enlarge profits. The benefit of this, after payment of interest on the new capital, necessarily accrues to the common stock holders.

"Whether it is better to get the capital needed to enlarge the works by continuing to sell bonds, or to initiate a financial policy which will serve for future growth, as well as for present needs, and make those who supply the capital partners, instead of creditors, is purely a question of judgment; the object is to get capital for the new works on the most favourable terms.

"The new policy is most strongly supported by those who have the largest interest in the common stock, and was adopted by the Board without a dissenting voice."

#### BRITISH COLUMBIA.

Fernie.—The stupendous sum of \$4,400,000, it is estimated by Mr. Elias Rogers, president of the Crow's Nest Pass Coal Company, who paid a brief visit to Victoria recently, was lost to the men in wages as a result of the strike which, after extending over many months, is just reaching a conclusion, more or less satisfactory to both parties.

Mr. Rogers said: "Our company has been paying out approximately an average of nearly eight thousand dollars less every day since April 1st than we were a year ago during the

same period, and I think on all the mines affected the reduction in wages would be equal to about \$20,000 per day."

Fernie.—There will be an increase in the price of coal from the mines concerned in the strike in the Crow's Nest Pass and Alberta when a settlement has been reached, and fuel from the properties now closed down again commences to reach the city, according to an opinion expressed last night by a local coal merchant.

The increase, he believed, would be about equal to the increase in the rate of wages granted to the miners under the settlement, which will mean that Galt coal, which previous to April 1st last cost \$8.25 per ton here, will be sold at \$9 per ton. The increase in the prices of other coals from the present strike area will, it is said, increase proportionately.

At present a large proportion of the coal being consumed in Nelson comes from Wyoming. It sells at \$8.75 per ton. Coal from Vancouver Island, Princeton, and Pennsylvania is also being used by local consumers. Prices range from about \$8 for Princeton coal to about \$16 for the eastern fuel.

Fernie.—The large force of special police which has been assembled here for the protection of miners who want to work at Coal Creek were out in force this afternoon to meet the mine train which came down at 4 o'clock with the four Barrs, who returned to work this morning.

Sergt. Tucker and 15 mounted men and 20 foot policemen lined up and the four men were escorted to their homes, without being disturbed except by the derision expressed by the large crowd of miners who turned out to greet them. Chief Inspector Campbell, Chief Constable Minty, and City Chief Bowen were also present, and the force was well arranged and well handled.

The trial of Sweeny, charged with intimidating Alex. Barr on October 31st, was concluded this afternoon, but Magistrate Whimster reserved judgment until next Monday in order that he may have time to go over the transcript of the evidence. George Linn will come up for trial on a similar charge next Monday.

Nothing has been heard from Frank to-day regarding the progress of the work engaging the attention of the joint scale committee.

Nelson.—Bob Mabry, of Spokane, yesterday closed mining deals aggregating \$140,000, purchasing the Yankee Girl for \$100,000 from John Frazer, acting on behalf of the creditors, in addition to the Bi-metallic and the Lost Cabin group, all the properties being near Ymir.

He has already 15 men working at the Yankee Girl, three at the Bi-metallic, and six at the Lost Cabin group, and is restoring the cabins and workhouses at the Nelly B. mine, as well as continuing the sinking of the double compartment shaft of the last named, which is down 55 feet.

He said that over \$400,000 worth of ore is ready to be mined at the Yankee Girl, and a flume is being built for generating compressed air.

At the Yankee Girl and Bi-metallic, on account of there being two feet of snow at Ymir and three feet at the mines, the work is being carried on under difficulties. At both the Bi-metallic and the Lost Cabin group tunnels are being driven to crosscut the ore.

