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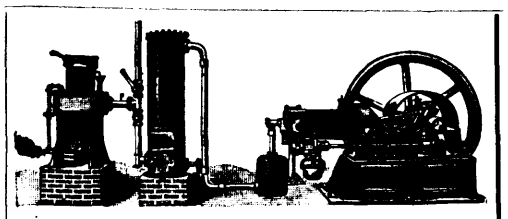

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CONTENTS.

THE PROPOSED ROSSLAND MINE CONSOLIDATION.

The Whittaker-Wright fiasco, in connection with the Rossland mines, is now a matter of ancient history, but nevertheless, the legacy that unfortunate man left behind him is still deplored, not only in this country, but by a very considerable section of the British investing public. Since Wright's death, the companies he promoted have, it is true, managed to keep afloat, but the handicap of over-capitalization, and lack of working capital, has been so great, that these concerns have been obliged to regard life as a mere struggle for existence rather than consider the feelings or the pockets of their shareholders. We confess, therefore, that we sympathize very heartily with the efforts that have been put forward recently by leading representatives of both Canadian and English interests in the Rossland mines to bring about a better state of affairs. How this might best be done has occupied a good deal of attention for some time past, and during the last year or so several praiseworthy attempts, to, for example, cheapen mining costs and by the introduction of new mechanical contrivances, turn to profitable account the lower grade products of the mine in that section have been tried. So far, they have not been particularly availing.

If a man has suffered from such serious injury, by which it becomes necessary for him to undergo the amputation of a limb, it were mere foolishness to temporize with court-plaster. That is the case with the Rossland mines. The disease is deep-seated, and only drastic measures can succeed. Mr. G. S. Waterlow is not only a director on the Le Roi board, and a large shareholder in the Company, but, in addition, he is a man of affairs. He was, we think we are correct in saying, the first to grapple with the situation, and the first to suggest a reasonable and practical solution. That solution involved the amalgamation of a number of properties in the Rossland and Boundary district, all of which were seriously over-capitalized, and the formation of a new concern to acquire the respective interests after removing from their backs "that old man of the sea," debt and over-capital, from whose attentions they had also severely suffered. Mr. Waterlow, in the spring of 1904, laid his proposal before Mr. T. G. Blackstock, who controls the Centre Star and War Eagle interests. That gentleman, acquiescing in the arrangement, agreed that the only way by which a fair valuation of the respective properties which it was proposed should be consolidated, could be arrived at, would be the employment of a competent and independent engineer whose services would be retained to make a thorough examination and base his report on the actual amount of positive ore the mines contained, and the interests were sufficiently fortunate in securing the services of Prof. R. W. Brock, of the Geological Survey of Canada, to undertake the examination. After Mr. Brock had submitted his report, a consultation was recently held at Winnipeg, at which were present Mr. Waterlow, representing the Le Roi and Snowshoe mines; Mr. MacMillan, General Manager of the Le Roi Company; Mr. Cronin, General Manager of the Centre Star and War Eagle mines; Mr. J. W. Astley, Engineer of the Le Roi Company, and Mr. Brock. At least three of the gentlemen present at this meeting had no other anticipation than that the business before it was merely the discussion and adjustment, of minor points in connection with the proposed consolidation scheme. But the first intimation to the contrary was the fact that copies of Mr. Brock's report had al-

ready been sent out of the country by Mr. MacMillan, before they, as it had been agreed, could be discussed between the engineers and representatives of the respective interests. This, to begin with, caused a great deal of embarrassment, but it is rather astonishing to learn that a very strenuous opposition to the scheme came from Messrs. MacMillan and Astley, who absolutely refused to acquiesce in Mr. Brock's valuation.

Of course these gentlemen are entitled to their opinions, but it is a well known fact that Mr. MacMillan has no technical knowledge, while Mr. Astley has, unfortunately, been in a very bad state of health for some time past, and we think quite probably is thus less well informed on the position than he might otherwise be. It practically then amounts to this, that Mr. MacMillan is taking the estimate of his Superintendent, a man who is largely uneducated, though doubtless a good practical miner, in preference to the opinion of a thoroughly qualified engineer of high professional standing. In view of Mr. MacMillan's previous attitude on the subject of consolidation, one wonders if he can now be entirely unprejudiced. Necessarily, in a big scheme of this kind, there must be give and take on both sides, and we are afraid that there is not much "give" to Mr. MacMillan. Whether he will be strong enough to "queer" the proposal, remains to be seen, but we question it very considerably. So far as the Mining Review is concerned, we unhesitatingly state that this consolidation, if carried into effect, will be the very best thing that could happen to Rossland, while it is about the only chance shareholders in these undertakings have of realizing anything at all reasonable on their investments.

Apropos of the foregoing an esteemed correspondent writes as follows:—

In September, 1904, Messrs. F. W. Bradley and John H. Mackenzie, two men of exceptionally high-standing, resigned their positions as temporary consulting engineers for the Le Roi Company (they had agreed to act for Le Roi at the instigation of the Bank of Montreal), because of the action of the London Board in failing to follow their advice in matters of the greatest importance to the present and future of the Le Roi property. The London Board, in its decision to disregard the advice of these engineers, was influenced by the Managing Director, (now General Manager), Mr. A. J. MacMillan. Upon what grounds Mr. MacMillan was able to convince his directors and shareholders that his ability in complicated mining and metalurgical matters was superior to that of two thoroughly experienced technical and business men, has never been apparent; for at any rate, Mr. MacMillan has no technical knowledge, and his superintendent engineer has been Mr. J. W. Astley, whose ill-health for nearly a year, has been such as to prevent his taking any active part in the affairs of the Le Roi, so that Mr. MacMillan has depended for technical advice almost solely upon his mine foreman, who is now employed under the title of mine superintendent. But to come to the point of this letter: For some eighteen months, Mr. Geo .S. Waterlow, a Director of the Le Roi and Snowshoe, and Mr. T. G. Blackstock, representing the War Eagle-Centre Star, have been vainly endeavouring to bring about a consolidation of their interests, believing tha that if the mines of Red Mountain, Rossland, which have produced some $30,000,000 in values, were worked as a unit, ther would be sufficient savings in operations to pay dividends. That they have failed thus far, seems, from recent events, to have been largely due to the machinations of the same gentleman, who professed to favour consolidation, but who was, nevertheless, apparently quietly placing as many obstacles in the way of consolidation as he conveniently could.

The climax of this episode seems to have been reached at a recent meeting in Winnipeg, where Messrs. Waterlow, MacMillan, Astley and Cronin, held a meeting with Professor R. W. Brock, who had spent many months in making a most careful and exhaustive examination of the Rossland and Boundary properties, in the joint interests of the respective parties. It would have been difficult to have found anyone better fitted for this important work, as Mr. Brock's reputation for honesty and fairness are unquestioned, while his experience for a number of years as one of the chief engineers and geologists of the Canadian Geological Survey, has made him familiar with ore deposits and industries throughout Canada, and particularly with those of the Kootenays. But at the meeting in Winnipeg, Mr. MacMillan decided, based upon the evidence of his foreman, that Mr. Brock was correct in his report upon the Le Roi, but that he had misrepresented the Snowshoe, and had over-estimated the War Eagle and Centre Star to the extent of almost 100 per cent. Mr. James Cronin, who had just come from Rossland, showed that the War Eagle and Centre Star had shipped nearly as much ore as Professor Brock had reported in sight, and had far more ore still in sight than at the time of the examination, which was hardly the case with the Le Roi, where MacMillan, it is believed, is "gutting" ore bodies, and economizing on development, in order to make a showing which will be acceptable to shareholders who are not qualified to fully appreciate the position of affairs. But Professor Brock's reports, maps, and positive statements did not in the least embarrass Mr. MacMillan in backing the mine foreman as against Professor Brock, whose contentions are further supported by actual shipments to the smelters, but Mr. Waterlow, who had in former days supported Mr. MacMillan, declined now to uphold him. In consequence, Messrs. Waterlow and Cronin agreed to recommend to the Boards of their respective companies, consolidation upon the basis of Professor Brock's estimate of profits in sight in all the properties.

There is a comical side to all of this from an outsider's stand-point, but to the shareholders of the various properties, and to Rossland, it means much, for if Mr. MacMillan can continue to persuade the directors and shareholders to act upon his suggestions rather than those of Professor R. W. Brock, there is little hope of a renewed era of prosperity for Rossland or shareholders in the mines of that district. The present situation cannot continue long. Economies must be effected, and a large amount of consistent development work performed to make up for the limited amount done in the last few years.

THE ASSOCIATED SILVER-LEAD MINES OF B.C. AND THE LOCAL SMELTERS.

The Associated Silver-Lead Mines of B.C. have addressed a letter to the Hon. W. S. Fielding, Minister of Finance, at Ottawa, submitting an alleged comparison of smelting rates on lead ore as between British Columbian and European smelters. In the letter the Association states that they are prepared to substantiate these figures, and in view of the marked additional cost of smelting ores at home, as shown by the statement, prefer a request that the lead bounty be now granted on all exported ores of lead. The statement submitted to the Minister by the Association reads as follows:—

European smelters pay in full for the total silver and lead contents in the ore, charging an inclusive treatment rate of $8.60 per 2,000 lbs. (40s per 2,240 lbs.) added to the freight rate to Antwerp of $13 and some local charges amounting to 75c per 2,000 lbs.

B. C. smelters deduct 10 per cent. of the lead and 5 per cent. of the silver contents and make a marketing charge of 1c per lb. of lead, in addition to their freight and treatment rate of $15, of which at least $12.50 is for treatment.

Taking as examples a ton each of two average grades of ore, one containing 120 ozs. silver and 50 per cent. lead, and the others containing 35 ozs. silver and 65 per cent. lead, with silver at 58c and lead at $2.60, the figures work out as follows:

	35 ozs. and 65 p. c.		120 ozs. and 50 p.c.	
	Gross contents $54.10		Gross contents $95.60	
Europe pays in full less:				
Treatment	$8.60		$8.60	
Freight	13.75		13.75	
Insurance	.35		.35	
	$22.70 nets	$31.40	$22.70 nets	$72.90
British Columbia deducts:				
Treatment	$12.50		$12.50	
5 p. c. and 10 p. c.	4.40		6.08	
Marketing charge	11.70		9.00	
Freight	2.50		2.50	
Difference in exchange	.12		.12	
	$31.22 nets	$22.88	$30.20 nets	$65.40
Loss to producer by selling in B. C.		$8.52		$7.50
Against which is bounty		9.75		7.50
Producers' proportion of bounty		1.23		Nil
Smelters' proportion of bounty		8.52		All

NOTE.—(1) If ore can be shipped to B.C. smelters in bulk and requires to be sacked for Europe, this would be about $1.50 per ton in favor of B.C. But such ore is rarely shipped in bulk, and bulk facilities for Europe will no doubt be available when requested. (2) Europe is prepared to pay for the lead on wet assay, a gain to the seller as against the fire assay on which the B.C. smelters buy, averaging fully $1.25 per ton.

The producers submit that the natural protection secured to the B.C. smelters by the difference in freight rate of $11.25 per ton of ore in their favor is full compensation for any increased expenses of smelting the ore and marketing the lead; that the penalties of 10 per cent. on lead and 5 per cent. on silver, still exacted by the B. C. smelters are now discontinued in Europe, owing to furnace methods which save losses formerly causing these charges and that the restriction of the bounty on ore mined in Canada to Canadian smelting has resulted in a monopoly which is diverting over three-quarters of the bounty from the producers to the smelters, and is practically putting a premium either on antiquated methods or in extortionate charges. If this restriction were removed and the producers of ore allowed to earn the bounty the immediate result would, by increasing the number of working mines, enormously stimulate the entire business of the country and further, would produce local smelting conditions whereby modern methods would take full advantage of the natural protection afforded by freight rates on ore.

While as yet we have had no opportunity of testing the accuracy of the foregoing figures, it may be very confidently asserted that, even presuming that the conditions are such that at present it would be more advantageous for the lead mine owners to ship their ores to Europe, provided, of course, the bounty was granted on exported ores, the feeling in British Columbia would in general disfavor the course which the Government is here asked to take, on the grounds that the proposal is economically unsound. When the bounty was granted on lead, the mine owners presumably went thoroughly into the question of smelting rates and apparently allowed the Government to understand that they had no particular cause for dissatisfaction on this score. In fact, it was largely due to the co-operation of the smelting interests, and the assurances the Government received that the granting of a bounty on lead would result in the upbuilding of the local smelting and manufacturing interests that the request for aid to the industry was accorded. As this information has reached us on the eve of our going to press, we must postpone, for the time being, a full discussion of the question, but it may be added that the Associated Silver-Lead Mines of B.C. is not a thoroughly representative organization of the British Columbian silver-lead interests, and it will be interesting to learn how those outside the organization view the matter.

THE RIGHTS OF SHAREHOLDERS TO INFORMATION.

We have read with much interest an address recently delivered before the Institution of Mining and Metallurgy by the newly elected President, Mr. Wm. Frecheville.

Mr. Frecheville, who, as an examining engineer has earned a well-merited reputation for sagacity and honesty, addresses his fellow members on the extension and increase of mining generally within the colonies of the Empire, and notes briefly the condition of the industry in India, the Malay States, Africa, Guiana and the Australian colonies. He also speaks with intelligence upon one or two mechanical questions which have developed in mining practice, notably the employment of electrically operated centrifugal pumps for lifting large quantities of water to high levels, instancing the installation of a pump at the silver-lead mines at Horcajo, in Spain, where

1,000 gallons a minute are raised from a depth of 1,450 feet, in four separate lifts.

But the point which Mr. Frecheville makes, and upon which we particularly desire to comment, is the duty of mining companies to give their shareholders more frequent and accurate information concerning the condition of their property. Mr. Frecheville (in spite of the recommendation of his counsel that the term "ore in sight" should be abandoned, and new terms substituted therefor), advances the argument that, in order to arrive at an estimate of the value of the mine, there are two important factors, one, the quantity of "ore in sight," or, as we would now put it, "positive ore," and second, the prospects for the future, or, as we would now put it, "the amount of probable and possible ore," and that the shareholders are entitled periodically to obtain a correct statement of the positive ore, and the closest approximation of the amount of probable and possible ore, believing further that the surmises, hopes or fears of the manager, as expressed in his periodical letters to the Board of Directors, should be given freely to shareholders that they may exercise their own judgment as to the market value of their shares, and dispose of them to the public, or increase their holdings, according to their points of view as influenced by these reports.

We conceive that the idea is susceptible of broad discussion, and of a considerable divergence of opinion. It has been our experience, and we fancy every engineer has a similar experience, that the average shareholder, in the main, is totally unable to form a correct judgment from the facts as expressed in the manager's periodical reports, which of necessity have to be couched in more or less technical terms. We fancy some of our English readers will admit that often-times the sole excuse for their consulting engineer being present at Board meetings is to interpret the language of the manager that it may be made understandable to the non-technical mind. If this be the case, what meeting of ordinary shareholders could be expected to correctly interpret the meaning of the manager's periodical reports? Mr. Frecheville notes this objection in his sentence "that it may not be wise to let the shareholder know too much, as he might be led to form hasty conclusions," but proceeds to give his own opinion that this danger is considered to be far more imaginary than real, and that if the shareholder did form hasty conclusions, and thereby suffer losses, it would be his own affair. This strikes us as rather a remarkable statement from one who is desirous that the shareholders should obtain the information which the directors get at the expense of the company, and which Mr. Frecheville previously had said would be of use to them in forming a just estimate of the value of their property. To the ordinary mind, the two conclusions, only a paragraph apart in the original, strike one as inconsistent. We submit, however, that if this detailed information contained in the manager's letters and which is often susceptible of misinterpretation by the ordinary shareholder, were given to the public as soon as received, that the opportunities for stock rigging and jobbery would not in any way be diminished, if anything the practice would be conducive to even greater abuses than at present.

Mr. Frecheville goes on to express the opinion that the shareholder is nervous and doubtful because he has no information, and that if this condition were altered and that he knew that all the letters, cablegrams and information on the matter of his property could be inspected at the company's office by any shareholder, he would be placed in a much more advantageous position. That Mr. Frecheville, however, recognizes, to some extent, our objection, is shown in a subsequent paragraph, in which he says briefly that, to get the full significance of the figures, measurements and facts, as reported by the manager, they must be "grouped, compared and commented on by some one." This shows that the Institution's distinguished President had in mind the points we have made, but did not apparently realize their full significance. If the mining engineer whose business it is to understand mines and reports, is often unable to form an opinion from them, how can it be possible for ordinary shareholders to derive any opinion or value from similar reports, until after they have been interpreted to them. The ordinary shareholder in a mining company is usually a man who has no technical knowledge, and who is quite unable to appreciate points which may make for increased value, or decreased value, in the manager's reports. The *raison d'etre* of directors is not alone the direction and management of the financial affairs of their corporation and the supervision of the employees of that corporation, but they also have duties towards their shareholders, a fact which is, on this side at least, but too rarely recognized. We submit that one of the duties of a board of directors is to conserve their property's interests, not alone at the mine but in the market, and that that conservation would not be in any way served by giving access to the public of all the doubts, queries and uncertainties of the property, as revealed by their manager's weekly, fortnightly or monthly report. Rather we believe that such periodical reports should be handed to the resident consulting engineer of the company, to be by him transcribed into understandable common business language, and then only published, if in the estimation of the directors the interests of the shareholders as a whole would be best served thereby. The English law puts the director in a position of trust, and holds him responsible for the proper administration of his property, and we can conceive of cases where directors, in making public the regular reports of their manager, might lay themselves open for impeachment and removal under the English statute.

While we recognize fully Mr. Frecheville's experience in mining and his authority as an engineer, we may perhaps be permitted to question the value of his advice in this particular instance. In this regard we are, however, quite prepared to recognize the infallibility of boards of directors, and the tendency observed in many of them to make money for their own pockets irrespective of the interests of shareholders, but this condition of things is not peculiar to mining companies but is common to all corporations whose public interests are confided to a board, and whose shares are quoted in open market. Against this feeling there can be no safeguard, so far as our knowledge goes, except the individual character and honesty

of each director. It is not going too far to say that the largest financial institution in Canada has had experiences of this nature whereby the directors, having knowledge of certain market conditions and future transactions, have been enriched and individually benefited by being in a position to take advantage of information which was first available to them in their official capacity. If Mr. Frecheville's point that all shareholders should be as fully informed as the directors, is made in the hope that thereby each shareholder would have an equal chance with the directors in taking advantage of market conditions concerning his particular property, we beg leave to disagree with him, for, apart from other things, the average intelligence of the shareholder is far below the intelligence of the director, and if given all possible sources of information to the same extent as his director he would be quite unable to avail himself of such information, by reason either of his more limited financial resources, or, more probably, by reason of his inferior intelligence. We make this last remark in the full knowledge that directors of English corporations are not of equal intellectual calibre, and that too often distinguished names are put upon the directorate for no other purpose than that of influencing the market, and without any regard whatsoever for the intelligence which these titled persons may possess. The topic of "guinea-pig" directors has been well and ably discussed for many years, and the point of our remarks is, that we decline to believe that Mr. Frecheville's recommendation would bring the relief to the shareholder which he indicates.

We are glad to note that Mr. Frecheville desires that the public (by which we suppose he means the shareholders) should be given free access to the workings of mines, and, as he suggests that to overcome or obviate the expense and loss of time incurred in taking visitors through the workings, those asking the privilege should be required to pay a small fee, say, two or three dollars, to an employees' accident fund, or some similar charitable object. Our esteemed contemporary, the *Engineering and Mining Journal*, will, we feel sure, take note of this Presidential address, and its distinguished editor, Mr. Rickard, will no doubt have something to say upon this important topic. Nevertheless, the conditions attending the operation and management of American mines, and by American we mean North American continent, are usually so much more business-like and clearer than the conditions surrounding the operation of a British owned mine, that perhaps what would be sauce for the one would not be sauce for the other.

THE EXTENSION OF THE SPRINGHILL, N.S., COAL FIELD.

One of the most important economic results that has ever been achieved from the researches and studies of the Geological Survey of Canada, is the authoritative assertion that the coal measures of Springhill in Nova Scotia extend southerly and westerly from that town, and cover an area of 200 or more square miles.

The late Sir Wm. Dawson, in his examinations of the Springhill field, allotted to the conglomerate which extends southerly from the mines a lower position than the coal, making the conglomerate basal to the coal, and hence it has always been assumed that boring or sinking below the conglomerate would be futile and non-productive of results.

During the last ten years, Mr. Hugh Fletcher has been carefully re-surveying and re-examining the coal fields of Cape Breton and Nova Scotia, and he found himself unable to accept as facts many of the data and conclusions of Sir William. Among other unaccepted statements was this one of the conglomerate being basal to the coal at Springhill; on the contrary, Mr. Fletcher believed it to be more recent than the coal, and, therefore, there was no apparent reason why the coal seams found at Springhill might not underlie this conglomerate.

Influenced by this conclusion of Mr. Fletcher's, a small number of coal men syndicated themselves for the purpose of sinking some deep bore holes to prove the truth of Mr. Fletcher's conclusions. At Newville, some twenty miles south from Springhill, a bore hole has cut 10 feet of good coal at a depth of 2,329 feet from the surface. The section at this hole shows 810 feet of red sandstones, belonging to the upper Permian, 1,500 feet of conglomerate, then 19 feet of carboniferous sandstone and then 10 feet of bituminous coal. As the coal gave no solid core, the exact dip of the coal seam is not known nor can its exact width be given.

