

THE CANADIAN MINING JOURNAL

VOL. XXXV.

TORONTO, December 15, 1914.

No. 24

The Canadian Mining Journal

With which is incorporated the
"CANADIAN MINING REVIEW"

Devoted to Mining, Metallurgy and Allied Industries in Canada.

Published fortnightly by the

MINES PUBLISHING CO., LIMITED

Head Office . . . 2nd Floor, 44 and 46 Lombard St., Toronto
Branch Office 600 Read Bldg., Montreal
London Office Walter R. Skinner, 11-12 Clement's Lane
London, E.C.

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

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

CIRCULATION.

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

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THE NICKEL QUESTION

The exportation of nickel is still engaging the attention of some of the daily newspapers. In its issue of Dec. 9 the Toronto Star has an editorial discussing the editorial in our last issue. On Dec. 10 the London correspondent of the Mail and Empire, like the Star, advocates prohibition of the export of nickel to the United States, on the ground that some of it might reach the enemy.

This, to us, seems a short-sighted policy, and one calculated to do more harm to the Allies than to the enemy. We agree that extreme care should be taken that nickel won from Canadian ores should not be obtained by Germany for use against us. But to prevent the chance of an occasional shipment escaping the watchfulness of the War Departments of the Allies our contemporaries would go to the extreme of preventing anyone from obtaining nickel from the International Nickel Company, by forbidding the shipment of matte from the furnaces at Sudbury to the refineries in New Jersey.

We have in Canada neither nickel refineries nor plants for working nickel into nickel-steel. Consequently, to place an embargo on nickel matte outside the Empire would mean that we should export only enough matte to supply the Mond Company's smelter in Wales, close down large mines and smelters in the Sudbury district, throw many men out of work, and cut off a large source of supply of armament for the Allies and friendly neutrals.

Our contemporaries are to be congratulated on their watchfulness of the interests of the Allies and on their desire to cut off the enemy's supply of nickel. But the circumstances are such that their efforts seem likely to result in more assistance to the enemy than to anyone else.

It has yet to be established that nickel won from Canadian ores is reaching the enemy. It is of course probable that he is trying to obtain a supply; but we have no evidence of his success. If the British War Office is of the opinion that nickel is being obtained by Germany some restriction will necessarily be made on the export of matte. But until there is more ground for believing the protection afforded by the navy and the agreements made with neutral powers inadequate, there is no need of extreme measures. In any case a general embargo would not be desirable.

In its issue of December 11, the Mail and Empire says:

"If, as is reported from London, nickel from the United States is reaching Germany, the Canadian Government will doubtless have its attention officially

drawn to the fact, and can be depended upon to use effectively any powers it has to stop that contraband traffic. As it is, no nickel produced from Canadian ores can be going forward to enemy countries except in disregard of the Canadian Government's authority. By an order-in-Council passed and brought into force several weeks ago, the Government prohibits the exportation of Canadian nickel to any but friendly countries, and an arrangement for checking exports from United States refineries using our matte is being carefully carried out by Canadian Government officials.

"If nickel of Canadian origin continues to reach Germany despite this prohibition, and these precautions, then the Government cannot refrain from the thoroughgoing course of completely barring the exportation of nickel ore, matte and refined metal to any country save the United Kingdom. That would be an effective and simple way of eliminating the risk of the enemy's getting any benefit of our nickel resources. By adopting that course our Government could assure itself as to the destination of every pound of the product of our nickel mines that is shipped out of the country. The moment that exports get beyond our Government's control the danger of diversion from the markets of friendly countries to those of the enemy becomes hard to guard against. No matter how good the faith of United States refiners may be, they cannot be expected to guarantee against mischances and smuggling on the part of carriers or dealers in whose honor they have to trust. By restricting nickel exportation to accredited persons or firms in the United Kingdom, our Government would not only baffle German bargainers, but it would save the British Government much trouble and spare it much friction with neutral Governments. If no Canadian nickel ore or matte were allowed to enter the United States, there would be no chance of United States merchant vessels engaging in a contraband trade in Canadian nickel. There would then be no need for British warships to halt United States merchant ships for the purpose of ascertaining whether or not they were carrying Canadian nickel to the enemy. Hence, there would be no hazarding of the good relations between Britain and the United States on that account. By prohibiting nickel exports to foreign countries we can best stand by Britain in the premises."

The Mail and Empire is correct in stating that to completely bar the export of nickel ore, matte and refined metal to any country save the United Kingdom would be an effective and simple way of eliminating the risk of the enemy's getting any benefit of our nickel resources. But, like the Toronto Star, the Mail and Empire seems blind to the fact that most, if not all, of our present trade is with friendly countries, and the Mail and Empire does not offer any evidence that Canadian nickel is reaching the enemy.

In the same editorial we find the following:

"At the present time the naval construction yards and armament works of Germany are being operated

to their maximum capacity. The shipbuilders, the ship armorers, the manufacturers of big guns for Dreadnoughts and super-Dreadnoughts are straining every nerve to add to Germany's naval strength. Construction is being accelerated at a headlong rate, so that when the time for fighting comes Germany's line of battle will be as formidable as it can be made. For every ounce of nickel it can buy the German Government is now prepared to pay double or treble the market price. Nothing this Government can do to keep Canadian nickel out of Germany's reach should be left undone."

Does the Mail and Empire imagine that activity in construction is confined to Germany. If the Allies and neutral countries found it necessary to buy nickel before the war, do they not need nickel now. Are they so frightened of Germany that they are willing to do without what they want in order to prevent any possibility, and it is a mere possibility, of Germany obtaining nickel from the same source.

REFINING NICKEL IN CANADA

The Toronto Star asks, "How long would it take to establish a nickel refinery in Canada." We regret to be unable to give a very satisfactory estimate. Nickel refineries are not common, and those in existence are the result of many years' growth. We might expect an experienced company to be able to erect a plant in a few months. How much longer it would take to "establish" it we cannot venture to guess.

We suppose the Star has in mind a refinery which can be economically operated. Such a plant was very much desired by the Canadian Copper Company before that company was merged with the Orford and other companies in the formation of the International Nickel Co. Back in 1889 Dr. Peters, the company's metallurgist at that time, proposed a refinery at Cape Breton, where supplies could be more cheaply assembled than in Ontario. After some study of conditions the proposal was dropped. Then in 1890 the Canadian Copper Company retained Jules Garnier to do his utmost to solve the refinery problem. Mr. Garnier's experiments cost \$150,000, and the results were unsatisfactory.

Later a plant was erected at Hamilton by the Hoepfner Refining Co. This attempt also failed.

In 1895 the Canadian Copper Co., still anxious to establish a refinery in Canada, sent its metallurgist to Wales to study the Mond process. This, after a year's study, was not thought suitable for a local establishment, however. The process is being now satisfactorily used by the Mond Nickel Co., but not in Canada. Both companies were evidently of the opinion that the Mond process could not be economically successful if the refinery were located here.

There is no doubt whatever that nickel can be refined in Canada, and we sincerely hope that in the near future it will be. Up to the present, however, the In-

ternational Nickel Co. and the Mond Nickel Co. have not found the proposition an attractive one.

If then we return to the Star's query, we may say that the Canadian Copper Co. endeavored for several years to establish a refinery here and spent a large sum of money without success. It does not necessarily follow that future attempts are destined to failure, but enough has been learned to warrant the belief that the present practice is economically the best and that the length of time it will take to establish a refinery in Canada will be determined by the length of time that conditions remain as they have been.

The Star may be of the opinion that the conditions brought about by the war are such as to warrant the establishment of a refinery here at any cost. And there may be many of the same opinion. But suppose the refinery established. What shall we do with the nickel. We cannot roll it into nickel-steel, the form in which most of it is sold. The Carnegie nickel-steel plant is said to have cost \$500,000. Shall we build such a plant? Shall we prohibit the shipment of nickel or nickel-steel to the United States and force this friendly country to look elsewhere for nickel for her army and navy?

Evidently the establishment of a refinery in Canada would not settle the question.

NOVA SCOTIAN COAL PRODUCTION IN 1914

An approximate estimate of the coal production of Nova Scotia for 1914 indicates a reduction in output of about half a million tons when compared with 1913, and it is probable that the output for the Province for 1914 will not exceed 7,000,000 tons. The major portion of the reduction has been caused by the falling-off in the demand for coal for steel-making purposes. The export of coal from the Province reached the highest figure in the history of the coal mines. Shipments to the St. Lawrence during the season just closed were at least 300,000 tons in excess of any previous year's figures. The demand for coal for household and manufacturing purposes was fairly well maintained, considering the unusual conditions which have prevailed during the year.

The outstanding feature of the year has been the increase in water shipments during war time, a subject on which much might be said, and to which fuller reference will be made in a later issue.

Taking all the factors into consideration, the reduction in output is less than might have been anticipated, and indeed some of the smaller companies have made slight gains.

The production during November and December will, however, be very much smaller than usual, as in view of the uncertain outlook the coal companies are taking conservative action with regard to the banking of coal. The coal-banks put down last winter were

abnormally large, and while the banks which will be put down during the ensuing winter will be very much smaller than last year's stocks, they will be equal to any winter stocks accumulated in the winters prior to 1913-1914 season.

While there is very little hope for great demand for heavier steel products, there are signs of a renewal of activity in some of the lighter grades of finished steel articles, such as barbed wire and wire rods. Some renewal of activity is reported in pig iron sales, but so far this has not affected conditions in Nova Scotia. Any increase of output in the steel trade will of course favorably affect the coal trade.

As a good deal of the ordinary commercial winter business of the coal companies is for screened coal, and as the consumption of the steel works consists chiefly of slack coal for coke making, the coal companies are facing unusual difficulty in the disposal of slack coal, and therefore unusual interest attaches at the present time to the reduction to the lowest possible minimum of the slack coal made in the process of mining and to transporting the coal. The situation is quite unusual, because since the great expansion in the steel industry in Nova Scotia, dating from about 1900, the demand for coal for steel making purposes has been a steadily increasing one. It is therefore apparent that the indications of a slight revival in the steel trade are being watched with interest by those connected with the collieries in Nova Scotia.

Generally speaking, the indications are that the coal mines in Nova Scotia will work from half-time to three-quarter time during the next six months. Some collieries will do better than this and others will not be so fortunate, but, on the whole, there seems to be no reason to anticipate full-time work at the collieries before the opening of navigation in 1915. There are many varying factors to be considered, and over and above all the great fact of the war, but the two most encouraging factors are that manufacturing generally seems to be holding its own, and that the outlook in the steel trade is better than it was.—F. W. G.

GUARDING THE PROFESSION

At the recent meeting of the Canadian Society of Civil Engineers, Professor H. E. T. Haultain called attention to a function of engineering societies which has been more or less neglected. In his paper, which is published in this issue of the Journal, Professor Haultain asks engineers to consider whether they are doing their part in advancing the profession in the estimation of the public. Should engineers be willing to let their work speak for itself? Should they not at least see to it that the listeners are in a receptive mood and that they hold the profession in esteem?

Most engineers object to anything in the nature of advertising. They are willing to go quietly about their work and they look askance on any member of their profession who believes in publicity.

Men who do their work well and say little or nothing about it win respect. But this is due to the fact that people have learned that their work is good. They learn in many ways. A few, a very few, have the ability and opportunity of judging from the work itself. Others learn from friends and associates. Naturally, in most cases, it is a small circle that knows of the ability of the average engineer. The engineer has reason to be satisfied if included in that small circle are his employers and prospective employers.

But even the engineer who shuns publicity for himself may feel with Professor Haultain that publicity for the profession is to be desired. If it is desirable, what steps should the engineering societies take to obtain it?

In view of the increase in interest in gold mining that has followed on the successful development of the Porcupine district, it is to be hoped that something will be done to encourage the proving up of some of the very numerous properties that have been located in the past few years. Scores of prospects have for various reasons not received the attention they merit. In many cases no doubt this is due to lack of willingness of the prospector to part with his claim on reasonable terms. He cannot test the property himself, and is unwilling to allow developing companies to make tests without paying large sums in cash for the privilege. Many prospectors would like to develop their properties themselves; but are unable to do so without costly machinery. If customs mills for treating gold ore were available there would doubtless be more small gold deposits worked.

The United States Geological Survey has published a little bulletin entitled "Our Mineral Reserves—How to make America Industrially Independent." The author is Mr. George Otis Smith, Director of the U. S. Geological Survey. The bulletin is an excellent summary of the mineral resources available for utilization under the pressure of present conditions.

Our attention has been drawn to a very erroneous statement in this bulletin, however. Speaking of the treatment of foreign ores in U. S. smelting plants Mr. Smith says: "Nickel having a value of \$19,000,000 and nearly an equal value of pig iron was produced last year from foreign ores, obtained mainly from Cuba."

As a matter of fact practically all the nickel produced in the United States is won from nickel matte shipped from smelters in Canada to New Jersey for refining. The nickel ore is produced in the Sudbury district, Ontario.

It is true that a large quantity of iron ore from Cuba is smelted in the United States, but it could hardly be inferred from Mr. Smith's paper that the nickel did not also come from Cuba.

Members of the Canadian Mining Institute in Northern Ontario will regret to learn that the annual meeting next March is not to be held at Cobalt. It is generally recognized that the meeting is not likely to prove the great success that others have been on account of the war conditions. The Cobalt branch was willing to undertake the burden and deserves a great deal of credit for its willingness to take the load off the other branches. Apparently the Council did not wish to hold the initial meeting at Cobalt under such trying circumstances, thinking that Toronto, having a record of several very successful meetings to its credit, was in a better position to stand the stigma of a slimly attended meeting. It is to be hoped that the invitation of the Cobalt branch will be renewed at a later date and that the Council will accept it.

According to the December bulletin of the Canadian Mining Institute, the letter sent out to members of the Mining Society of Nova Scotia concerning affiliation with the Institute is not to be interpreted as meaning that they may become members of the Institute upon the payment of an annual fee of five dollars per annum. What then does it mean?

In a letter to the Secretary of the Canadian Mining Institute, Mr. David H. Browne, of New York, gives it as his opinion that the great field of usefulness of Government Bureaus lies not in publication, but in investigation. We take it that Mr. Browne is in favor of widespread publication of the results of investigation, however. Otherwise investigation would lose much of its usefulness and there would be great duplication of effort.

Mr. Norman T. Fisher in a letter to the Secretary of the Canadian Mining Institute urges that a greater force of geologists should be put in the field so as to enable the activities of the Mines Department to be extended in various directions. He seems to be under the impression that geologists might be made of some use to the mining industry. We commend him to the attention of Professor Haultain.

Encouraging reports come from the mining districts in British Columbia and Northern Ontario. Porcupine is one of the most flourishing districts in the Dominion, the gold mining industry being almost unaffected by the war. At Cobalt there is not such marked activity as at Porcupine; but the silver mining district is doing fairly well. Last week the Buffalo mine resumed at full force, and now all the larger producers are active. In British Columbia it is reported that the Granby Company, which is obtaining excellent results at Hidden Creek, will shortly resume operations at Phoenix and Grand Forks. The Crowsnest district coal mines are also reported more active.

Mining, like other industries, has been adversely affected by the war, but the men in charge of operations are proving equal to the emergency.

THE ENGINEER*

By H. E. T. Haultain.

The majority of the papers read before this Society are descriptions of work accomplished, descriptions of successful results, accompanied by detailed plans and specifications. This effort of mine is as far removed from this type of paper as it is possible to go. It is but a groping. Perhaps it would be more becoming the dignity of this meeting if it were referred to as a reconnaissance; but the region of the survey is not new. It is one we have all looked at. But by most of us it is passed by as being unfruitful or unpleasant. Safety and success are the prime essentials for much of the work of the Engineer, with the result that where he cannot see clearly, he is the more timid. He avoids doubtful material; where he cannot avoid he raises his factor of safety. He will rarely talk of his mistakes, though they may be of much greater educational value than his successes. In fact, he will rarely talk in public about his work except in the form of plans and specifications. Yet I am venturing before you with my groping. One reason for this is that of late I have viewed the subject from a new standpoint one far removed from that of the field engineer.

Last year the President of the Institution of Mining and Metallurgy, said to me:—"You are at a gate of the profession, what are you doing to guard it?" Part of my function as a teacher is to guard the profession as is also part of the functions of this Society. If I am at a gate-way you are at the citadel. I submit that it is probable that the activity of this part of our functions might with advantage be very materially increased. Perhaps it is still more important that the range of this activity should be widened. Many will say that the profession is being well guarded, that the standard is high, is in fact very much higher than is generally realized. With this I would agree, more particularly with the last part. Is it not possible that this is a point that we have been neglecting.

A recent editorial in the University of Toronto Monthly, contained a reference to "the feud in Medicine and Applied Science between the practical and the genuinely University conception of training."

I do not think that the word feud expressed the idea satisfactorily, but the condition referred to has impressed me more strongly than any other academic condition in the six years I have been in the University. There seems to be a wide gulf between the older faculty of Arts, and the faculty of Applied Science and Engineering. In the picture, as it appears to many observers, the bright light and the high land is on that side of the gulf away from the Engineers. In fact, in a general view, there is not a gulf which betokens an equality of level between the two shores, there is rather the appearance of high mountains and valleys. There is no doubt that there is a haze of misunderstanding between the two.

I do not know that this atmosphere does any harm or causes any more unpleasantness than does occasional bad weather. I sometimes think it may be a sign of health. Perhaps if it were intensified it might stir up some healthy activity. I bring it in only as an illustration. Is it not exactly the same way out in the field,

though the picture may be obscured by many conditions absent in the smaller academic world. Are not the Engineers, in the eyes of the public, but hewers of wood and drawers of water?

Possibly it is sufficient that we remain so and confine our attention to the wood and the water as becometh men of low degree. Without doubt the general attitude of the Engineer is one of indifference in this regard.

Is it not possible that this is the real problem before the Engineering societies? Is not this really the whole of which the other problems are but parts?

If this condition is to be changed, how is it to be accomplished and who should attempt it? Engineers do not talk about engineering, except to themselves and in their own language. It is nobody's business to talk about it for us. Others misunderstand us because they do not know us. They recognize that we are different from them. We must be either inferior or superior. Naturally they think we are inferior. Can you blame them? We take the trouble neither to dress nor speak the part.

One reason, without doubt, is that our work is intensely interesting and we are so busy with it that we have neither the time nor the energy to pay attention to anything but our work. Probably another reason lies in the fact that we are so accustomed to putting our ideas in the form of plans and specifications, that not only do we find other language difficult, but we avoid expressing ourselves on any subject that has not formed itself in our minds clearly and distinctly. An elaboration of details which the Engineer's mind demands, only befogs the public or robs them of their interest. Broad impressions, sometimes purposely distorted to what the Engineer would consider inaccuracy, attract and educate the public.

We all shy from the question, "What is Engineering?" It appears an unprofitable and tiresome subject. I am inclined to submit, however, that some of us, at least, should tackle it and keep on tackling it. It is neither possible nor necessary to draw complete plans and specifications; but we must produce a general view that will convey correct impressions, not only to ourselves and to those entering at the gate, but also to the outside public. Do we think the lawyer or the business man or the man about town has anything like a true understanding of the Engineer and his ideals? Are we not quite sure in our own minds that their ideas on the subject are very far from the truth. I am perfectly sure that the ideas concerning the Engineer and Engineering held by the University Senate are very materially different from those held by the teachers in the Engineering faculty. An Arts professor, who has been associated with the Engineering faculty throughout his academic life, said to me:—"I have no patience with your ideas of education. Your only reason for wanting analytical geometry is to enable you to cut out boiler plates." I could hardly frame a statement that would be further from my ideas of education and yet I failed completely to convey this to my colleague. The association in his mind between

*A paper read before the Canadian Society of Civil Engineers in Montreal on Nov. 5th, 1914, under the title of "The Wielder of the Weapon." The paper was preceded by some slides, one of which showed clause 2 of the Engineering Ethics section of the By-Laws of the Can. Soc. C.E. Mr. Haultain said that he sought a broad interpretation of the last part of the clause, viz.:—"The surest way for an Engineer to obtain such necessary consideration and deference from the public will be found in his manner of carrying himself." Another slide showed the man of Coreze with his club and stone.

the high mental training of such a subject and the Engineer reached only to the cutting of boiler-plates.