# STATISTICS AND RETURNS

## COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending Nov. 17, and those from Jan. 1, 1911, to date:—

	Nov. 17. Ore in lbs.	Since Jan. 1. Ore in lbs.
Badger .....	55,200	
Bailey .....	40,000	
Beaver .....	1,520,217	
Buffalo .....	55,161	3,328,024
Chambers-Ferland .....	64,000	1,214,900
City of Cobalt .....		727,980
Cobalt Lake .....		3,760,920
Cobalt Townsite .....		1,189,881
Colonial .....		183,410
Coniagas .....	40,893	3,661,380
Crown Reserve .....	46,769	2,049,829
Drummond .....	60,000	1,140,000
Green-Meehan .....		146,800
Hargraves .....		161,100
Hudson Bay .....	62,452	1,382,859
Kerr Lake .....	60,950	2,294,620
King Edward .....		40,000
La Rose .....	110,560	6,504,599
McKinley-Darragh .....	148,127	5,851,397
Nipissing .....	191,583	5,319,251
O'Brien .....		1,257,958
Peterson Lake, Little Nip. ....		58,430
Provincial .....		202,050
Right of Way .....		1,274,027
Silver Cliff .....		106,680
Standard .....		102,813
Temiskaming .....	48,980	1,536,262
Trethewey .....		1,159,630
Wettlaufer .....		117,232

The shipments for the week were 889,475 pounds, or 444 tons, against 348 tons the previous week.

The shipments from Jan. 1 to Nov. 17 were 45,396,262 lbs., or 22,698 tons.

## B. C. ORE SHIPMENTS.

The ore shipments for the week ended Nov. 11 totalled 19,494 tons, making the total for the year to date 1,381,102 tons. The smelter receipts for the week and year respectively are 17,055 tons, and 1,254,317 tons.

### Boundary Shipments.

Mother Lode .....	6,670	270,309
Rawhide .....	4,202	47,525
Jack Pot .....	359	22,894
Athelstan .....	100	17,218
Unnamed .....	638	9,725
Other mines .....		630,490
<b>Total .....</b>	<b>11,969</b>	<b>998,161</b>

### Rossland Shipments.

Centre Star .....	3,363	172,084
Le Roi No. 2 .....	270	25,564
Le Roi No. 2, milled .....	300	13,500
Le Roi .....	857	15,311
Other mines .....		494
<b>Total .....</b>	<b>4,790</b>	<b>226,953</b>

## Slocan-Kootenay Shipments.

Van Roi, milled .....	800	33,849
Molly Gibson, milled .....	300	5,100
United Copper .....	38	114
Mountain Con .....	6	6
Royal Canadian .....	26	26
St. Eugene, milled .....	420	23,556
Richmond-Eureka .....	89	2,033
Queen, milled .....	420	18,950
Granite-Poorman, milled .....	250	11,260
Nugget, milled .....	110	4,950
Emerald .....	36	1,775
Society Girl .....	43	520
Knob Hill .....	197	4,434
Other mines .....		29,825
<b>Total .....</b>	<b>2,735</b>	<b>136,038</b>

## Consolidated Company's Receipts.

### Trail, B.C.

United Copper .....	38	114
Mountain Con .....	6	6
Royal Canadian .....	26	26
Knob Hill .....	197	4,434
Van Roi .....	62	1,403
Centre Star .....	3,363	172,084
Le Roi No. 2 .....	270	25,564
Le Roi .....	857	15,311
Richmond-Eureka .....	89	2,033
St. Eugene .....	420	23,556
Emerald .....	36	1,775
Society Girl .....	43	520
Queen .....	34	622
Other mines .....		55,407
<b>Total .....</b>	<b>5,086</b>	<b>285,584</b>

## B. C. Copper Company's Receipts.

### Greenwood, B. C.

Mother Lode .....	6,670	270,309
Rawhide .....	4,202	47,525
Jack Pot .....	359	22,894
Athelstan .....	100	17,218
Unnamed .....	638	9,725
Other mines .....		10,652
<b>Total .....</b>	<b>11,969</b>	<b>378,323</b>

## COBALT ORE SHIPMENTS.

Following are the shipments from the Cobalt camp for the week ending November 24th, and those from January 1st, 1911, to date:

	Nov. 24. Ore in lbs.	Since Jan. 1. Ore in lbs.
Badger .....		55,200
Bailey .....		40,000
Beaver .....		1,520,217
Buffalo .....		2,228,024
Casey Cobalt .....	60,000	60,000
Chambers-Ferland .....		1,214,900
City of Cobalt .....		727,980
Cobalt Lake .....		3,760,920
Cobalt Townsite .....		1,189,081