This result has naturally produced a considerable comment amongst both coal men and scientists, and has added to the already very considerable weight of the crown which Mr. Fletcher has worn so modestly for many years. For Mr. Fletcher, to those who have known him, the result is but a well-earned honor due to his laborious, minute and painstaking researches in his beloved profession, but for the Dominion and especially for the mainland of Nova Scotia, the result is worth many millions.

The increasing depth of the Pictou county mines, causing increased costs, has handicapped them in their competition with Cape Breton mines for markets, and many industries of the mainland have relied almost entirely upon the Cape Breton coals. The discovery of this great asset in Cumberland County will redound to the credit of our Canadian Geological Survey as well as to the personal credit of Mr. Fletcher, and do much to relieve that branch of the public service from the common criticism that it has added nothing to the national wealth of Canada.

We note with much satisfaction evidence of the establishment of more intimate and friendly relations between the Canadian Mining Institute and the Canadian Society of Civil Engineers, an arrangement having been recently concluded by which the Institute has been accommodated with most convenient and comfortable quarters in the Society's building, No. 877 Dorchester Street, Montreal; and here, at any rate for the next twelve months, the Institute's Secretary will take up his official abode, while the Library, which is also to be housed in the same building, will be under his personal supervision. It is needless at the moment to more than casually allude to the antagonism which at one period existed between

the two organizations, for, if it has not quite disappeared, it is certainly now high time that it should. At any rate the new arrangement may be regarded as a treaty of peace, the original *casus belli* being no longer a matter of practical politics.

As most of the members of the Institute are readers of the REVIEW, it may not be out of place, now we are on the subject, to add a word or two in explanation of the reasons which induced the Council to accept and act upon the disinterested suggestion made by Dr. J. Bonsall Porter, of McGill University, who, by the way, is an active member of both organizations, that negotiations with a view to this co-tenantry arrangement be opened with the Canadian Society of Civil Engineers. One of the several important considerations then, was the desire to increase the value and utility of the Library to the membership at large by a plan which would admit of the circulation of books. It was felt that the Library had been of little value in the past to any but members actually resident at headquarters, and hence the proposal to place non-resident members on a better footing in this regard, by affording them the opportunity of borrowing such books, or publications as the Library contained, which met, generally with much favour. The difficulty, however, of carrying out this idea without injury to the Library as a permanent collection, appeared somewhat formidable, but this quite vanishes when it is explained that the Library of the Canadian Society of Civil Engineers, which members of the Institute have now permission to consult, to all practical purposes duplicates that of the Institute, and consequently the reference value of the Library will always remain intact. In addition, the Institute shares the use of a capital lecture hall, and, what will appeal to many, a smoking and lounging-room, comfortably furnished and generously supplied with popular illustrated periodicals. The rooms, moreover, are within a minute or two's walk of the Windsor Hotel, where our friends visiting Montreal usually put up, and the building is open from 9 a.m. to 11 p.m.—which is long enough for anyone.

Mr. John Stanton, a well known authority on copper, in a recent interview is reported to have made the following statement regarding existing conditions:—

"Copper conditions are stronger and healthier than they have been in past years. There is an absence of speculation and buying for the purpose of advancing prices. The export as well as the domestic demand for the metal is good. Exports for this month will be heavy and I should not be surprised if they reach 20,000 tons. China is taking large quantities of copper, presumably for coinage purposes. A large portion of the 40,000 tons taken by China recently has not been shipped. Shipments to the Far East extend over a long period, due largely to the fact that stocks on hand amount to practically nothing. In other words we have to make the copper before we can ship it.

"While I always seek to get the market price for my copper, I would not like to see quotations advanced. Under conditions as they exist to-day there is always a possibility of sharp advances, but prices at present are satisfactory to th consumer as well as the producer.

"The copper mines of the country are being worked for al they can produce, which is natural in view of the heavy de mand which exists for the metal. The production of copper this year will show an increase in the United States and probably in other countries, as conditions are healthful all over th world.

"The steel industry is a good barometer of copper conditions. The demand for railroad supplies, new buildings, etc., is always followed by a good demand for copper."

Meanwhile few people realize what the advance of one cent a pound in the price of copper means to industry. In the case of mines such as those in the Boundary District, where large tonnages are produced, for example, the increase in the price of copper of 1 cent per pound is of the greatest significance. It may be safely said that improved market conditions this year will enable the Granby Company to pay a really substantial dividend, while, of course, all other copper mines throughout the country will be equally benefited.

The *Engineering and Mining Journal*, referring editorially in a recent issue, to the uses of photography in mining, states that the first large coal mining company to reduce the practice to a system is the Delaware, Lackawanna and Western who has appointed an official photographer, whose duty it is to make a complete graphic record of all new work showing progress from week to week. So far as we are aware, the potentialities of the camera for accurate mine record-making work have not been yet recognized in Canada, though photography is being utilized more and more by engineers in connection with mine reporting. Judiciously used, the camera may thus become a very valuable and faithful auxiliary, but it must also be remembered that the instrument is capable in unskilled or unscrupulous hands, of lying with the most unblushing effrontery. The best set of work-recording photographs we remember having seen in this country were made by Mr. W. Meredith, the Electrical Engineer in charge last year of the Vancouver Power Company's construction operations. A set of from four to eight views of the work as it progressed was made regularly every week, suitably mounted on grey paper, and bound up with a paragraph or two of typewritten explanation for the information of the Directors. The progress of the work from start to finish was thus illustrated in the most understandable fashion, with a consequent saving of much laborious report writing which, at the best, would have conveyed a less lucid idea of what was being accomplished.

There has been some talk of the employment of Mongolian labor, to replace white labor, in the operation of hydraulic mines in the Atlin district in British Columbia. It will be remembered that some years ago a number of Japanese were taken into the district for that purpose, but the Local Miners' Union was then sufficiently strong to induce the mine operators to abandon their project. It is learned, however, that

conditions in this regard have since changed somewhat, and the same opposition would therefore not be brought to bear. At the same time it is rather questionable whether this means will be taken to cheapen labor costs in this northern mining camp, but rather the problem will be solved—in fact it has already been partially solved—by the introduction and application of new methods of mining. Thus there can be no doubt that in the future, gold recovery in the district will be made largely by means of dry land dredging, an initial undertaking of this character having already given promising results, while, too, this season, steam shovels are to be, for the first time, utilized.

It is very gratifying to learn that satisfactory financial arrangements have been made to carry on the work which has been for so many years past courageously undertaken to develop the ancient river channel systems at Slough Creek and elsewhere in the Cariboo district. Some months ago Mr. J. D. Kendall, a well-known mining engineer, at one time resident partner in Vancouver, of Messrs. Bewicke, Moreing & Co., was retained to examine the Slough Creek properties, on behalf of the promoters of the undertaking, who have since taken the property over. Mr. Kendall's report was eminently favorable, and as he has the reputation of being most conservative in his opinions, there is every reason to believe that this enterprise will be carried to a successful issue.

With the rapid development of electricity in metallurgy the possible improvements and applications of that force in the field of electro-metallurgy are very great. It behooves the metallurgical and the mining engineer to keep himself in touch with the results that are being almost daily chronicled, since some of these are bound to shortly be adapted to ordinary practice in concentration and metallurgy.

A NEW MINERAL AREA IN ONTARIO.

By JOHN E. HARDMAN.

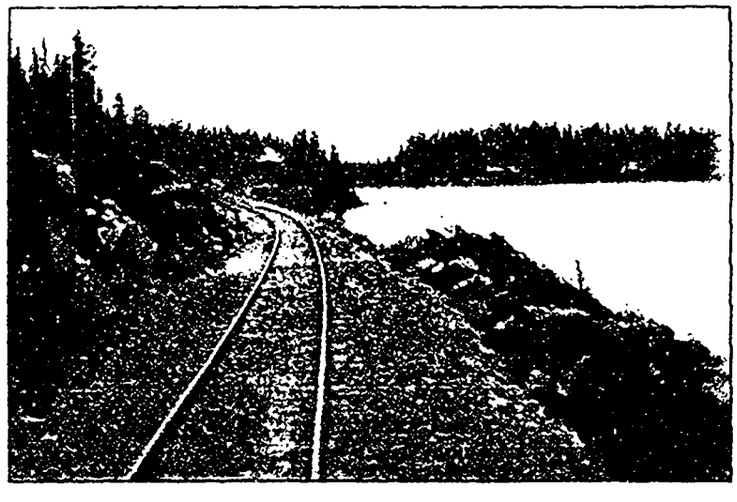
The discovery of ores of cobalt, nickel and silver, with which metallic silver is associated, has during the last 18 months, attracted considerable attention to that portion of Northern Ontario which lies north of the C.P.R. track at North Bay, and west of Lake Temiskaming.

The mode of discovery of these deposits has already been noted in the April issue of the REVIEW, but as yet nothing fully descriptive of the region and its deposits has made its appearance in print. The following notes gathered during a brief visit of inspection may therefore be of interest:

The Temiskaming and Northern Ontario Railroad, an Ontario Government undertaking, starts from the town of North Bay on Lake Nipissing, and, running north-easterly for 10 or 11 miles through the township of Widdifield, turns through an angle of 90 degrees and pursues a general north-north-west course for over 50 miles through a country which is almost entirely gneissic (Laurentian) in character. For 53 miles this great stretch of Laurentian gneisses is traversed by the road until the southern end of Rabbit Lake is reached, when patches of slates, felspathic sandstones (greywackes), granites and breccia, with areas of diabase and gabbro interjected, are found for about 30 miles. Near the middle of this area the railroad touches the north-east arm of Lake Temagami at Temagami station. For the 60 odd miles of its line to this station no minerals of economic importance have as yet been noted, nor are they likely to be found in the gneisses of the Laurentian country.

VIEW ON THE T. & N. O. RAILWAY.

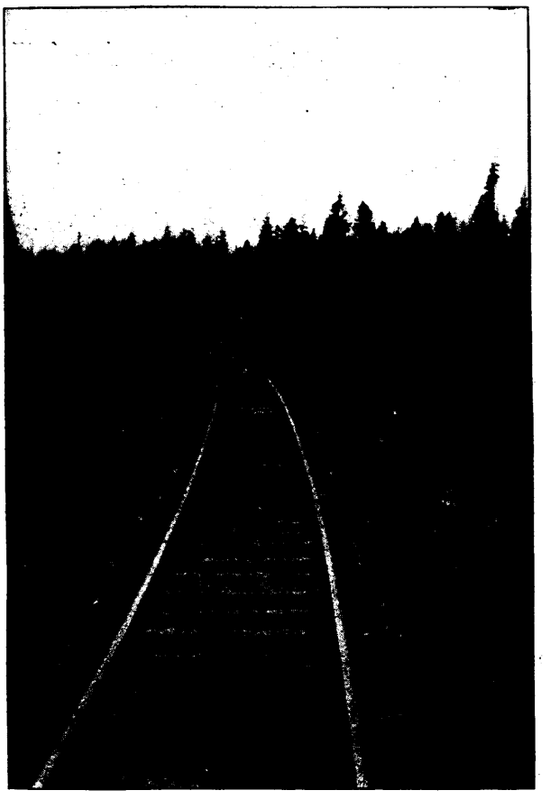
At Temagami several small steamers ply to distant points on the lake and will act as feeders to the railway from the numerous promising mineral prospects which have already been located and some of which are now being vigorously opened. The region around Lake Temagami is rich in surface showings and gossan, and the occurrence on the north-east arm of outcrops of iron ore, both magnetic and hematite, banded with red jasper, promises the ultimate discovery of iron ores of commercial value. Near Vermillion Lake in the slates and sandstones of Huronian age, Major R. G. Leckie is opening a deposit of mispickel and pyrrhotite carrying gold values. For some ten miles after leaving Temagami the road traverses this formation, then meets with acidic granites which follow the line for eight or nine miles, and in which there is little of mineral interest; passing through this area diabases, quartzites and breccias of the Huronian again come in and continue to New Liskeard.



NORTH-EAST ARM OF LAKE TEMAGAMI, FROM THE RAILWAY.

The lower Huronian of the present day is lithologically quite different from the Lower Huronian of the time of Sir Wm Logan. Instead of being a series of aqueous sediments,

altered by heat and by compression, it has been found that many of the beds of this age are composed of volcanic dust and ejectamenta. Besides quartzites, slates, conglomerate and felspathic sandstones, we have breccias, shaly sandstones and coarse agglomerates.



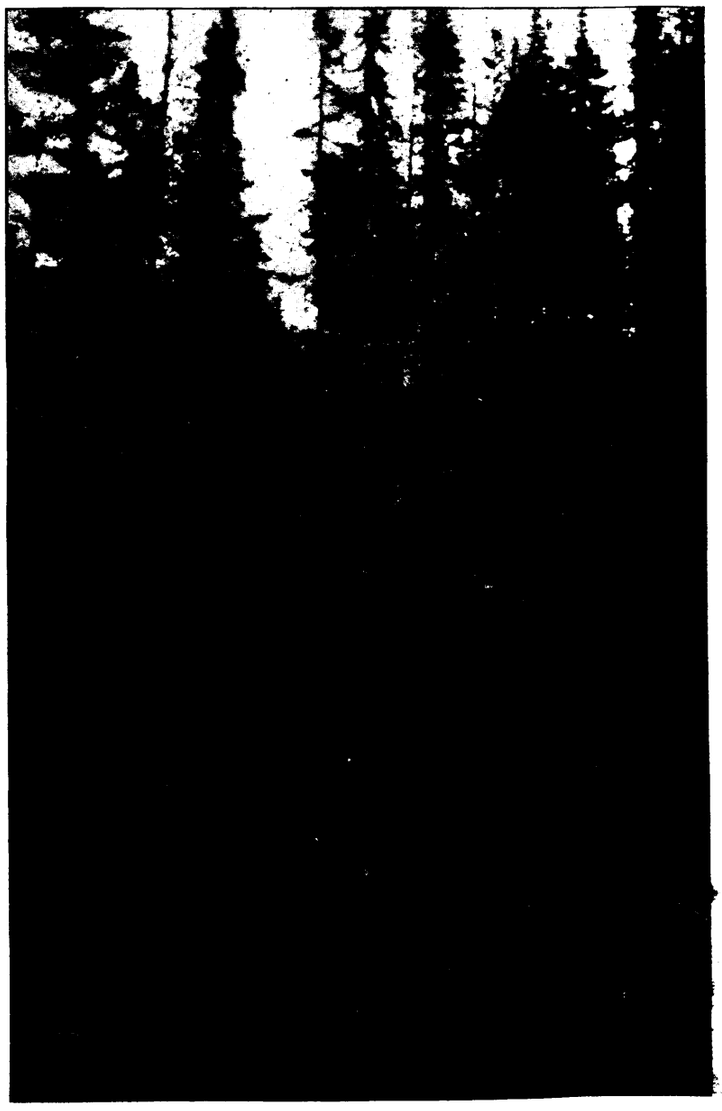
ANOTHER VIEW OF THE LINE.

Here and there occur patches of greenstones, and other igneous rocks more or less disturbed and folded, and the series generally has been marked as Keewatin, in which mispickels and pyrrhotites are found carrying some gold. Sasaginaga and Clear Lakes are both completely surrounded by this series of rocks, and the sixth, seventh, eighth and ninth lots of the fifth and sixth ranges of Coleman Township seem to be worth careful prospecting.

At the 102 mile post on the railway, one comes in sight of Cobalt Lake, or "Long Lake" as it was called before the present discoveries of cobalt-silver ores were made. This pretty sheet of water is about 7/8 of a mile in length, by 1/8 to 1/4 of a mile in width. The town plot, having the shore line for its south eastern boundary, has been made to the north and west of Cobalt Lake, covering about 250 acres of land. The Temiskaming and Northern Ontario Railway have built a half mile siding here, a pretty station house and a neat section foreman's dwelling. A general store and one or two dwelling houses are at present the sum total of the town, but a small hotel to accommodate transient mining men is much to be desired, since the nearest place where a bed or a meal can be gotten is the town of Haileybury, about five miles distant.

From the station platform can be seen, barely half a mile to the south-westward, the buildings of the McKinley-Darragh mine, while just across the Lake to the south-east are the buildings on lot 404, belonging to the Earle properties, now known as the "Nipissing Mining Company," and a quarter of a mile to the north-east, the steam from the Timmins mine is noticed rising above the curve in the railway track, going towards Haileybury. A quarter of a mile distant to the northwest is J. B. 7, the property of Mr. W. G. Trethewey, which is not visible from the station because of an intervening hill. These four properties have, up to the 1st of May, 1905, and since the 1st of January, 1904, shipped and sold $640,000 worth of silver, cobalt, nickel and arsenic. The biggest shipper has been the Earle, or Nipissing Company, with a record of over $300,000; the Timmis is second and the Trethewey third. The average of all shipments has exceeded $1,000 per ton in values, which values have been paid for.

The bulk of this large sum has, of course, been in metallic silver, to which sulphurets of silver (argentite, stephanite and polybasite) have added largely. At first somewhat good prices were obtained for the base metals, but now cobalt, instead of bringing 72 cents a pound, yields only 40 cents; nickel 12½ cents, and arsenic ½ cent per pound of metal contained in the ore. The silver brings New York quotations, less the deduction of 10 per cent., which, considering the high values in silver which the shipments have contained, means a very substantial profit to the purchasing firm.



THE AUTHOR, MR. HARDMAN, EXAMINING THE TRETHEWEY PROPERTY IN THIS REGION.

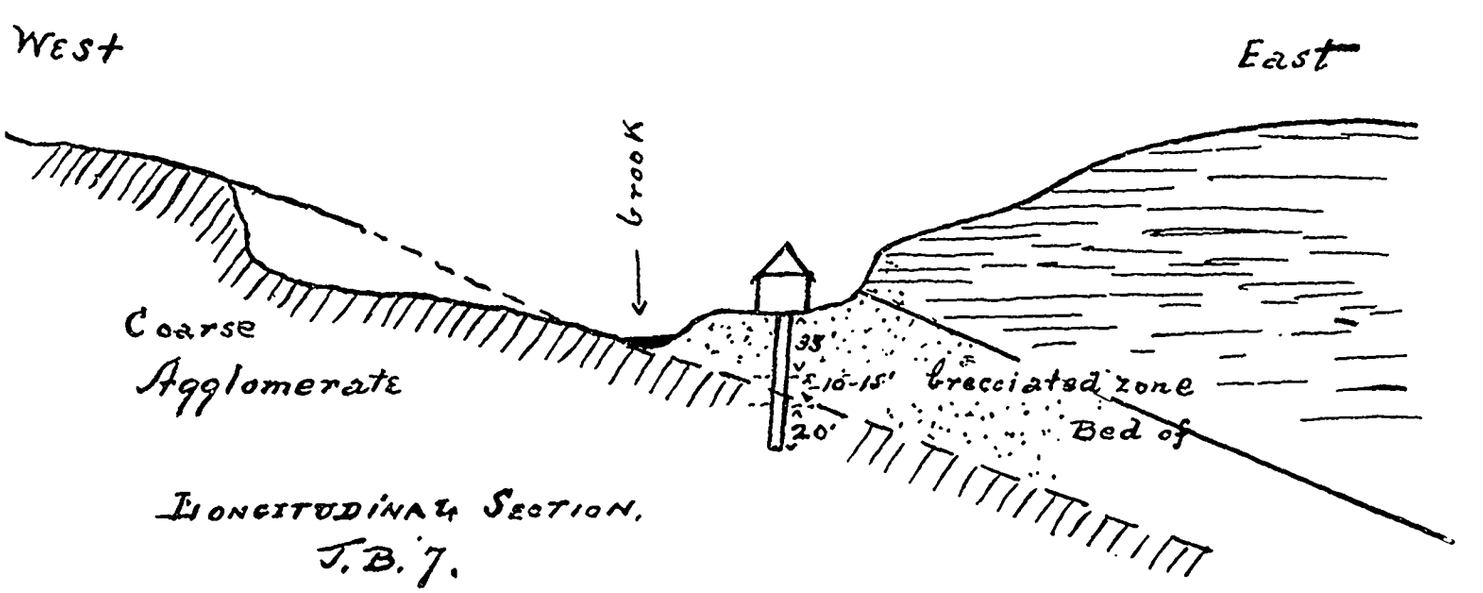
The prior discovery of the district is the Timmins property, or J. S. 14. On this location occur two seams or veins both carrying cobalt and silver, but having a divergent strike. The one runs S 70 E, the other north-east and south-west.

On the latter vein a shaft has been sunk to a depth of about seventy feet, the vein retaining its size and carrying high values in silver to that depth. At the time of inspection the property was being equipped with a steam plant and an air compressor, and mining operations had been suspended. The production of the mine has exceeded one hundred and fifty thousand dollars up to the first of May, 1905.

Almost due west from the Timmins property, and about three quarters of a mile distant in a straight line, is the property of Mr W. G. Trethewey, J. B. 7, on which but one vein has yet been found, but that one has produced in excess of one hundred thousand dollars. These two properties north of the lake are the deepest and most extensively worked in the district. The accompanying illustration gives a photographic view of the shaft-house, and of the large open cuts on either side of it, which are found on Mr. Trethewey's property. The vein was first discovered by Mr. Trethewey at the point marked with a letter "A" in the photograph. It was opened by stripping and an open cut, and showed a width of about six inches and values approximating $1,000 per ton. A shaft was then begun and sunk on the dip of the vein (which is nearly vertical) to a depth of about thirty-five feet when a flat slip or zone of broken matter was encountered. This broken matter continued for ten or twelve feet and carried little patches of ore scattered through it, but comparatively little metallic silver. At a depth of fifty feet this broken matter disappeared and the vein appeared again in the country rock, solid and unchanged in size, but carrying little or no silver. The vein had apparently crossed from the foot-wall to the hanging wall, lost its silver but retained its values in cobalt. The formation below the slip-seam was one of the characteristic agglomerates of the region, whereas, the formation above it to the east was a fine grained pyro-clastic rock which was submitted to Dr. A. W. G. Wilson, of McGill, for microscopic examination. Dr. Wilson reports the constituent minerals to be angular grains of quartz, plagioclase and some orthoclase which is frequently decomposed to muscovite. Associated with these three minerals are small grains of biotite, magnetite and secondary epidote, the whole being cemented together by chlorite. The rock has a dark green color with spots of black which the microscope shows are aggregates of biotite and chlorite. The structure is micro-crystalline or felstite and the rock is probably a rhyolite or andestitie, tuff. The following sketch will illustrate the conditions just described.