Another colleague inferred that the difference between Science and Applied Science was something like the difference between wall paper in the roll and on the wall. All the great art and skill lay in the roll. The applying it to the wall was a simple matter; a matter of low degree.

What then is Engineering and who is the Engineer. If he is not simply a hewer of wood what is he? Does he belong to any specified herd or are we all mavericks? Is there a distinguishable brand on our hide or are there only irregular and uncertain marks proving only that we are not exactly wild beasts. Are we sufficiently gregarious to constitute a herd, or is it that there are only a few of this kind and do they only herd from fear. Evidently the simile is badly taken.

Are we a tribe—if so wherein do we differ from those outside the tribe? Have we inherent characteristics? Are we differentiated from other tribes. Have we any tribal pride and of what are we proud. Or are we simply content to be the vassals of the community. Are we leaders or simply workers.

I am inclined to think that the simile of the hewer of wood is at the base of most of the misunderstanding. Let us go back to the beginning of things, to the dim red dawn of man. Did not the man of Coreze represent at his time the greatest force in the world. Was he not above all the animals. Wherein was he different from them. Was it not probably in the fact that he used forces outside of himself to win from nature. Was he not the inventor and the first user of the weapon. Was not the wielded club or thrown stone the first step towards the separation from the brute. From then until now who has always been the greatest man? Let me quote from my paper, "The Geologist."

"When we go back to the beginning of things, that is to the beginning of things for man, to about the times, let us say, of *Pithecanthropus erectus*, the story teller was beginning. He was almost the first luxury. Possibly man's first distinction was that he was a fire-using animal. Certainly about the same stage of his development he became a story telling and story hearing animal, and the story telling part was certainly more removed from mere animal than any other phase of his activities. Progress in all stages has been based largely on co-operative organization and this came first with the fighting animal but organization alone did not win out from the animal stage. Organization could and does exist without language and without man, but we departed from the animal through language and progressed through language. Language was produced by and for the story-teller. For his purpose was language developed and without language we would have had no modern man. The neolithic scribe on bone, that "mammothistic etcher at Grenelle," was a later development of the story teller, who told stories in pictures and was not only the forerunner of the comic supplement, but of all that we understand in modern pictorial art. Later he told stories in song and in mimicry so that all our art, which represents our greatest departure from the anthropoid ape, is the work of the story teller.

"Now the story teller is still the greatest man among us. What does Kipling get per word? And has he not had the refusal of the high honors of the realm?"

*"The Geologist"—a paper read before the Canadian Mining Institute in March, 1913, and published in the Annual Volume for that year, No. XVI, and also published in The Canadian Mining Journal, March 15th, 1913.

Theodore Roosevelt received \$350,000 for seven years' work as President of the United States but received a million dollars for the story of his African holiday."

Man was a weapon wielder before he was a story teller. The weapon wielder was the real leader. We always have and always will look up to the story teller but we bow down to the successful wielder of the weapon. He has had more of the world's real adulation. Though he may use the same weapon he is the anti-thesis of the hewer of wood. The conquered slaves, the weak and the imbeciles were the hewers of wood and the drawers of water. It is true that they won something from nature, but they made no progress and they risked nothing in the effort. Man's struggle against man has been only a small part of the sum total of his effort as compared with his struggle with nature and the struggle with nature to-day is more universal, more rapid, more intense and more successful than ever before. The man in the forefront of the struggle, he who is forcing nature to the use and convenience of man as never before is the Engineer and the reason that he progresses more rapidly and more successfully than ever before is largely on account of his new weapons but still more on account of himself and his methods. His weapons are drawn from the sciences but the wielding is his own. The choosing of the weapon and the plan of campaign are his. But he is in the thick of the fight and there are no war correspondents. He makes no effort to hold communication with non-combatants. He is busy for results and to him nothing but results counts. He has not yet arrived at the stage of holding communication with the public through means of show and parade, of brass bands and uniforms. No slave toiling at the wood pile ever shrank from the public gaze more carefully than does many an Engineer from publicity. He is content to stand behind his wood pile and the public thinking that the pile arrived by a simple process of hewing give as little attention to the man as to the slave. Nobody tells the public that to produce the modern pile there has been a struggle calling upon higher standards than ever before in the struggle with nature that the men who are winning in this struggle are men of as high a calibre in mental effort and moral fibre as in any other branch of human affairs and very much higher than in most other callings.

We do not dress the part. To the public eye dignity and weight of personal character are intimately associated with gown and wig and valor and worth with uniform and decorations. We have neither religion nor law nor military without their wrappings which tell to the ordinary man plainer than any words that the man within is of high worth in the general scheme of things. We neither talk nor dress the part. We are pleased to say that we work and that workers don't talk. As a matter of fact we fight. The word work only covers a part of our efforts. We wield weapons and plan campaigns and we risk personal safety in reputation, if not in limb and life. Some will say that the fighter also doesn't talk. No, he does not talk the part, he dresses it. I can't imagine Lord Roberts liking the fuss and feathers; but he is punctilious to a degree in such matters. And we Engineers, with the exception of a few whom we rather blame for "advertising," do nothing—absolutely nothing to tell our fellows what manner of men we are. Is it not possible that this is the real problem before this Society. We cannot wear a uniform either in the shape of helmet and tunic or of wig and gown, nor can we have parades and brass bands.

Publicity of some kind we need more than anything else; but it must be of the right kind and apparently the right kind has still to be discovered. We must recognize that there are innumerable kinds of useful publicity and that many, very many, most extraordinary ones are really good form. General French can wear white feathers in his hat. Among the University staff one of the most respected translates very feeble limericks into what I am informed is excellent Greek, and publishes it. A judge is never so impressive as when garbed in his wig and gown, which look only absurd under other circumstances. But these are all hallowed by time and are denied to us. We are so young that language itself is denied to us. Our very name is without meaning or what amounts to the same thing, has many meanings, and so with many other words connected with us, technical, practical, scientific, theoretical and so on. But the means of publicity, though many, may still be added to. The magnificent home of the Institution of Civil Engineers must by its dignified appearance alone be of great educative importance. The knighting of Sanford Fleming was not without its value; but needs repetition as does all publicity. "There are certain conditions of intimacy, continuance and repetition which are necessary if an idea or feeling is to gain a foothold in the mind and remain." At the celebration this year of the addition of the word Royal to the name of the Canadian Institute, an organization founded by Fleming 60 odd years ago, a speaker of the evening not content with Sir Sanford's reputation as an engineer labored to show that he was a scientific man, a geologist forsooth, because he had published the fact that the sands of Toronto Island had come by wave action from Scarborough Bluffs, and as a scientific man was worthy to have been a founder of a society honored by the word Royal in its title.

The pitiful position held by many of the municipal engineers is a publicity of the opposite kind that is doing us much harm. On the other hand the good citizen activities of some of our Engineers who are energetic on Civic Guilds and other public committees is of the right kind. To a few it is given to be Presidents and Vice-Presidents of large commercial organizations. Their presence in our Council is good publicity. There are many avenues closed to us however. The Engineer is too direct and too what-shall-I-say, to be a successful politician. We study our men but not our fellow man. The settlement of labor troubles comes more and more to the Engineer but we shall not succeed in persuading our fellow man to elect us to office for a long time to come. The study of our fellow man may be the first step to a successful publicity.

Am I stumbling too much in my groping over this idea of publicity. Many of you, especially those who have made your mark and your assured income may say that the last thing you want is publicity. But surely you will agree that the proper kind of publicity, the kind that will educate the public to a better appreciation of the Engineer would be of great help and benefit to those coming in at the gate of the profession, and is not this Society a guardian of all the best interests of those entering the gate as well as a guard against incompetents and wrongdoers. The fact that ordinary methods of publicity offend us is no reason why we should avoid all publicity. The problem that is before us is to find suitable publicity. Without presuming to do other than grope might I suggest that legislation that would compel municipal engineering work to be under the control of Engineers of the rank of members of this Society would be very good public-

ity. The publication of a comprehensive code of ethics might also be good publicity. The expulsion of some of our members might be as good as any other form. Possibly we have not guarded the citadel so carefully but that some have entered who are not fit company for decent men, much less for Engineers.

In our publicity direct attack will not do. We are not good enough as story tellers. It may be true that all that counts for health and prosperity is based on the work of the Engineer; but the story or the picture of our work shows to the public but a pile of wood or a calabash of water—larger or smaller but still the same. We must exhibit the man—we must show that it is not the slave and the imbecile accomplishing only through toil. We are wielders of the weapon and we must show that the wielding calls for all the best there is in man by any count you choose. We must emphasize the man. The weapon has been glorified—the forger of the modern weapon of the Engineer is a trained story teller, the story telling is a part of his training that accompanies his education as a maker of weapons. The modern worker in science not applied is fully one half story teller, and often the scientific half exists primarily for the story telling half. Just as there are many alleged weapons wonderful in their gilt and filigree whose only use is that of adornment, so is much of science polished and attenuated for purposes of exhibition rather than of use.

But published or unpublished, modern science is no wonderful and the story of it is told so well and so often that the forger of this weapon appears on a very much higher plane than the wielder of it. As usual truth is at the bottom of the well and search shows that the reverse is the truth. The man who can choose his weapon—who can see so broadly and so clearly in the complexities of local conditions that he can select the weapon to fit his campaign and then with skill and moral fibre wield the weapon is not less worthy of high place in the community than the maker of weapons, no matter how wonderful or polished they may be.

This simile will offend by its incompleteness and apparent weakness. Is the gun-layer greater than the designer and constructor of the modern 13-inch rifle? The simile seems in error. I use it in an attempt at a broad impression—a parallel to the hewer of wood and drawer of water, not as a definition. The man from Coreze used the club and the stone and won thereby progress for the race—it was the wielding of these weapons that won. The modern weapons developed by science have given man much greater power over nature; but it is still the wielding of these weapons that makes them of benefit.

The doctor and the engineer are the wielders of these modern weapons in the struggle against nature. The gun-layer taking orders from the fire control in order to destroy his fellow man is not a parallel with our man of Coreze.

This wielding of the Engineer is new, is so very new and is growing so rapidly that we have no comprehensive view of it. It is not part of the so-called science, it is not applied science, it is man in action, using the sciences, in the most complex and the most useful action progress has had. If we simply refer to this action as work the mind of the public will follow the old nerve path and associate it with toil, with the slave and the wood and the water. Do we need anything different, do we require the higher approval of our fellow man? Some of us, perhaps, are not interested.

What about our duty to those entering the gate?
What about our tribal pride?

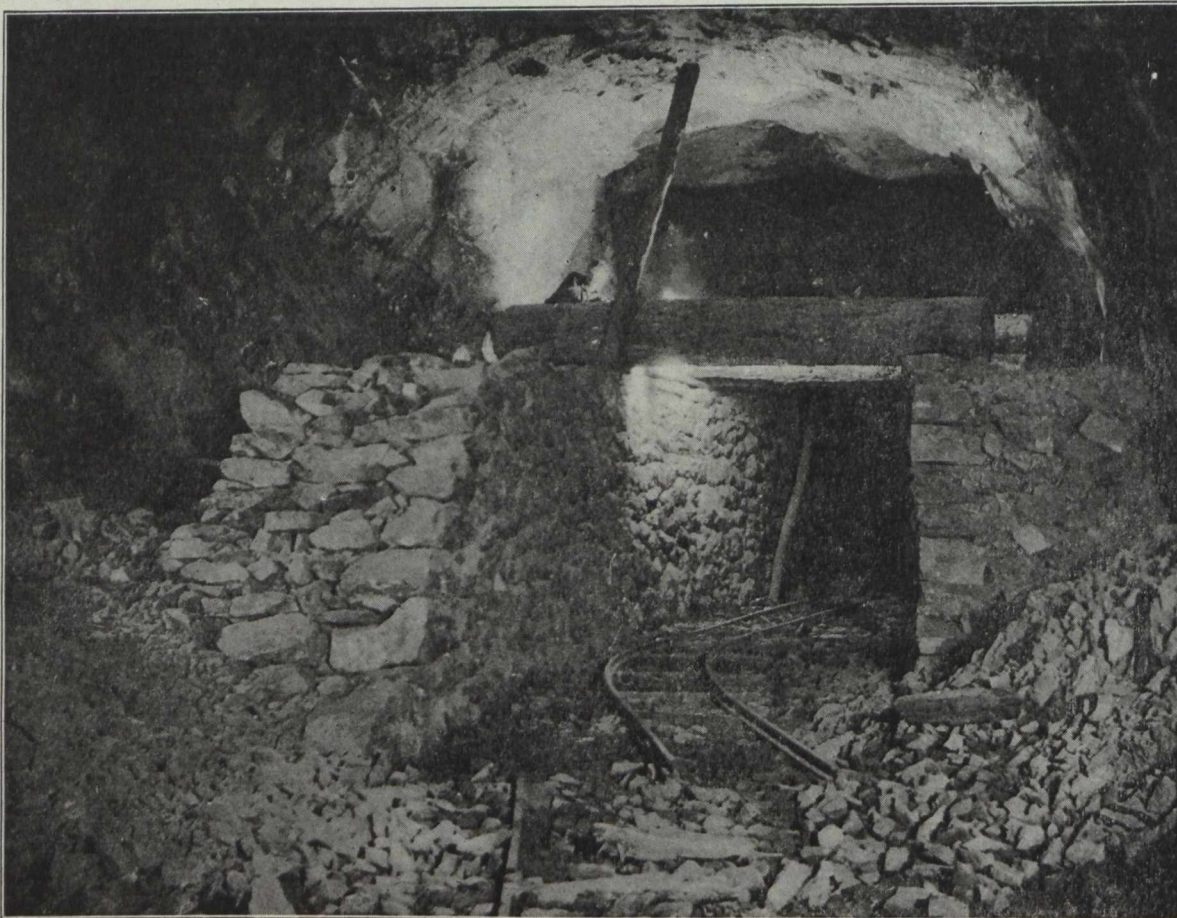
THE BALTIC MINING METHOD

The Baltic lode is one of the chief copper deposits in Michigan. While it has not been explored at great depth compared with the Calumet and Hecla and Quincy lodes it is expected to yield several hundred million pounds of copper. Mr. J. R. Finlay in 1911, without allowing for very great depth below the workings estimated the production at 15,000,000 tons ore containing 311,000,000 pounds copper. This estimate will be far exceeded if the deposit persists to such depths as the other great lodes in the district.

The mines on the Baltic lode are the Champion, Baltic and Trimountain. The width varies commonly from 15 ft. to 60 ft. In some places the lode is mined for

through mill holes. The mills are built up with a circular wall of rock, leaving an opening about 4 ft. in diameter. Iron lips are placed at the chute, so that the ore can be drawn off from the flat bottomed mill holes into tramcars.

When walls are built and mill holes started, the remaining space is filled with poor rock. Then stoping is started, the drills being rigged up on the waste. Where the amount of poor rock broken is too small for the filling required, additional rock is broken from the foot or hanging in "poor rock stopes." The ore broken is sorted where it falls. The waste is left to fill in the stope, and the ore is thrown into or car-



View on Twelfth Level, Baltic Lode, Champion Mine, Michigan, Showing Method of Protecting the Levels

a width of 80 or 90 ft. The thickness is in most places greater than 20 ft. and averages about 24 ft.

In all the mines on the Baltic lode, the system of mining adopted is to break the rock for the full width and sort out the poor rock and use it to fill in the stopes.

Shafts are sunk in or near the footwall, and levels are about 100 ft. apart. Drifts are either run 8 ft. x 8 ft. and then cut out the full width of the lode, or else run the full width at once. Then another cut is taken off the back, the drills being mounted on broken ore. There is then an opening 16 ft. high for the width of the lode. The ore is drawn off, and the broken waste rock left in piles in the drift. The levels are now enclosed by "dry" walls built of rock, and a cover of lagging laid on heavy timber caps. Openings are left at intervals in the wall for chutes to draw off ore

ried in small cars to the mill holes. Stopping proceeds in this way, the mill holes being built up and the stope filled with waste while the ore is being drawn off.

When the stope has been carried up to within about 30 ft. of the next level, a so-called caving method is used to remove the arch. A raise is carried up to the level, and numerous holes drilled in the ground on either side of the raise. When the level is no longer needed, a wide opening is made by firing all these holes, and the waste rock filling in the stope above follows the ore down into the stope below. The ore is sorted out and thrown into the millholes and then drills are rigged upon the waste filling in the stope, and slices are taken off the arch. When only a few feet remain a large number of holes are drilled nearly through to

the level, the stope is well cleaned of ore, and then the holes fired. The broken ore falls down into the stope, and is followed by a pile of waste from the stope above. As much of the ore as possible is sorted out and thrown into the mill holes. When all readily reached is sorted out the drills are rigged up on the side of the pile of waste and another cut is made across the lode. Then again the stope is well cleaned of ore, and the last few feet of back is drilled with numerous holes. These are fired, and another cave of waste takes place. In this way all the lode is broken and most of the ore is saved.

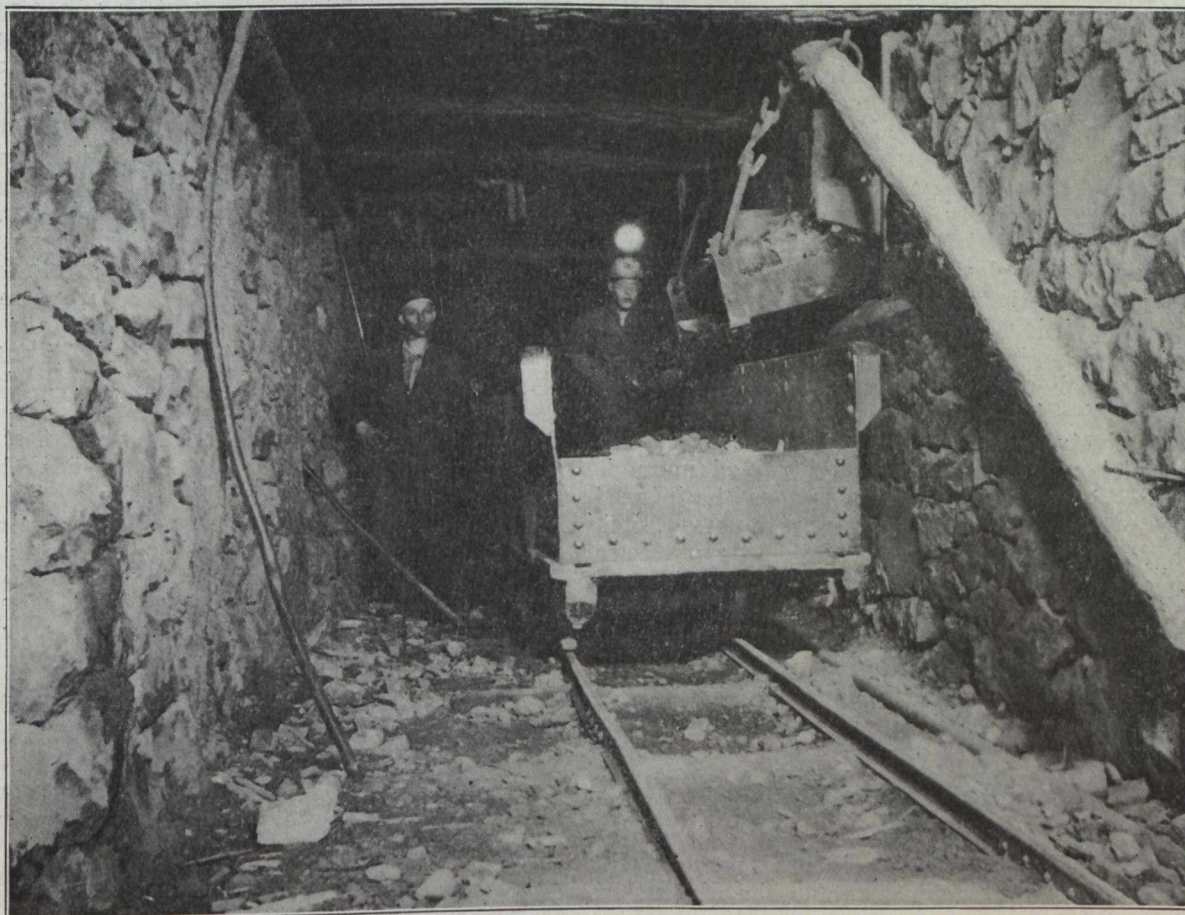
MR. LINDSEY ADDRESSES STUDENTS.