Colonial	44,500	227,910
Coniagas	62,482	3,733,862
Crown Reserve		2,049,829
Drummond	60,000	1,200,000
Green-Meehan		145,000
Hargraves		161,100
Hudson Bay		1,382,859
Kerr Lake	40,500	2,335,120
King Edward		40,000
La Rose	170,032	6,684,631
McKinley-Darragh	59,732	5,911,129
Nipissing	206,200	5,525,441
O'Brien		1,257,958
Peterson Lake, Little Nip.		258,430
Provincial		202,050
Right of Way		1,274,037
Silver Cliff		106,680
Standard		102,813
Temiskaming		1,636,262
Trethewey		1,159,633
Wettlaufer		117,232

The shipments for the week were 703,446 pounds, or 351 tons, against 444 tons the previous week.

The shipments from Jan. 1st to Nov. 24th, were 46,099,708 pounds, or 23,049 tons.

**B. C. ORE SHIPMENTS.**

Two Slocan properties are added to the list of producing mines in the week ending November 18th. Both mines are silver-lead propositions and have been developed steadily during the past summer. These are the Hampton group and the Elkhorn group. The shipments in this district last week totalled 15,054 tons, and the smelter receipts 13,551 tons. For the year to date the ore shipments total 1,376,113 tons and the smelter receipts 1,299,721 tons.

**Boundary Shipments.**

Mother Lode	5,310	275,619
Rawhide	2,934	50,459
Jack Pot	289	23,183
Athelstan	101	17,219
Unnamed	298	10,023
Other mines		630,490
<b>Total</b>	<b>8,932</b>	<b>1,006,993</b>

**Rossland Shipments.**

Centre Star	3,669	175,753
Le Roi No. 2	146	25,710
Le Roi No. 2, milled	300	13,800
Le Roi	491	15,802
Other mines		494
<b>Total</b>	<b>4,606</b>	<b>231,559</b>

**Slocan-Kootenay Shipments.**

St. Eugene, milled	420	23,976
Ruth	36	490
Queen, milled	420	19,010
Granite-Poorman, milled	250	11,510
Nugget, milled	110	5,060
Utica	21	97
Meteor	19	30
Knob Hill	115	4,549
Van Roi, milled	800	34,649

Molly Gibson, milled	300	5,400
Hampton	1	1
Elkhorn	24	24
Other mines		32,765
<b>Total</b>	<b>2,516</b>	<b>137,561</b>

**Consolidated Company's Receipts.  
Trail, B.C.**

St. Eugene	97	6,382
Centre Star	3,669	175,753
Le Roi No. 2	146	25,710
Le Roi	491	15,802
Ruth	36	490
Utica	21	97
Meteor	19	30
Knob Hill	115	4,549
Hampton	1	1
Elkhorn	24	24
Other mines		23,924
<b>Total</b>	<b>4,619</b>	<b>252,753</b>

**B. C. Copper Company's Receipts.**

Mother Lode	5,310	275,619
Rawhide	2,934	50,459
Jack Pot	289	23,183
Athelstan	101	17,219
Unnamed	298	10,023
Other mines		10,652
<b>Total</b>	<b>8,932</b>	<b>386,555</b>

**LA ROSE IN OCTOBER.**

La Rose mine in October made a net profit of \$75,500. The October production was rather larger than usual, being 255,800 ounces, the gross value of which was \$136,000. The October income was \$141,000, and the total expenses \$65,500. La Rose is evidently looking to make a record before the end of the year.

**TORONTO MARKETS.**

Nov. 20.—(Quotations from Canada Metal Co., Toronto):

- Spelter, 6.75 cents per pound.
- Lead, 4.50 cents per pound.
- Antimony, 7 to 9 cents per pound.
- Tin, 44 cents per pound.
- Copper, casting, 12.95 cents per pound.
- Electrolytic, 12.95 cents per pound.
- Ingot brass, 7 to 12 cents per pound.

Nov. 21.—Pig Iron—(Quotations from Drummond, McCall & Co., Toronto):

- Summerlee, No. 1, \$23.00 (f.o.b. Toronto).
- Summerlee, No. 2, \$22.50 (f.o.b. Toronto).
- Midland, No. 1, \$18.50 (f.o.b. Toronto).
- Midland, No. 2, \$18.00 (f.o.b. Toronto).