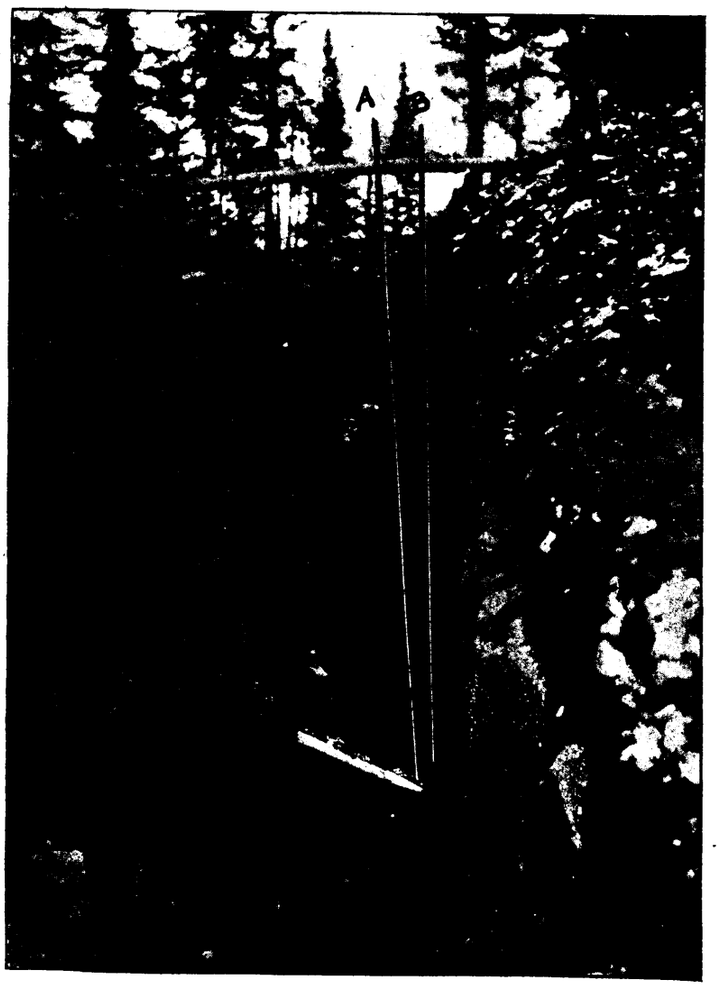
On the Timmins property the vein still continues associated with this pyro-clastic rock and the dump affords many specimens of it. On the Earle property, No. 404, the same two divergent series of strikes was observed. On the Wright property (No. 269) and on the two forty acre lots belonging to the Messrs. Drummond, of Montreal, the strike of the cobalt veins was, in all cases, S. 70 E. On the Wright property, which shipped a car load of ore in April having a value of between fifteen and twenty thousand dollars, this same fine grained vol-

SHAFT-HOUSE AND OPEN CUT AT TRETHEWEY MINE.



canic was noticed. But it was not observed on some of the other locations round Kerr Lake.

The veins so-called, consist of a series of "spaces of discission," almost vertical, and which have subsequently been mineralized for widths which vary from a fraction of an inch to eight or nine inches; there are some wider crevices (a series of seams sometimes extending to a width of nearly six feet) but the filling is chiefly rock matter, the smaltite and niccolite rarely having a greater width than three to four inches. Professor W. R. Miller has more specifically described the igneous rocks as breccia-conglomerate and agglomerate with which are interpolated bands of a silicious rock called by Sir William Logan, Huronian Slate. His term "slate" was applied to a rock which is really composed of minute grains and fragments of rocks of various kinds which have been consolidated and more or less altered; they are fine grained and delicately laminated rocks, but they are not argillites, on the contrary, they are decidedly silicious. Professor Miller, who has carefully

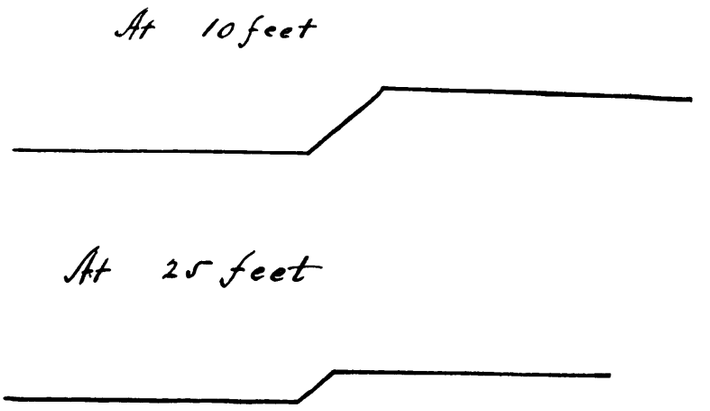


VIEW OF BIG OPEN CUT AT WRIGHT MINE.

studied this region and made many sections, says that the series of slates represent ash rocks in which are found fragments of orthoclase, plagioclase, trachyte, chlorite and calcite.

The fractures by which the veins have been formed seem to have been due to two forces acting in directions inclined to each other at angles varying from 120 to 160 degrees. In many cases the minor fracture has become obliterated. The diminution of the secondary fracture is shown in the accompanying photo of the Wright Mine, 269, where the convergence in depth of the two lines, marked A and B, is most noticeable, and the extinction of the east and west running seems very clearly shown.

This extinction is often marked by a wall which is curved rather than straight.



The very high values which have been realized from these ores have attracted much attention from capitalists and miners. The available area of Coleman Township has been blanketed with locations, but many are to be investigated before the commission, and will probably be located.

(To be continued.)

THE KINGSTON SCHOOL OF MINING.

By PROF. J. C. GWILLIM.

The twelfth annual meeting of the subscribers of the Kingston School of Mining shows that there were 345 students taking classes in this Institution; 162 of them were engineering students.

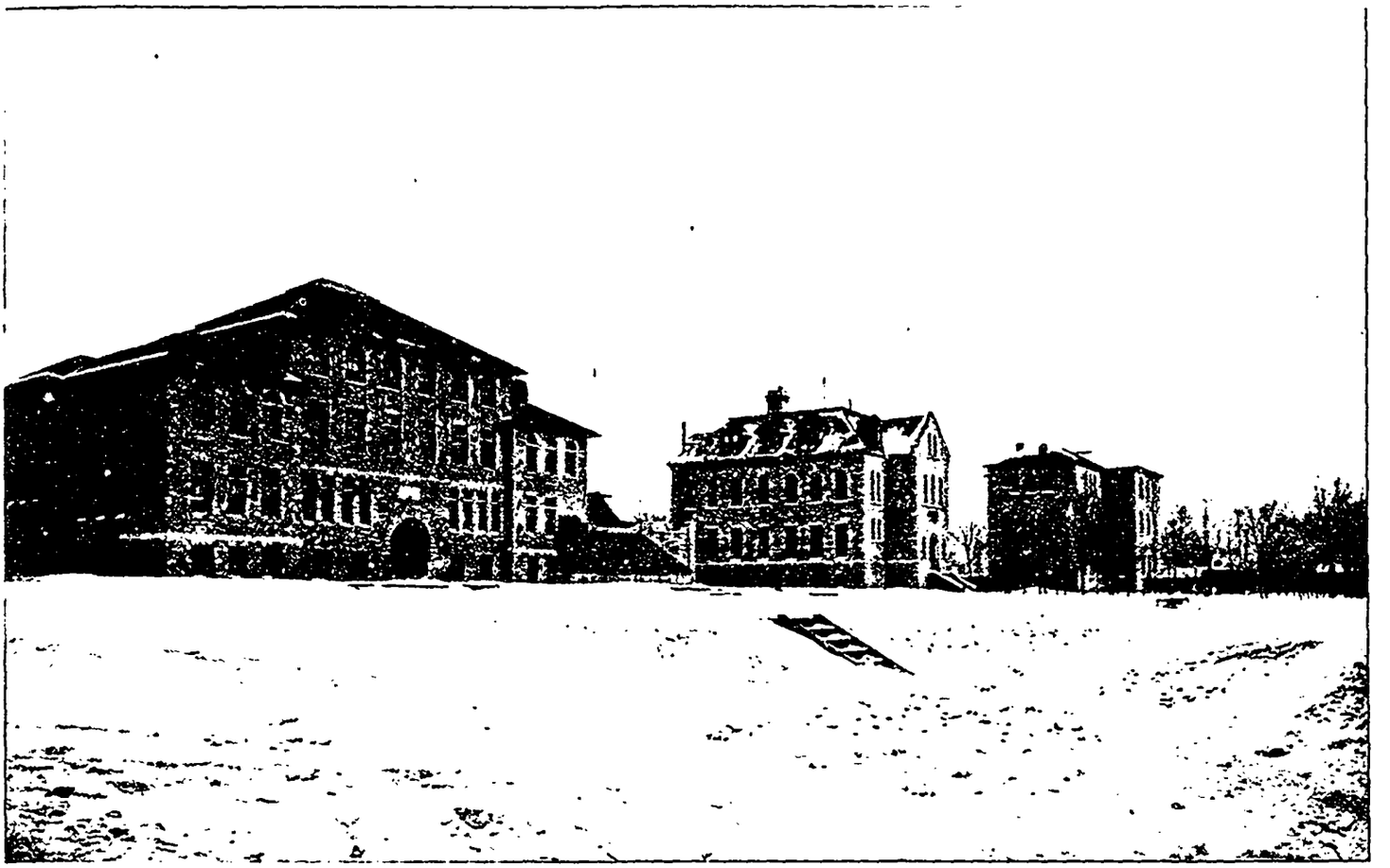
The Mining School is affiliated with Queen's University; closely in touch with it in every respect as to interchange of classes and fellow feeling. The buildings being all grouped on a fine site overlooking Lake Ontario, the students of Science, Arts, and Medicine are thus brought together in the class rooms and in every phase of University life. In the Mining School, or Faculty of Practical Science, there are eight courses now well provided for in accommodation and instruction, although the rapid growth of this faculty will soon call for more room and equipment.

These eight courses are:—

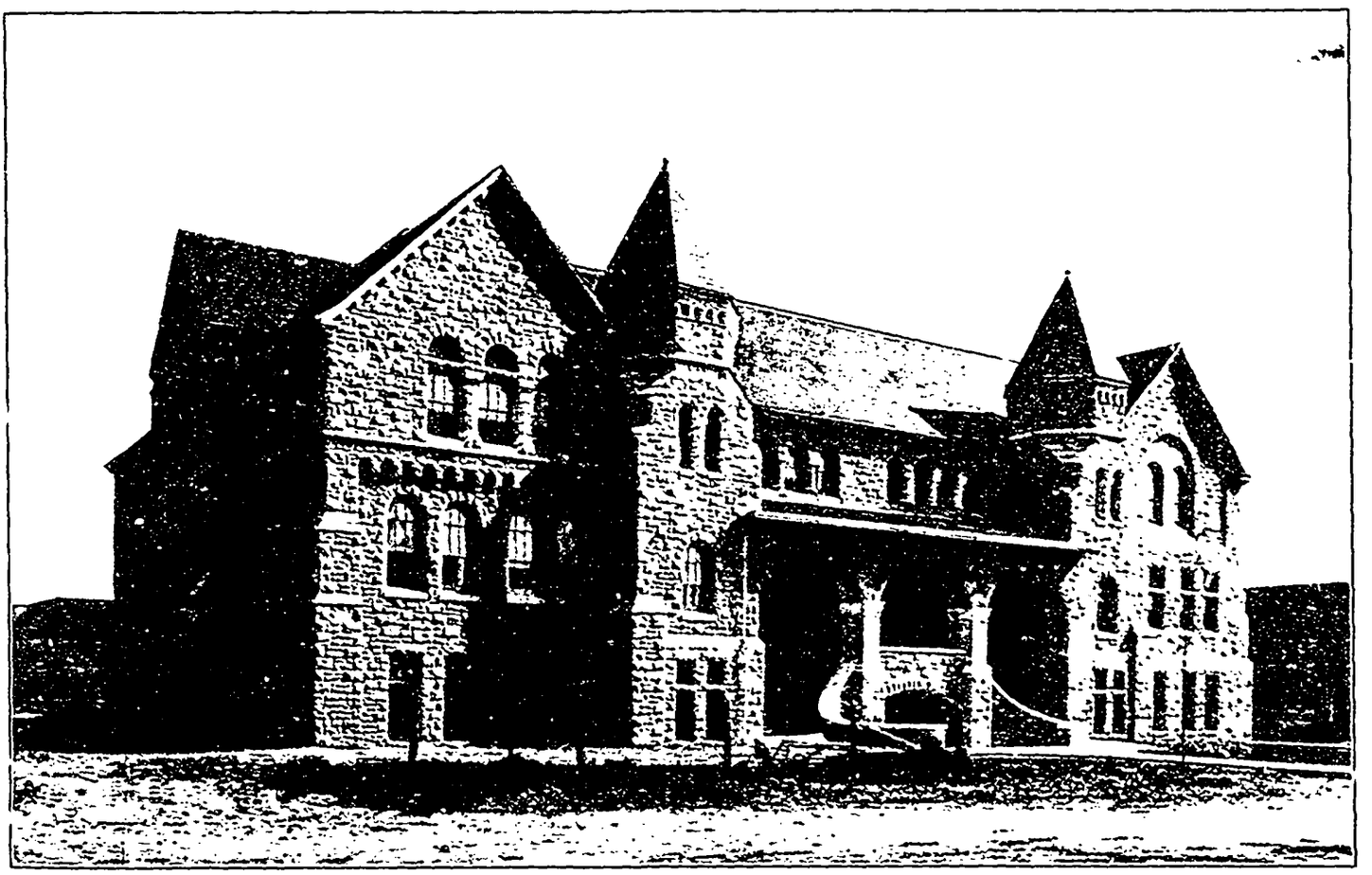
Mining and Metallurgical Engineering;
Civil, Electrical, Mechanical, and Chemical Engineering.
Chemistry and Mineralogy.
Mineralogy and Geology.
Biology and Public Health.

These courses are four years' each, the first year's study being common to all, so that a student during, or after, his first year my recognize his inclination or talent and proceed to the course best suited for him. The degree of B.Sc. is given alike for any one of these courses.

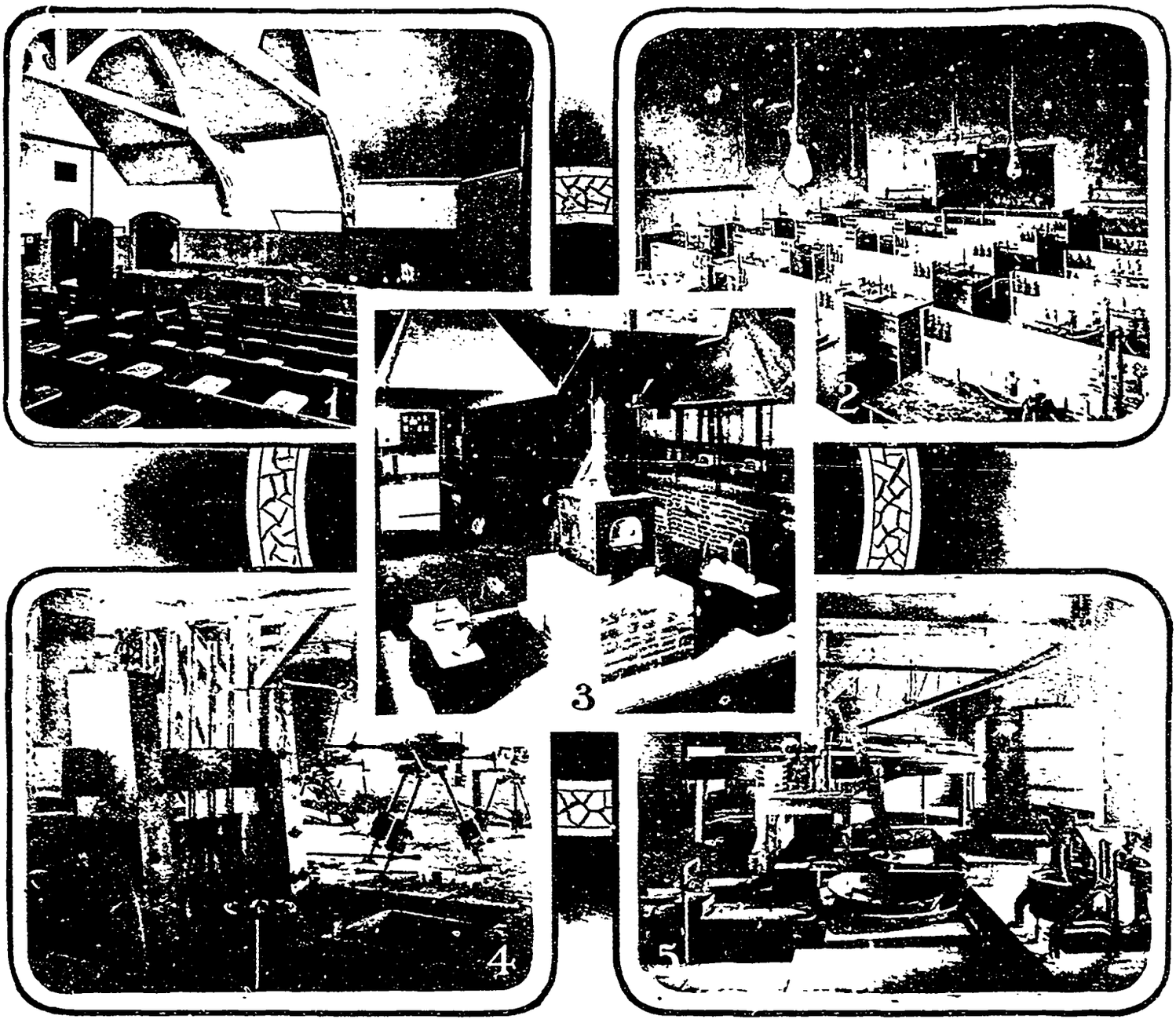
The Province of Ontario, which contributes to the support of this Mining School, makes it possible for many students to gain a practical science training, who, otherwise, could not afford it. Such students appear to form the best material for some engineering professions and can here find a combination of circumstances which make it possible for them to gain a degree. The fees are light, and living expenses less than is usual in university towns, the cost per session not being over $250.00, with a minimum of consider-



ENGINEERING AND CHEMISTRY BUILDINGS, SCHOOL OF MINING, KINGSTON
(See article on page 98.)



GEOLOGY, MINERALOGY AND PHYSICS BUILDINGS, SCHOOL OF MINING, KINGSTON.
(See article on page 98.)



LECTURE ROOMS, LABORATORY, ASSAY AND METALLURGICAL ROOMS AT THE KINGSTON SCHOOL OF MINING.

(See article on page 98.)

ably less. It is possible, and it is quite common, for the students to put themselves through on their own earnings.

Until lately the Province of Ontario has given nearly all of the engineering students, but during the last two or three years a considerable number are coming in from the West, and some from the States. The West has no efficient Practical Science School, and its men are forced to come East for training; transportation to and fro is a heavy cost—nearly as much as the cost of the session.

The C. P. Ry. and the G. T. Ry., however, have this year given much reduced rates to *bona fide* students living in the West, or desiring to work during the summer season there. This is a considerable help and a wise policy, for no better material could be introduced into the development of the country.

Concerning the equipment of this School, it may be said that Mining and Metallurgical Engineering have a very fair and useful mill with laboratories and draughting room of their own. The allied departments of Geology, Chemistry, Mineralogy and General Engineering have each their own buildings and equipment, the first three subjects being especially strong, as they have been longer building up. Recently the Civil Engineering Department has been much developed, also Electrical and Mechanical Engineering, so that each has a course of its own, quite complete, and benefited by association with all the other courses of the University.

In the mill and laboratories tests are made each year upon such ores as appear to offer instructive work in milling or concentration. These ores come principally from Ontario, but small lots from British Columbia and other long distances can be accommodated owing to the facilities given by the C.P.R. and their special rates given to mining schools.

To those who may have ores which afford an interesting problem in milling or concentration, it may be said that we are ready to do what we can to experiment upon them at very reasonable rates. As a rule, people are slow to appreciate the benefits of this work, which entails very little effort on their own part.

It is expected that the present growth will continue with a corresponding increase of opportunity for students in the practical world. Up to the present time the increase in opportunity appears to quite keep pace with the material turned out, and it is believed that the mining community is not yet surfeited with trained men at positions which are as well paid as other professions.