At its meeting on Nov. 11th the Mining and Metallurgical Club of the University of Toronto, was fortunate enough to have Mr. George G. S. Lindsey, K.C.,

out any visible indication of a mine and whose chief object is to line his own pocket.

Turning to the more prominent mineral productions of Canada, Mr. Lindsey gave figures to show the wide variation in costs and profits and pointed out the need in many cases of care at every turn in order to declare dividends. In the case of iron the profits are very low and have to be supplemented by combining allied industries such as railways, power plants, etc., with that of iron and steel. An interesting fact pointed out was that there is a distinct shrinkage in the demands for iron and steel on account of the fact that our railway construction is reaching its completeness.

In conclusion Mr. Lindsey pointed out that although Canada's mineral resources were vast in extent, the sources of capital for development were equally extensive, and predicted that mining in the future would be



A View on Twelfth Level, Champion Mine, Illustrating Method of Drawing Off Ore from Stopes

President of the Canadian Institute, to address it, his topic being "Canadian Mining, Its Needs and Difficulties."

Mr. Lindsey introduced his subject by showing how much the existence of mining owes to the prospector, but on the other hand, how the profession is being held back by the difficulty of the prospector and the capitalist or engineer in meeting on a common basis concerning the value of the claim. The prospector wants to be paid for enduring loneliness and suffering hardships while searching for the elusive vein, and the mining man wishes some tangible value in return for his purchase price.

The speaker next uttered a warning concerning a certain type of mining broker who floats companies with-

much less "happy-go-lucky" in nature as the prospector's attitude changes, and expressed the hope that mining boards of directors would soon see the advisability of including a technical mining man in their number. As a parting word, the speaker admonished the coming mining engineers to maintain a high standard of integrity and to raise the dignity of the profession by meeting the public in an honest and open manner.

Washington special says England has offered to lift her embargo on various commodities, including wool, in return for a more definite policy on part of United States toward preventing shipment of copper and other contraband to enemies of allies.

FIRST AID TREATMENT OF INJURED PERSONS

By Magnus W. Alexander.

(Secretary, The Conference Board on Safety and Sanitation.)

Humanitarian as well as economic considerations demand of each employer, and for that matter of every one in his employ, persistent effort for the prevention of accidents and of injuries to persons. To accomplish this purpose is the finest work that can be done in the field of safety and sanitation. It is clear, nevertheless, that absolute immunity from all accidental injuries cannot be expected; it is therefore of next importance to eliminate or promptly check the harmful results of such injuries as do occur, in order that injured persons may not be kept unnecessarily from their daily work or suffer any permanent physical impairment or disfigurement.

Injuries to persons may be due to accidents such as the breaking of a machine or a tool, the spattering of molten metal or the flying of chips, or they may result from unsanitary or injurious conditions such as are caused by smoke or poisonous vapors; persons may suffer temporary disability from physical weakness or from unavoidable conditions of employment, and quite often, inexcusable carelessness of the employee may be the cause of the injury. Whatever the cause, it is obvious that an injured person should receive prompt and effective attention, sometimes to prevent graver consequences such as blood poisoning, and sometimes to save even life itself, as when the injured person bleeds excessively.

If a physician or a professionally trained nurse is close at hand, it is of course safest to turn the injured over to his or her care; in most instances, however, such is not the case. Even where doctors and nurses are regularly employed in industrial plants or are located nearby, they may be engaged upon other equally serious cases or may be temporarily absent when they are urgently needed. Often also the nature of the injury, such as severe bleeding or unconsciousness from electrical shock, demands effective treatment without the waste of a single minute, when the time lost in taking the patient to the doctor or in bringing the doctor to the patient might prove fatal. Then there are the thousands of slight injuries like cuts of the hands or irritations of the eyes, when the injured persons will not take the time nor trouble to go to the dispensary in the plant or to a doctor nearby, but will use unsafe methods of self-treatment, or will secure similarly harmful attention from a co-worker, who is as incompetent as himself to properly attend to the injury. For all of these reasons, it is becoming quite universally agreed that selected persons in employment—usually the superintendent and some foreman, clerks or storekeeper—should be taught proper first aid treatment of injured or sick persons. Where it can readily be done and particularly in large establishments or where there is an unusual risk in the employment, the first aid instruction should be given by a competent physician and should be repeated periodically so as to keep the "First Aid Corps" in good practice.

One strong point that should be impressed on laymen who give first aid treatment to injured persons is that they are not rendering medical service and should not attempt to do so. First aid men are either supplanting in an effective way the slipshod methods of the

person who treats his own slight injuries or those of his fellow men, or they are doing in an intelligent way the necessary preliminary work in more serious cases, pending the arrival of a physician.

Often in order to save the expense of first aid instruction by a physician, but usually to supplement his efforts and to provide some readily available guide as to what should be done in emergency cases, first aid books are placed in the hands of first aid men. These books are sometimes rather voluminous because they go into a very complete description of the nature and character of the various injuries and ailments, point out their manifestations and, aside from giving instructions for their treatment, indulge also in lengthy explanations of the reasons for such treatment.

Bearing in mind the purpose for which first aid instructions are given and that the first aid man should never consider himself or be considered as a substitute for the physician, but rather as his emergency assistant, it would seem the wiser course to eliminate from these instructions every unnecessary word so as to reduce the reading matter and concentrate attention upon the things which should and should not be done. Quick action in emergency cases is of vast importance and no time should be lost in reading irrelevant matter or in searching through many pages of a first aid book. Finally, the instructions should specify the use of simple materials that may be readily available to first aid men and can be used safely and effectively by them. Concise instructions for first aid treatment, readily understandable by the laymen, and calling only for a few commonly used materials, quite harmless in themselves, will, if properly followed, prove of inestimable practical value and eliminate much suffering.

It was with these ends in view that the first aid instructions, accompanying this article, were developed. Groups of physicians who had had large experience in treatment of injured persons in a great variety of employments were called together in conferences for the purpose of agreement upon the best methods for first aid treatment by laymen, and the most effective and necessary medicaments, bandages and instruments to be used in this connection. "There must be one best method of first aid for each kind of injury; such best methods should be agreed upon in order that they may be recommended to industrial managers as a standard practice for treatment of their injured employees." This was the task placed before the physicians, and in addressing themselves to this task they reached tentative conclusions which were given practical tests, on the basis of which final conclusions were agreed upon at a subsequent conference. With these conclusions as a guide, first aid instructions were prepared and submitted to and approved by all physicians participating in the conferences. Other medical practitioners also confirmed the findings.

These instructions are therefore confidently recommended for general use as being practicable and effective directions for the treatment of injured and sick persons by laymen, with least chance of harmful consequences through unnecessary manipulation of the

patient or the application of unsterilized water or the use of injurious medicaments.

Special attention should be given to the training of men in a method of artificial respiration of persons who are asphyxiated by gas, water or smoke or rendered unconscious by electrical shock. Instructions for resuscitation as given in this article follow the Prone Pressure Method which was recommended some years ago by the Commission on Resuscitation, composed of authorized representatives of The American Medical Association, The National Electric Light Association and The American Institute of Electrical Engineers.

If the uncounted thousands of injuries treated by laymen could be analyzed, the high degree of the effectiveness of such treatment would at once astonish and gratify. In quite a few instances, nevertheless, wounds even apparently slight in character which have received careful attention by first aid men have developed serious consequences, because of under-estimation of the real extent of the injury or on account of the contributory cause existing in the impaired physical condition of the patient or for other reasons unknown to the first aid man. If these cases could be located promptly and put under medical care before they develop too far, much would be gained in still further popularizing first aid treatment by laymen. This may be done by adopting a first aid follow-up system which must, of course, be simple and inexpensive in character and practically automatic in its operation. The use of first aid record cards admirably fulfills this function. It is only necessary to provide each first aid man with a supply of these cards and instruct him to fill out one for each injury which he treats and to forward the same promptly to the general office or works dispensary of an industrial establishment or to a responsible person designated for this purpose. The record should include the name of the injured person and a brief record of the injury. The recipient of the record cards is thus afforded the opportunity of knowing exactly, day by day, who among his employees has been injured and the character and extent of their injuries; he is therefore in a position to follow up all injured persons and determine whether subsequent medical attention is needed and in that case furnish the same promptly. This follow-up system is inexpensive and wherever tried has proved very effective.

In some plants it may prove advisable to elaborate the information on the card even to the extent of calling for suggestions for the prevention of the recurrence of the accidental injury, or data may be added that will permit a study of the conditions under which accidental injuries occur most frequently. In general the simpler the card, the more surely will it be used properly.

First aid treatment of injured persons by laymen without any subsequent checking of the work may give rise to justified criticism; coupled with an effective, quick-acting follow-up system such treatment will be found efficacious in large employments as well as in small.

INSTRUCTIONS TO LAYMEN FOR FIRST AID TREATMENT OF COMMON INJURIES AND DISORDERS.

(Copyright, 1914, by Conference Board on Safety and Sanitation.)

Wounds That Bleed.

Abrasions, Cuts, Punctures.—Drop 3 per cent. alcoholic iodine into wound freely, then apply dry sterile

gauze to wound and bandage it. Do not otherwise cleanse wound.

Severe Bleeding.—Place patient at rest and elevate injured part. Apply sterile gauze pad large enough to allow pressure upon, above and below wound. Bandage tightly.

If severe bleeding continues apply tourniquet between wound and heart and secure doctor's services at once. Use tourniquet with caution and only after other means have failed to stop bleeding.

Nose Bleeding.—Maintain patient in upright position with arms elevated. Have him breathe gently through mouth and not blow nose. If bleeding continues freely press finger firmly on patient's upper lip close to nose or have him snuff diluted white wine vinegar into nose.

Injuries Which Do Not Bleed.

Bruises and Sprains.—Cover injury with several layers of sterile gauze or cotton, then bandage tightly. Application of heat or cold may help, other means are unnecessary. If injury is severe place patient at rest and elevate injured part until doctor's services are secured.

Eye Injuries (except eye burns).—For ordinary eye irritations flood eye with 4 per cent. boric acid solution. Remove only loose particles which can be brushed off gently with absorbent cotton wrapped around end of toothpick or match.

Do not remove foreign bodies stuck in the eye. In that case and for other eye injuries drop castor oil freely into eye, apply sterile gauze, bandage loosely and send patient to doctor.

Splinters or Slivers Embedded in Skin (except in eyes).—If easily reached withdraw with tweezers, then treat same as "Wounds that Bleed;" otherwise let doctor attend to it.

Fire Burns, Electrical Burns and Sunburn.—Do not open blisters. Use burn ointment (3 per cent. bicarbonate of soda in petrolatum) freely on sterile gauze applied directly to burn. Cover with several thicknesses of flannel or other soft material, then bandage, but not tightly.

Acid Burns.—Thoroughly flush wound with water, then dry wound, apply burn ointment and bandage as above.

Alkaline Burns.—Thoroughly flush wound with water then flood with white wine vinegar to neutralize (dilute vinegar for alkaline eye burns), dry wound, apply burn ointment and bandage as above.

Eye Burns.—Treat in the same manner as other burns.

Dislocations.—In case of dislocation of finger except second joint of thumb, grasp finger firmly and pull it gently to replace joint, then place finger in splint and bandage it. In all other cases place dislocated part at rest and promptly secure doctor's services.

Fractures.—Make patient comfortable and secure doctor's services at once. Avoid unnecessary handling to prevent sharp edges of broken bones tearing artery. If patient must be moved place broken limb in as comfortable position as possible and secure it by splint.

In case of severe bleeding apply sterile gauze and follow directions under "Severe Bleeding."

Dizziness, Headache, Nausea.—Give patient teaspoonful of aromatic spirit of ammonia in hot or cold water.

Chills and Cramps.—Give patient 20 to 30 drops of Jamaica ginger in hot or cold water. If improvement is not speedily obtained send for doctor.

Frost Bites.—Rub with ice, snow or cold water, then treat as "Fire Burns."

Insect Bites.—Treat as "Wounds that Bleed."

Internal Poisoning.—Immediately secure doctor's services. Make patient drink large quantities of water, preferably warm, and make him vomit by sticking one's finger down his throat or by other means.

Heat Prostration.—Give patient teaspoonful of aromatic spirit of ammonia in hot or cold water. In case body feels warm apply cold to it; if necessary give cold bath. In case body feels cold and clammy, apply heat to it and immediately send for doctor.

Unconsciousness from Fainting.—Lay patient on his belly and turn his face to one side. Loosen all tight clothing. Remove false teeth, tobacco, etc., from mouth. Apply cold to head, warmth to hands and feet. If breathing stops treat patient as directed under "Electric Shock." Give no liquids by mouth until patient is fully conscious. Then give teaspoonful of aromatic spirit of ammonia in hot or cold water.

Shock, Following Injury.—In case shock is due to severe bleeding, control it first as directed under "Severe Bleeding," and summon a doctor.

Lay patient flat on back and keep him warm with blankets, hot water bottles, etc., and provide plenty of fresh air. Let patient inhale fumes of aromatic spirit of ammonia. If fully conscious give patient hot drink or teaspoonful of aromatic spirit of ammonia in hot or cold water.

Unconsciousness from Asphyxiation by Gas, Smoke or Water.—Treat patient as directed under "Electric Shock."

Electric Shock.—Immediately free patient from electrical circuit using every care to protect one's self against electric shock. Then if patient is unconscious, even if he appears dead, lay him on his belly with arms extended forward, turn his face to one side, remove false teeth, tobacco, etc., from his mouth and draw his tongue forward.

Kneel, straddling patient's thighs, facing his head, and resting your hands on his lowest ribs. Swing forward and gradually bring weight of your body upon your hands and thus upon patient's back, then immediately remove pressure by swinging backward. Repeat this movement about twelve times per minute without interruption for hours if necessary, until natural breathing has been started and maintained.

Meanwhile send for a doctor, have patient's tight clothing loosened, keep him warm and provide plenty of fresh air. Do not give patient liquids by mouth until he is fully conscious.

ALASKA GOLD.

It is estimated by A. H. Brooks, of the United States Geological Survey, that the total output of gold lode mines of Alaska, from earliest mining in 1882 to the end of 1913, has been \$62,626,113, and that since mining began in 1880 the Alaska placers have produced \$165,480,848. The total output of silver from auriferous lode mines has been 1,096,336 fine ounces and from placers, 1,710,503 fine ounces.

The gold production of Alaska in 1913 was \$15,626,813, against \$17,145,951 in 1912. The yield from siliceous ores was \$4,814,813, against \$5,002,399 in 1912, and that from copper ores was \$132,000, against \$153,552 in 1912. The remainder of the output was from placers and amounted to \$10,680,000 in 1913, against \$11,990,000 in 1912, and \$12,540,000 in 1911.

THE RHYMES OF THE RE-SURVEY

By R. Sidney Bartram in Applied Science.

(With apologies to Robert W. Service.)

PART I.

Now this is the tale of the labors performed by a survey gang

Away in the back of the wild lands, where nobody cares a hang;

Where the brown bear prowls in the thicket, and the screech owl splits the night,

And skunks and other blossoms sweet, yield scents of rare delight.

When grey the dawn is breaking, your duties are begun,

Throughout the hours of daylight you labor with the sun;

And when the shadows lengthen, and the stars are shining bright,

You take a shot at the polar star in the middle of the night.

You sleep in a dis-used box car, on a bed of boughs of spruce,

But there's nothing to get by kicking, so what in hell's the use?

You dine on pork and cabbage, on pork and beans you sup,

And there's pork next day for a breakfast dish, to clear the remnants up.

You pump a rusty handcar for seven miles down the track,

And the sweat runs into your eyebrows, and you long to ease your back.

With picket, chain and transit, you run the traverse through

For seven miles, or maybe ten; as much as you can do.

You sit on a rotting deadfall, and open a can of pork, And eat a hasty dinner, with fingers for a fork;

Then on you go with the traverse, as hard as you can push,

Till the shades of night are falling fast, o'er swamp and track and bush.

And then you hurry homeward, to the supper waiting there,

And think of your lowsy spruce-bunk, and the sleep that knows no care;

But, swinging round a rock-cut, you "make a meet" with a freight,

And "Safety First" is a maxim sound, so you leave the car to its fate.

The car is smashed to splinters, which pleases the engineer,

While you stand and swear in chorus, but only the night winds hear,

So you shoulder the blasted transit, the picket, axe and chain,

And start to tramp it homewards, a dozen miles in the rain.

At last, when the stars are shining, and the moon is swinging low,

You reach the cars on the siding, foot-sore and full of woe;

You kick while you eat your supper, you growl when
you go to bed,
And curse all night at the chap who snores, and wish
that you were dead.

But somehow, in the morning, you wake as fresh as
paint,
Although last night you thought the life would de-
moralize a saint;
And you gather the junk together, and out on the line
you go,
For another day's hard labor, in rain, or sun, or snow.

But to-day is not track traverse, it's Township lines in
the bush,
And your axe bites deep of the cedar, and down she
comes with a rush.
You splash your way through the muskeg, you flounder
across the creek,
And flies and "skeeters" drink their fill till you
feel too mad to speak.

But it's not bad work in the summer, it's rather fine in
the fall,
But in the good old winter it's the greatest job of all;
With frozen ears and fingers, and nose that you cannot
feel,
You laugh aloud with your stiffened lips, for you're
doing the work that's real.

And so it was in the Beginning, and so it is to-day,
And so shall it be to the end of things, when you are
taken away;
Until you are made into Angels, with transit, and tape
and chain,
You will work for the darned old C.P.R., World with-
out End,

Amen.

PART II.

"The Next World."

Now this is the fate of surveyors, who love their beer
too well,
They must do their work in Hades, surveying the
bounds of hell;
They must blaze their trail through the darkness, they
must run the Line of Regret,
Till the Hubs of Hell are planted well, and the Devil's
Corners set.

And this is the fate of the Draughtsman, a red hot com-
pass and pen,
And a red hot draughting table, for ever and ever.
Amen.

He must draw the Thing as he sees It, with a Flag on
every Hub,
Till a white hot print of the Bounds of Hell is passed
by Baalzebub.

And the Picketmen and Chainmen must set a witness
stake,
Well squared and truly numbered, in the midst of
the Burning Lake
They must drag the chain forever, and measure every
lot
Through bush that burns but never wastes, and
swamp that's always hot.

And the Cook who cooked their dinner, oh! what shall
be his fate
Shall he stand beside the furnace door, and fill a
fiery plate?

Oh no, he shall stand in the corner, away from the
furnace heat.

He had it hot in the cook car, so now he shall cool
his feet.

For surveyors and all their outfit are sinners beyond
recall,

They hold no law but the law of might, which gives
to the mightiest all.

So he who has learned his lesson, who has served his
year and a day

May sin to the full of his heart's content, and none
shall say him "Nay."

But the Devil stands in the Gates of Hell, to see who
each may be,

When an O. L. S. is sighted, he rubs his hands with
glee,

He calls aloud to his stokers, "Ha, stoke the furnace
well,

Here's another surveyor coming along, we must make
him hot in hell!"

SEPARATION OF COPPER FROM NICKEL

In a paper to be presented at the February, 1915,
meeting of the American Institute of Mining En-
gineers, Mr. Boyd Dudley, Jr., describes results of
study of the reactions that have been considered as
part of the mechanism of the chloridizing roast and of
the conditions under which nickel oxide and copper
oxide may be chloridized.

The study of the chloridation of the oxides of nickel
and copper was undertaken in order to determine the
conditions most favorable for the chloridation of each,
and thus to demonstrate whether or not a separation
of these metals can be effected by the use of the chlori-
dizing roast. In particular would such a process be
useful in treating heavy pyritic ores containing copper
and nickel. Such ores occur at Sudbury, Ontario, and
are there treated by heap roasting followed by partial
pyritic smelting for copper-nickel matte. The matte
thus produced is concentrated in a basic converter to
a matte containing 80 per cent. of combined nickel and
copper with less than 1 per cent. of iron. The con-
verter slag is resmelted in reverberatory furnaces. By
this method of treatment all of the iron of the ore
enters the waste slags of the furnaces and is therefore
lost. If the copper can be removed from such ores and
the iron and nickel left in a residue of such character
as to be suited to blast-furnace smelting for nickel-
bearing iron, the iron would be saved and the value
of the ore would be correspondingly increased. In ad-
dition to saving the iron, there is of course the possi-
bility of utilizing the sulphur for the manufacture of
sulphuric acid, where such utilization is warranted by
local conditions and markets.