**GENERAL MARKETS.**

- Coal, anthracite, \$5.50 to \$6.75.
- Coal, bituminous, \$3.50 to \$4.50 for 1¼-inch lump.
- Nov. 17.—Tin, straits, 43.35 cents.
- Copper, Prime Lake, 12.75 cents.
- Electrolytic Copper, 12.75 cents.

Copper wire, 13.50 cents.  
 Lead, 4.35 to 4.40 cents.  
 Spelter, 6.70 cents.  
 Sheet zinc (f.o.b. smelter), 8.00 cents.  
 Antimony, Cookson's, 8.00 cents.  
 Aluminium, 19.00 to 19.50 cents.  
 Nickel, 40.00 to 45.00 cents.  
 Platinum, ordinary, \$46.00 per ounce.  
 Platinum, hard, \$48.50 per ounce.  
 Bismuth, \$1.80 to \$2.00 per pound.  
 Quicksilver, \$46.00 per 75-lb. flask.

**SILVER PRICES.**

	New York	London.
	cents.	pence.
Nov. 7	Holiday	25¼
" 8	55	25½
" 9	56½	26
" 10	56¼	25¾
" 11	56⅞	25⅞
" 13	56	25⅞
" 14	56¾	25⅞
" 15	56½	26
" 16	56¾	25⅞
" 17	56½	25⅞

**SHARE MARKET.**

(Courtesy of E. D. Warren & Co.)

**NEW YORK CURB.**

	Bid.	Asked.
Braden	5¼	5¾
B. C. Copper	3¾	4
Butte Coal	17	18
Ely Central	..	..
Ely Cons.	⅝	¾
First National	1½	1¾
Giroux	4⅝	4¾
Greene-Can.	7¾	7½
Inspiration	7¾	8¾
Nevada Hills	2¾	2½
Ohio Copper	1½	1¼
Ray Central	1½	2
Union Mines	..	..
Yukon Gold	3¾	3½
Goldfields	4½	4¾
Nevada Cons.	17½	17¼
Miami	21	21½
Granby	off	60
Con. Mining & Smelt.	44	46
Davis-Daly	⅞	1
Cons. Arizona	⅝	¾
Rawhide Cons.	..	..
Ray Cons.	14½	14¾
Chino	23	23½

New Baltic	..	..
United Copper	1¾	1½

**PORCUPINE STOCKS.**

American Gold	.90	.95
Apex	.11	.13
Coronation	.02¾	.02¾
Nor. Exploration	..	..
Dobie	1.00	1.10
Dome Ex.	.78½	.79
Foley-O'Brien	.71	.75
Rea	3.02	3.05
Hollinger	11.00	11.20
Monita	off	.12
Pearl Lake	.47½	.48
Central	off	3.90
Imperial	.09¾	.10
Northern	.81	.85
Tisdale	.05	.06½
Preston East Dome	.23¾	.24
Standard	.16	.17½
Swastika	.34¼	.34½
United	.03¾	.03¾
Porcupine Gold	.58¼	.58½
West Dome	1.02	1.03
Crown Chartered	.53½	.54
Eldorado	.11	.14
Gold Reef	off	.20
Porcupine Canada	.85	1.00
Dome Mines	41.25	41.50

**COBALT STOCKS.**

Bailey	.02	.02½
Beaver	.45	.46
Buffalo	1.40	1.90
Chambers-Ferland	.11	.12
City of Cobalt	off	.09
Cobalt Lake	.29	.29¼
Coniagas	6.25	6.40
Crown Reserve	2.85	3.00
Great Northern	.13½	.14
Green Meehan	.01¼	.01¾
Hargraves	.05	.07
Kerr Lake	3.00	3.50
La Rose	3.83	3.85
Little Nipissing	off	.02½
McKinley-Darragh	1.80	1.82
Nipissing	7.40	7.52½
Nova Scotia	off	.10
Peterson Lake	.06½	.07
Right of Way	.07	.07½
Rochester	.01½	.01¾
Silver Leaf	.03	.03¾
Temiskaming	.34½	.35
Trethewey	.60 bid	..
Wettlaufer	.80	.85