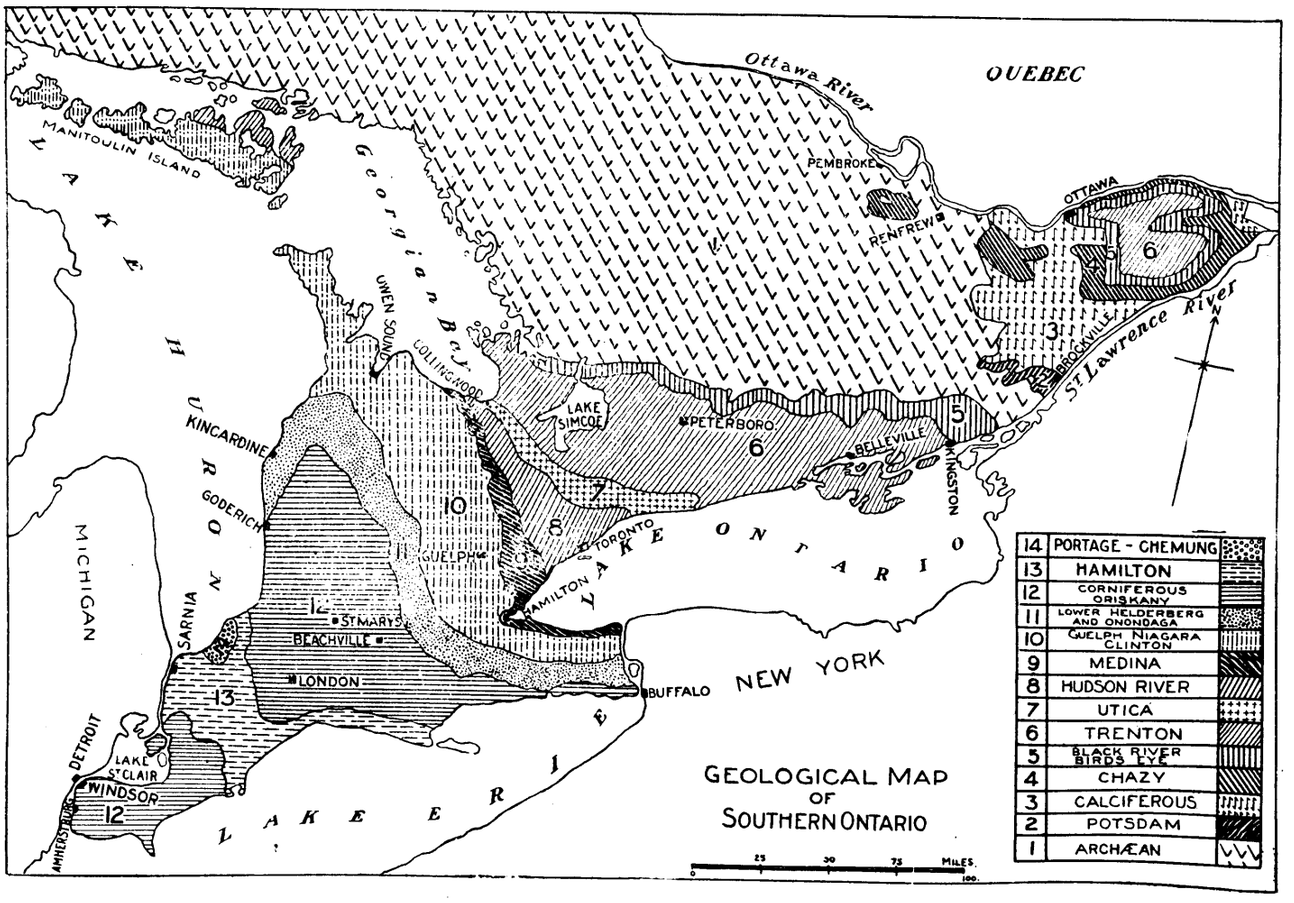
MILLING LABORATORY, SCHOOL OF MINING, KINGSTON.

LIMESTONES OF ONTARIO.

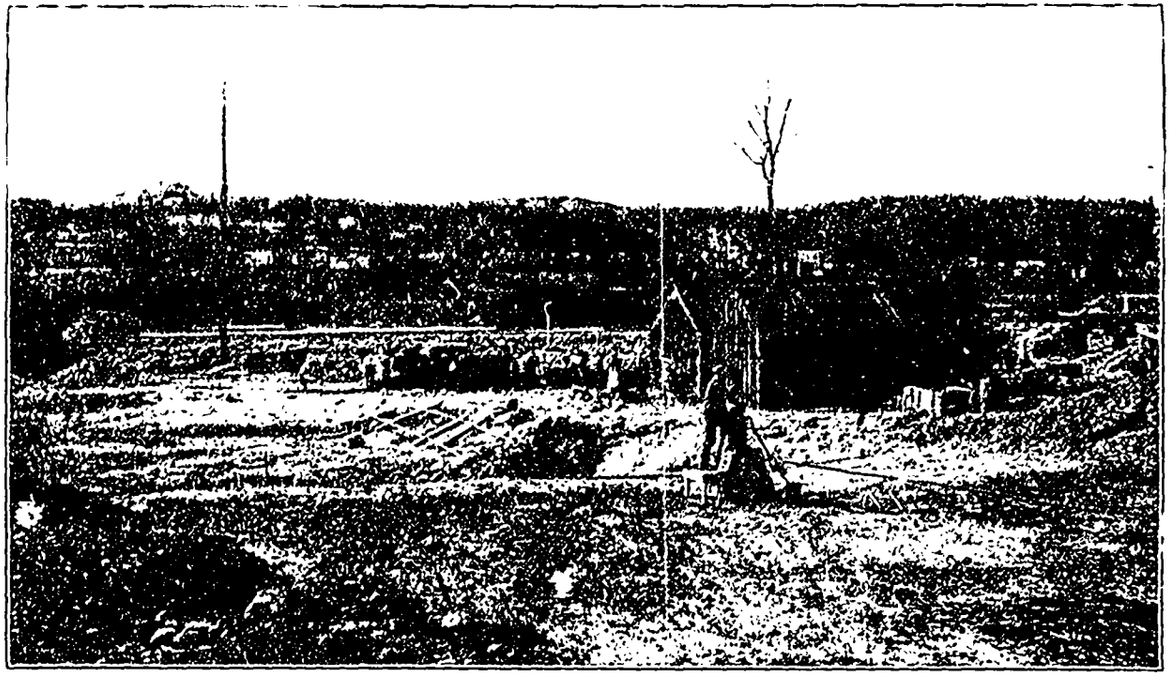
The Ontario Bureau of Mines has just issued a report compiled by the State Geologist, Prof. Willet G. Miller, on this subject, the Bureau having received during recent years frequent inquiries as to whether limestones of suitable quality for various industries were to be found in the Province. As Mr. Miller, in his introductory report remarks, the industrial value is in general very imperfectly realized, and it is not widely known that during recent years a number of important industries have either come into being, or have been perfected, which depend on limestone as a base.

On the uses of limestone we excerpt the following from Mr. Miller's report:

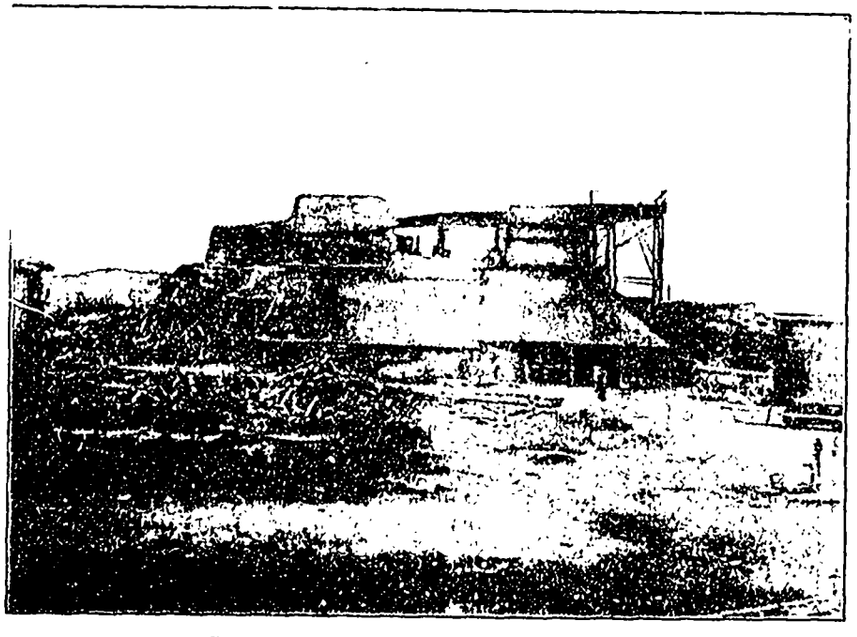
"Although the quantity of rock used in some industries is not in itself of great money value, still it is impossible for certain works to be established in a locality where limestone of suitable quality cannot be obtained at a satisfactory price. Industries that were not dreamed of twenty years or less ago are now firmly established. One of these is the manufacture of calcium carbide, which has developed into a world-wide industry. Ten years ago the manufacture of Portland cement was but a business almost unknown on this continent. It has now become one of the greatest in America. In Ontario much capital has been invested in it, and well-situated deposits of marl and limestone are eagerly sought for. Then, within the last two or three years several beet-root sugar factories have been built in the Province. These require lime of a very pure quality. Our wood-pulp industry is also a growing one, and it is believed that it will in time add much to the wealth and prosperity of our population. The sulphite pulp process requires a limestone high in magnesia, of quite different character from that used in the manufacture of beet-sugar. Our smelting industry is also becoming greater yearly, and limestone suitable for certain smelters sometimes has to be sought for at a distance, e.g., limestone occurring near the town of Renfrew has been found to be of the quality required at Sudbury, and has been quarried and shipped thither. In the varied industries in the vicinity of Sault Ste. Marie limestones of three or four kinds are required, One quarry has been operated on an island in Georgian Bay and two others were purchased in the State of Michigan. If we had had a fairly complete knowledge of the limestones situate adjacent to the Ontario shore of Lake Huron, it is probable that it would not have been necessary for the company to go out of the province in order to find this part of their raw materials. It is believed that this province has vast undeveloped iron deposits. Some of these are situated within easy access of the great lakes, and the ore can be shipped without difficulty. Other deposits lie at such a distance from water routes that if they are to be worked the ore will have to be smelted on the ground, and the fuel must be charcoal. In reducing wood to charcoal, valuable by-products are formed. One of the most important of these is acetate of lime. In the preparation of this material a pure lime is required. Thus it is seen that, in the manufacture of charcoal iron, limestone is required, not only for smelting the ore, but also in the preparation of one of the wood distillates. As there are very few occurrences of ordinary solid limestone in some of the more remote northern parts of the Province, it would seem that some of the marl deposits in lakes and marshes are likely to become of economic importance.



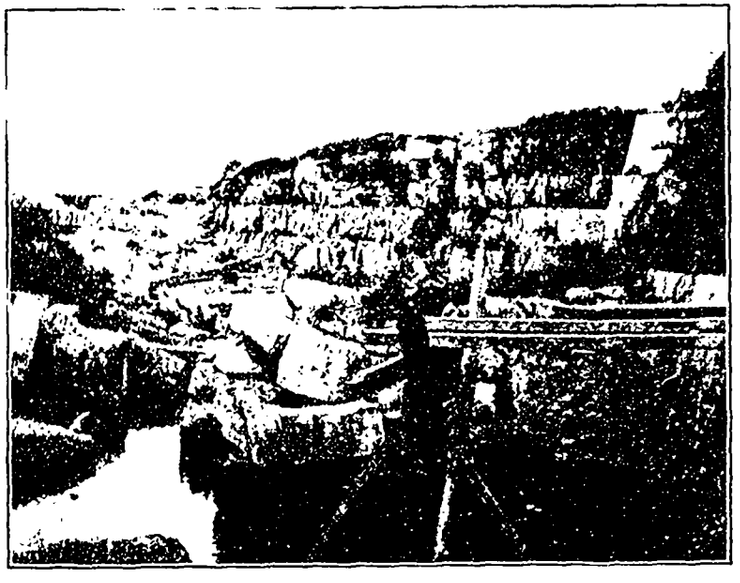
It is easy to demonstrate that limestone plays a very important part in the industrial economy of any nation. Having in abundance raw materials or unused resources in connection with which for many purposes limestone is required, or can be profitably employed, especially timber, iron ore and water



QUARRY OF GRAY DOLOMITE, ANDERDON, SHOWING FLOOR OF HIGH GRADE LIMESTONE. ESSEX COUNTY.



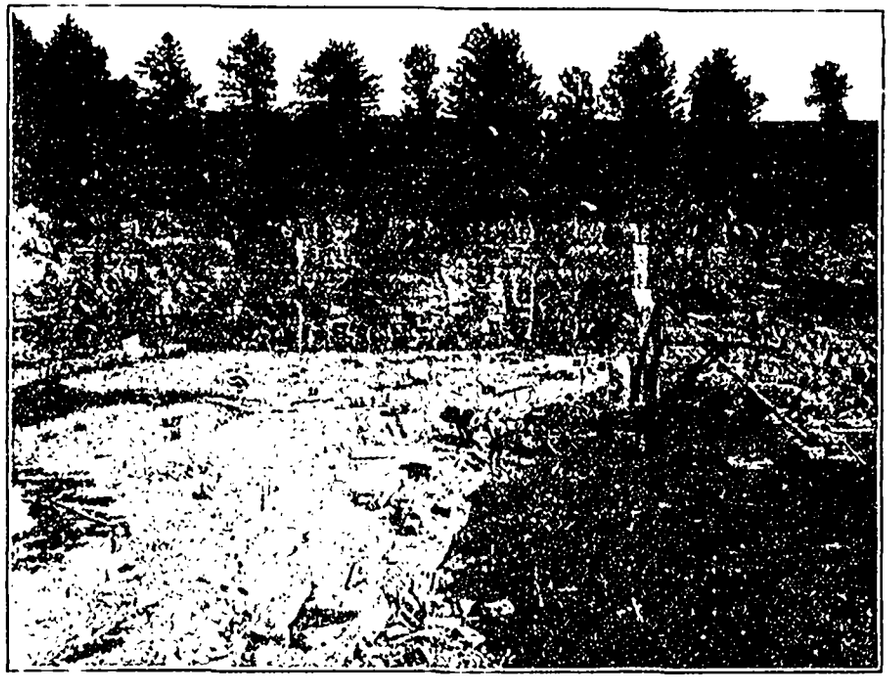
BEACHVILLE LIME KILNS. OXFORD COUNTY.



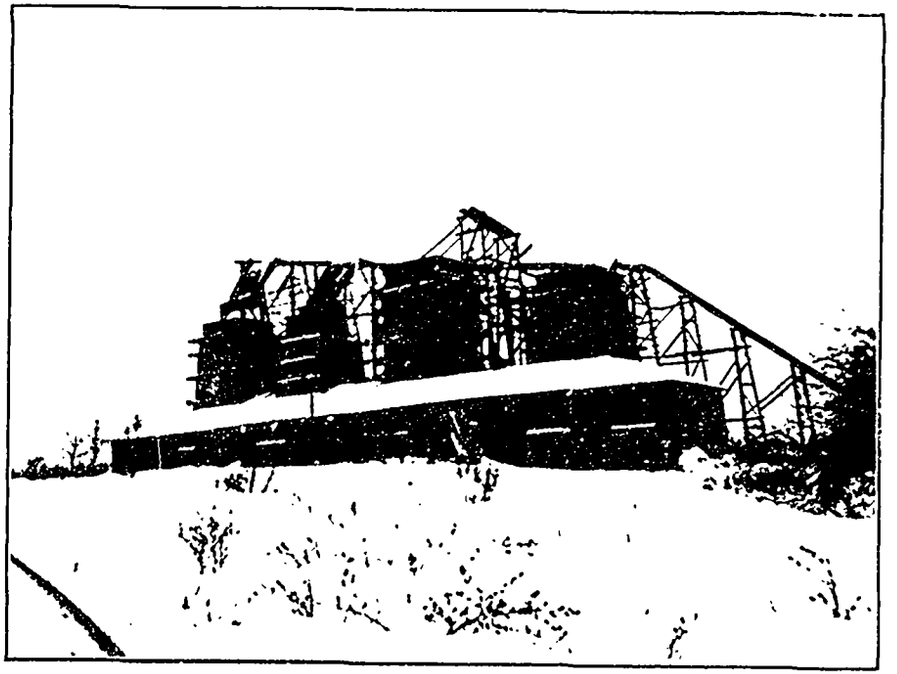
GRAY DOLOMITE BLUFF, ANDERDON QUARRIES, SHOWING DEBRIS FROM QUARRYING BLOCK STONE. ESSEX COUNTY.

LIMESTONES OF ONTARIO.

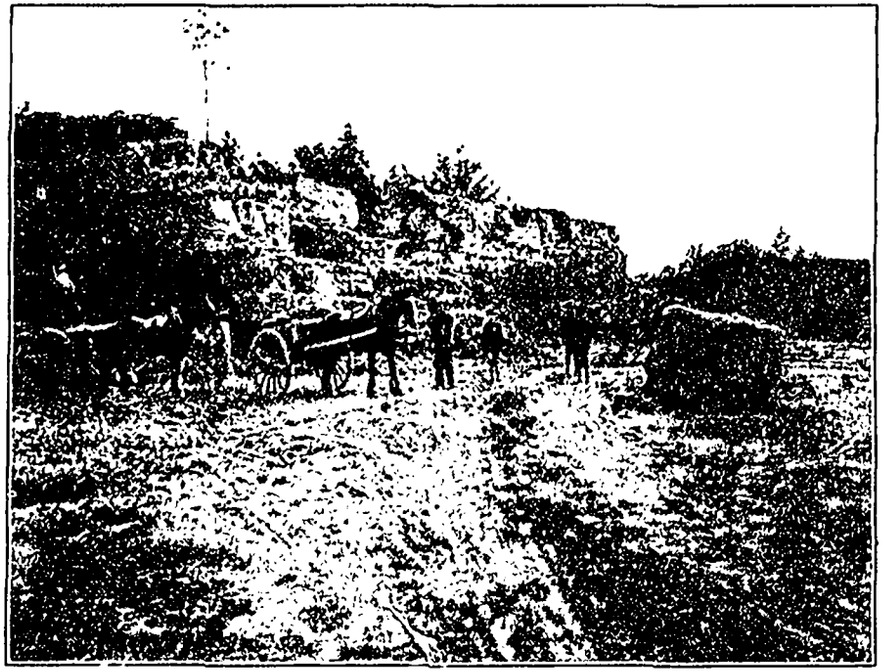
(Reproduced by kind permission of Ontario Bureau of Mines.)



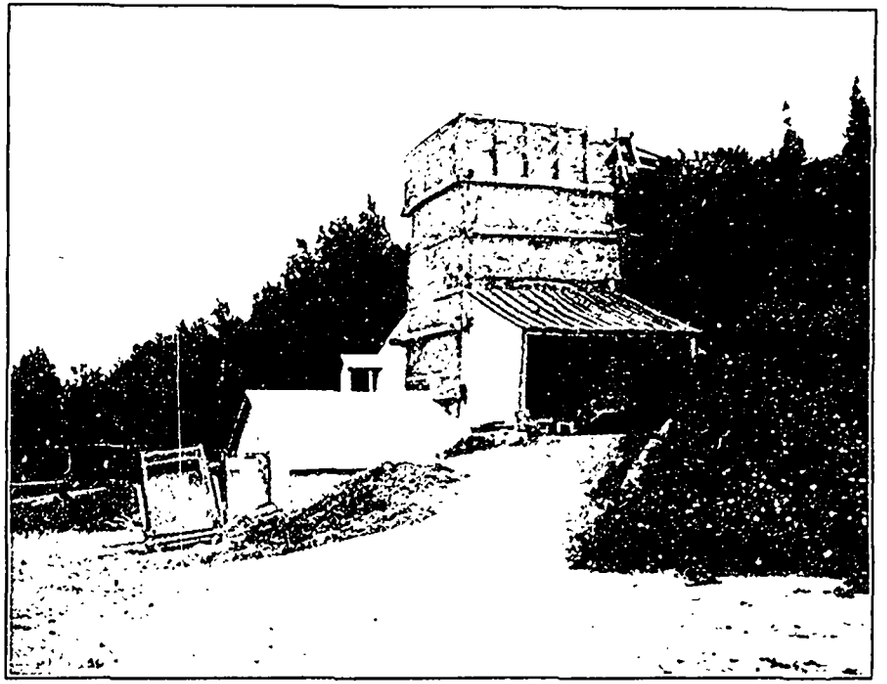
ST. MARYS QUARRIES. PRODUCT USED FOR BUILDING, AND WASTE ROCK FOR ROAD METAL. OPENING IS 200 BY 400 FEET, AND 20 FEET DEEP. PERTH COUNTY.



LIME KILNS AT SHERKSTON QUARRY, USING NATURAL GAS AS FUEL. WELLAND COUNTY.



E. HARVEY'S LIMESTONE QUARRIES AT ROCKWOOD. WELLINGTON COUNTY.



LIME KILN AT LIMEHOUSE. HALTON COUNTY.

LIMESTONES OF ONTARIO.

(Reproduced by kind permission of Ontario Bureau of Mines.)

power, our limestones should be considered as being among our valued assets. An accurate knowledge is required of them for use in those industries which are capable of great expansion in the province.

At the present time the value of the products of three or four of our industries in which the rock plays an important part, represents about 20 per cent. of our total annual mineral production of over $13,000,000. Limestone has as great a bearing on the wealth of other countries.

The following is a list of manufactures and industries—arranged in alphabetical order—some, of course, consuming only a small amount of lime, in which limestone is used as a raw material: Acetate of lime, agricultural uses, ammonium sulphate, beet sugar, bone ash, building stone, calcium carbide, carbon dioxide, cement (natural and Portland), chalk chloride of lime, as a dehydrating agent, disinfectant, in dyeing, gas manufacture, glass, furnace linings, lime for mortar and whiting, lime pencils used in the oxyhydrogen light, lime water, lithographic stone, marble, as a polishing material, potassium dichromate, pottery glaze, for preserving eggs, etc., pulp and paper making, as a chemical reagent, silicate brick, smelting of iron, lead, etc., soap, soda manufacture, tanning.