In the experiments performed by Mr. Dudley, mix-
tures of copper oxide and nickel oxide with ferric
oxide, silica, ferric sulphate, and sodium chloride were
subjected to heatings at various temperatures and for
different times in an electric tube furnace, a current of
dry air being passed over the mixture during the
heating.

Mixture No. 1 contained double the amounts of
ferric sulphate and sodium chloride necessary to con-
vert all of the copper into cupric chloride. Mixture
No. 2 contained double the amounts of these ingre-
dients necessary to convert all of the nickel into chlor-

ide. Mixture No. 3 contained enough ferric sulphate and sodium chloride to chloridize both the nickel and the copper.

During the first 10 minutes of heating, chlorine and sulphur trioxide were evolved freely. After this length of time the rate of evolution of these gases usually diminished perceptibly, and continued to diminish until at the end of 4 hours the air coming from the tube contained only small amounts of them. The time of heating was in most cases 4 hours; in a few it was only 2 hours.

Mr. Dudley, in reviewing the results of the experiments, says: "It is necessary to keep in mind the facts, that only small amounts of material were used, that the time of treatment in each case was comparatively short, and that the results cannot be directly compared with those secured when a chloridizing roast is performed on a large scale because of the differences in the conditions: It was the intention to study the behavior of copper oxide and nickel oxide when mixed with iron oxide and subjected to heating under the conditions that favor the chloridation of the metals. It is necessary to consider as chloridized that part of the copper and nickel which was volatilized, because neither the sulphates nor the oxides of these metals are volatile under the conditions existing in the experiments.

"The experiments with mixture No. 1 show that the completeness of chloridation of the copper increases with increasing temperature and with increasing time. An interesting point is the fact that in the last experiment with this mixture 92.5 per cent. of the copper was recovered from the volatile product. Experiments with mixture No. 2 containing nickel oxide show the behavior of the nickel under conditions similar to those to which the copper oxide was subjected. Only traces of nickel were found in the volatile products. The maximum production of water-soluble nickel resulted at 550 degs. C., the nickel thus extracted amounting to 17.7 per cent. The experiments at higher temperatures showed decreasing amounts of water-soluble nickel. Roasting for 4 hours at 700 degs. C. produced only 0.8 per cent. of water-soluble nickel. Whether or not the nickel extracted in these experiments was in the form of chloride or sulphate was not determined; the conditions were favorable for the production of either compound.

"Considering the results of these two series of experiments, it appears that nickel is not rendered water soluble nor is it volatilized to any considerable extent when the temperature of the roast is above 650 degs. C., while such temperatures are quite favorable to the chloridation of copper. In confirmation of this conclusion the third series of experiments show a maximum of 3.3 per cent. of the nickel converted into water-soluble and volatile compounds at 650 degs. C. The increased tendency toward volatilization exhibited by the nickel in the presence of copper is probably due to the more or less mechanical influence exerted on the nickel chloride by the volatilization of the copper chloride.

"These laboratory experiments of course do not prove that roasted pyritic ores containing copper and nickel can be treated commercially by chloridizing the copper and leaching it from the iron and nickel oxides, leaving a product suitable to be smelted to nickel-bearing pig iron. That could only be demonstrated by carefully conducted experiments on large quantities of the ore in question. However, the experiments do prove the possibility of effecting such a separation and indicate the temperatures at which the roast should be conducted in order to secure the desired results."

GEOLOGY ALONG YUKON-ALASKA BOUNDARY

Some time ago Dr. D. D. Cairnes, of the Geological Survey of Canada, presented before the Geological Society of America, a paper entitled "Geological Section Along the Yukon-Alaska Boundary Line Between Yukon and Porcupine Rivers." Early in the current year this paper was published in that society's Bulletin, and recently it was reprinted in pamphlet form. Dr. Cairnes has done much geological work in Yukon Territory and other parts of the Canadian Northwest during the last ten or fifteen years so has very much more than a superficial knowledge of that country. During the field-work seasons of 1911 and 1912 he was employed mapping and studying the geology along the 141st meridian (the Yukon-Alaska International Boundary) between Porcupine and Yukon rivers, or between latitudes 67 deg., 25 min. and 64 deg., 40 min., a distance of 191 miles. This work, he explains in the introduction to his paper, was performed on behalf of the Canadian Geological Survey, and was extended for two or three miles on each side of the boundary line, an agreement having been entered into between the Geological Surveys of the United States and Canada whereby geological work was conducted on both sides of the 141st meridian to the north of the Porcupine, by members of the United States Geological Survey, in exchange for similar work by the Canadian Geological Survey, to the south of that river.

Dr. Cairnes continues: "The belt to the south of the Porcupine river proved to be of particular interest and stratigraphic importance, as all the Paleozoic systems from the Cambrian to the Carboniferous are represented and nowhere else in the entire Rocky Mountain region of Canada and the United States is so complete a section of the Paleozoic known within so limited an area. A considerable collection of fossils was obtained, which includes, in addition to the Cambrian faunas, many other interesting varieties, including graptolites, which are of rare occurrence in Alaska and Yukon."

No previous geological work had been performed along the 141st meridian between the Porcupine and Yukon, except in the immediate vicinity of those rivers. McConnell, of the Canadian Geological Survey, came down the Porcupine river in 1888, making a geological reconnaissance en route, and Kindle made a geological examination of the rock formations along the Porcupine below New Rampart House for the United States Geological Survey during the summer of 1907. In addition a number of geologists, including McConnell, Spurr, Prindle, Brooks and Kindle, and others have reported on the geological formations along Yukon river in the vicinity of the International Boundary. With these exceptions, practically nothing was known geologically concerning the area in which Dr. Cairnes was engaged during the summers of 1911 and 1912, previous to the commencement of his work in the former year.

Topographically, the area or belt along the 141st meridian between Yukon and Porcupine rivers lies for greater part, at least, within the Yukon Plateau province; and since this physiographic terrane in the vicinity of the 141st meridian has a general westerly trend, it is cross-cut by the meridian practically at right angles. Thus in going from New Rampart on the Porcupine, south to Yukon river, the line of travel is transverse to the trend of the main topographic features of the district, and consequently a considerable diversity of topography is encountered.

In certain localities where the prevailing bedrock is limestone or dolomite, the plateau characteristics are still well preserved, and extensive tracts of upland occur having elevations of 3,000 ft., or more, above sea-level. With the exception of these areas, the original plateau surface has been almost, or entirely, destroyed, and throughout the greater part of the district the land surface has become thoroughly dissected.

Two ranges or mountain groups are crossed by the boundary line, which mountains have summits rising to elevations exceeding 5,000 ft. above sea-level, and it is possible that one or both of these may be connected with the Rocky Mountain system to the west, and thus constitute outlying lobes of that physiographic terrane. It is mere probable, however, that these are but isolated mountainous areas included within the Yukon plateau. To the north and south of these more rugged and mountainous areas, as well as between them, the topography consists dominantly of well-rounded, irregularly-distributed hills, and at frequent intervals throughout the district westerly flowing streams are encountered which have, in most places deep, steep-walled valleys, the floors of which are as much as five miles in width and from 900 to 1,200 ft. in elevation above the sea. Nowhere was any evidence of glaciation noted.

General Geology.—The information given by Dr. Cairnes relative to the General Geology of the region under review cannot be reprinted here, for it comprises twenty pages of the Bulletin. It is dealt with first in a general statement, followed by a table of formations, and then under the following sub-heads, respectively: Metamorphic Rocks, Dominantly Sedimentary Rocks, and Igneous Rocks. Under the first of these come the pre-Cambrian (?)—Yukon Group. The second lot includes the Lower Cambrian or pre-Cambrian—Tindir group. Devono-Cambrian limestones and dolomites, Devono-Ordovician shale—chert series, Carboniferous, Permian-Carboniferous (?) conglomerate, Mesozoic-Pennsylvanian—Orange group, and Quaternary—superficial deposits.

Summary and Conclusions.—Dr. Cairnes closed his paper as follows: "A very complete and interesting section of the Paleozoic has been found to occur along this portion of the Yukon-Alaska boundary, which adds considerably, both stratigraphically and lithologically, to our knowledge of this era in the north-western portion of the continent. One of the most important results of this work along the boundary is the finding of the great thicknesses of limestones and dolomites which there occur. These beds range in age from Carboniferous down to the Middle and possibly also include the Lower Cambrian, showing that the deep sea reigned, apparently continuously, over extensive portions of the region during this tremendous period of time. Another very interesting conclusion concerns the rapidity with which it has been shown that the lithology changes, and consequently how uncertain and unsatisfactory lithological evidence has proved to be, thus adding greatly to the difficulties connected with geological mapping in that region. Toward the southern end of the section, where a limestone and a shale group are well developed, at one point the limestone group persists upward from Middle Cambrian to Lower Devonian, and is overlain by the shale group, which contains a fauna ranging in age from Upper Ordovician to Carboniferous.

"In addition, a certain amount of light has been thrown on the age of the older schistose rocks of the

region. Heretofore these rocks, which have been generally considered to constitute the oldest geological terrane in each district in which they have been studied, were accordingly variously classed as pre-Devonian, pre-Silurian, or pre-Ordovician, according to the age or supposed age of the oldest overlying sediments. It would now appear that this schistose complex of the Upper Yukon basin is at least pre-Middle Cambrian and is in all probability of pre-Cambrian age. This information is of more than ordinary significance, since these rocks are so extensively developed, and since from them has been derived a great portion, at least, of the placer gold of the Yukon and Alaska."

Dr. Cairnes says, in conclusion, that the geological work done along the 141st meridian, as a result of which his paper was prepared, was necessarily performed very rapidly, owing to the difficulties of access to the district. As a consequence, the information obtained concerning many points is very incomplete, and numerous interesting problems which might otherwise have been solved still remain unsettled; in fact, the whole work was that of the pioneer. It is hoped, though, that the knowledge gained will be of some slight assistance in the advancement of geological research in the Northland.

The pamphlet is illustrated by a number of reproductions of photographs and a small locality map, which together add to its value.

THIRTEEN-CENT COPPER.

Boston, Dec. 8.—Thirteen-cent copper for delivery during the first quarter of 1915 comes on top of a persistent advance in the metal extending over three weeks.

During the past week consumers have been confronted with a puzzling situation caused by the varying prices at which the metal was held, depending upon delivery required.

It is understood that for December shipment electrolytic may be obtained at 12 $\frac{3}{8}$ cents; for January at 12 $\frac{7}{8}$ cents, while 13 cents is named for February and beyond.

The American Smelting & Refining Co. has been virtually out of the market for the past week, as it would do no business below 13 cents. This indicated to the trade a well sold up position. Amalgamated Copper Co. has been willing to do business at a lower figure and on Tuesday effected some sales at 12 $\frac{7}{8}$ cents, before naming the new top figure. Its London price at the same time was up to £60, the ordinary equivalent of 13 cents, but which under existing conditions was regarded as having a parity nearer 12 $\frac{3}{4}$ cents.

CANADIAN KLONDIKE.

A telegram dated Nov. 18, from the Yukon to the New York office of the Granville Co., states that on Nov. 14 a clean-up of 923 oz. was made, representing two days' digging and general clean-up of dredge No. 1. The telegram continues as follows: "Other boats down account no power; water now coming north fork. Started dredge 4 17th November; dredge 1 shut down for season 17th November. Will endeavor to start dredge 3 18th November. Having great difficulty dredge 2 account ice accumulation during past week, with no power for working. Have every hope raising dredge 2 shortly. Boat apparently only slightly damaged."

BENEFICIAL RESULTS OF THE WORK OF THE UNITED STATES BUREAU OF MINES

The U. S. Bureau of Mines, established in July, 1910, has become by its work a very important factor in the mining industry. The chief work of the bureau during the four years since its establishment, has been the investigation of problems having to do with the causes and prevention of coal-mine explosions and the safeguarding of the lives of coal miners. In addition, work has been done on the testing of coal and other mineral fuels belonging to or for use of the Government of the United States. During the fiscal year just ended investigations were undertaken looking to greater safety and the prevention of waste in the metal-mining and miscellaneous mineral industries of the country. Recently a small amount of work has been done in an examination of several oil and gas fields of the country with a view to eliminating the large waste of natural gas in these fields. The need of such investigations may be plainly seen when it is understood that so large a part of this waste is easily preventable, that the supplies of natural gas are limited, and that the gas wasted yearly may be fairly valued at not less than \$50,000,000.

The report, just published, of the Director of the U. S. Bureau of Mines, Joseph A. Holmes, describes the work of the Bureau. The following extracts indicate what has been accomplished.

Probably the most notable accomplishment of the Bureau of Mines has been the developing of the movement for greater safety and better health conditions in the mining, metallurgical, and other mineral industries of the country and the gaining of the co-operation of all possible agencies in behalf of this movement.

All the co-operating agencies are entitled to share the credit for the resulting benefits. It is not possible to determine exactly how much credit should be given the Bureau of Mines which has been in existence only a few years, nor can a money value be put on all that it has done. The scientific determination of the physical and chemical factors involved in processes or methods and the routine work incident to the many phases of the mining industry may be so intermingled with the general progress of the industry itself as to render segregation impossible. Moreover, the saving of human life is not a work the value of which can be measured in dollars.

In conducting its campaign for the increase of safety and efficiency in the mining industries there has been adopted the following general plan of co-operation between the National Government and other larger agencies. (1) That the National Government conduct the necessary general inquiries and investigations in relation to mining industries and disseminate in such manner as may prove most effective the information obtained and the conclusions reached; (2) that each State enact needed legislation and make ample provision for the proper inspection of mining operations within its borders; (3) that the mine owners introduce improvements with a view to increasing safety and reducing waste of resources as rapidly as the practicability of such improvements is demonstrated; and (4) that the miners and mine managers co-operate both in making and in enforcing safety rules and regulations as rapidly as these are shown to be practicable. The States, the miners and mine owners, and other agen-

cies, such as the mining and engineering societies, are now showing a commendable willingness to co-operate with the National Government in this work.

During the last fiscal year Bureau of Mines rescue crews were responsible for saving the lives of 7 miners; in the same time, 63 rescues were made by miners and others not connected with the bureau. The training of these rescuers, for the most part, was started by the bureau and continued by the operators, or, in some cases, by the miners themselves.

That the mine-rescue and first-aid training and demonstration work of the bureau is resulting in good is beyond question. Many reports have been received of the beneficial results of first-aid training, not only as an object lesson in the prevention of accidents but in decidedly lessening infection of wounds and death after accidents. While this first-aid training is part of the educational work of the bureau, the fact is clearly recognized that other organizations are engaged in similar work, and that the work is being extended by the recipients of the training.

The furtherance of the work of betterment is in the hands of the leaders in the mining industry. To them, and to State officials, various organizations and societies, and to the miner himself, great credit is due for what progress has been made in rendering mining safer and less wasteful.

The Nature and Prevention of Coal-Dust Explosions.

When the U. S. Congress first authorized an investigation of the causes of mine explosions few people in that country believed that coal dust alone could spread an explosion throughout a mine. Now, that the explosiveness of coal dust has been demonstrated by the bureau, through work in the laboratory, in the field, and in the experimental mine, the bureau's efforts are being directed toward the devising of effective and practical methods of preventing or arresting explosions. Through the development of rock-dust barriers and other devices, as described in another part of this report, the intensity of future coal-mine explosions will most certainly be decreased.

A careful study has been made of the inflammability of coal dust collected from hundreds of mines in different coal fields; a systematic investigation has been made of the possibility of coal-mine explosions starting from the improper use of explosives or the use of improper explosives, or from electric sparks, miners' lamps, mine fires, or other agencies; and various tentative conclusions and proposed recommendations regarding proper precautions are now being tested on a practical scale in the experimental coal mine 12 miles south of Pittsburgh. Through the lack of such an experimental mine properly equipped the progress of the work was delayed for several years; but during the past year the experiments in this mine have given promise of the early development of thoroughly practical preventive devices.

Improvement of Mining Explosives.

In connection with its investigation of explosives the bureau has brought about what is little short of a revolution through the introduction of new types of low-temperature, quick-flame powders, designated as "permissible explosives," of which, during the past

year, more than 25,000,000 pounds was used in the more dangerous coal mines of the United States. Metal-mining explosives should be investigated thoroughly. As indicating the efficacy of certain of these investigations of explosives, the president of the company operating one of the largest metal mines in America recently stated in a public address that the results of the bureau's explosives work, incomplete as it was, had brought about an actual saving to his company in this one mine (the Treadwell mine, Alaska) of \$80,000 yearly.

Development of Mine-Rescue and First-Aid Methods.

The bureau, with the co-operation of miners and mine operators, has developed its mine-rescue and first-aid work into an agency for aiding the rescue of miners imprisoned by mine disaster, for training miners in rescue methods and in first aid to the injured, and in advancing the general movement toward greater safety in all branches of mining. It is in this work that the bureau has recorded its most notable achievements. Nearly 100 men have been rescued from mines by employees of the bureau and a much larger number have been rescued by men who had received the bureau's training. Rescue and first-aid organizations have been established at many mines and more than 1,200 sets of rescue apparatus have been purchased by mine owners. The bureau itself now has eight mine-rescue cars traveling through the different mining districts in order to give instructions to miners in rescue, first aid, and safety methods. The bureau also has five mine-rescue stations in different coal fields from which it is carrying on similar work. Legislation now pending in Congress will, if enacted, provide for needed increase of equipment and personnel and permit the continuous operation of cars throughout the year. Not the least of the benefits resulting from the work of the mine-rescue cars and stations is the promotion of good citizenship among miners through the demonstration of the Government's interest in their welfare.

The Use of Electricity in Mines.

Through the activity of the bureau in calling attention to dangers heretofore unappreciated, in the use of electrical machinery in mines, manufacturers have devised safer types of apparatus and States have enacted stricter laws governing electric installations. An investigation of electric lamps for miners has resulted in greatly improving the types now offered for sale.

Other Mine-Safety Investigations.

During the year the bureau began on a small scale to make investigations looking to the reduction of accidents caused by falls of roof and by caving in mines, by the lack or the improper use of safety appliances in mining and metallurgical plants, by the use of improperly installed electrical apparatus in mines and mills, and by the use of improper explosives and the improper use of explosives in metal mines, quarries, and tunnels. The humanitarian motives for undertaking such investigations are obvious. A sufficient economic reason is that during the past year more than 3,000 men were killed and more than 100,000 were injured in the mining and metallurgical industries of the United States. One-half of these fatalities and three-fourths of the injuries may be regarded as easily preventable. The money loss from the accidents may be estimated at not less than \$12,000,000 a year, and this loss must be ultimately paid by the consumers of mineral products throughout the country.

Mineral Waste Investigations.

The investigations relating to mineral waste which were begun much later than those relating to safety in mines, have been confined to certain general inquiries and to specific investigations dealing with such topics as the waste from smelters and other metallurgical plants, the waste in the treatment of rare minerals and metals, and the waste in the mining and utilization of coal.

A preliminary inquiry as to the coking of coal in beehive ovens has shown that the total value of the by-products annually lost in the United States through the use of such ovens amounts to \$75,000,000. Although the desirability of developing by-product industries has been recognized, such development has now become an actual need, and the bureau is preparing for publication a report on the progress already made in utilizing the by-products of coke making.

The bureau has also ascertained that the annual waste of metals in brass-furnace practice amounts to over \$4,500,000, and has issued a report showing how this waste can be largely prevented by practical means.

By an expenditure of less than \$15,000 during the past 18 months there has been brought about a saving of natural gas worth not less than \$15,000,000, a sum many times greater than the total cost of all the work done by the bureau during the four years of its existence.

Chemists and engineers of the bureau have demonstrated that a process they have devised for the extraction of radium from its ores can be successfully used on a large scale and will prove more efficient than that used by the largest foreign producers of radium. Through this process it is possible that the cost of radium to the consumer will be reduced to one-third of the present price. The process is to be patented and dedicated to the public.