In Ontario very little use has been made of the crystalline limestones which are adapted to decorative and monumental purposes. At the present time, so far as known, only two quarries are worked for marble. The marble used in this country nearly all comes from the large quarries of the United States. Although there are in the province native varieties that are as good, trade prejudices favor the imported article.

Referring to the uses in Ontario of limestones for fluxing purposes, Mr. Miller states that owing to greater cost in some localities of obtaining stone carrying a high percentage of calcium carbonate, rock high in magnesia is often utilized, while crystalline limestone from the town of Renfrew has been used in the smelting and refining operations at Sudbury.

Mr. C. B. Fox, M.A., chemist and metallurgist at the Hamilton Steel & Iron Company's plant, reports that dolomite quarried in Wentworth County has been used for several years in the company's blast furnaces. An average analysis of this stone is:—

	Per cent.
Silica	.75
Alumina and ferric oxide	1.00
Lime	30.24
Magnesia	20.18
Phosphorus	.021
Sulphur	.050

In the Steel Works, calcium carbonate is used for desulphurizing and removing the phosphorus from the steel in the open hearth process. This has an average analysis of:—

	Per cent.
Silica	2.00
Alumina and ferric oxide	1.10
Lime	51.00
Magnesia	1.10
Phosphorus	.015
Sulphur	.05

Mr. Fox adds:—

"This calcite stone comes from the vicinity of Port Colborne, on Lake Erie, the nearest point to Hamilton at which calcite stone is found, all the limestone of our mountain being dolomite, with silica running from one-quarter of one per cent. up to six or eight. If the silica runs above three per cent. it hardly pays to use it here.

"It is generally conceded by blast furnace men that dolomite stone takes more fuel than calcite when used in a blast furnace, and calcite is generally supposed to be more efficient in the removal of sulphur. When smelting lean ores requiring a large amount of flux (i.e., where the proportion of ore to stone is lower than 3 to 1), the slag is liable to be dark and spongy, and difficult to handle when dolomite is used. On the other hand, it is claimed for dolomite that it prevents sticking and hanging in a furnace, and causes the stock to descend more easily.

"We have had samples of stone from a quarry at St. Mary's, which shows the stone there to be a calcite of about the same purity as that from Port Colborne."

In keeping with the object of this report, which is to show where limestones of various chemical compositions are to be found in the province, and with a view to assist those who are in search of raw materials of particular kinds, quite the bulk of the volume before us, the preparation of which has manifestly required an immense amount of labor and research, is taken up with a detailed classification and description of localities in which limestones occur. Hence with the information afforded, and by the aid of a map also contained in the report, the searcher for stone of a special chemical composition should have no difficulty in locating areas in which suitable outcrops occur. The report is a further testimony to the good and practical work for which the Ontario Bureau of Mines has already established a reputation.

THE STRATIGRAPHY OF THE CASCADE COAL BASIN.*

By D. B. Dowling.

(*By permission of the Acting Director Geological Survey.*)

Previous to the uplift of the Rocky Mountains all that part of the continent had for ages suffered but little from earth movements except, perhaps, a shallowing of the sea from Carboniferous times. There is little if any deposit to mark the lapse of time between the Carboniferous and the earlier stages of the Cretaceous, but the succession of the beds indicate no physical break. During most of the Cretaceous time the sea does not seem to have maintained any great depth, but shallow water conditions are marked at its inauguration, at about the middle period and again toward the close. This was followed by fresh water inundations, probably in the form of large lakes in which were deposited the Tertiary beds of Alberta.

The shallow water periods of the Cretaceous also show intervals of emergence during which land conditions prevailed and vegetation flourished. As the elevation of the land was not greatly above the sea, frequent inundations followed and the vegetation was covered up to be gradually changed to coal beds. We have thus three horizons that can be considered coal bearing in the Cretaceous.

1. The lower part of the formation—called the Kootenay series. Typical sections of this are given in the Crow's Nest Pass, as well as in several of the Rocky Mountain coal areas and in the Queen Charlotte Islands.
2. The middle portion of the formation—The Belly River series. This is exposed between Lethbridge and Medicine Hat, on the Belly River, and on the Peace River near Dunvegan. To this we may refer probably some of the seams that are exposed in the foothills near the outer range of the mountains.

* A paper read at the March meeting, 1905, of the Canadian Mining Institute.

3. The upper part of the Cretaceous—the Lignite Tertiary of early nomenclature. In Northern Alberta this is now known as the Edmonton series and it probably is continued south as the St. Mary River beds.

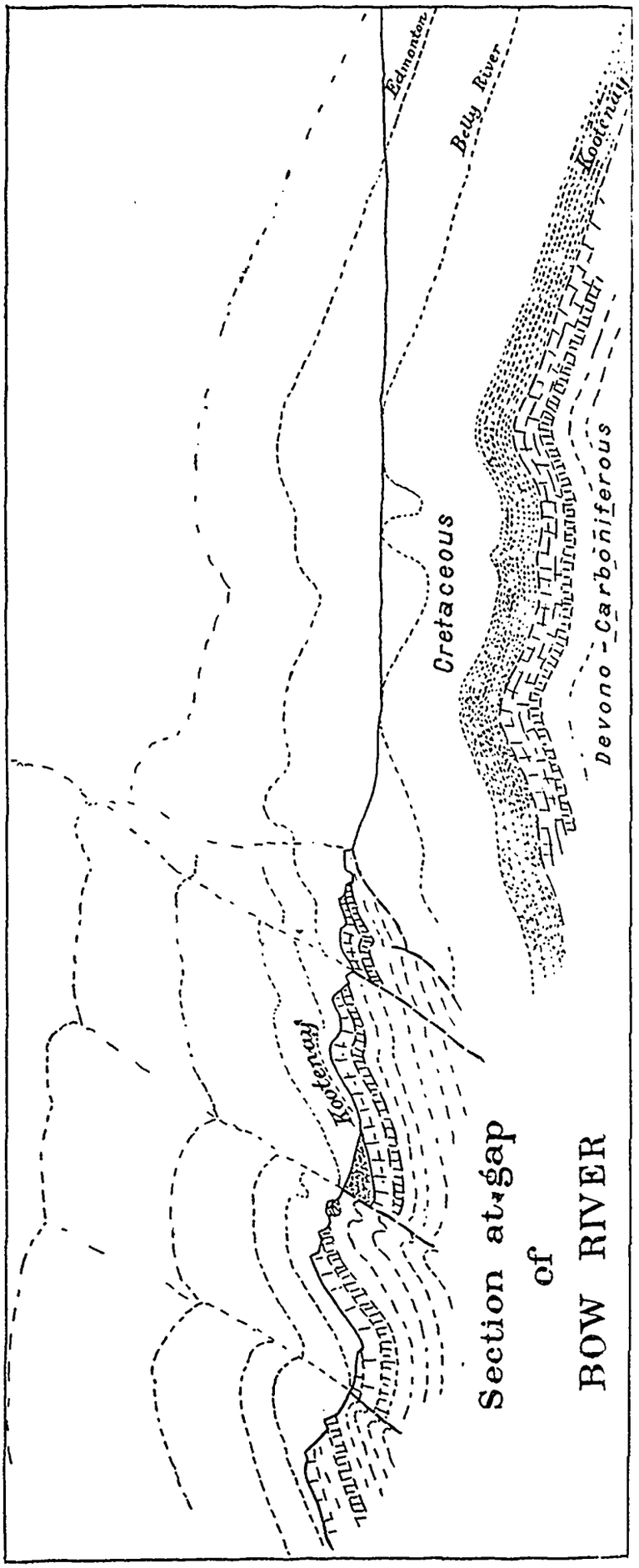
This last division furnishes coal over a large area reaching from Manitoba to near the mountains. In Manitoba these rocks occupy the summit of Turtle Mountain in the south. In Assiniboia, or the new Province Saskatchewan, they underlie portions of the Cypress Hills and cap Wood Mountain and the Coteau, and occupy a shallow syncline eastward through which the valley of the Souris is cut and from which much of the lignite consumed in the eastern section is obtained.

The one with which we are at present interested is that first mentioned—the lower part of the Cretaceous, the Koo-

Prospective of model of Cascade and Bow Valleys, looking about N.N.W. It shows the Bow River from below Canmore up to Banff, and also a part of Cascade River. The coal-bearing rocks occupy a somewhat narrow belt along the western part near the centre of the valley. The topography is obscured a trifle by the geological coloring.

tenay series, as it contains the most ancient and therefore, we might say, the best quality of coal. It owes its exposure here altogether to the uplift of the Rocky Mountains and is found to the west of the outer break of the range. This outer break has been of such dimensions that the uplifted beds on the west exposed the lower rocks as low down in the series as the Cambrian, and these latter rocks are found thrust up over those of the middle Cretaceous to the east of the fault. At the gap of the Ghost River, Mr. McConnell observed an overthrust of over two miles, and estimates the total there to be nearly seven.

A rough diagram of the section as observed at the Bow River Gap from near Cochrane to the valley of the Spray River, will help to place before the eye the disposition of the beds after the various fractures. The amount of displacement of the outer fault is conjectural in so far as concerns the thickness of the lower portion of the Cretaceous. Faint lines



to show the amount of eroded material are added, but it must be remembered that the breaks which are so sharp through the limestones probably when continued upward through the softer rocks vary much in character and were compounded or even ran into folds before reaching the surface. The original surface line would probably represent the section of an undulating elevated plateau.

Three blocks of the model in perspective to show structure of the field northward from Bankhead. Coal seams are indicated by broken lines.

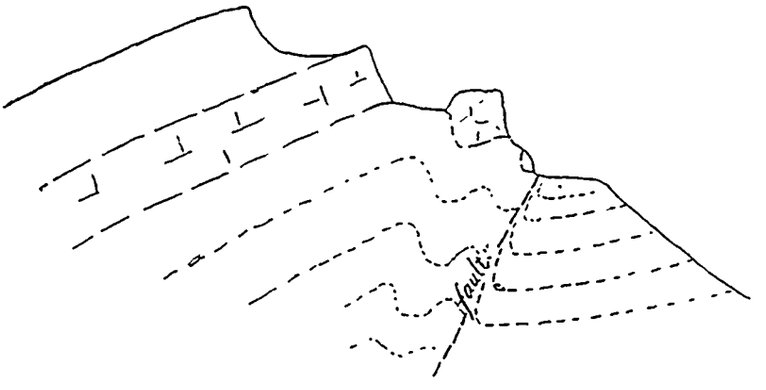
The general elevation here has been much greater than farther south in the vicinity of the Crow's Nest Pass and the denudation consequently of a more pronounced nature, so that remnants only of the softer rocks above the limestones are left in the broader longitudinal valleys. The section will also help to illustrate what is meant in such a statement as —If a few thousand feet less of these rocks had been swept away, we would have here what would compare, very favourably, for a coal producing area, with that at Blairmore and Frank. The section across the measures at the latter place to the north of Grassy Mountain resembles very much one drawn here, about three thousand feet higher than the present surface.

The preliminary study of the rocks of the Cascade basin, which is here the first and most prominent of the remnants of the Kootenay rocks inside the first range, led Dr. Dawson to speak of it as a basin or trough. This is true for a small portion of the area near its northern end, but for the major part, the break at the west is of the nature of a fault, and much of the coal producing rocks have been overridden by the rocks thrust up from the west.

A study of this break shows that the primary folds did not attain such great dimensions as are generally given for mountain structure, but were rapidly sharpened up and the break in the limestones was attended by little folding. The upper members of the series thus affected have since been removed, so that a study of the complete fault line is impossible. The general line followed by the fault apparently is near the crest of the anticline. In the Cascade basin, however, there is an example of the break leaving one fold and running to another. At least the deflection in the general line of the fault would look somewhat like this, as the continuation of the fault line from the Kananaskis along the front of the Rundle range would strike near the centre of Cascade Mountain where there is distinctly showing on the face of the mountain an anticlinal fold, and its continuation along part of the Rundle range has been traced. This has been figured by Dr. Dawson as proof of the complete downturn of the limestones beneath the Cretaceous trough, but there is room for but a small portion of the beds.

Northward of Cascade Mountain the break gradually changes to a fold with perhaps a small break in the beds between the crown of the anticline and the bottom of the syncline. The hills forming the continuation of the Cascade Mountain are anticlinal ridges with a trough of Cretaceous along either margin.

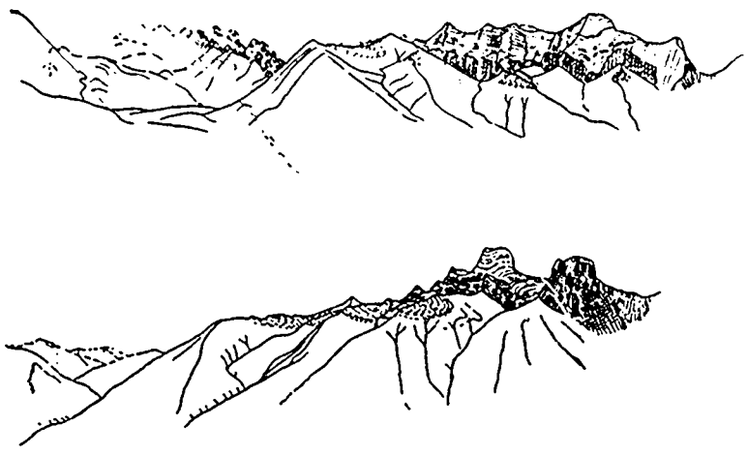
South of the Kananaskis river the Cretaceous beds dip to the southwest and run under the limestones brought up by the fault. On the height-of-land, between this stream and the Bow, the slope of the beds becomes less and very little of the coal-bearing rocks seem to have been over-ridden, and the limestones abut directly against the ends of the beds. They have in consequence sustained a severe pressure, and the lateral movement of the mass has been taken up by a series of flexures in both the limestones and the coal-bearing sandstones. The former are crumpled in a series of waves running nearly parallel to the fault line by which the beds away from the fault become more elevated in a series of steps. This can be seen in the peaks called the Three Sisters—three peaks in line back from the fault, at successively higher elevations. The lower and more easterly one is a remnant of a syncline in the beds which form the centre one. These folds continue south to the foot of Wind Mountain, and seem to pass beneath it and may continue still farther.



Section at Three Sisters Peaks

In the Cretaceous in front of this part the beds are not very much disturbed, except near the contact, where they are crumpled and seem to be brushed up along the fault line. These comparatively disturbed beds occupy a partly dissected plateau south of the Three Sisters and on the height-of-land to the Kananaskis, a strong fold is seen to accompany the change to the monocline structure. This is well marked in the upper beds, which are coarse sandstones and conglomerates, and the fold is seen to run from near the fault line north

of Wind Mountain, southeastward, on a line which carries it gradually higher and away from the fault. In the lower beds of the series it is thought that the fold will be less marked, and in the angle contained between the fold and the fault, there is probably a sharp anticline. Northward from here to the Cascade Mountain, the Cretaceous is overlapped by the limestone from the west, but a series of flexures in the coal-bearing measures are found in the Canmore mines, which



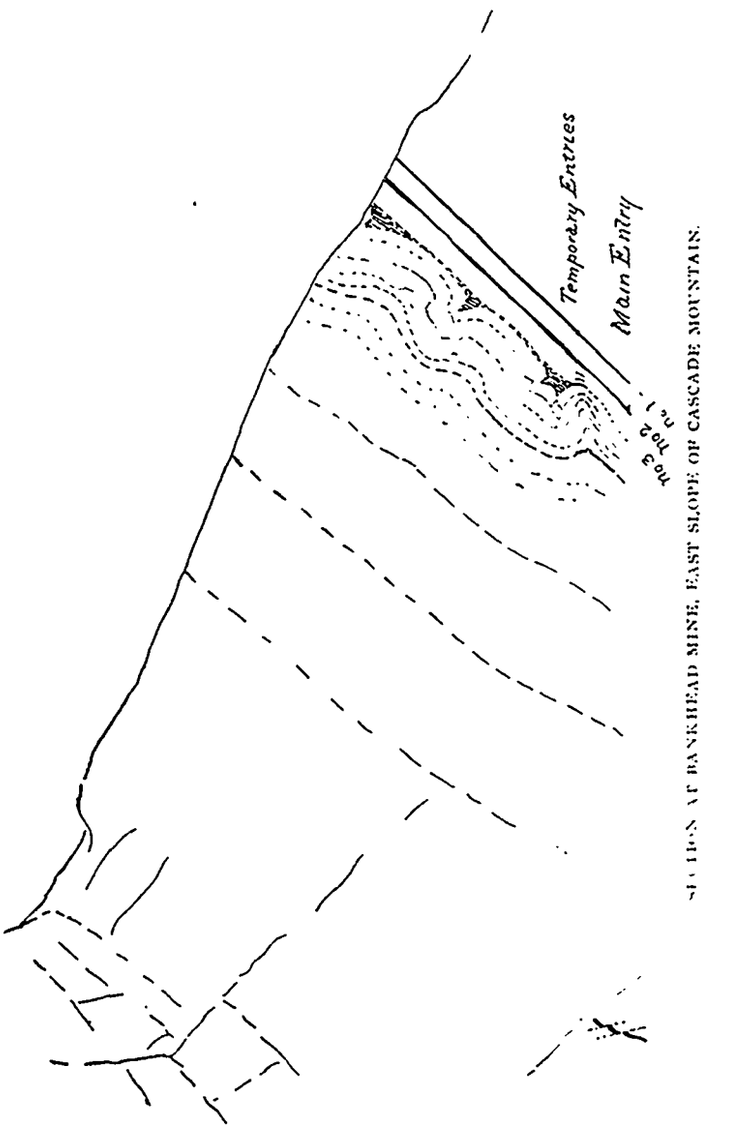
SKETCHES OF THE CRETACEOUS PLATEAU BETWEEN THE BOW AND THE KANANASKIS RIVERS.

The upper one is looking across the valley of the Kananaskis southward, and shows the coal-bearing beds dipping beneath the limestone. The foreground in each shows the limestone abutting against the Cretaceous, forming a fold in the latter by the pressure.

are probably continued along in front of Rundle Mountain, and seem to indicate that the direction of pressure was not at right angles to the fault, but more from the west. As the sliding of the limestone was upward along the fault, a series of waves in the coal seams might have been expected running parallel to the fault and not far from horizontal. Those found, however, have a pitch downward toward the south. A possible explanation may be deduced from the fact that the fault line in the vicinity of Anthracite is deflected to the north and then gradually dies out or is changed into a fold with less displacement. This gives us then a pivotal point on which a large block can be assumed to have swung. This would allow of a sliding of the limestones upward in a direction at right angles to the direction of the folds.

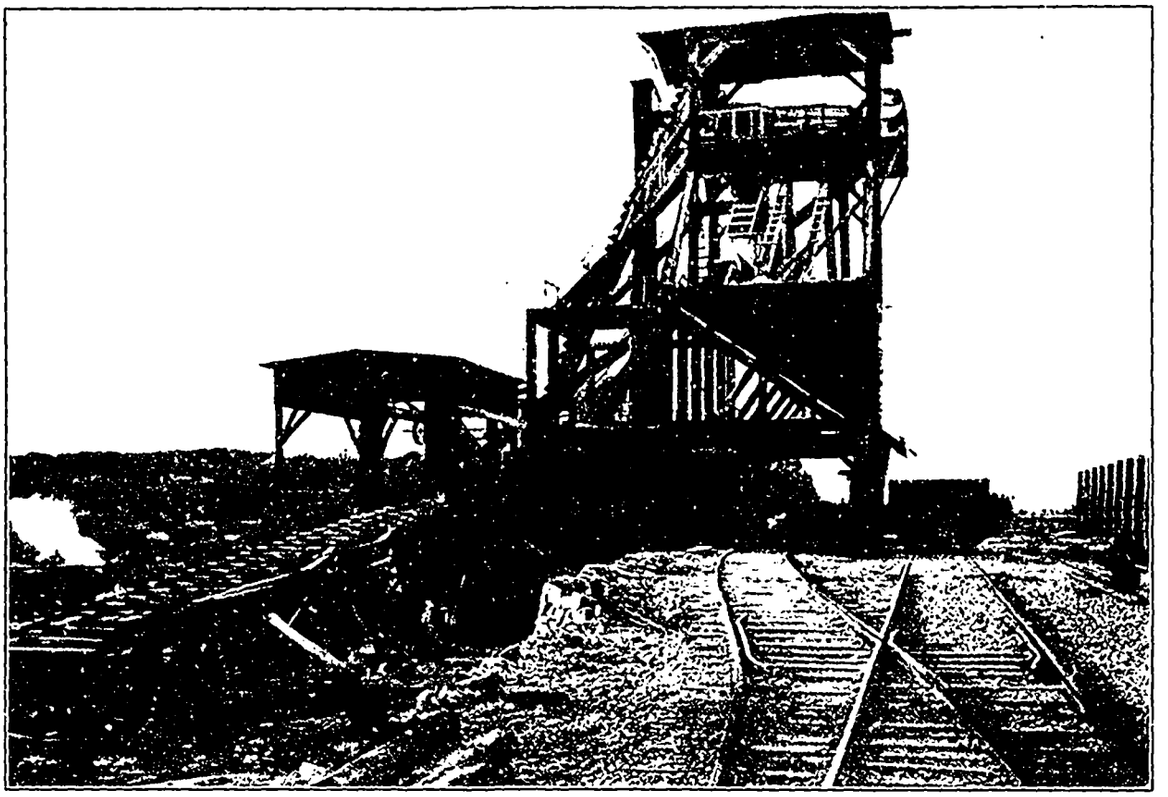
The part of the field thus affected extends from between Canmore and Anthracite southeastward to the foot of the hill below the Three Sisters. The beds east of a line running north and south through the town of Canmore are not much disturbed. To the west of this line they dip downward and pass through a series of waves as already noticed. At Anthracite the seams do not appear to have been affected by this series of small waves, but there is instead a much larger fold pitching downward in nearly the same general direction but at an easier angle. Mining operations commenced here on the beds dipping down into this fold, and on account of the great denudation in the valley of the Cascade River at this point the beds could not be safely followed down through the trough and over the saddle on the far side, without running into the water-laden gravel of the river. In the northern part of the mine, where the trough was shallower, the western upturn showed a slight bending toward the west, and this if it could have been followed far enough, would have led downward into the seams in the rest of the property. The sandstones below the coal can be traced northward to cross the Cascade River, and it seems rational to suppose that the coal seams above should do the same. The mining operations were continued only long enough to extract the coal from the seams within the fold, and little prospecting was done on the northern and larger part of the property. That the seams continued north past the fold is abundantly proven in the prospecting done on the measures north of the Cascade River by the C. P. Ry. The strike of the beds changes after passing Anthracite, but remain fairly constant for about five miles from the crossing of the Cascade, with a general dip to the west of 45 deg. or 50 deg., but here the beginning of a shallow syncline is found, and before the end of the Cascade Mountain ridge is reached the coal-bearing beds run into the fault line. As the valley of the Cascade River narrows up, less of the Cretaceous rocks remain, and at the northern end only the dark shales below the coal-bearing measures are left. As the whole of this area is taken up by the C.P.R., it is intended to work it all from the south end, following the seams on an entry but little above the Cascade River.

The southern end of this field consists of a monoclinal block of Cretaceous dipping to the west, partly over-ridden by the limestone of Cascade Mountain. This overthrust has made some impression on the rocks composing the block. The two lower seams on which work is progressing now are well protected by heavy beds of sandstone, and the shearing

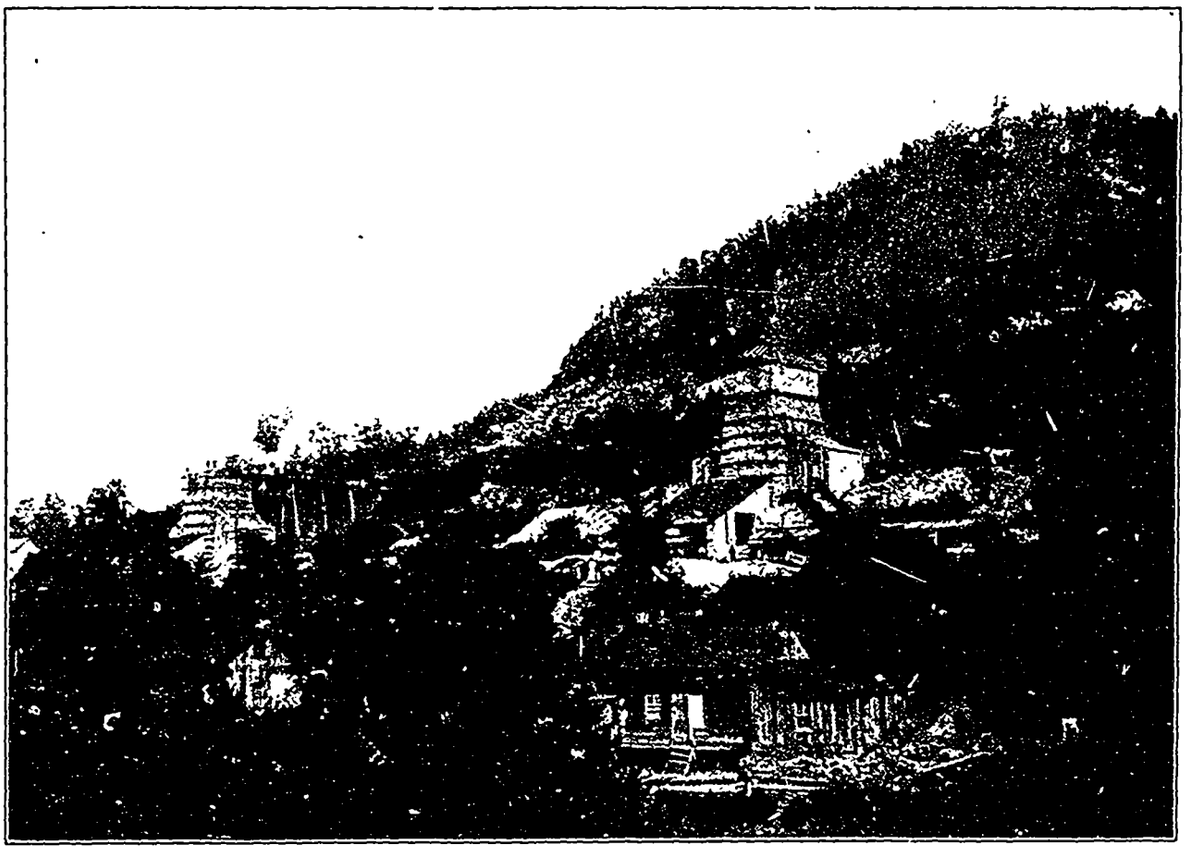


SECTION AT BANKHEAD MINE, EAST SLOPE OF CASCADE MOUNTAIN.

and pressure of the overthrust has caused little damage to the coal. The one above has suffered much more, owing no doubt to weaker covering beds, and there is evidence that there has also been sliding and bending of the overlying rocks. The sliding plane seems to have been mostly along the plane of seam No. 3.



PLANT FOR CRUSHING LIMESTONE AT ANDERDON QUARRIES ESSEX COUNTY.



D. ROBERTSON & CO.'S LIME KILNS, 2½ MILES NORTHWEST OF MILTON. LIMESTONE BEDS FOR BURNING ONLY ARE IN BACKGROUND ON HILLSIDE. HALTON COUNTY.

LIMESTONES OF ONTARIO.

(Reproduced by kind permission of Ontario Bureau of Mines.)

THE HON. FRANK OLIVER,

who succeeds Mr Sifton as Minister of the Interior.

In the beds immediately under the mass of the mountain little crumpling could take place, and the beds must have slidden bodily or in sections at different planes. In the beds at a distance from the overlying mass some relief could be had by the beds crumping up in front of the load. The rolls thus made would at the sliding plane be filled with broken material, and there would be a local thickening of the series along the face of the overthrust mass. The folds at Canmore are probably of this origin, but there are some in the beds at Bankhead that can be directly traced to this cause. In the prospect work at the top of the hill half a mile north of the mine, No. 3 seam apparently showed 100 feet of coal. This afterward was found to be but a mass of broken coal occupying a triangular area in vertical section. The foot wall was not disturbed but the roof had been forced back to nearly a vertical position, and below, the seam was continued with a thickness of only about five feet. In a cross cut to this same seam at the temporary entry on No. 2 seam the rocks were apparently undisturbed till No. 3 was approached, then the dip increased and the seam was found standing vertical, and farther on the dip reversed and where work was stopped the rocks were nearly horizontal. This points to a possibility of the tunnel passing beneath another of these rolls or pockets of broken coal. The foot wall of the mass was smoothed and showed small horizontal ridges, as though from the lateral pressure. Another example of buckling in the beds was observed on the walls of a gully five miles north of this place, but it can not be correlated with the same seam as at the mine. It probably is in somewhat higher beds, and if so there is some reason to think that No. 3 may as it is traced in the mine, prove to be workable in its northern part.

The effect of this buckling on the coal seams above the plane of sliding will be to form a series of waves such as are in the Canmore mine. Other sliding planes may, however, be found, but they are as likely to be in the thin bedded shales as the coal seams and will there cause no great amount of damage.

The work so far at Bankhead has disclosed two very regular and little disturbed coal seams, perhaps the best feature of the coal-field. The smashing of No. 3 seam is probably at its maximum at the south end and may diminish northward. The rolls do not seem to be horizontal, as the disturbance which is noted near the entry on No. 2 dies away farther in, but it must be admitted that the tortuous course pursued by this gangway at the entry is attributed to the proximity of a cross fault which divides the range to the east along the valley of Minnewanka Lake, and helped to make the great break between Mounts Rundle and Cascade. The section across the measures at the mine is emphasized to show the probability of portions of No. 2 being thinner opposite the extra pressure points of No. 3 or thickened by the relief of pressure opposite the pockets. One of the points where extra pressure might be expected would be between the two entries or below the temporary works. The state of this seam is no doubt already known, as there is being a slope put down on it at the mine to meet the main entry.

The thickening or apparent increase in the thickness of the measures caused by the crumpling of the strata is probably confined to the unloaded portion, and near the fault line the measures may be expected to increase their dip. A coal seam was found just under the foot of the mountain, and as it was of soft coking coal it was determined to test the seam by going down on it by a slope. Instead of a steep dip the seam started at the normal but bent downward and was carried still farther by a series of small faults which appear to run along in front of the mass of the mountain. By this series of steps the dip was increased to about 80 deg. This seam appears to be too close to the fault plane and is probably too much crushed to be profitably worked, but there seems to be no reason to suppose that higher up it may not have some portions that will be all right.

The two lower seams are of semi-anthracite, very nearly as hard as those in the old mine at Anthracite, but from the samples taken from the outcroppings of the higher seams along the hillside softer coal will probably be found, and after the cross entries are finished the shipments may include anthracite, steam coal and coking coal. The seams at Anthracite are slightly harder, but it must be remembered that the mining there is all from below what in this section is the main entry. I need not point out the great advantage there is here in having such a great body of coal above the entry.

It may be asked, how is it that as these beds are in regular ascending order above Carboniferous limestones, the age assigned to them is so much later than the Carboniferous? Is there not a chance that they are really the upper part of the Carboniferous, or near the age of the coal measures of Nova Scotia? The answer is that in the shales below the coal of this area Belemnites and Ammonites, with a few other shells known to be Cretaceous or Jurassic, have been found. The plants also that are associated with the coal bear but distant relation to the fern trees of the Carboniferous. At Anthracite and Canmore there have been recognized five species of ferns that have survived with slight change to the present day. Of the allied species, Cycads and Conifers, which can hardly be traced back as far as Carboniferous times, eight are found and all are related to modern types.

A NEW MINISTER OF THE INTERIOR.

Elsewhere in this issue, we print a portrait of the Hon. Frank Oliver, who recently succeeded Mr. Sifton as Minister of the Interior. Mr. Oliver is a native Canadian, having been born in Peel County, Ontario, in 1853. He went to the North West at an early period in his career, and was for a number of years employed as a printer in the office of the *Free Press*. Before the rebellion he went to Edmonton, where he established the *Bulletin*, which he still owns and conducts. In 1883 he was appointed to the North West Council and was elected to the Legislative Assembly in 1888 and continued a member until 1896. At the general election of 1896 he was elected in the Liberal interests for Alberta to the House of Commons, and was re-elected in 1900, and again in 1904. At the general elections last November, he defeated his Conservative opponent, Mr. M. Macaulay, in the new constituency of Edmonton by a large majority and at the recent bye-election he was returned by acclamation.

PROSPECTS OF CANADIAN COAL.

We quote the following extremely able article from our esteemed contemporary, *The Colliery Guardian*:—

"The improved outlook in Canada cannot fail to have a beneficial influence upon the coal industry, and a more prosperous time for colliery owners may be expected. This hopeful condition is reflected from all sides, and nowhere more prominently than in the iron and steel industries, which appear to be emerging from the depression of last year. The report of the Nova Scotia Steel and Coal Company for 1904, which has recently been issued, shows that a wave of depressed trade during last year resulted in a reduced sale of iron by the

amount of 156,000 tons, but, on the other hand, the quantity of coal raised was considerably in advance of the output of the previous year, although prices had been low in consequence of the severe depression which had prevailed in the iron and steel trades in Europe and America. Since the beginning of 1905, however, a marked improvement has set in, prices have advanced and consumption has increased. The same story is revealed in the report of the Dominion Coal Company, which, moreover, records a considerable falling off in business with United States customers in 1904, owing to the reimposition of the coal duties. There was also a loss of profit due to the payment of duty on shipments to the New England Gas and Coke Company.

"The history of the Dominion Coal Company is instructive to all who are watching the development of Canadian industries. Formed in 1893, there was, in the first year of working a total profit of over $300,000. Last year—that is, after about ten years' work—the net proceeds of sales of coal and income from other sources amounted to $1,620,475 which represents a very satisfactory development in so short a time, especially in view of the fact that all has not been by any means plain sailing, and the company has had more than one set-back of considerable importance. Of these mention may be made of the disastrous fire which broke out in 1903 in Dominion No. 1 Colliery, to extinguish which the waters of the Atlantic had to be admitted and the workings flooded. Pumping operations extending over a whole year were necessary to pump out the mine. The experiment tried in 1902 of leasing the concern to the Dominion Iron and Steel Company turned out to be of somewhat doubtful advantage, and a new agreement has now been entered into whereby the Coal Company undertakes to supply the Iron and Steel Company with fuel under more favorable conditions than those fixed by the leasing agreement, whereby it was possible for the Steel Company to call for an unlimited supply of coal at times when prices were barely remunerative.

"The most noteworthy feature of the report, however, is the result of the investigation which has been made of the company's property and prospects by Messrs. Emerson Bainbridge and George Blake Walker. These gentlemen, after an exhaustive examination of the Dominion Coal Company's properties in Cape Breton, find that:—

"1. The company possesses a combination of properties of great and unique value, with special advantageous conditions: (a) An immense proved and working coalfield, with enormous reserve areas, which will be worked by future generations; (b) a very large capacity of output; (c) thick seams of good quality at moderate depths; (d) the possession of shipping wharves at the chief markets; (e) the control of a private railway, enabling it to give prompt despatch to its shipments.

"2. The favorable conditions of working, coupled with the fact that the Cape Breton coalfield has a practical monopoly of the St. Lawrence market, and (unless barred by future legislation) can face any competition in the New England ports, are of great value. "The collieries, under present management, should yield profitable returns, and we do not believe that any existing coal company enjoys advantages so favourable."

"3. The present collieries with the suggested extensions have a capacity for output which are estimated at 4,000,000 tons per annum.

"Another important feature is the labour question. A three years' agreement has been made between the company and its employees, having in view the improvement of mining operations and an equitable adjustment of wages, in order that the company may be in a position to enter into long-term contracts if necessary.

"On the whole, therefore, there is very good reason to hope for a speedy return on the $15,000,000 of the common stock of this company, which has received no dividend for some time past.

"The coal and iron fields of Nova Scotia, although they have hitherto been rather disappointing to the investor, are too valuable a property to remain in their present position New markets are opening up with the growth of population in Canada, and over the vast area of lands, which, with the extension of railways, are destined for speedy settlement, the internal demands alone should be sufficient to ensure prosperity for those mines which are taking care to maintain efficiency and economic working.

A NEW TYPE FOR COAL BOATS.

The Dominion Coal Company, in furtherance of its intention to obtain a share of the Ontario market, is having a boat built in Toronto of a type which will obviate the necessity of the ocean coal boats tying to a wharf before being able to load river craft.

The type is known as a "Tubular" steamer, and will load from the larger boats in mid-stream. Belt conveyors are to be utilized for unloading and loading, and will have a capacity of 400 tons per hour. The smaller coal boats have a capacity of 2,000 to 3,000 tons, and will be able to discharge in ten hours' time; the larger boats, those having a capacity of 10,000 tons, will operate four sets of conveyors, making the unloading time no longer than for the smaller boats. It is figured that by these new boats the cost of carrying coal to Toronto will be cut to $1.10 per ton, all charges included. As the cost of American coal delivered at Toronto averages $3.35, it is figured that the margin of $2.25 will permit of successful competition with United States coal.

The new boat is to be launched about the first of June, and she will have a long enough season this year to demonstrate the possibility or otherwise of securing the Ontario soft coal market, which is figured at 2,000,000 tons per year.

PRODUCTION OF PIG IRON IN THE UNITED STATES.

The active capacity of the furnaces producing pig iron in the United States during January was 377,879 tons, or at the rate of 20,000,000 per annum. These figures are startling in the revelations they make of current consumption. In addition to the monthly output of over 1,600,000 tons, stocks are declining at the rate of 100,000 to 120,000 tons a month. The consumption is chiefly by the steel companies, whose orders for rails and structural steel are very heavy. Using this trade as a barometer, the press is uniformly optimistic about the summer of 1905.

STEEL BRIDGE SPANNING THE ST. LAWRENCE.

A steel bridge now under construction over the St. Lawrence river at Quebec is a remarkable structure. The weight of this bridge will be about 35,000 tons. Its span of 1,800 feet crosses the entire St. Lawrence river at such a height as not to interfere with navigation, and will be the longest in the world, the Forth bridge in Scotland being 1,710 feet long, the Brooklyn bridge 1,680 feet, and the new East river bridge in New York 1,600 feet. There have been manufactured by the Phoenix Bridge Company, Phoenixville, Pa., to date, and partly shipped to the site of the bridge, about 10,000 tons of steel. It will take about two more years to complete the structure. The masonry piers are entirely finished, and the temporary false works, of steel, are now in place on the south shore, upon which erection will begin at the opening of spring of this year. The 1,800 feet of steel bridge work between the piers will be erected without any false work in the river. The bridge is to be 80 feet wide over all, carrying a double-track railroad, a double-track trolley and highway, and two sidewalks. Many novel features have been adopted in the design and manufacture of this bridge. The total length of the bridge will be 3,800 feet; length of channel span, 1,800 feet; ship clear headway, 150 feet above highest tide; height of cantilever towers, 360 feet above the river. The Phoenix Bridge Company are the contractors for the superstructure.

THE WORLD'S COAL PRODUCTION.

The tenth annual general report on the coal production and consumption of the principal countries of the world has been issued by the British Board of Trade. The tables in the first part of the statement show, for a series of years, the total quantity of coal produced in each country; its value (at the collieries where possible); the average value per ton; the quantity produced per head of population; the number of persons employed in coal mining, the number employed below ground being separately shown wherever possible; the quantity produced per person employed; the quantity of coal exported; the excess of imports over exports, or vice versa; the total quantity of coal retained for consumption; the quantity of coal retained for consumption per head of population. Additional tables show, for the principal consuming countries only, the total quantities of coal consumed and the percentage proportions that are of home production, British production, and the produce of other countries. Tables are also included giving more detailed information with regard to the exports of coal from Great Britain, the United States, Germany, British India, and New South Wales, together with two short tables with regard to the consumption of coal for locomotive purposes in the United Kingdom and certain other countries, and the quantity of coal brought to London. Tables with regard to the production of lignite are given, also some particulars of the production of petroleum in the United States, Russia and other countries. The statistics are given in almost every case up to the end of the year 1902. Wherever possible figures are also given for the year 1903, but these are, to a great extent, provisional figures only, and subject to correction.

The following statement shows what has been the production of coal in the five principal coal-producing countries of the world in 1901, 1902 and 1903:—

	Tons, 1901.	Tons, 1902.	Tons, 1903.
United Kingdom	219,047,000 a	227,095,000 a	230,334,000 a
Germany	108,539,000 b	107,474,000 b	116,638,000 c
France	31,634,000 b	29,365,000 b	34,318,000 c
Belgium	22,213,000 b	22,877,000 b	23,912,000 c
United States	261,874,000 a	269,277,000 a	320,983,000 a

a Tons of 2,240 lb. b Metric tons of 2,204 lb. c Provisional figures.

The production of coal in 1903 in each of these five countries was greater than in any previous year. The production of the United States exceeds that of Great Britain, but the production of Germany represents only about a half, and that of France and Belgium together about a quarter of the production of that country.—Coal Trade Journal.

LEAD PRODUCTION OF THE WORLD.

As contributing data which may be of value to the lead mining industry we publish the following table of the production of pig lead throughout the world during the years 1901, '02, '03. From this table it will be seen that the Canadian production, at its best, is only about one per cent. of the world's total production.

	1901. Tons.	1902. Tons.	1903. Tons.
United States	260,059	259,780	266,691
Spain	166,792	174,936	172,521
Germany	118,862	136,703	141,558
Australia	95,000	104,000	93,500
Mexico	85,000	95,000	95,000
England	35,134	25,504	30,958
Italy	25,415	25,350	22,239
France	20,690	18,522	19,500
Belgium	18,444	18,050	20,015
Greece	17,502	13,840	13,075
Austria-Hungary	12,009	13,307	13,953
Turkey	2,200	3,622	7,493
Canada	10,300	8,335	8,121
Japan	4,000	4,000	4,000
Sweden	968	826	661
Russia	400	300	400
South America	2,125	225	150
Africa and East India	100	100	165
Total	875,000	902,400	910,000

BRITISH V. AMERICAN MACHINERY.

In his recent report, Mr. Biorklund, Clerk to H.M. Legation in Mexico, remarks that the supremacy of American imports is easily understood, as, owing to the proximity of the two countries, orders can be much more easily executed, and American manufacturers are continually introducing improvements in all kinds of machinery, whether for agricultural or industrial purposes. American machinery, however, is never so serviceable as that made by the British manufacturer, for when once the latter finishes his machine it remains unchanged for many years, and repairs are always to be had, which cannot be said of those of American manufacture. In this case, when once a patent has run out, a small alteration will require a new patent, and the machine being out of date is very often rendered useless unless the purchaser orders a casting to be made of the piece which is required, at a cost which is very often exorbitant for the extent of the repair.—Foreign Office, Annual Series, 3,332.

MINING AND METALLURGICAL CONGRESS.