Other investigations dealing with mineral waste are already demonstrating the possibility of effecting on a commercial scale and without undue cost decided savings in the utilization of various minerals and metals. The need of such investigations should be obvious to anyone who remembers that there is but one supply, and that unreplaceable, of these resources, and that the total wastes or losses in mining and utilizing our mineral resources now amount to more than \$1,000,000 a day.

Fuel Investigations.

In regard to the fuel investigations of the U. S. Government, these until recently have been largely limited to coal. The bureau has developed methods upon which the Government now purchases its fuel supply and has effected savings in the fuel expenditure of the Government that far exceed the total annual cost of the work. In 1914 the value of the coal purchased by the U. S. Government under specifications prepared by the Bureau of Mines or under the advice of the bureau was more than \$8,000,000. In the same year, as a result of the selection of fuels best adapted to particular heating or power plants, and the constant checking, through the use of samples, of the quality of the coal delivered, the saving to the Government was \$200,000 as compared with the prices paid in previous years. Moreover, the beneficial results of the purchase of coal under specifications have been perceived by many cities, and the savings reported by them last year amounted to thousands of dollars.

A further result of the bureau's fuel investigations is the compilation of a series of comparable analyses of the coals found in different parts of the United States, which are of the greatest value to Government engineers and purchasing agents and to all large users of coal.

The results of other fuel investigations published by the bureau have served as a basis for improving boilers such as are used to heat public buildings and for the development of a new type of power-plant boilers. Moreover, these investigations have stimulated the development of more efficient gas producers. Investigations of house-heating equipment adapted to the needs of Army posts, naval stations, and public buildings under the Treasury Department throughout the country are developing results that must prove of great value to the heating of private buildings.

COAL AT TULAMEEN, BRITISH COLUMBIA.

Three or four years ago the Columbia Coal and Coke Co., an organization in which Winnipeg, Manitoba, men were largely interested, undertook to open coal measures occurring in the neighborhood of Tulameen river, between Granite creek and Collins gulch. Prior to this company obtaining possession of the property, much prospecting had been done by a British syndicate, under option of purchase, and some good coal had been opened high up the hill on the north fork of Granite Creek. The company, however, did most of its development work from the Tulameen river side of the property, starting a crosscut adit at 710 ft. above the Coalmont townsite, situated in the Tulameen valley and owned by the company. This adit was driven 2300 ft. and it cut a 16-ft. coal seam at 1,900 ft. from the portal; levels were driven on this seam, to the east for 400 ft. and to the west for 850 ft. In 1912 work was concentrated on the west side of the adit; it consisted chiefly of driving main and counter gangways with crosscuts, but great trouble was experienced in keeping the roadways open. Prospecting was also done at what was known as the "Bear's Den," situated about 3,500 ft. northwest of the main adit and at an elevation 1,000 ft. higher; here the No. 1 drift was driven 250 ft. on No. 3 seam, while a crosscut from this working cut No. 2 seam at 150 ft., and the latter seam was opened for a distance of 100 ft. However, coal was not produced on a commercial scale, and in the spring of 1913 operations were suspended.

Late in 1913 control of the property was secured by a Vancouver, B.C., syndicate, and in November work was resumed. An official report for the year includes the following: "The work so far has been confined to exploration on the north fork of Granite creek, and principally in what are termed Nos. 2 and 4 tunnels. The No. 2 tunnel, which had previously been driven a distance of 820 ft. on a seam of coal and shale-bands about 60 ft. thick, was extended another 50 ft., and crosscuts driven to both walls for the purpose of taking samples to demonstrate the quality of the coal. No. 4 tunnel, previously driven 210 ft., was extended another 40 ft., and a similar procedure followed as in No. 2."

Little information had been made public during the current year as to progress made, though it was understood that operations were only on a small scale. However, there now appears to be reason to look for an early improvement in the local situation, judging by the following account published in the Hedley Gazette of November 26:

"A most gratifying strike was made at the Coalmont mine a few days ago when, in the course of development a newly-driven tunnel entered a seam of coal, lying in an excellent position for working, with a good floor and roof. The quality of the coal is finer than that of any encountered hitherto. It is of a high grade and has very little rock mixed with it. Though expected by all in the community, this latest development is a source of quiet satisfaction to all who have interests at stake in the town or mine.

"Considerable activity is noticeable in the office department and it is stated that a prospectus is being prepared with a view to raising money to place the mine on a substantial shipping basis. The question of getting the coal from the mine to the shipping point has been settled. For a time it was undecided as to whether an aerial tramway or a surface tramway would provide the best means for bringing the coal down. In the former case two overhead cables would have to be strung over the top of the mountain and straight down to a point whence a connection could be made with the Great Northern railway across the Tulameen river at Coalmont. A right-of-way for the aerial tramway was begun in the autumn and completed quite recently; but now it is understood that this project will be abandoned in favor of a surface tramway, which is to be built through "The Gap" near where the present wagon-road leads to the mine. This decision is doubly satisfactory, since it suggests operations on a large scale, the great objection to the aerial tramway being that it would not be equal to handling a large output of coal. It would also seem to indicate that sufficient capital is actually in sight to put the more expensive project through.

"After all its ups and downs Coalmont bids fair to come into its own, and that dawning prosperity is well deserved. The possession, in commercial quantities, of high-grade coal with good coking possibilities is sure to have a tremendous effect on the commercial activities of the entire Similkameen district."

MONTREAL MINING EXCHANGE.

The Montreal Mining Exchange announces officially that it is open for business again and is prepared to buy and sell mining shares at unrestricted prices.

The exchange closed up when the war broke out, along with all other exchanges, and has been idle ever since.

The re-opening of the Standard Exchange in Toronto for dealings in mining stocks has proved such a success that it has paved the way for dealings in Montreal.

THE CYANIDE SUPPLY.

According to Mr. A. A. Cole, mining engineer of the Ontario Government Railway Commission, cyanide plants at Cobalt and Porcupine are well supplied with cyanide and satisfactory arrangements have been made for future supplies. Mr. Cole states in the November Bulletin of the Canadian Mining Institute that consumption in Northern Ontario is now 70 tons per month.

The mining companies now using cyanide in Northern Ontario are: At Cobalt:—Nipissing, Dominion Reduction, O'Brien, and Buffalo. At Porcupine:—Hollinger, Dome, McIntyre, Vipond and Porcupine Crown. To these will likely be added early in 1915; Cobalt Reduction, at Cobalt; and Tough Oakes, at Kirkland Lake.

The present price is 18 cents per pound.

PERSONAL AND GENERAL

Mr. I. P. Rexford has resigned his position as a director of the Crown Reserve Mining Co.

The eighteenth annual dinner of the Engineering Society of Queen's University will be held on Dec. 15th, 1914, in Grant Hall.

At a meeting of the Council of the Canadian Mining Institute held in Toronto on Saturday, Dec. 5, it was decided to hold the annual meeting in Toronto in March, 1915.

Mr. M. E. Purcell, of Rossland, has been appointed a vice-president of the Canadian Mining Institute, to succeed the late W. F. Sutton.

Mr. H. P. H. Brumell, general manager of the Buckingham Graphite Co., attended a meeting of the Toronto branch of the Canadian Mining Institute on Dec. 5th, and gave an interesting talk on the graphite industry.

Mr. Gwynn G. Gibbins has returned to Montreal after making a six months' trip in the region of Great Slave Lake.

Mr. T. W. Gibson, Deputy Minister of Mines, has returned to Toronto after visiting Northern Ontario mining districts, including Sudbury, Cobalt, Porcupine and Kirkland Lake.

Mr. Hermann C. Bellinger, of Spokane, Washington, U.S.A., was at La Junta, Rancagua, in the province of O'Higgins, Chile, last month, on a visit to the Braden Copper Co.'s mines and smeltery. The mines are distant rather more than 200 miles by railway from Valparaiso, at an elevation of 8,000 to 9,000 ft., in a very rugged region on a part of the main range of the Andes mountains.

Mr. J. W. Bryant, for several years mine manager for the Tye Copper Co., with mines on Vancouver Island, British Columbia, and afterward in Southern Yukon, near Windy Arm, is now manager for the Spassky Copper Mine, Ltd., a British company, having two main groups of properties in the Kirghiz Steppes, about 300 miles apart, one group being 200 and the other 500 miles from the nearest point on the Trans-Siberian railway, Russia. One group includes the Yuspensski copper mine, the ore of which runs high in copper.

Mr. Henry Harris, for seven or eight years general manager for the Tasmanian Smelting Co., with reduction works at Zeehan, on the west coast of Tasmania, is reported to have resigned that position and to have become manager of the works of H. J. Enthoven & Sons, Ltd., Rotherwhite, England. Mr. Harris before going to Tasmania was for some time assistant superintendent at the Brown Alaska Company's smelting works at Hadley, Prince of Wales Island, Southeast Alaska, under Mr. Thomas Kiddie, and in earlier years was assistant to Mr. Robert R. Hedley, then superintendent of the Hall Mines Co.'s smelting works at Nelson, B.C.

Mr. Robert C. Sticht, at one time superintendent of the A. S. and R. Co.'s smelting works at Great Falls, Montana, and in recent years general manager for the Mt. Lyell Mining and Railway Co., Ltd., with mines in the Mt. Lyell and other districts of Tasmania, and smelting works at Queenstown, in the same State of the Australian Commonwealth, was in New York City recently. He was announced to speak before the New York section of the American Institute of Mining Engineers on Dec. 2.

Mr. Melbourne Bailey, manager of Mr. John Hopp's placer gold mines near Barkerville, Cariboo, B.C., has gone to his home in Tacoma, Washington, U. S. A., for the winter.

Mr. Frank Breeze, mining superintendent for the North Columbia Gold Mining Co., operating hydraulic mines in Atlin district, British Columbia, has gone to Cincinnati, O., the company's headquarters, to report on the season's gold mining operations.

Mr. C. M. Campbell, superintendent of the Granby Consolidated Co.'s copper mines at Phoenix, Boundary district, B.C., has been in Vancouver consulting with the general manager concerning a resumption of work after four months' inactivity at mines and smelting works.

Mr. W. J. Elmendorf, general manager for the Portland Canal Tunnels, Ltd., has been spending a week or two at Victoria and Seattle, Washington, after having been nearly all the year engaged in superintending deep-level development in the company's mining property near Stewart, Portland Canal, B.C.

Mr. Newton W. Emmens, of Vancouver, B.C., after having been engaged several months in investigating mining conditions in Camborne, Ferguson, and other mining camps of the Lardeau country, for the British Columbia Department of Mines, has made a lengthy report on numerous mining properties he visited, and generally on the mining industry of the district.

Mr. W. J. Hamilton, manager of the Cerro de Pasco mines and smelting works in Peru, who early last month was in Montana, U. S. A., studying some of the new methods of the Washoe smeltery, is a McGill man, he having graduated from the university in 1888.

Professor Andrew C. Lawson has been appointed dean of the School of Mining of the University of California. Prof. Lawson is a graduate of the University of Toronto.

Dr. T. O. Bosworth, of London, Eng., is in Toronto after spending several months in the Northwest of Canada examining oil prospects.

OBITUARY.

William MacGarvey.

A brief cable from London, Eng., on Dec. 7, 1914, advised relatives in London, Ont., of the death at Vienna, Austria, of William MacGarvey, the millionaire oil operator.

Mr. MacGarvey was 71 years old and was born at Huntington, Quebec. His early experiences in the Petrolea oil fields made him wealthy and he was Mayor of Petrolea many years. On going to Europe he became a leader in the oil business. Many of his immense holdings in Galicia, have been battle centres in the present war and his losses have been enormous. Mr. MacGarvey was decorated by Emperor Franz Joseph and the British Admiralty for services rendered at different times.

His brother James was murdered by Russian brigands. Mrs. (Dr.) Westland, of London, is a sister. His daughter is the wife of Count Zeppelin, son of the dirigible inventor, and another daughter is the wife of Col. Lavadel, of the Austrian army.

Mr. MacGarvey successfully fought the Standard Oil Company, preventing it from securing large holdings in Austria. The town Mrianpol, which he founded and where he had two thousand employees, was wiped off the map in a recent battle between Russians and Austrians.

SPECIAL CORRESPONDENCE

COBALT, GOWGANDA, AND ELK LAKE

Canadian Mining Institute.—At the best attended and most enthusiastic meeting of the Cobalt branch of the Canadian Mining Institute has held for some time it was decided to invite the Canadian Mining Institute to hold their annual meeting in Cobalt this year. It was referred to the Council, which is now meeting in Toronto. The motion was proposed by Mr. Stewart Thorne, seconded by Mr. N. R. Fisher, and carried after some discussion. A feature of the meeting, if it were here in Cobalt, would be an excursion to Porcupine.

The annual meeting was to have been held in the West this year, but the secretary of that section of the Institute wrote stating that they would prefer that they should be allowed to have the meeting at some date when a larger proportion of the eastern members would be likely to go west. The alternate proposal was the visit to Cobalt. It was stated at the meeting that there was a disposition to hold the meeting at Cobalt in 1915, and that if arrangements could be perfected locally it probably would come north for the first time. The secretary of the Institute wrote suggesting that the annual dinner and meeting be held in Toronto and that the latter days of the meeting should be spent in Cobalt with an excursion to Porcupine. This did not meet with the approval of the members and finally it was decided to invite the Institute to Cobalt.

The chairman, Mr. B. Neilly, read a list of papers that would be given this winter that proved conclusively that the Cobalt branch will have a busy and interesting winter. Papers had been promised by Dr. J. Mackintosh Bell on the argentiferous veins of the Porcupine district, Mr. A. R. Globe will give a paper on the Hollinger mine, and Mr. R. B. Watson on the essential points in an annual report. Mr. Lorne Campbell gave a precis of his paper on the sampling of the Cobalt ores, which has already been published by the Institute. A short but interesting discussion followed. Mr. R. B. Watson, in asking some questions paid a tribute to the accurate sampling of the Campbell and Deyell plant and a very cordial vote of thanks was passed to Mr. Campbell for his address.

The branch passed a vote of condolence to Mrs. C. C. Farr on the death of the late Mr. C. C. Farr. Mr. Farr was not a member of the Institute, but he had always taken a keen interest in its doings.

There were between 30 and 40 members present.

Buffalo.—When the Buffalo mines started up on Dec. 7th, the last of the big mines which closed down when the war started, is working at full strength again. For the time the high grade mill and the refinery will not be run and the concentrates from the low grade mill will be stored until the price shows signs of improvement.

The Buffalo stopped most of its underground work in August, but has gradually been picking up men until they had between ninety and a hundred at work. Now they have two hundred on the pay roll, which is almost as many as when they ceased operations. A very vigorous plan of development has been outlined and is being carried out. All old employees were given preference out of the large number applying for work when the news became known that the property was resuming at full strength. Mr. T. R. Jones is himself

in sole charge of the property and has returned to Cobalt to live.

McKinley-Darragh-Savage has declared a regular dividend of three per cent. payable on January 1st. This brings the total up to 196 per cent. on the capitalization or \$4,404,708.

Pebble Supply.—The shortage of pebbles for the many mills in the Cobalt and Porcupine camp has been overcome by the finding of a market in Newfoundland. All the pebbles used in the mills before the war came from Denmark. Their shipment has been cut off by the war. It was stated before the war that the Newfoundland pebbles were not sufficiently hard and in consequence very few of them were used. They are now being given a fair trial. No less than 1,200 tons was purchased from Newfoundland some months ago to be distributed among the mines of Northern Ontario.

Quicksilver again is a commodity that has been greatly affected by the war. Much of it was being obtained from Austria before the war. Now that source of supply has been cut off, unless it is smuggled over the borders into Italy and shipped from the latter's neutral ports.

Shipments.—There have been practically no shipments of bullion during the past three weeks. Producing companies are storing all their bullion and are obtaining advances on it from New York. Little advantage is being taken of the Government's offer to back the banks if they would lend cash on bullion as collateral.

Timiskaming is having some success in development in the diabase at the 750 ft. level. Two veins of high grade ore have now been opened up and are being developed. A winze has been started on the main vein found at the 750 ft. and at 25 ft. down both grade and width were still good. At the mill twenty stamps are dropping with a capacity of between 60 and 70 tons daily.

Curry.—The only property at present working in the South Porcupine camp is the Curry. One hundred feet below the 300 ft. level a station is now being cut on this property, which adjoins the Wettlaufer. At this depth the vein is 18 in. wide of calcite, smaltite and miccolite; but silver values are small.

Lignite.—Interesting but altogether too indefinite to be of any importance is the discovery of lignite at the bottom of a well at North Cobalt. The discovery was made at a depth of 25 ft. when a householder was boring for water. The cutter brought up fragments of lignite, which were sent to laboratories by the Timiskaming and Northern Ontario Railway Commission. On analysis it was found that it was real lignite, with a 50 per cent. ash. The Timiskaming and Northern Ontario Railway Commission has let a contract to sink test pits to a depth of 25 ft. to discover the extent of the bed. The discovery was made within a hundred yards of the Nipissing Central railway tracks.

PORCUPINE AND KIRKLAND LAKE

Jupiter.—The visit of all but one of the board of McKinley-Darragh-Savage directors to the Jupiter at Porcupine has excited a good deal of comment as to the action of the company in deciding as to whether they will take up the option on the Porcupine property. This option expires on Dec. 15th. Developments at the Jupiter mine have been much more satisfactory

latterly, and it is confidently anticipated that the option will be taken up, though no official announcement has been made to date.

Teck-Hughes.—The Nipissing Mining Company has made another payment on the Teck-Hughes. At the 185 ft. level the ore is very rich; but the shoot is not as long as at the upper level. The prospect was promising enough, however, to induce the big Cobalt company to make a payment.

Goldfields, Limited, at Larder Lake, has decided to close down indefinitely. A contract was let for 100 ft. of sinking some months ago, otherwise there has been no activity at the property for a year or more.

Wolf Lake.—The agreement between the Huronian Belt Mining Company and the owners of the Murray-Mogridge claims at Wolf Lake has been signed. These properties consist of large veins of low grade ore. The company has until the middle of next month before commencing work, and the first substantial payment will not be made for six months.

Ogden.—A contract has been let for a crosscut of 200 ft. on the Hayden Mining Co.'s property in Ogden township. The work will be carried on at the 100 ft. level.

Dome.—A difficulty has been encountered in the diamond drilling at the Dome mines. It was found that the drills were showing such a very decided deviation from the vertical that the value of the cores for a basis of the revaluation of the mine would have been questionable. The drills were accordingly pulled up and one is now being operated with a view of discovering if it is possible to put down holes straight enough to be of exact value in estimating the grade of ore available below the levels at which the mine is now being worked.

Hollinger.—For the four weeks ending Nov. 4 the Hollinger gross profits amounted to \$162,885. Ten dividends amounting to \$990,000 have been paid this year, and there is still a surplus of \$1,173,640. The mill ran 88 per cent. of the possible running time during the four weeks, treating 18,645 tons, all of which was Hollinger ore, although the development of the Acme is now proceeding very rapidly indeed. The average value of the ore treated was \$14.09 per ton, which is higher than the average. The milling costs were \$1.250 and the mining costs \$2.232 per ton, and total costs were \$4.488 per ton. In the mining costs the amount spent in exploration is still negligible, the amounts being constituted as follows: Exploration, \$0.064; development, \$0.538; production, \$1.630.