Members are invited to participate in an International Congress of Mining, Metallurgy, Mechanics and Applied Geology, to be held at Liége on June 26th to July 1st, 1905, in connection with the International Exhibition. The subscription to the Congress is 25 francs (£1), and members should enter their names in that section of which they wish to receive the publications. The General Secretary of the Organizing Committee is Mr. Henri Dechamps, 16 Quai de l'Université, Liége.

The autumn meeting will be held in Sheffield from September 25th to 29th, 1905. An influential committee has been formed in Sheffield for the reception of the Institute, with the Lord Mayor as chairman, and the Master Cutler as vice-chairman. The chairman of the executive committee is Colonel H. Hughes, C.M.G.; the vice-chairman, Mr. J. Rossiter Hoyle; the hon treasurer, Mr. Francis Huntsman; and the secretaries, Professor J. O. Arnold, Mr. A. McWilliam, and Mr. J. Wortley.

McGILL UNIVERSITY SUMMER SCHOOL.

The Field Class in Mining of McGill University is just completing its annual session. The party, numbering about eighteen, started out a little over a month ago, in a private car furnished by the Grand Trunk Railway, and visited first the magnetite mines, at Mineville, N.Y., the blast furnace at Port Henry, N.Y. (2 days); the anthracite mines and breakers of the Wilkesbarre and Scranton regions of Pennsylvania (3 weeks); the anthracite open cut workings at Hazleton, Pa. (2 days); the Sleetington and Bangor slate quarries of Pennsylvania (one day); the Bethlehem Steel Works (2 days); the Crucible Steel Works of America, Newark Works (one day); the American Smelting and Refining Company, lead smlters and copper refinery; Perth Amboy Works (one day); the Nichols Chemical Company, copper smelters and refinery, Laurel Hill Works (one day); New York subway and extension and Hudson River tunnels (one day); and Columbia University (one day).

As will be seen, the main part of the work was done in the anthracite region, where the party spent nearly two weeks in daily underground work in the mines of the Susquehanna Coal Co. (Penn. R.R.). Visits were also made to specially interesting operations of the Lehigh Valley Coal Co. (road haulage and coal proportion) and the D. L. & W. Ry. Coal Co. (electric equipment). Several days were also given to geological field work in the neighborhood of Pittston and Hazleton. Following this more detail work, a number of brief visits were made to mines and metallurgical establishments, and, finally, to a few of the most interesting of the recent engineering developments in New York City. The party is in charge of Dr. Porter, Professor of Mining, assisted by Mr. J. F. Robertson, Lecturer in Mining, and for the geological part of the work, by Dr. A. G. Wilson.

THE CANADIAN MINING REVIEW IN THE MARITIME PROVINCES.

Mr. E. Geoffrey Stairs, formerly employed in the head office of the Canadian Mining Review, has been appointed representative of The Review Publishing Co., in the Maritime Provinces, where he is well and favorably known.

MINING MEN AND AFFAIRS.

Mr. David Brown, formerly of the Oxford Copper Co., Constable Hook, New Jersey, has been appointed Metallurgist to the Canadian Copper Company, with headquarters at Copper Cliff.

The death occurred in Toronto, on May 3rd, of Mr. George Gooderham, for several years past prominently associated with mining in the West. He left an estate valued at $15,300,000, his mining interests being valued at $1,000,000.

It is reported from Ottawa that there is no immediate intention of filling the vacancy caused by the resignation of Mr. Congdon as Commissioner of the Yukon. The duties of the office are meanwhile being performed by Major Woods, as Acting Commissioner.

We are glad to learn from a recent letter that Mr. Geo. I. Waterlow, who last month underwent, at Calgary on his way to Rossland, a critical operation for appendicitis is making rapid recovery, and hopes soon to be able to conclude the negotiations of the proposed Le Roi-War Eagle-Centre Star amalgamation.

An Order-in-Council has been passed creating the Temiscaming Mining District of Ontario, covering the areas of the rich silver cobalt deposits discovered on the Temiscaming Railway, and a considerable district to the north. The head office of the district will be at Haileybury, and will be in charge of Mr. Gea. T. Smith, of Mattawa.

Mr. T. F. Kenny has been appointed Mechanical Engineer of the Allis-Chalmers-Bullock, Limited. He graduated from the Department of Mechanical Engineering at McGill University, in 1896, and then spent two years with the British Columbia Iron Works. For the past six years he was Mechanical Engineer for the Jenckes Machine Co.

The Vancouver Island Exploration and Development Syndicate, which controls the Victoria Mine, near Ladysmith, B. C., has elected the following directors: Messrs E. Dewdney, H. Cecil (manager), W. A. Stevens, J. L. Beckwith, Sam Erb, W. T. Williams, and R. T. Elliott. Mr. J. L. Beckwith was appointed president; Mr. A. Lindsay, auditor.

At a recent meeting, Mr. Warner Miller, of New York, and ex-senator of New York, was elected president of the Montreal & Boston Company, which is about to undergo reconstruction. It is understood that the financial affairs of the company will now be placed on a satisfactory basis, and an adequate sum of money will be provided for the continuation of development work and equipment of the properties.

A meeting of the Institute of Science was held during the month at Halifax to hear read a paper presented by Mr. M. V. Grandin, of Chetecamp, on the ore deposits of that district, which have attracted considerable attention lately. A paper was also read by Mr. F. H. McLearn, of the Dalhousie School of Mining and Metallurgy, giving the results of a detailed structural analysis of the Golderville anticline of the gold measures of Nova Scotia.

Mr. Ross Thompson, well known as one of the pioneers of Rossland, who like many others in those happy-go-lucky-days made money and let it slip through his fingers again, recently went to the new gold fields of Nevada, where, report has it, his old luck has followed him, for he and his prospecting parties are said to have located this spring some exceedingly promising gold-copper showings, distant about thirty-five miles from Goldfields.

Assuming, no doubt, that the Rossland Miners' Union had already received a salutary lesson, as an outcome of the litigation consequent upon the strike of 1901, and, generously enough, not desiring to "rub it in," if the colloquilliner be permitted, the War Eagle-Centre Star companies have withdrawn the judgments obtained against the Western Federation of Miners, and the local Union, in consideration of the merely nominal payment of the sum of a thousand dollars.

Mr. George S. Waterlow, of London, a director of the Le Roi Mining Co.; W. H. Aldridge, of Trail, manager of the C.P.R.'s mining department; James Cronin, Rossland, general manager of the Centre Star and War Eagle Company; and A. T. McMillan, Rossland, manager of the Le Roi Mining Companies, with Mr. T. G. Blackstock, of Toronto, have been in Montreal in consultation with Sir Thomas Shaughnessy concerning the amalgamation of the Trail Smelter with the proposed combination of Rossland mines.

Although the Dominion Government has decided not to send an exhibition of minerals to the Lewis and Clark Exposition, which will be shortly opened at Portland, Ore., a good display of Canadian ores and minerals from the west, will, it is hoped, be made. It is possible that some action in the matter, so far as British Columbia is concerned, will be made by the Provincial Mining Association, while already in the Yukon steps are being taken to get together a representative collection of minerals, chiefly in the form of gold dust and nuggets.

In a speech recently, in the Ontario Legislature, Mr. R. R. Gamey, referring to the zinc resources of the province, said that too little was known about them at the present time, although the value of the mineral was very great. Missouri, he stated, was treating zinc ores of 15 per cent., while ores of 20 and 25 per cent. were neglected. He also stated that there was no smelting plant in the province, and when an attempt was made to ship zinc ore to Belgium last year, the Government export duty of $5 per ton prevented a development of the industry.

Mr. R. W. Brock, we learn, has estimated the cost of re-surveying geologically the Rossland district at the high figure of $8,000.00, which estimate does not include the salaries of himself or of his two assistants. He furthermore asks for the services of two assayers, two surveyors, two draftsmen, one metallurgist, and one lithologist, who are not connected with the survey force. It is understood, however, that the Director has not yet sanctioned the work, and that Messrs. Brock and Boyd have instead received instructions to proceed to the Lardeau district to continue the work begun last year in that section.

A party of officials of the British Columbia Copper Company, composed of Messrs. Underwood (president), Thomas (consulting engineer), Schon and Merrill, visited the Similkameen district of British Columbia during the month, with a view, it is said, to ascertaining the probable ore-tonnage that the mines of that district might be expected to afford to a smelter which the company have some idea of establishing at Midway. With the exception of the Nickel Plate mine, at Hedley, there are no properties in the Similkameen which have been developed much beyond the prospect stage, though the potentialities of the district are extremely promising.

A table compiled by the American Iron and Steel Association shows that the production of pig iron in Canada became of importance in 1901, and amounted to 244,999 tons. For 1902 it was 319,000 tons, for 1903 265,000 tons, and for 1904 it totalled 270,000 tons. The output is now being stimulated by Government bounties, and it is probable that a demand for rails in the making of new and great railways will help in bringing the 1905 production up to the standard of 1902. The annual report of one of the chief producing companies shows a profit of $500,000 for 1904, as compared with $855.000 in 1903. The decrease was due chiefly to the lower prices which were obtained, but there was also some reduction in the quantities of the ore mined.

We have much pleasure in congratulating Mr. L. H. Cole, of McGill University, Montreal, on having been awarded first place, by the judges, for his excellent paper, entitled "Mine Surveying Methods Used in the Centre Star Mine, Rossland," sent in for the Student Papers Competition, and read at the last annual meeting of the Canadian Mining Institute. Mr. Cole's paper was not only very carefully prepared, well written and illustrated, but also showed considerable originality in treatment of the subject. The other papers, in order of merit were, a paper by Mr. A. McL. Hamilton, also of McGill University, entitled "Notes on Recent Reverbatory Smelting Practice at Anaconda, Montana;" and a paper by Mr. G. C. Hanes, School of Practical Science, Toronto, on the "Solubility of Cobalt and Nickel Arsenides in Ammonia."

Mr. Ned Wallingford, the manager of the well-known Wallingford Mica Company, met with a serious accident, in the middle of last month, in Ottawa. After getting off an electric car on Sussex Street he crossed the track and was struck on the head and knocked senseless by another car coming in the opposite direction. He was at once carried to the Protestant Hospital, where he lay unconscious for several days. We are glad to learn, however, that he is now out of danger, and he is so much improved that he will soon be able to resume his duties as manager of the concern whose success is in no small measure due to his untiring energy and hard work. Mr. Wallingford is the discoverer of the famous Wallingford mine, of the Battle Lake and Rheaume Lake mines, and of several other prominent mica properties in the district of Perkins Mills in the County of Ottawa. The accident at this time of the year is the more to be regretted, as the better outlook in the mica market just now prompted operations in these mines on a much larger scale than heretofore; but we trust that Mr. Wallingford will take up his duties ere long at the head of the successful concern with which he is connected.

CANADIAN MINING NOTES.

NOVA SCOTIA.

The steamer Micmac was loaded with 2,200 tons of pig iron from the Nova Scotia Steel & Coal Co.'s pier, North Sydney, for Montreal. The coal seam at Broad Cove still maintains its dip towards the north, which inclines to the presumption that there is yet a big lot of coal to the northward.

QUEBEC.

It is reliably stated that neither the trainmen nor the machinists in the employ of the Dominion Steel Company have made any formal demand for an increase in wages. It is generally thought, however, that the demand will be made ere long by the skilled workmen, to obtain a raise in wages, which they feel satisfied of securing, owing to the present great demand for skilled labor.

The company has now more orders for its products than it can fill, and to ensure the required output the service of skilled workmen must be retained.

NEW BRUNSWICK.

The British Columbia Review, of London, states that an English syndicate has secured control of the New Brunswick oilfields, and development work on a large scale is looked for as a result of the deal just consummated. Under the arrangements all shareholders of the original company become shareholders with the English syndicate, receiving two shares at the par value of £1 each for each share they owned. The new company will have a capital of £650,000, and besides giving the two shares to each shareholder of the New Brunswick company, it will put in the treasury £100,000 in cash for immediate development work, and £100,000 in stock for future work. The great drawback in the past has been the lack of sufficient capital to enable the company to prosecute development work successfully. All this should now be changed, and if the oilfields are as extensive and as productive as the preliminary work seems to indicate, the future will be encouraging. As the controlling interest in the company will be held in England, the head office will be there, but it is understood that arrangements will be made which will keep a fair share of the influence in Canadian hands.

ONTARIO.

It is reported that the Bruce Copper Mines are to be re-opened by an English syndicate. The representative, Mr. E. O. Williams, an English engineer, has been recently at the mines examining the properties.

It is stated on good authority that the United States Steel Corporation is looking for a site in Ontario for the establishment of a Canadian steel plant. Mr. Gayley, first vice-president of that company, paid a visit to Port Colborne, Ont., last week, and looked over the advantages of that place. It has admirable vessel facilities, both for the shipment lake and canal, and with a few miles of railroad construction could have rail outlet via the Grand Trunk, Canadian Pacific, Pere Marquette and Wabash Railways.

It is understood that a new steel and iron works will be established at Morrisburg, Ontario, by an American syndicate headed by William J. Allison, of New York City. Morrisburg is situated on the Canadian side of the St. Lawrence River, just east of Ogdensburg, New York.

ALBERTA.

The Canadian Metals Co., who are erecting the zinc smelter at Frank, have purchased the big steel stack, 105 feet high, formerly used by the Republic Power & Cyanide Co., of Republic, Wash. This stack weighs ten tons, and will require three flat cars to transport it. Besides the stack, they have also purchased from this company about three carloads of machinery, including two sets of 26 inch steel, an H crusher and a number of mine and mill cars.

Rapid progress is being made on the smelter plant, the pottery group building being more than half up, and the foundation for the main building is completed and the walls are being run up by the masons.

BRITISH COLUMBIA.

The Coast.—The Britannia Copper Syndicate expects to be sending ore from the mines of the company to the smelter at the rate of from 250 to 500 tons per day by July 1. It is expected about 1,000 men will be employed in and about the mines. Meanwhile the syndicate has purchased the Crofton Smelter, at Crofton, V.I.

While the Britannia Company and the new smelter company will remain distinct concerns, the arrangements entered into for the smelting of Britannia ore at Crofton will be continued. The smelter, will, however, remain a custom smelter, and will handle ore from all shippers.

Niccla.—The Portland Mining Co., of Terre Haut, Ind., have recently acquired 880 acres of land and water rights for 1,000 inches of water, and contemplate installing a power plant to be used in connection with the working of the property, which is to be extensively developed this summer.

Atlin.—Tar Flats, on Pine Creek, above Discovery, have been the locus of winter sinking and mining operations. Sluicing is now under way on the creek, and reports are to the effect that the yields will be good. The two largest dumps are those owned by Helgren & Co., and Van Volkenberg & Sons.

The Pine Creek Power Co.'s ditch, as well as the Brackett ditch, are running full.

The Willow Creek Mining Co. have ordered an additional 1,400 feet of 28-inch pipe in order to increase the scale of their workings.

Operations on Birch Creek have been resumed, and on pay dirt this time; a very large clean-up is expected.

Cariboo.—The matter of the Slough Creek, Ltd., was recently in the British courts, when counsel said the company and its liquidator asked the Court to sanction a scheme by which the debenture-holders were to receive fully-paid shares in exchange for their debentures. The company was formed in April, 1903, with a capital of £200,000, to work certain mining rights in British Columbia, and it took over the business of a previous Slough Creek Company. An agreement had been entered into between the company, its liquidator, and the Federal Property and Assets Trust, Limited, providing for the sale of the assets to the Federal Company for £75,000, to be satisfied by the issue to the debenture-holders of 150,000 fully-paid shares of 4s. each, so that they would get £30,000 worth of shares in exchange for £19,600 debentures. The shareholders had agreed to the sale as a going concern. The Court sanctioned the scheme of arrangement.

Lardeau.—A considerable activity is reported in the Ainsworth district. Development is being resumed on the Smar and Sunset, where a long tunnel is to be run. The lease-holders of the No. 1 have been most fortunate in the working of that property, having struck a rich vein of carbonates from which already two carloads have been shipped.

The Bonanza group has been recently bonded in this district, and work is to be commenced forthwith. The property is situated on Haskin Creek, about three miles southeast of the Silver Cup.

The Eva Gold Mines, Limited, of Camborne, Lardeau district, has applied to the Gold Commissioner for financial aid to build a new trail from Camborne to the mine. The present trail is steep, and is in bad condition.

The Spokane Falls people who are mining near Camborne are making daily clean-ups of good dimensions. For one day, one man cleaned up 42 dwts., and the days average about 25 dwts. to the man.

Slocan.—Ore has at length been struck in the lowest tunnel of the Reco. The value of the discovery is not yet known, but the work of drifting to discover this ore body has been in progress for a number of months past. The Reco last month paid a further dividend of $20.00.

A splendid body of ore, six feet wide, has been uncovered on the Hidden Treasure, one of the four claims owned by the Republic Mines, Limited. The lead is very clearly defined, and the formation distinctly traceable for over a mile through three of the company's claims. The assays give values in gold, silver and copper. The properties are between Greenwood and Boundary Falls, on the west side of the railway. W. T. Smith, the original discoverer of the Knob Hill and the Ironsides, at Phoenix, is manager.

The lessees of the Majestic and Unexpected are now being rewarded for their persistent entrprise, as they have struck two feet of ore, says the Sandon "Standard." For over eighteen months the lessees have been working the property, and recently secured two years' renewal and an option of a bond. A few cars of the ore were shipped last year, but the main shoot ore was not exposed.

Mr. S. S. Fowler, of Nelson, has leased the Whitewater Mine in the Slocan. The old lessees have been shipping at the rate of two to three cars a week.

The mill of the Minnesota Silver Company, at Sandon, is turning out a high grade zinc product. A recent carload of 33 tons, sent to Pueblo, Colorado, gave zinc 50.5 per cent., lead 1 per cent., silver 31.5 ozs. to the ton.

Mr. G. O. Buchanan, B. C., Administrator under the Lead Bounty Act, is attributed with the statement that when the Marysville smelter is in operation the production of metallic lead will be increased to about 24,000 tons per annum. The lead production of the Canadian Smelting Works, Trail, is placed at 8,000 tons per annum, and that of the Hall Mining & Smelting Co.'s smelter, at Nelson, at between 8,000 and 9,000. The Sullivan Co.'s works, at Marysville, East Kootenay, will, it is thought, produce between 7,000 and 8,000 tons.

The new plant installed during recent months at Kalso for the treatment of zinc ore is now in operation. The building is 80 by 75 feet. The ore is received in bins below the level of the tracks, from which it is fed by an automatic feeder to the roasting furnace, which is of the White-Howell revolving make, with a capacity of 60 tons per 24 hours and upwards, according to the amount of roasting required, an advantage of this make of furnace being that the degree of roast which is found to give the best results with the different classes of ore is cooled by passing through an iron revolving chamber, where it is rotated through currents of cooled air, and thence, after a preliminary sizing and recrushing of the over size, the ore is elevated to the top of the building, where it is subjected to a very close and accurate classification, eight bins being provided (with ample accommodation for more if necessary), to contain the various degrees of fineness, each accurately sized. The ore is now ready to be delivered by an automatic feeder to the process of magnetic separation, whence the finished product proceeds directly to the shipping bins.

It is anticipated that the mines at Slocan will be greatly benefited by the installation of this plant, as facilities are thereby afforded, heretofore lacking, for the local handling and marketing of zinc ores.

Nelson.—American capitalists, it is stated, have become interested in the development of the La France mine in this district, and money has been provided for the development of the property during the ensuing summer.

The Athabasca-Venus, Limited, owning mining properties on Toad Mountain, near Nelson, is in liquidation, with J. J. Campbell as receiver.

Mr. J. N. Scott, of Everett, Wash., has purchased the Dundee group of claims, near Nelson, for a party of Everett capitalists. The group consists of three claims, the Dundee, Dundee Fraction and M. S. Fraction adjoining the Poorman, and Gold Note on Forty-Nine Creek.

The lead receipts from the Halls Mines smelter for April totalled 3,883,864 lbs., or about 1,942 tons; the lead contents amounted to 1,784,985 lbs., averaging nearly 50 per cent lead. The St. Eugene mine sent 1128 tons of ore, and the Ymir was second with 175 tons.

Boundary.—The Granby Co. has further extended its properties in the Boundary district by having recently acquired the Bank of Engiand claim, a copper-gold property in Phoenix Camp.

Shipments have recommenced from the Winnipeg mine, upon which work was recently resumed. The ore is being shipped to the Granby smelter, the company having a bond on the property. It is some eighteen months since the ore was sent out from this property.

A new tunnel is being driven on the Helen, a high grade gold-silver property, near Greenwood, and it is stated a new well-mineralized lead has been encountered, said to be four feet wide. The Helen was acquired by Chicago capitalists at the beginning of April last.

At a general meeting of the shareholders of the McKinley Mines Company, owning the McKinley and Hanna mineral claims, Franklin camp, held at Grand Forks, on Tuesday, a working bond for $150,000 was granted Miles H. O'Brien, jun., of New York, as trustee for Boston and New York capitalists. The life of the bond covers a period of eighteen months from April 1st. The McKinley has a large surface showing of ore.

Twenty other claims in the same camp, water rights and a townsite of 320 acres have been transferred by Mr. McLeod to the eastern syndicate. The deal is fraught with great possibilities for Grand Forks, as it is likely to result in the opening up of the rich mineral resources of the north fork of the Kettle River.

The output of the Boundary Creek division for April was 80,102 tons, or about 10,000 tons less than for March. The decreased output is attributed to the fact that so many smelter stacks were under repair in April.