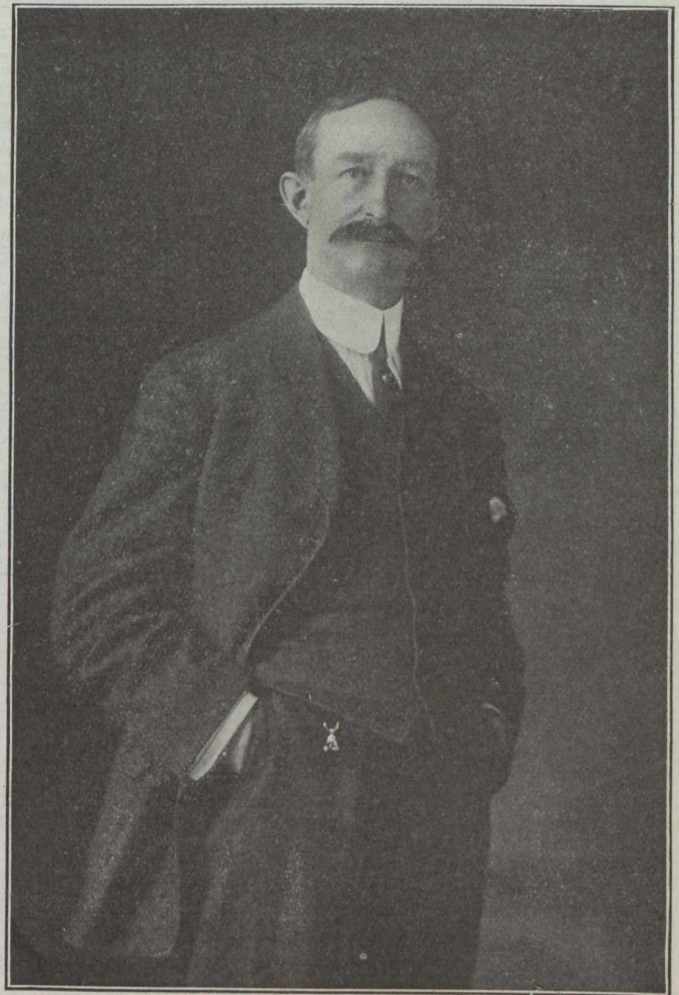
At the 800 ft. level ore has been cut in a winze. This ore is of average grade and width and is in all probability No. 1, although it was not cut in exactly the same position as anticipated. As two units of the central air compressing plant are now in operation, it is possible to at last obtain a more desirable ratio of drills on development and exploration compared with those on production. The actual ore reserves of the mine should be very largely extended within the next six months.

BRITISH COLUMBIA

Granby.—One of the chief items of British Columbia mining news at the beginning of December was an announcement that the Granby Consolidated Mining, Smelting & Power Co., was arranging to resume operations at its copper mines, near Phoenix, Boundary district, and its smelting works at Grand Forks. Early in August, following the practical collapse of the metal markets and the consequent suspension of sales of copper, the

company found it necessary to close its mines at Phoenix, the copper content of the ore occurring there being too small to allow of operations at a profit under then existing conditions of low prices and little demand for copper. The company continued work at its Hidden Creek mines and smelting works at Anyox, Observatory inlet, however, for the ore being mined at that Coast district property contains more than twice as much copper as that at Phoenix, so approximately 1,000 tons of ore a day has been smelted throughout the months that have elapsed since the commencement of operations at the Anyox works.

The effect of the closing of the Granby mines and smelting works in Boundary district was distinctly bad,



Prof. GEO. GUESS, University of Toronto
To whom is attributed much of the credit for improved smelter practice at Anyox, B.C.

especially for married employees of the company, for with the exception of the Jewel gold mine, there was no other mine within fifty or more miles of Greenwood or Phoenix at which work was being done, other than a little prospecting, or to meet annual assessment requirements. Some of the men from both mines and smeltery went north, to Anyox, but a considerable number remained in the Boundary, and with the winter coming on the outlook for them was most serious. Under these circumstances a meeting was held at Phoenix on November 12, "to consider suggestions for the amelioration of distress consequent on the closing of the mines, the only source of local revenue." At that meeting, the company's mine superintendent stated that he had some time previously addressed a letter to the general manag-

er outlining the situation at and around Phoenix, and suggesting that, if possible, the company proceed with certain development and exploratory work. Unfortunately, however, he had received an unfavorable reply, the company's attention being for the time directed to its affairs in connection with its Hidden Creek mine. He thought, though, that as the Government had seen fit to bonus the lead, iron and steel industries, there was no good reason why the line should be drawn at the copper industry. Although he could not speak with authority, he ventured the opinion that if some inducement was held out by the Government, the Granby Co. directors might be induced to operate its local mines and smeltery on a reduced scale. He did not know whether or not the feeling was general, but he had heard that there was a disposition among some of the men to accept a reduction of wages for the time being. There was one thing quite evident, namely, that there was no profit for the Granby Co.'s Phoenix mines with copper at only 11 cents a pound. After discussion, the meeting adopted the suggestion of the district representative in the Provincial Legislative Assembly and appointed a committee to draw up a statement of local conditions with recommendations made at the meeting and arrange for that committee accompanied by himself to wait on the Provincial Government.

At the end of November the general manager of the Granby Company and the district representative discussed the matter in Victoria with the Premier, Sir Richard McBride, who is also Provincial Minister of Mines, and as a result it was announced on December 1 that the Hon. the Premier had informed the Victoria Daily Colonist that a deputation from Boundary district had "made such representations to the Government and the Granby Co. as were helpful toward a successful solution of the problem involved in the re-opening of the Granby Co.'s mines and smeltery in Boundary district and the operating of its mining and smelting plants during the war."

In this connection, the Daily Colonist published the following statement made to it by the district representative: "The news of the re-opening of the Granby Co.'s plants in Boundary district will prove very welcome to the large number of men who were thrown out of employment when the company was compelled to discontinue mining and smelting operations nearly four months ago. Phoenix is purely a mining camp, and practically all the mining men living there have been out of work since early in August. The problem of relieving such a distressful situation has for some time been engaging the attention of all who have at heart the interests of that part of Boundary district. It was my privilege as member for the district to accompany a delegation from Phoenix when the members of it waited on the Premier and Attorney-General. As a result of our conferences and subsequent representations to the company, it has decided to resume operations at Phoenix and Grand Forks, although, of course, on a somewhat restricted basis. I have just been informed that the company intends to resume work at both those places during the first week in December, and to this month operate two blast furnaces, these together having a capacity of 900 tons of ore a day. In January four furnaces will be in blast, and then the works will be operating at about one-half its full capacity, and will treat 1,800 tons of ore a day. While the direct benefit to the men who will thus be again employed is obvious, the re-opening of the Granby Co.'s plants will have a much wider influence in restoring better conditions, for the railways which have been operating with fewer crews will

now employ more men, and there will, as well, be more men employed in mining coal and making coke at Crowsnest collieries."

General News.

The total quantity of ore from Rossland mines received at the Consolidated Co.'s smelting works at Trail during the eleven expired months of 1914 is approximately 264,000 tons.

The lead content of ore and concentrate received at Trail during ten months ended Oct. 31, 1914, was 45,287,856 lb. Allowing 4,000,000 lb. for December, it appears as if there will be a decrease of 6,000,000 lb. this year as compared with the total for 1913.

A carload of silver-lead ore has been shipped from the Early Bird, a small property situated on the west shore of Kootenay lake, near the town of Ainsworth. No ore was shipped during November from any other mine near Ainsworth, although development work was done on several properties.

At Princeton a local association is endeavoring to arrange for a comprehensive exhibit of minerals from Similkameen district to be included in the Canadian mineral exhibit at the Panama-Pacific Exposition, to be opened in San Francisco, California, next February.

Zinc ore is being shipped from the H. B. mine, near Salmo, Nelson mining division, to the Mineral Point Zinc Co.'s smeltery at Perdue, Ill., U.S.A. There is in the H. B. mine a large deposit of oxidized zinc ore, in places associated with lead ore which latter is sent to Trail as fast as mined, more than 2,000 tons of this product having been shipped in 1914.

Less than 1,000 tons of silver-lead ore was shipped from Slocan mines during eight weeks ended November 26. The chief individual shipping mines were: Rambler-Cariboo, 445 tons; Hewitt, 130 tons; J. L. Retallaek & Co., (Whitewater group), 123 tons; Slocan Star, 84 tons; Ruth, 83 tons, and Utica, 35 tons. Much development work is being done at other mines, some of which are preparing to ship when the snow roads and trails shall be hard enough for rawhiding or packing.

Last month a new arrangement was made for working the Crow's Nest Pass Coal Co.'s Coal Creek mines, this to be continued while the demand for coal is insufficient to require longer time to be worked. Morning shifts are worked each week in successive order until the required quantity of coal has been produced. It is stated that this arrangement obviates dissatisfaction that might otherwise be caused by an irregular method of working the coal mines.

The Hedley "Gazette" states that the Hedley Gold Mining Co.'s new power plant is slowly nearing completion, but much work remains to be done before it will be generating electricity. The cement work at the power house is not being done so fast as earlier, owing to a number of the men being idle while teams are hauling the generating machinery from the railway station at Hedley to the power house, a distance of between one and two miles.

Slocan mining notes include the following: A car of ore from the Mountain Con mine gave returns of silver to the value of \$686 to the ton of ore. A car of ore is being taken out at the Mercury; this ore assays 265 to 285 oz. silver to the ton and about 45 per cent. lead. The working forces at the Standard and Hewitt mines, near Silverton, were reduced about the middle of November, and it is possible still more men will be discharged unless better prices shall be obtainable for silver and lead than have ruled lately. Work has been stopped at the Apex, at which several men have been doing development the greater part of the year.

MINING IRON ORE.

Mr. P. B. McDonald in an article in *The Engineering Magazine*, says of mining methods in the Lake Superior iron districts:—

"The mining and stoping methods that have been introduced and contrived in the iron mines, usually by the ingenious Cornishmen, partake of a wide variety. In the extraction of such wide ore bodies, with often none too firm walls, it was obvious that if the ore was removed, leaving large open rooms, it would be dangerous to walk in them, on account of falling masses loosened by cracks and water. Iron ore is at best treacherous ground. Thus, a number of methods of stoping were perfected, which either allow no large open rooms, or else leave them behind in worked-out portions of the mine where it is never necessary for the miners to go. The free use of timber for holding up the back or roof was possible at first, but has become increasingly expensive, as timber rose in value, and the most popular methods are those which use little or no timber. Another consideration is the necessity for getting the ore out cheaply, consuming as little dynamite and as little manual labor, such as shovelling, as possible.

"As an illustration of a method which requires little timber, dynamite, and labor, the following is a system suitable for a wide ore body of medium hard ore. A great block of ore 250 by 200 by 100 feet high, is undercut 8 feet deep along one side, one end, and underneath, the exact amount of undercutting varying with the characteristics of the ore. The final removal of pillars from underneath the block is accomplished by simultaneous blasting. The block is then left to itself for seven or eight months, during which time it slowly caves down and grinds itself into small pieces suitable for shovelling. This tendency of some iron ore to rack and grind itself into small fragments, when undercut, is rather a peculiar fact; it of course saves breaking the ore up by dynamite. The whole affair takes place several hundred feet underground, and no one can see the grinding process taking place, as it would be dangerous to go into those workings, the miners being employed at other places in the mine. To remove the broken ore to the surface, timbered drifts can be driven in the loose material for shovelling into tram cars, or the caving could have been carried on above the main level, about 25 feet, in a "sub-level," and the broken-up ore now drawn off in chute-raises from which tram cars are loaded just as at a coal dock.

"Caving methods permit of much variation according to the form of the ore body, hardness or softness of the ore, etc. In nearly all of them, the surface of the ground over the ore body slowly settles down as it is undermined, and it is sometimes necessary to keep this surface material (sand and pebbles) from mixing with the ore by layers of timber laid closely. It is usual to cave from level to level as the mining goes deeper, the levels being generally 100 feet apart. With a very soft ore, caving in 10 or 12 feet horizontal slices is resorted to, working from the top down, hence the term top-slicing. If the ore is high grade as well as soft, and it is desired to get it all, shovelling and hand methods may be necessary, in which by removing 6 or 7 feet of a slice, only 3 or 4 feet can be caved, after which the sand or waste rock follows, kept from mixing with the ore by a matting of timber. Wheel-barrows or little sub-level cars may be used to get the broken ore to the chutes for dumping to the main-level tram cars (probably drawn by an electric loco-

otive), but wherever possible the ore is blasted or caved directly into the chutes, to save shovelling and handling, which are expensive. By systems of chute-raises and sub-levels (of which there may be three, 25 feet apart, between the main levels) the shovelling is frequently reduced to a minimum and made necessary only in driving the drifts and sub-drifts."

MINING MEN AT THE FRONT.

Mr. T. A. Rickard, editor of the *Mining Magazine*, London, has the following in the December 5 issue of the *Mining and Scientific Press*:—

Two days ago I went to the Hotel Cecil to see the Sportsman's Battalion, which assembles at that famous hostel. More particularly I went to see my friend J. H. Curle, the author of "The Gold Mines of the World," a writer well known on both sides of the Atlantic, and a former special contributor to the *Press*. The battalion consists of such men as himself, over age according to the recruiting requirements, but fit for military service and anxious to fight for their country. From 10 to 15 per cent. of those now in the battalion are too old or otherwise unfit, but the rest are first-rate material. Curle tells me that they have come from every corner of the map. He himself had just returned from Guiana, another in his section hailed from Trinidad, another from the Argentine, a fourth from Singapore, and a fifth from the Gold Coast. Among those in this battalion, which is attached to the Royal Fusiliers, are several mining men: J. H. Curle, W. S. Holloway, F. P. Bray, A. G. Bevan, G. R. Nicolaus and W. H. Rundall. They have now gone into camp at Romford, in Essex, to prepare for active service. Curle has a high opinion of his comrades; he says that he would go with them anywhere. They will give a good account of themselves, no doubt.

By the way, one of the London Scottish officers, writing home, explains that before going into action they had to spend several days getting used to the sight of the horrors of slaughter, which at first will nauseate and unnerve any man. The heaps of dead and dying on both sides, on the battlefield in Flanders are such as to appall the average man. Another soldier tells me he had not believed the stories of mass attack until he was in the trenches facing one of these assaults. The Germans came onward bravely and so thickly that he felt sure that every shot he took must have gone through half a dozen of them. Then when our fellows used the bayonet they screamed like wounded hares. No wonder. "Did you ever cry?" I asked. "Yes," he said, "one day I had been firing fast when my rifle jammed. I blubbered. It was the worst thing that could happen. But I knew that the regimental armorer was in a cottage a couple of hundred yards to the rear, so I bolted across the shell-swept ground to reach him. Half way across I heard a roar and glanced over my shoulder to see that a shell had fallen in the trench just where I had been placed. A second later another shell smashed the roof of the armorer's cottage and killed him. I took cover behind the ruined wall and found a brick, with which I loosened the breech-block. Then I felt better."

PORCUPINE VIPOND.

Production at the Vipond mine, Porcupine, in November is said to have been about \$25,000. Good progress has been made since the company was reorganized some months ago.

THE FIGHTERS

(From "London Daily Mirror.")

Kitchener sat in his London den,
 Silent and grim and grey,
 Making his plans with an iron pen,
 Just in Kitchener's way.
 And he saw where the clouds rose dark and dun
 And all that it meant he knew:
 "We shall want every man who can shoulder a gun
 To carry this thing right through!"
 Bravo Kitchener! Say what you want,
 And the world shall know, where our bugles blow,
 We've a man at the head—to-day!

Jellicoe rides on the grey north seas,
 Watching the enemy's lines,
 Where their lord high admirals skulk at ease,
 Inside of their hellish mines.
 They have drunk too deep to the boasted fight,
 They have vowed too mad a vow!
 What do they think—on the watch—to-night?
 What toast are they drinking now?
 Bravo, Jellicoe! Call them again,
 And whenever they take the call
 Show them the way, give them their "Day!"
 And settle it once for all!

And French is facing the enemy's front
 Stubbornly day by day,
 Taking the odds and bearing the brunt,
 Just in the Britishers' way.
 And he hears the message that makes him glad
 Ring through the smoke and flame:
 "Fight on, Tommy! Stick to them, lad!
 Jack's at the same old game!"
 Bravo, Tommy! Stand as you've stood,
 And, whether you win or fall,
 Show them you fight as gentlemen should,
 And die like gentlemen all.

So Kitchener plans in London Town,
 French is standing at bay,
 Jellicoe's ships rise up and down,
 Holding the sea's highway.
 And you that loaf where the skies are blue
 And play by a petticoat hem
 These are the men who are fighting for you!
 What are you doing for them?
 Bravo, then, for the men who fight!
 To hell with the men who play!
 It's a fight to the end for honor and friend,
 It's a fight for our lives to-day!

—FRED E. WEATHERLY.

MINING CONGRESS DISCUSSION.

At the meeting of the American Mining Congress, held in Phoenix, Arizona, last week, President Carl Scholz introduced two important subjects, namely: Arbitration of Industrial Disputes and Workmen's Compensation. His views were briefly put as follows:—

"It must remain a matter of honor between the two interests to avoid industrial conflicts. Under our constitution no compulsory measure can be enforced. It is not fair to ask employers to yield to unreasonable demands of employees because of any special or unusual business conditions existing, or by this denial bring about business interruptions or even bloodshed.

Likewise, is it not proper that employers should take undue advantage of their men under stress. Such actions encourage discrimination or other unreasonable attitudes at opportune occasions. Interruptions to mining do not end by affecting the employers and mine owners; the damage to the consumer and user of mining products may be much greater. I need only call attention to the expense which our coal consumers are put to every two years by storing vast quantities of coal in the face of uncertainty regarding the renewal of expiring wage agreements. Appeal to the patriotic spirit is not a cure, and it is proper that we duly consider the best solution of the subject by discussing it from every viewpoint and form some basic opinions.

"State legislation is more or less contagious—if one state considers a certain measure, and particularly one which meets popular favor, other states will endeavor to adopt it. The Workmen's Compensation bills have furnished their share of opportunity to the spectacular politicians by supporting this popular legislation, frequently under the disguise of desiring to appear more progressive and liberal than neighboring states. Many bills have been proposed which are unworthy of the cause they represent, and modifications will be proposed at the coming sessions.

"There is no question but that each industry should bear the cost of its toll of life and injuries. The injured workmen or their families should not be dependent upon charity. There may be no difference between the services of a soldier who draws a pension for giving his services to his country to defend it, perhaps, only for a short time, and the workman who gives his entire lifetime to build it up. The employer, to meet these expenses, must be placed in a position to earn the cost of this protection. The schedules of compensation must be fair to both sides, else the employers will not place themselves under the acts, which are optional and under our constitution cannot be made compulsory. The present method of litigation is wasteful, deprives the needy at the time when assistance is of the greatest value, often giving the greater sums to those least entitled, at the expense of those really deserving. This condition should not be permitted to continue.

"My own opinions differ somewhat from the expressed view of our committee, insofar as I believe the workmen should contribute a part of the cost of this insurance. It will make the plan more valuable to them. Their self interest will prevent unfair payments, because increases would have to be borne in part by themselves. Their ability to contribute can only be measured by the readiness with which the organized men pay dues and assessments, about 2 per cent. of their gross earnings being given to the union fund of the organized coal fields. Should they contribute an equal amount to the compensation fund in addition to the equivalent added by the employers, we would have a fund of 3 to 3½ cents per ton of coal, which is considered adequate at this time. Such contributions would entitle them to representation in the administration of the fund, which should be kept out of the reach of political influence.

TECK-HUGHES.

President A. D. Crooks is credited with stating that development work at the Teck-Hughes mine, Kirkland Lake district, is progressing favorably and that the Nipissing Company, which is doing the work under an option to purchase, has made payments as they have come due.

DIVIDENDS OF AMERICAN MINES AND WORKS.

Despite the fact that the American metal market has been about the most unsatisfactory in the history of mining, 119 companies paid dividends during the 11 months just ended totaling \$69,401,778. Add to this the disbursements of six securities-holding corporations of \$18,715,396 and we have a total of \$88,117,174. These figures are verified by reports made to Mining & Engineering World and are surely indicative of what a really great industry mining is, and what it can do under the most adverse conditions.

Reports available for a number of years back add further proof to the claim that mining when carried on as a business proposition is one of the most lucrative among American industries. A careful compilation of these reports shows that the 119 companies paying dividends so far in 1914 have enriched holders of their stock in the magnificent sum of \$1,085,681,600.

During 1914 but 23 copper companies paid dividends (as compared with 34 in the same period in 1913) of \$30,606,897 (\$43,607,211 in the 11 months of 1913). These 23 properties since incorporation have yielded profits in the shape of dividends amounting to \$413,584,141.

Eighty-seven companies operating properties classed as gold-silver-lead-zinc producers, paid dividends during the 11 months of 1914 amounting to \$24,714,728. Since incorporation these companies have disbursed \$306,210,315 on an issued capitalization of \$257,939,952.

Sixty-one of the above are located in the United States and they have to their credit for the year \$14,865,057 and since incorporation \$223,156,264, on an outstanding capital of \$179,805,923.

Twenty-one Canadian properties in the above class disbursed \$8,560,023 in 1914 and \$62,006,454 to date. This was done on an issued capitalization of \$62,596,326. When it is considered a large majority of these properties have been operated but a few years the result is certainly remarkable.

But five Mexican gold-silver-lead-zinc companies report dividend payments in 1914, these distributing \$1,299,654 and since incorporation \$21,047,597.

Seven metallurgical companies have had an excellent 7-months period for they have to their credit disbursements totaling \$12,631,209. Total disbursements amount to \$172,591,011.

The accompanying table gives the amounts of dividends paid during November, the date of payment and the amount per share.

	Nov.	Per share.	Amount.
Alaska-United, Alaska	28	\$.20	\$ 36,040
Alaska-Treadwell, Alaska	28	1.00	200,000
Alaska-Mexico, Alaska	28	.20	36,000
Amalgamated, Mont.	30	.50	769,430
Amparo, Mex.	10	.03	60,000
Bunker Hill Con., Cal.	4	.02 1/2	5,000
Caledonia, Idaho	5	.02	52,100
Center Creek, Mo.	1	.05	5,000
Coniagas, Ont.	2	.30	240,000
Crown Reserve, Ont.	16	.02	39,990
Fremont, Cal.	28	.02	4,000
Golden Cycle, Colo.	1	.02	300,000
Hazel, Cal.	5	.01	9,000
Hecla, Idaho	20	.01	10,000
Hollinger, Ont.	4	.15	90,000
Homestake, S. D.	25	.65	163,254
International Nickel, pfd.	2	1.50	138,689
Lucky Tiger, Mex.	20	.18	128,760

Nevada Wonder, Nev.	21	.05	7,041
Parrott, Mont.	30	.15	34,478
Right-of-Way	16	.01	16,855
South Eureka, Utah	15	.07	20,999
Temiscaming & H. B., Ont.	10	.07	23,283
Tom Reed, Cal.	20	3.00	36,382
United Verde, Ariz.	2	.75	225,000
Wasp No. 2, S. D.	15	.01	5,000
Yellow Pine, Nev.	25	.02	20,000
Yellow Aster, Cal.	25	.05	5,000

CANADIAN MINING INSTITUTE

A meeting of the Toronto Branch of the Canadian Mining Institute was held on Saturday, Dec. 5th, at the Engineers' Club. Several members of the Council, including President G. G. S. Lindsey, M. B. Baker, of Kingston; D. B. Dowling, Ottawa; Secretary H. Mortimer-Lamb, Montreal; A. A. Cole and Norman Fisher, of Cobalt; Dr. W. G. Miller, C. E. Smith, and James McEvoy, of Toronto, were present.

It was announced by members of the Council that the next annual meeting of the Institute will be held in Toronto. The Cobalt delegates brought an invitation from their Branch to hold the meeting at Cobalt. While several members of the Council favored this, a majority thought it would be inadvisable to go to Cobalt this year, and it was finally decided to meet in Toronto in March next.

President Lindsey gave some account of the condition of affairs of the Institute, and asked members not to forget that the Institute needs their assistance more than ever this year on account of conditions brought about by the war.

Mr. Cole and Mr. Fisher extended the greetings of the Cobalt Branch and told of the flourishing conditions of Porcupine, and of the fairly satisfactory conditions at Cobalt.

Mr. Dowling gave some account of the situation in the Calgary oil field, explaining that two companies are obtaining some oil, though not in large quantities.

Mr. Baker referred to the proposal to change the method of presenting papers at the Annual Meeting, urging that less time be given to the presentation of papers, and more time to discussion.

Mr. Lamb stated that several papers have been promised for the annual meeting.

Mr. H. P. H. Brumell, general manager of the Buckingham Graphite Co., gave an interesting account of the graphite industry in Canada. Replying to questions, he described the methods of treating the ore, and outlined the course of investigation which resulted in the designing of a very satisfactory method of concentrating the graphite flakes.

Deputy Minister T. W. Gibson was present for the first time in several months. He was heartily welcomed, and congratulated on his improved health.

Mr. Gibson has recently returned from a visit to Northern Ontario mining district, and in a brief talk he spoke very encouragingly of the industry.

The next meeting of the Toronto Branch will be held on Dec. 19th, at the Engineers' Club.

The mine output of gold in Colorado was valued at \$18,146,916 in 1913, against \$18,588,562 in 1912, a decrease of \$441,646.

The Cripple Creek district (Teller County) produced \$10,905,003 in 1913, or 60 per cent of the State yield, against \$11,008,362 in 1912.

COBALT SHIPMENTS.

Cobalt, Ont., December 7.—For the third time within the past six weeks, no bullion has left the Cobalt camp in the week. With the suspension of shipments from Nipissing, only some of the smaller shippers are left and these mines have bullion every other week. No announcement has been made by Nipissing regarding the shipment of bullion now stored at the property.

The steadier price of silver within the past few days is no doubt responsible for the larger shipments from camp and a further increase this month would result in an exceptionally heavy shipping list from the mines.

The Mining Corporation of Canada figure well up on the list during the week. From the Cobalt Lake three cars of high grade ore and concentrates went to Deloro, while the Townsite and City of Cobalt mines shipped one car of high grade to Denver.

McKinley-Darragh and Crown Reserve each had a car of high grade material, the latter being composed of high grade ore only, and La Rose sent out 43 tons of low grade.

The ore shipments for the week are:—

Mining Corporation of Canada :	
Cobalt Lake Mine.....	193,060
Townsite and City of Cobalt Mines.....	87,410
LaRose Mines.....	86,220
Coniagas Mines	125,880
Crown Reserve	37,545
McKinley-Darragh	61,600
Dominion Reduction Co.....	168,800
Total	760,515

Silver Bullion Shipments.

The bullion shipments for the week ending Dec. 11th, were:

	Oz.	Value.
Nipissing.	312,233.91	\$154,946.08
Dom. Red. Co.	55,419.00	27,400.00
Crown Reserve	30,500.00	15,000.00
	<hr/>	<hr/>
	398,152.91	\$197,346.08

COPPER EXPORT SITUATION.

The Wall Street Journal says:—"Italian steamship lines, operating out of New York, continue to refuse copper for shipment to north and south European ports. From this it is adduced that the conferences to date at Washington, between the diplomatic representatives of the several countries concerned, as to the status of export copper to neutral final destinations in neutral bottoms, have failed to provide a basis on which such copper may be handled without risk of delay or possible loss.

"Great Britain's stand on the export copper question seems to be one of calling into question every shipment that arrives in European waters; in other words, to assume the probability that every cargo of copper is destined ultimately for Germany or Austria. By way of justifying this stand, Great Britain is seeking to make clear that there has been an actual and material increase of imports of copper by neutral countries circumjacent to Germany, Austria and Turkey; that there is, in fact, an excess current absorption of copper by those neutrals and that this excess is sent across the borders into belligerent territory.

"Statistics have been collected by the British authorities bearing on the copper imports of the neutral countries on the consideration for a series of years past, to-

gether with other German statistics, and some of these are reported to have already been submitted to the State Department by the British Ambassador at Washington.

"The State Department is said to still have under examination the right of the British authorities to interfere with copper shipments to neutral countries. In connection with this, the department is also considering the arguments presented by the four big copper producers of the United States, protesting against interference with copper shipped in neutral vessels and billed to neutral consignees."

HOLLINGER.

The report of General Manager P. A. Robbins for the four weeks ending Nov. 4 1914, shows that Hollinger Gold Mines, Ltd., in that period made a gross profit of \$162,885.42, or over \$40,000 per week. The profit from Jan. 1 to Nov. 4, 1914, was \$1,477,956.16. During this period \$990,000 was distributed in dividends, and the surplus was increased from \$668,462.80 to \$1,173,640.38.

During the four week period ending Nov. 4, there was expended on plant \$31,237.03. Of this \$26,675.59 was for mill extension.

There was hoisted 18,434 tons ore, 3,133 tons from development and 15,301 from stopes. The average value of the ore hoisted was \$14.09.

Mining cost was \$2.23 per ton and milling cost \$1.25. The mill ran 88 per cent. of the possible running time, treating 18,645 tons, all of which was Hollinger ore.

The new central air compressing plant of the Canadian Mining & Finance Company, Limited, has been put into operation and the increased supply of air is making it possible to push underground development.

The 800-ft. level has been reached by a winze and ore (probably No. 1 vein) has been encountered at that level.

COPPER SEIZURES.

The steamship Ran has been seized by the British and taken into Liverpool. This vessel was bound for Sweden with a small cargo of copper, but must now share the fate of two ships preceding her to that country.

Within a fortnight the steamship Sif, destined for Malmoe, a naval port in Sweden, was taken off the coast of Scotland and the copper removed from the cargo. Early last week the steamship Sigrun bound for the same port and under similar conditions, was taken into Newport, while the Ran was conveyed into Liverpool on Tuesday. It is understood that between 1,500 and 2,000 tons of copper were on the three vessels.

The refusal of steamship companies to handle copper for Mediterranean ports during the past week or two has brought about lessened activity on the part of the British navy off Gibraltar, where about a dozen vessels were taken, all of which were forced to proceed without their copper.

Total copper seized by Great Britain, although consigned to neutral countries, now approximates 30,000,000 pounds.

GEOLOGICAL SURVEY PUBLICATIONS.

The Geological Survey has issued Museum Bulletins No. 3, The Anticosti Island Faunas, by W. H. Twenhofel, and No. 4, The Crowsnest Volcanics, by J. D. MacKenzie.

Recently published geological maps are Texada Island, B.C., and Franey mine and vicinity, Victoria Co., N.S.

USE OF MUD IN WELL DRILLING.

According to I. N. Knapp in a paper prepared for the February 1915 meeting of the American Institute of Mining Engineers clear or turbid water circulated in rotary drilling will erode the walls of the well particularly in loose sands and sandy materials and cause them to cave and to lose their cylindrical form. Sticky clays and such unconsolidated strata as can resist the erosion of circulating clear water will drill much faster with it than with mud on account of its solvent action. It is a matter of necessity however, to start with and keep a mud circulation of a standard that will resist erosion of the weakest sand strata, if the well is to be kept in proper cylindrical condition for successful cementation and completion. If the walls of a well in sand or other material cave, a large amount of such material will come out with the overflow. This caving increases enormously the area to be mudded off.

Clear or turbid water flowing on the surface will erode unconsolidated materials, the rate depending upon the velocity or grade and upon the volume. It has also a solvent or slacking action on earthy matter. If such flow was, for instance, through a shallow ditch it might perhaps cause the banks to cave sufficient to make a meander outside of the dug channel. If, however, clayey matter is added to the flowing water the erosive action weakens until a point is reached where erosion practically ceases and the suspended matter will begin to build up and protect the loose material. The solvent action also will be very much weakened and in such a case a shallow ditch in loose material will tend to keep its shape as dug. Clear water will continue to sink in sand or porous material in quantity for an indefinite time. Turbid water will gradually render sand or porous material impervious, but the suspended matter will be carried in and deposited in the sand to a considerable depth. A good mud (or mud-laden water) will render sand or porous materials impervious almost instantly and the penetration of the mud is small. These are all matters of common observation.

THE EXHAUSTION OF U. S. COAL FIELDS.

Mr. Carl Scholz in his presidential address to the American Mining Congress on Dec. 7, said of the coal resources of the United States:—

"I am not competent to speak authoritatively on the great amount of mineral resources available, but I have often endeavored to reconcile the statements published by the U. S. Geological Survey on the vast amount of coal available in certain fields with which I am quite familiar. These statements refer to all the coal in existence without distinguishing as to the cost of extraction; in fact, all government reports are silent on this point, and the ordinary reader naturally believes that the billions of tons of coal available can be produced at no greater cost than the present supply. This cannot be true, and in less time than the average man believes we will be forced to recognize the fact that even the largest coal fields are being exhausted very rapidly, and that the remaining coal while available, will cost many times over the present cost of production. Even within the limit of my personal experience many important mining centers have abandoned or gone back in their production. This may not indicate extraction of all the available coal, but certainly no more coal will be produced in these sections at the

present prices, and undoubtedly large proportions of the abandoned territories are lost forever, or can only be recovered at a greatly increased, or perhaps prohibitive, cost. The average life of a coal mine in this country is rarely in excess of 25 years. In the major portion of our coal fields, particularly the interior sections, rarely more than two or three workable veins exist in the same territory, frequently only one. I may mention the production has diminished, such as the northern coal field of Illinois and the Hocking Valley field of Ohio. In the Great Kanawha district of West Virginia all of the coal along the river has been worked out or abandoned and the newer mines have been located along creeks and tributaries to the river. If these mines are worked out in as short a period as those along the river front, it will not take very many generations to exhaust the field."

LARGE INCREASE IN U. S. ZINC EXPORTS.

All records in exportations of U. S. zinc were surpassed during last three months, at 65,504,574 pounds, valued at \$4,443,381, compared with 1,346,877 pounds, valued at \$80,756, a year ago. A Washington report states that exports of domestic zinc in pigs, ingots, bars, etc., in last three months exceeded the total for the seven-year period ended June, 1914. In last four fiscal years zinc exports averaged 12,800,000 pounds per annum. In 1897, the former record year, the total was 35,869,987 pounds. That was surpassed by September last, with 38,090,144 pounds.

The unusually large exports were sent chiefly to Europe. In September, when exports of zinc pigs, etc., rose to the highest point ever known, 28,000,000 pounds was sent to England, 3,000,000 pounds each to Scotland and France, and 333,000 pounds each to Denmark and Italy, while 1,250,000 pounds went to British Africa, and 250,000 pounds to Australia.

Exportation of 65,504,574 pounds in three months ended with October represents about 10 per cent. of annual domestic product, which in 1912 amounted to 647,814,000 pounds.

GRANBY CONSOLIDATED.

Boston—A production of 2,000,000 pounds of copper from two furnaces of the Hidden Creek smelter during November was accomplished, according to preliminary returns. In October the yield was 1,794,308 pounds turned out at a cost of 6½ cents a pound at the smelter. An even better showing in the matter of costs may be shown for the past month.

By the first of July Hidden Creek will have a largely increased output at a cost of close to 7½ cents a pound, f.o.b. New York.

Against less than 18 pounds recovery from the Phoenix property, now idle, the Hidden Creek mine has been yielding 40 pounds of copper net per ton. The ultimate cost at this property will be lowered to seven cents a pound if indications prove up.

The company has placed its management control in the hands of an "operating committee" of three directors—something unique in mining affairs.

Lake Superior iron ore shipments for season of 1914 totaled 32,021,000 tons, or 17,048,000 tons below the movement of 1913.

COAL MINING PRACTICE IN ILLINOIS.

The explosion at the North Mine, Royalton, Illinois, on October 27, 1914, in which 52 lives were lost, adds force to the recommendations leading to safer mining made in Bulletin 8, Coal Mining Practice in District VI., by S. O. Andros. This bulletin, published by the Illinois Coal Mining Investigations Co-operative Agreement, describes methods of mining in bed 6 east of the Duquoinanticine in Frankline, Jackson, Perry and Williamson Counties. This district, with an annual production of over 12 million tons, is one of the most important in Illinois and its undeveloped coal resources are so great that it will doubtless become the most important. The output of the district is 20.8 per cent. of the total production of Illinois. The face workers average 7.6 tons of coal daily as compared with an average of 5.9 tons per face worker in the mines of all other districts in the State.

Bed 6 in this district varies in thickness from 7½ to 14 feet and averages over 9 feet.

The subject of ventilation is a vital one to the district inasmuch as there have been serious explosions of gas and dust in many mines resulting in much loss of life and destruction of property. The disastrous explosion at the Zeigler Mine in 1905 and the fire in 1908 will be recalled by those familiar with Illinois mining history. Frequent explosions of less magnitude in other mines, many of them resulting in loss of life and all of them entailing great expense in recovering the mine or a portion of it, have caused this district to be regarded properly as a dangerous one.

Copies of this bulletin may be obtained upon request from the Illinois Coal Mining Investigations, Urban, Illinois.

IMPORTS OF CYANIDE.

According to J. McLeish, chief of the division of statistics, Mines Branch, direct returns have not been received from Canadian mining companies with respect to their consumption of cyanide, but in view of the fact that there is no local production, a fairly accurate estimate of the consumption in Canada will be furnished by the record of imports. The imports of all cyanides for metallurgical purposes in 1911 totalled 308 tons, or an average of about 25 tons per month. The imports in 1912 totalled 475 tons, or an average of nearly 40 tons per month. The imports in 1913 totalled 708 tons, or an average of 59 tons per month. During the first six months of 1914 the imports totalled 227 tons, or an average of only 38 tons per month, but in the month of August the imports increased to 130 tons.

The large increase in August was due to anxiety concerning the supply. There is now good reason to believe that all ordinary orders can be filled however. It is expected that a very large increase in consumption of cyanide will be recorded in 1915.

MOND NICKEL.

In announcing an issue of £500,000 six per cent. debentures, at 99, in London this week the Mond Nickel Company achieved the distinction of putting out the first Canadian capital issue in London since the outbreak of war. There was a full four months' cessation of all Canadian capital issues, in the London market.

This newly issued stock ranks after the £3,750,000 five per cent. first mortgage debenture stock, subject to which it is a floating charge upon the undertaking and assets of the company.

The outstanding feature of the new issue as affecting the Dominion is the further announcement that the proceeds will go to further extensions to plant in Canada.

The Mond Nickel Company, which was organized in 1901, to acquire the process for the extraction of nickel invented by Dr. Ludwig Mond, as well as the latter's nickel and copper mines in Ontario and refining plant at Swansea, Wales, has made dramatic progress in its comparatively short career.

The net profit of the company grew from £2,095 in 1902, to £297,614 in the year ended April 30, 1914. The dividend of the ordinary shares, which was started at 6 per cent. in 1905, advanced by steady stages to 21¼ per cent. in 1912-13, and to 35 per cent. in 1913-14. On the deferred capital of £50,000 the company paid dividends ranging from 18 per cent. in 1906, to 85 per cent. in 1912-13.

This spring the company announced a re-organization plan by which its ordinary shareholders received 1 preference share and 1½ new ordinary shares for every ordinary share previously held. The distribution, it was explained, was with a view to bringing the capitalization of the company into closer relation with the real value of the assets which had proved much greater than at first estimated.—Financial Times.

MR. SCHWAB'S VISIT TO MONTREAL.

Montreal, Dec. 7.—The possibility of the construction by Charles M. Schwab, of the Bethlehem Steel Corporation, of destroyers and submarines in Montreal, secured strong support to-day, when it became known that during his visit to this city he inspected the shipbuilding and repairing plant of the Vickers-Maxim Company of Canada.

It is known that Mr. Schwab discussed the valuation of the plant and the work which it had on hand which might interfere with its carrying out a portion of a contract for the construction of destroyers and submarines.

No confirmation of the report that war craft will be built here was obtainable to-day from the Vickers-Maxim Company, though in the light of the fact that a meeting of its directors is being held this afternoon it is expected to have some bearing upon the matter.

Mr. Schwab was accompanied by engineers from the Fall River Shipbuilding Co.

Bethlehem Steel has been acting under advice of the most eminent international lawyers, and has held that it would be within the law to ship submarines in parts to belligerent countries. One manufacturer said the decision not to build submarines was not through fear that the law was being violated.

Prof. A. A. Michelson, winner in 1912 of Nobel prize for physical research, exhibited before National Academy of Sciences in Chicago, a bar of new steel which he claims has tensile strength many times greater than that of present product. Fortifications built of that metal, he said, might be made indestructible, thus achieving a long step toward elimination of warfare.

CALIFORNIA GOLD.

The mine production of gold in California in 1913 was \$20,406,958, against \$19,713,478 in 1912. The output from placers and gold-quartz, copper, and lead ores increased in 1913, but there was no recovery reported from zinc ores.

The deep mines of California yielded \$11,570,781 in gold in 1913 of which \$11,222,566 was derived from gold quartz ores (almost wholly gold milling), \$320,939 from copper ores, and \$27,276 from lead ores. The gold-quartz ores produced \$10,771,759 in 1912. The placers supplied \$8,836,177 in 1913, of which \$8,090,294 was produced by dredging (against \$7,429,955 in 1912), \$329,300 came from hydraulic mines, \$224,045 from surface or sluicing operations, and \$192,538 from drift mines, in ancient river channels.

The dredges produced nearly 40 per cent. of the total gold yield in 1913 and over 91 per cent. of the placer output. The total dredge production of gold in California from 1899 to the end of 1913 has been \$63,505,485, and during these 15 years the production has steadily increased, showing small decreases only in 1900, 1907, and 1912.

CHANGES AT QUEEN'S.

At a recent meeting of the Board of Governors of the School of Mining Profs. Malcolm and Ellis were given leave of absence from January 2nd in order to proceed overseas with the 5th Engineering Corps, and Prof. Malcolm was given the standing of Professor of Municipal Engineering. The resignation of J. E. Hyde, assistant professor of geology, who is going to the Western University, was accepted, the resignation to take effect the beginning of next session.

The board appointed Prof. A. E. Stone, Vancouver, B.C., as acting professor of municipal and structural engineering for the session, to take Prof. Malcolm's place, and J. B. Harvey, late assistant professor of surveying of McGill University, as acting professor of general engineering and surveying, to take Pro. Ellis' place. The board discussed ways and means of broadening the research work carried on by the school, and appointed committees to deal with different aspects of possible researches.

TRAIL SMELTER ORE.

Consolidated Mining and Smelting ore receipts at Trail smelter for week ending Dec. 3rd, 1914, and from Oct. 1st, 1914, to date, in tons:

Company's mines—		
Centre Star	2,636	30,884
Le Roi	2,182	23,060
Sullivan	1,011	8,240
Other mines	1,248	9,576
Total	7,077	71,760

HUDSON BAY RAILWAY.

From Le Pas to Thicket Portage, a distance of 185 miles, the new line has been practically completed. It will be remembered that a year ago this portion of the line, known as section 1, was graded for a distance of 130 miles, and had received steel for 60 miles. Section 2, extending from Thicket Portage to Split Lake, a distance of 68 miles, has been graded and steel is now being laid. On section 3, the remaining 165 miles between Split lake and Port Nelson, considerable clear-

ing and grading has been done. Officials of the Department of Railways and Canals, Ottawa, state that the work will be continued throughout the winter, and that completion of the Hudson Bay Railway may be looked for early in 1916.

THE MINING CORPORATION OF CANADA.

The Mining Corporation of Canada is making large shipments from its mines at Cobalt.

This company was incorporated March 20, 1914, with a capitalization of \$2,075,000 in shares of \$1 each. A dividend of 12½ per cent. was declared on Nov. 1 and paid on Nov. 16, 1914.

The directors are: Sir H. M. Pellatt, president; J. P. Watson, first vice-president; W. R. P. Parker, second vice-president; R. E. G. van Cutsen, George M. Clark, Graeme Watson and D'Arcy Weatherbe.

The mining properties of the Cobalt Townsite, Cobalt Lake, City of Cobalt and the Cobalt property of Townsite Extension were taken over by the corporation in April, 1914, and these companies have been wound up.

The office of the corporation is Traders Bank Bldg., Toronto. W. W. Perry is secretary.

The Steel Corporation is operating over 35 per cent. of ignot capacity, the best reported in several weeks. Orders appear more numerous, and it would not be surprising if operations were around 65 per cent. before the close of January, with prices \$1 or \$2 a ton higher.

Bethlehem Steel Co. ordnance plant is said to have all the business it can handle without construction of submarines, although the shipbuilding plants may be affected by decision not to build submarines for any belligerent nation. Whether some of this work will be carried on in Canada remains to be seen.

Two news despatches published in the Daily News, of Nelson, British Columbia, indicate an improvement in the mining situation in that province. One, from Fernie in Southeast Kootenay, dated Nov. 29th, was as follows: "The superintendent of the Kalispell (Montana) division of the Great Northern railway has been in Fernie since the 24th inst., conferring with, among others, the officials of the Crow's Nest Pass Coal Co., and it is stated that within the next week or ten days the coal order of the Great Northern railway, which has been slowly increasing for some time, will be placed on its old status, when it will be necessary for the coal mines to be worked full time. For some considerable time the miners have been working but a few shifts a week and full time will mean that the large number of unemployed miners will be given work." The other, from Grand Forks in Boundary district, also dated Nov. 29th, ran: "The Granby Co. yesterday afternoon gave notice that as soon as possible work would be resumed at the company's smelter here, by blowing in two blast furnaces, to be followed by two more as soon as conditions shall permit. Wages will be 25 per cent. less than prevailed at the time of the shut down in August." As the Granby Co.'s coke supply is obtained from the Crow's Nest Pass Coal Co. this will also favorably affect that company's coal mines.

SPELTER.

Boston, Dec. 10.

Spelter has advanced to 5.55 cents under continued heavy buying from abroad. With stock in producers' hands apparently reduced to a low point and with the Butte and Superior production out from the market the rise from below five cents a pound has been a logical result.

The former big buying movement during August and September, which carried spelter to above six cents, was the result of record-breaking exports during the latter month, the total being 38,090,144 lb.

Clearances during the first two weeks of November from the port of New York totaled slightly in excess of 6,000,000 lb.

With the cessation of shipment of zinc ores from Australia for treatment in Germany and Belgium Europe has been more and more dependent upon the United States for its spelter supply since the first of August.

WELLAND CANAL CONSTRUCTION.

Expenditures totaling about \$6,000,000 have been made on the Welland canal work this season. The contracts for sections 1, 2, 3 and 5 are reported about one-quarter completed. Together they total over \$20,000,000. The sections still to be contracted for will not be let until the existing contracts have advanced considerably further. Nearly 3,000 men are at work.

MICHIGAN SILVER.

The Michigan copper mines produced 295,173 fine ounces of silver in 1913, against 528,453 ounces in 1912, the decreased output being a reflection of the labor troubles of 1913, which caused a falling off in copper mining. The silver production is mainly from the electrolytic refining of the copper produced. The average recovery of silver per ton of ore treated in 1913 (both conglomerate and amygdaloid) was 0.04 ounce, against 0.05 ounce in 1912 and 0.04 ounce in 1911. Of the total production in 1913 Houghton County produced 253,030 ounces and Keweenaw County 42,143 ounces.

CALUMET AND HECLA.

For the second successive quarter Calumet and Hecla has passed its dividend. The passing of two disbursements in consecutive quarters has not happened heretofore since the mine went on a dividend basis 43 years ago.

The following statement is issued by the directors:

"Since the first of September the mine has been operated on three-quarters time, with a reduction of 10 per cent. in wages of the men and 15 per cent. in the pay of all salaried employees and officials.

"In the last few weeks the demand for copper has increased; but general conditions which affect the copper market are still so unsettled as not to warrant putting the men back on full time, nor the declaration of a dividend at the present time."

Mr. Wakely A. Williams, superintendent of smelters for the Granby Consolidated Co., has returned to Grand Forks, Boundary district, B.C., after having been closely employed the greater part of the year in constructing and equipping the company's smelting works at Anyox, Observatory inlet, and in getting the reduction plant in running order after its completion.

The Western Federation of Miners has called off the coal strike in Colorado.

The highest tariff in a decade has been put into effect on shipments of Michigan copper to eastern market points with the naming of 42½ cents per 100 pounds to New York and 44½ cents to Connecticut valley points. This represents an advance of seven cents per hundred-weight over the all-rail rate prevailing last winter and for the past nine or ten years following the closing of navigation. Lake producers believe that the next summer tariff will also be somewhat advanced from the 18½-cent schedule prevailing during the past few years.

Nipissing Mining Co., operating the Nipissing silver property at Cobalt, will have increased its surplus this year by between \$300,000 and \$400,000, according to present indications. This is after the payment of 20 per cent. dividends. Directors meet this month and will declare regular quarterly dividend of 5 per cent., it being the intention to continue to omit "extras" for the present.

Mr. Dudley Michel, instructor in First Aid to the Injured for the British Columbia Department of Mines, who has been occupied since last May in connection with the organization of first aid classes among metal miners in Kootenay and Boundary districts, and in giving instruction in the use of the Draeger pulmotor, was married on November 11th at Pilot Mound, Manitoba, to Miss Christina Marjory Little, daughter of Dr. Michael Little, of that place.

Henry Milton Grills is suing A. G. Penman in the non-jury Assize Court before Chief Justice Sir Glenholme Falconbridge, alleging that \$15,000 is due him from the sale of a mining claim west of Silver Lake in the Temagami Forest Reserve to Warren, Gzowski and Co. Plaintiff and defendant are real estate agents, and the former states that he and the defendant were engaged, while partners, by Warren, Gzowski & Co., to procure the right of sale of the mining claim in question. According to his view of the matter Mr. Penman entered into negotiations with Warren, Gzowski & Co., whereby he and Mr. Grills were to receive one-third interest in the mine. In 1909, he adds, Mr. Penman, without letting him know anything about it, had the one-third interest changed to a cash payment of \$30,000. Mr. Grills asserts that he only recently learned of this part of the transaction. Therefore he asks for an accounting and the sum of \$15,000. Mr. Penman denies that a partnership ever existed between the plaintiff and himself.

Gen. Villa has ordered bullion of American Smelting & Refining Co. returned to company "upon its settling with Gen. Garcia for expenses incurred."

Swedish state railways have asked American coal producers for offers for 130,000 tons of coal to be delivered next year.

The employees of Siemens Brothers' dynamo works have responded with great enthusiasm to the call to arms. A large number of men from their works and offices at Stafford, amounting in all to about 400, have already joined the forces, and, together with the reservists and volunteers from their head office, branch offices and other departments, the total amounts to over 520. The firm is arranging to keep the posts of all these men open, and ample provision is being made for all the dependents of those who have gone to serve.

WORKMEN'S COMPENSATION COMMITTEE.

The Ontario Government has announced that Mr. A. W. Wright and Mr. Geo. A. Kingston will serve with Chairman Samuel Price, K.C., of St. Thomas. Alexander Whyte Wright has been chosen as the second member and vice-chairman of the commission. Born at Elmira, Ont., about 70 years ago, his life has been largely spent in Canada. In 1895 he was appointed by the Dominion Government a commissioner to enquire into sweatshop conditions. In 1897 he went to New York to edit the American Artisan, having acquired considerable journalistic experience in his younger days as editor of the Guelph Herald, the Orangeville Sun, the Stratford Herald and Toronto National and Labor Reformer. On his return, some years later, he became Conservative organizer for Ontario. His present home is in Niagara, although he lived for many years in Toronto.

Samuel Price, K.C., whose appointment as chairman of the Commission was announced previously, is eminent among the lawyers of the province. He lives in St. Thomas, and specializes in actuarial work and the more abstruse branches of his profession. He has served on royal commissions, and once declined the chairmanship of the Ontario Railway Board.

The third member of the commission, George A. Kingston, is 45 years of age, and has lived in Toronto continuously since 1889. He was born near Stirling, in Hastings County. During the seven years which followed his graduation from Osgoode Hall in 1892, he practised law.

Chairman Price will receive \$10,000 annually as his salary; Mr. Wright, \$8,500, and Mr. Kingston, \$7,500.

It has been announced that the new Workmen's Compensation Act of Ontario will go into effect on January 1, 1915.

METAL OUTPUT OF ONTARIO.

Following is a summary of shipments of metalliferous ore from Ontario mines for the nine months ending September 30, 1914:

	Amount.	Value.
Gold, oz.	196,934	\$3,942,848
Silver, oz.	19,448,018	10,082,229
Copper, tons	11,585	1,664,896
Nickel, tons	18,085	4,023,556
Iron ore, tons	165,759	379,918
Pig iron, tons	495,161	6,444,213
Cobalt ore, tons	95	26,563
Cobalt and Nickel oxides, lbs.	852,014	454,687

GERMAN OIL SUPPLY.

There is no doubt that Germany is badly supplied with petroleum products, whether motor spirit, kerosene, or fuel oil, and that as the war progresses the scarcity of these is felt to an increasing degree.

Germany's direct oversea imports are stopped by the action of the British fleet; but there are certain channels through which petroleum supplies have reached Germany indirectly. Holland was one of these channels; but there is every reason to believe that, owing to the prompt measures taken by the Netherlands Government to secure the maintenance of strict neutrality, this route has been largely blocked.

There are in addition Denmark and the Scandinavian countries. One of the active spots in a very apathetic

oil export market in New York has been the persistent enquiry for refined oil in barrels for these parts, and the unusual chartering of Norwegian and Danish steamers to carry these cargoes. Scores of thousands of barrels a week have been thus arranged for; and there has been no secret about where the oil was going; in fact, the correspondent of one well-known American paper openly stated that it was for Germany.

Fortunately the British authorities at home are aware of this important movement; and we may have every confidence that prompt and vigorous steps will be taken to counteract it.

Germany's only remaining source of overland supplies, now that Russia and Austria are no longer available, is Roumania; and during the last few days news has reached London that considerable quantities of motor spirits were being imported thence via Hungary. Of course no British-owned oil company is engaged in this traffic; but one must remember that the largest petroleum corporation in Roumania, the Steaua Romana, is under German control. It is believed to be this concern which is making the deliveries.—Oil News.

Readers of this journal who are familiar with mine-rescue work will probably be interested in the following extract from the columns of "Mining and Scientific Press," San Francisco: "At the Labor Day first-aid and mine-rescue celebration at the University of Nevada in September, one of the interesting events was the demonstration made by E. P. Cullinan, chief electrician of the Tonopah Belmont Co., of his method by which one man can carry two unconscious men from a mine, although the burden may be more than twice the weight of the rescuer. To illustrate his method, Mr. Cullinan, who weighs 140 lbs., placed two men on the ground, the first on his stomach and the other in the same position on top of him, with arms extended forward over and beyond the shoulders of the first man. Taking a position at the head of the two men, Mr. Cullinan raised their heads and bodies to an angle of about 45 deg., then loosening his hold he ducked under them as their bodies fell, and caught them on his back. Then securing a lock hold at the knee and arms, he rose with the two men on his back, and in that position was able to carry them a considerable distance. The combined weight of the two men whom Mr. Cullinan carried was 335 lbs. The method has been named the 'Nevada one-man carry,' and it is a distinct innovation in the mine-rescue work."

KEWAGAMA.

The Department of Mines, Ottawa, has issued a geological map of the Kewagama district, Quebec, north east of Lake Timiskaming. The northern part of the area mapped is traversed by the National Transcontinental Railway. Opatatika lake, where gold discoveries have been made is in the area mapped.

The U. S. steel industry, with its allied branches, which employs close to 1,000,000 men, was operating around 70 per cent. before the war. Some independent companies were averaging considerably above 70 per cent. Two or three weeks ago the steel industry was down to 30 per cent., and operations now cannot be greatly in excess of 35 per cent. Equipment companies have been on a 25 per cent. basis for a long time.

MARKETS

STANDARD MINING EXCHANGE.

Dec. 11, 1914.

Following are the quotations on the Standard Exchange:

Cobalt stocks—	Sellers.	Buyers.
Bailey . . . . .	.01¾	.01½
Beaver Consolidated . . . . .	.20	.19
Buffalo	1.10	.90
Chambers-Ferland . . . . .	.15	.13
Coniagas	5.85	5.50
Crown Reserve . . . . .	.80	.75
Gould . . . . .	.01	.01½
Great Northern . . . . .	.05½	.05
Hudson Bay	50.00	...
Kerr Lake	5.00	4.50
La Rose . . . . .	.77	.68
McKinley-Darragh-Savage . . . . .	.60	.54
Nipissing	5.75	5.55
Peterson Lake . . . . .	.28	.27
Right of Way . . . . .	...	.02
Seneca Superior	2.10	...
Silver Leaf . . . . .	.03¼	.03
Timiskaming . . . . .	.11¼	.10½
Trethewey . . . . .	...	.15
Wetlaufer . . . . .	.10	.05
York, Ont. . . . .	...	.05

Porcupine Stocks—

Apex . . . . .	.02¼	.02
Dome Extension . . . . .	.09	.08¾
Dome Lake . . . . .	.35	.33
Dome Mines	8.50	8.00
Foley O'Brien . . . . .	.20	.17½
Gold Reef . . . . .	...	.01½
Homestake . . . . .	...	.12
Hollinger	19.30	19.10
Jupiter . . . . .	.09¾	.09¼
McIntyre . . . . .	.25	.24
Pearl Lake . . . . .	.03½	.03¼
Porcupine Crown . . . . .	.85	.70
Porcupine Gold . . . . .	.01	.00½
Porcupine Imperial . . . . .	.01½	.01
Porcupine Tisdale . . . . .	...	.00¼
Porcupine Vipond . . . . .	.25	.23½
Teck-Hughes . . . . .	.09½	.09
United Porcupine . . . . .	...	.00%

SILVER PRICES.

	New York.	London.
November—	cents.	pence.
24	49¾	22½
25	49¾	23
26 . . . . .	...	22¾
27	49¼	22½
28	49¼	22¼
30	49½	22¾
December—		
1	49¾	23
2	49¾	23½
3	49¾	23½
4	49¾	23
5	49¾	23½
7	50¼	23¼
8	50¼	23¼
9	49¾	23½
10	49¾	23½
11	50	23½

TORONTO MARKETS.

Dec. 12—(Quotations from Canada Metal Co., Toronto)—
 Spelter, 6 cents per lb.
 Lead, 5 cents per lb.
 Tin, 35 cents per lb.
 Antimony, 17 cents per lb.
 Copper casting, 13½ cents per lb.
 Electrolytic, 13½ cents per lb.
 Ingot brass, yellow, 10c. per lb., red, 12c. per lb.

Dec. 11—(Quotations from Elias Rogers Co., Toronto)—
 Coal, anthracite, \$8.00 per ton.
 Coal, bituminous, \$5.25 per ton.

GENERAL MARKETS.

Dec. 10—(Connellsville coke (f.o.b. ovens)—
 Furnace coke, \$1.65 to \$1.75 per ton.
 Foundry coke, prompt, \$2.10 to \$2.50 per ton.

Dec. 10—Tin, straits, 32.75 cents.
 Copper, Prime Lake, 12.87½ to 13.00 cents.
 Electrolytic copper, 12.75 to 12.85 cents.
 Copper wire, 14.25 cents.
 Lead, 3.80 cents.
 Spelter, 5.70 to 5.80 cents.
 Sheet zinc (f.o.b. smelter), 8.50 cents.
 Antimony, Cookson's, 15.75 to 16.25 cents.
 Aluminum, 18.75 to 19.25 cents.
 Nickel, 40.00 to 45.00 cents.
 Platinum, soft, \$44.00 to \$46.00 per ounce.
 Platinum, hard, 10 p.c., \$48.00 to \$50.00 per ounce.
 Bismuth, \$2.75 to \$3.00 per pound.
 Quicksilver, \$52.50 per 75 lb. flask.

PETERSON LAKE.

It is understood that the origin of the recent rise in Peterson Lake stock is due to the cutting of a promising looking vein on the property at the 300-ft. level in a cross-cut. This vein is in the Keewatin, but is being followed into the conglomerate, where it is hoped that it will develop into ore. It is at present calcite, with small silver values.

ROUMANIAN OIL.

The Roumanian Government has forbidden the export of oil and oil products and the oil business there is almost at a standstill. It is reported the new work is going on, but that as there is a large supply on hand pumping has been stopped at most of the wells.

HOLLINGER HAS SUPPLIES.

In view of the threatened shortage of supplies for the treatment of gold ores the following statement by Mr. P. A. Robbins, of the Hollinger, is of interest. He says: "We have been successful in fortifying ourselves against shortage in chemicals and other foreign-made supplies. Good stocks of all necessities are on hand and we anticipate no trouble in keeping our stock up."

GERMAN HEROES.

—I have bestowed on Gen. von Haeve the Iron Cross for his noble work at Rheims. God is with us, and I still hope to blow up the Cathedral of Notre Dame at Paris.

Rest assured the contents of the Louvre shall not escape us.

We continue to fight in defence of the Fatherland.

WILLIAM.

—Life.