East Kootenay.—Experiments are being carried on in Denver, Colo., with a view of ascertaining whether the installation of a lixiviating plant will solve the problem of the Paradise ore, near Windermere, in the event of the Kootenay Central Railroad not being built this season, which seems more than likely. The mine to date has shipped about 1,000 tons of ore, averaging about 50 ounces in silver and 60 per cent. lead, or, roughly, a $45 ore. This was to meet development expenses. The property is situated fourteen miles up Toby Creek. The Paradise is not shipping any of its second class, which runs about $18 to the ton. A recent examination by S. S. Fowler put a guess of the amount of ore in sight at 25,000 tons, but as the lead is very irregular, being in a contact zone rather than vein, Mr. Fowler does not pretend that his estimate is any more than an approximation. About a mile of development work has been done, one tunnel on the fourth level being 1,500 feet, with a depth of 525 feet from the outcrop. Development is being continued, the fourth level being pushed, and as soon as the ore body is reached the various levels in the mine will be connected by upraises. —Wilmer Outcrop.

The East Kootenay town of Cranbrook, now a divisional point on the Crow's Nest Pass line of the C. P. R., is to become incorporated.

The Fort Steele Prospector states that there is a rumor to the effect that the Mackenzie-Mann mines on Hucklebury Hill will be consolidated and a company formed to operate the property.

COAL MINING NOTES.

NOVA SCOTIA.

It is estimated that the reorganization of the Dominion Coal Company will place the finances of that company on a sound and satisfactory condition, as it eliminates its heavy floating debt, large indebtedness to the Dominion Iron & Steel Co., and the heavy annual payments for interest and preferred stock dividends.

A strong syndicate of banking interests in Boston, Montreal and Toronto has purchased from the Dominion Coal Co. the entire issue of $3,000,000 new seven per cent. preferred stock and $5,000,000 of five per cent. bonds, which will prove sufficient capital to redeem the present issue of preferred stocks and bonds, pay off all the indebtedness of the company, and leave a comfortable surplus for working capital, taking into consideration, of course, sinking funds and cash on hand

Fixed charges of the company for 1904 amounted to $730,137. They are estimated for the present year at $655,000, while under the new plan they will be in the first five years $460,000 per annum, thereby effecting a saving of $270,000 over last year's charges and $195,000 less than this year.

The reduction in fixed charges is shown by the folowing table:—

	As now out.	Chgs. & div.	As reorganized.	Chgs & div.
Bonds	$2,435,000—6 %	$146,100	$5,000,000—5 %	$250,000
Stock	3,000,000—8 %	240,000	3,000,000—7 %	210,000
Debt	2,380,000—5 %	119,000	....	.....
Sink. fd...	....	150,000	....	None for 5 yrs.
Total..	7,815,000	655,000	8,000,000	460,000

The average net earnings of the company for the past three years have been between $1,600,000 and $1,700,000 per annum.

The Cape Breton Coal, Iron and Railway Company have awarded contracts aggregating $30,000 for the erection of buildings at their collieries at Broughton, Cape Breton. The buildings include a hotel, private residence, and general offices. The company will spend $250,000 there this summer.

George McKenzie, a prospector, claims to have discovered a vast coal area in Northern British Columbia, near the proposed line of the Grand Trunk Pacific

The April output and shipments of the Dominion Coal Company were as follows:—

Dominion No. 1	44,578 tons
Dominion No. 2	41,371
Dominion No. 3	.....
Dominion No. 4	39,187
Dominion No. 5	50,263
Dominion No. 7	5,865
Dominion No. 8	16,845
Dominion No. 9	23,432
Total	221,541 tons
Shipments	139,226

The April shipments of coal by the Cumberland Railway and Coal Company amounted to 37,890 tons.

Coal Export.—It is reported that the Dominion Coal Company having succeeded in creating a small market for Cape Breton Coal in Mexico, have sent a trial shipment of 3,000 tons to South Africa. If the experiment is successful, the company will be able to maintain operations on a continuous scale throughout the winter seasons.

This company expects to ship about 2,100,000 tons of coal this season, or about three or four hundred thousand more than last year. Of this, a small amount has been contracted for to be delivered in Toronto and other Ontario points.

The Dominion Coal Company are making arrangements for the erection of a discharging plant at Halifax. This is evidence that the company anticipates extending its business at this point, as a tower costs all the way from twenty to forty thousand dollars. The company have secured a wharf property adjoining the Tram Co.'s power house.

A coal trade between Cape Breton and Sweden is now to be resumed, the Dominion Coal Company having arranged to market coal in Sweden, and bring back iron ore, which will be sold to the Dominion Iron & Steel Co.

The Acadia Coal Company loaded its first steamer for the Montreal market the first week in May. This first shipment is to be rapidly followed by others.

Of the first cargo from the Acadia Coal Co., some 1,100 tons came from the Acadia colliery, and the balance from the Albion colliery. The deficit in the Acadia output was due to the strike.

The Nova Scotia Steel & Coal Co.'s regular fleet for the season consists of eleven steamers, including the two owned by the company. Eight of the steamers will be employed as coal carriers, and three in the ore trade. The capacity of the coal carriers is from 2,000 to 4,500 tons. One of the ore steamers is very large, with a carrying capacity of 7,400 tons. The smallest of them carries 4,000 tons. This company has everything in splendid condition for rapid handling of its products, and this should be one of the best years in its history.

ONTARIO.

The annual convention of the Western Ontario Coal Dealers' Association was held at London, Ont., last month. The principal question discussed was that of abuses in connection with transportation, more especially the inequality in freight rates. It was urged that the western portion of the province was unjustly dealt with, rates upon coal coming by rail via Detroit being so much higher than on consignments by way of Suspension Bridge. Resolutions on the subject were adopted for presentation to the Dominion Railway Commission and the Ontario Legislature. The following officers were elected: President, John C. Hay, Listowel; vice-president, Wm. Heaman, London; executive committee, F. Mann, Brantford; John Garroch, Sarnia; A. J. McIntosh, Woodstock; J. K. McLauchlin, Owen Sound; and F. M. Griffin, St. Thomas.

E. F. Stephenson, Inspector of Crown Timber and Mines, has returned to Winnipeg from an official trip through the West, and reports a rapid development of the coal-mining industry in Alberta and southeastern British Columbia, especially in the Crow's Nest Pass and at Banff. Mines are also being worked on the Knee Hill Creek to the northeast of Calgary, the product there being a good quality of coal resembling the English Cannel coal, between a high-grade lignite and anthracite. It burns well in stoves and furnaces, and can be bought by settlers at $1.50 per ton at the mines, and much of it is also disposed of in Calgary.

The Dominion Iron & Steel Co. have officially notified the Dominion Coal Company of their intention to operate three blast furnaces as soon as the coke ovens are completed, in order to insure, as per the agreement between the two companies, an adequate supply of coal.

BRITISH COLUMBIA.

The Seattle and Washington Coal Company has been formed in Seattle during the past month to acquire and develop about four square miles of coal lands near Coutlee, in the Nicola Valley. This property has been held under lease for some years back, but seemingly has not been opened up to any extent. There are, however, many promising indications of coal in this vicinity.

Very considerable credit is accorded the engineering department of the Coal Creek Mines for the expeditious manner in which mining operations were continued after the destruction of the tipple by fire in March last. Timbers were being set for No. 1 tipple while the ground was still hot, and water used to cool it. Inside of three days coal was dumped down the chute. A temporary screen was placed on this tipple, and the coal cleaned as effectively as before, but with more cost to the company.

The regular battery of 390 coke ovens at Fernie have continued without any interruption, as if nothing had happened. A lot of surplus slack has been used, and now the supply is regular again.

The engineering department worked night and day on plans for the new tipple. The trestle alone, if built of wood, will cost in the neighborhood of $2,000, and if built of steel the cost will be more than double that amount. The tipples and all machinery to be replaced will make the total expenditure exceed $200,000.

The new structure will be modern in every particular, and will have a capacity of more than double that of the old one. It may have capacity to load box-cars and open-top cars on two tracks each and slack cars on another track, and one or perhaps two box-car loaders will be employed. The new plans for the track, etc., may necessitate the removal of all colliery buildings from their present position, and also some alterations in the course of the creek. These alterations will cost $50,000. It is estimated that the permanent tipple will be completed in about four months.

The contract for the new tipple at the Coal Creek colliery has been let to the firm of Heyl and Patterson, of Pittsburg. The tipple will be built entirely of steel, and will be in every respect a most modern equipment. The following description appears in a recent issue of the Fernie Free Press:—

"The entire structure, stretching across the valley, 900 feet in length, will be built of steel. Its position will be a few feet farther up than the site of the wooden structure that was destroyed by fire on March 11th. Starting at the mouth of No. 2, the trestle runs in a straight line to the opposite side of the valley.

"The tipple proper is 234 feet long, and forty-four feet wide, with extensions for picking tables. The width of the trestle is thirty feet. The entire structure is to be roofed with corrugated iron sheeting, and the tipple will be housed in with metal siding with windows for lighting. All the supports are to be built on concrete piers sunk deep in the ground.

"The new tipple will be equipped with the latest machinery for dumping, cleaning and loading the coal. Two revolving dumps, with a daily capacity of 4,000 tons, will empty the coal cars as they enter the tipple. These dumps turn the cars upside down and do away with the need for doors on the end of the cars. Each of these dumps is connected with a distinct system of machinery for treating the coal, which is briefly described as follows: The coal after entering the receiving hopper is fed to the shaking screens, which delivers the coal to the picking table. A hinged apron at the end of the table is lowered into the railroad car, and the coal is loaded without any drop. Alongside the picking table is a revolving rock conveyor. As the rock is picked off the table it is placed on the rock conveyor which takes it to the rock bin, where it is loaded on a car. Underneath the shaking screens is a belt conveyor which carries the slack and fine coal to the slack car beneath. This system, as stated, is duplicated for the other car dumper. Each picking table is five feet wide and fifty feet long, and extends at right angles to the tipple. Each small car after being dumped is pushed along a return track by a 'trip maker,' and loads of empties are automatically made up.

"Two of the celebrated Smith Gravity Box-car Loaders will be installed. These will be similar to the ones installed at Carbonado a couple of years ago, which have given great satisfaction. The car is tipped on one end and then on the other, and each end is loaded by gravity. All the machinery of the tipple is worked by electricity, supplied from the power house. Coal can be loaded on to four tracks and slack on to one track. The tipple's capacity will be 4,000 tons daily.

"The structure will contain 850 tons of steel. The parts will be made at the factory at Pittsburg, and shipped here ready to be put up. The contracting firm agrees to have the tipple ready by July 18th to ship 2,000 tons daily. The total cost of the entire structure, with machinery, will approach close to $200,000. Heyl and Patterson are large contractors who do a great amount of work of this kind, which fact may easily be deduced from their agreement to have the tipple well on to completion in three months."

ALBERTA.

It is satisfactory to note that the Canadian-American Coal and Coke Company are now again in full operation, the fire, which started some time ago in one of the rooms, having now been got under control.

The assets of the North-West Coal and Coke Company have been acquired by an English syndicate, which will return the original shareholders a satisfactory profit on their investments.

The new tipple at the No. 1 mine of the Lillie Collieries has been put in use and the force of miners employed at the mine increased. This company is now making a larger output of coke than formerly, and is marketing their product with the British Columbia smelters. Meanwhile, the company has entered into a contract with the United Mine Workers, ensuring stability of labor conditions for a period of two years.

The International Coal Company, of Coleman, is at present working one shift, and shipping about 600 tons daily. This is the largest output now being made by any collieries in the district.

A washer is shortly to be erected at these collieries.

Tenders are being invited for the sinking of a main hoisting shaft at Breckenridge and Lund Coal Company's Collieries.

MINING COMPANY MEETINGS.

The Britannia Mining Syndicate.—The annual meeting of the Britannia Mining Syndicate was held in Vancouver last month, the Hon. E. Dewdney, presiding. The chairman stated that since the last meeting the work had been carried on with great energy. The financial statement for the past year showed that the capital stock of the company is divided into 400 shares at $625 each fully paid, amounting to $250,000. The mineral property, plant, buildings, and water power, are valued at $212,104.13. There is shown on the accounts an unexpected balance of advances in the New York office of $51,042.74, and cash in the Bank of Montreal $14,102.84.

"The work on the construction of the buildings and tramway did not commence before August of this season. Previous to that about forty acres of densely wooded flat had been cleared at the beach, where are erected the several buildings in which the machinery is being installed.

"On the shore, in the most protected part of the harbor, a substantial wharf, with approach of about 250 feet in length, with frontage of 100 feet, has been erected, with a tramway leading from it to the centre of the flat for the purpose of handling the heavy machinery to be installed in the different buildings. A building, 133 by 125, has been completed, capable of accommodating about sixty concentrating tables, all of which are now being placed in position. A crushing mill, built on the brow of the hill, is now verging on completion. The power-house is practically completed, and awaits the installation of the machinery which has been provided for.

"The aerial tramway being built by Mr. Riblet is far advanced towards completion, the lower section, about two miles in length, being finished as nearly as it is possible, until such time as material has all been transported for the upper section. The upper section, of about one mile in length, is expected to be completed in about five weeks.

"A dam of very substantial proportions has been constructed on the creek, from which point water will be taken to operate one of the most powerful water powers on the coast. The piping and all the material necessary for its completion are on hand, and only await the taking over of the tram line from the contractor, to be placed in position.

"Work at the mine has been simultaneously carried on, and consists of various buildings for the accommodation of men at that point, a crushing mill, ore bins at Jane and Bluff tunnels, ore bin at upper terminal of tramway, trestles leading from the tunnels to upper terminal and necessary snowsheds, are about completed, together with work being done for tramming the ore to the surface.

"It is confidently expected that the month of May, at the latest, will see the whole of the machinery in perfect order, and ready to handle the ore up to its fullest capacity."

Slough Creek Gravel Gold.—The first annual meeting of the above company was held in London, England, last month, Sir J. Bevan Edwards, chairman of the company, presiding. The chairman, in the course of his address, said that Mr. J. D. Kendall, consulting mining engineer, went to the Cariboo to report upon our properties on behalf of a group of gentlemen interested in mining, with the object of acquiring the property from the old company if Mr. Kendall's report was satisfactory. As this proved to be the case—and we must all acknowledge that the report was highly satisfactory—a new company was registered for the purpose of acquiring the property, and the terms offered to the old shareholders were unanimously agreed to. On the formation of the new company Mr. Kendall was appointed consulting engineer, and the work at the mine is now being carried out energetically under his directions. He estimates the value of the gravel as at least £1 to the yard cube, but he feels very sanguine that it will be higher, and that with an output of 200 cubic yards a day, the gravel can be worked for 10s. a yard, including all expenses. There will be no difficulty in maintaining this output from the present shaft alone, when the gravel is opened up, and Mr. Kendall considers that by sinking two or three more shafts, and thereby drying a large extent of channel, the output of 200 yards a day can be increased to any extent suggested by economical considerations. Even if the estimate of the value of the gravel made by Mr. Kendall is not exceeded, the company have a most valuable property, but the gravel so far met with in opening up the channel in Slough Creek has nowhere been less than £3 to the yard cube—more than three times as rich as Mr. Kendall's estimate. The Slough Creek shaft—which is the only shaft put down as yet in the company's property—is on the old channel of William Creek, eight miles below the part which yielded gold at the rate of £2,000,000 to the mile. In these eight miles the old channel receives numerous feeders from leads which have produced large quantities of gold from their upper parts. The work already done from the shaft in Slough Creek gives every indication that the gravel in the channel at that point will equal in richness, even if it does not exceed, that of the upper part of William Creek.

The company's property extends to 13 miles of old channel or deep lead, 11 of which is the old channel of William Creek. It must not be forgotten that this channel is in the very centre of the gold belt, that there are no engineering difficulties in opening up the gravel which cannot easily be overcome.

Mr. Kendall, who addressed the meeting, observed that the indications were that the ground would be rich, and he did not think it would be long before they would be able to demonstrate this on a commercial scale. There was no apparent reason why it should not be as rich as it was in either Lightning Creek or Williams Creek. However, time alone could settle that. The present prospects were excellent.

COMPANY NOTES.

Montreal & Boston.—This company is being reorganized in a very radical manner. It is proposed to issue $700,000 first mortgage 6 per cent. bonds, which are underwritten at 80, and to change the par value of the stock from $5 to $1, giving the present stockholders one share of the new stock, par $1, for every share of old stock, par $5.

The capitalization of the new company will compare with the old as follows:—

	Present capitalization.	New capitalization.
Bonds, 6 per cent.....	.....	$ 700,000
Stock	1,300,000	2,600,000
Par value shares.....	$5	$1

Of the above 2,600,000 shares, 1,000,000 go to the old shareholders, 1,400,000 as a bonus with the $700,000 bonds on the basis of 200 shares of

stock with every $1,000 of bonds, and 200,000 for reorganization expenses and as a bonus to Munroe & Munroe creditors.

As the creditors of Munroe & Munroe have 310,000 shares of stock, they get as stockholders 1½ shares of new stock for each share of old.

Mackenzie & Mann, the original owners of the Dominion group, have underwritten $300,000 of the new bonds, and they will be represented on the board of directors of the new company.

The proceeds of the bonds will be used to pay all indebtedness due on the Dominion group of mines and on the other properties, all floating debt, and leave a balance of $250,000.

Immediate steps will be taken to enlarge the smelter from two to four furnaces.

Dominion Coal.—At a general meeting of shareholders of the Dominion Coal Company, to ratify the plan of financial reorganization, President James Ross said, as the company would not have any sinking fund to provide for five years, the saving to be effected annually would be close on $200,000, keeping in view also the difference in interest on bonds and preferred stock. Besides that, the company would now have no floating debt, and there would be $2,000,000 in the treasury to carry out improvements. Mr. Ross said thirty-five per cent. of the issue of new securities had been underwriten by the directors, and the remainder by Bank of Montreal, Bank of Commerce and American banks. He was unable, in answer to an enquiry, to state the price at which the securities had been underwritten.

Ymir.—Return for March: 35 stamps ran 29 days and crushed 2,600 tons (2,000 lbs.) of ore, producing 616 oz. bullion; estimated realisable value (gross) of the product, $6,750; 170 tons of concentrates shipped, of a gross estimated value of $3,750; cyanide plant treated 2,100 tons (2,000 lbs.) of tailings producing bullion having an estimated gross value of $1,300; sundry revenue, $287; total revenue, $12,087; working expenses, $11,410; profit $677 There has been expended during month on development, $100.

MINING AND INDUSTRIAL SHARE MARKET.

There has been quite a movement recently in War Eagle and Centre Star shares, as it is anticipated that the amalgamation will be beneficial to both properties. The silver-lead mines are also in request, and there has been considerable quiet buying of Rambler Cariboo, in fact the whole mining situation is improving, and it will not be surprising if the public interest in mines will be to the fore before a great while. Industrials have been fairly active, but on the whole show a shrinkage in values from last month. This is not due to any change of earning power in these companies, but to the fact that speculative market conditions have been more or less on the bear side.

The following list shows the quotations for the week ending Friday, May 26th, as supplied to the Review by Robert Meredith & Co., 57 St. Francois Xavier Street, Montreal:—

Par value of shares		Asked.	Bid.
.10	Canadian Gold Fields Syndicate	.05¼	.05
1.00	Centre Star	.28	.27½
1.00	Deer Trail Consolidated	.02	—
1.00	Giant	.03½	.01
10.00	Granby Consolidated	5.75	5.50
10.00	Montreal and Boston	1.00	—
1.00	North Star	.02	—
1.00	Payne	.02	.01
1.00	Rambler Cariboo	.20	.15
1.00	Republic	.03½	—
1.00	St. Eugene	.50	.47
1.00	War Eagle	.16	.14½
1.00	White Bear	.04	—
100.00	Nova Scotia Steel (common)	61.00	60.50
100.00	Ditto ditto (preferred)	—	—
100.00	Diminion Coal (common)	77.00	75.00
100.00	Ditto ditto (preferred)	—	—
100.00	Dominion Iron and Steel (common)	22.50	20.00
100.00	Ditto ditto ditto (preferred)	68.75	66.50
——	Ditto ditto ditto (bonds)	84.00	83.50

BRITISH COLUMBIA LEAD OUTPUT.

For the first nine months of the present fiscal year, that is, up to April 1st, the total lead output of the Kootenays has been 19,020 tons, and the bounty paid by the Government during the period mentioned amounted to $259,365. Of the total output, 13,291 tons were treated at home smelters and 5,729 tons were exported to foreign plants.

THE COPPER MARKET SITUATION.

Messrs. D. Houston & Co.'s copper circular says in part:

"Although sellers' quotations remain about 15¾ for lake and electrolytic, these figures are considered nominal, and there are no indications at the moment of any general movement to stock up liberally as yet. Some offers to sell have been made at 15 cents, but large holders quote higher figures

"Current production for some time to come is largely sold, and with important contracts still running, the leading producers refrain from pressing sales. Domestic consumption and exports are absorbing fully 40,000 tons of copper a month, and while these conditions last it is hardly reasonable to expect the market to turn radically or permanently weak, unless some over-anxious seller undertakes to force business. The situation will require to change essentially before a violent reaction in prices is justified. A moderate readjustment of values later may possibly be necessary to stimulate buying, and the trend of affairs may result in creating a somewhat different basis for negotiating new business But while demand is maintained at the present level it would be unwise to anticipate a return to prices anything like those prevailing when trade and business were suffering from acute depression. The situation is a waiting one, but meanwhile deliveries for consumption are very large, and they will continue to be so for several weeks to come to fulfill engagements already made. The production of crude copper undoubtedly shows some increase over last year, but refineries are understood to be operating up to their limit, and with no increase in capacity reported at the leading refining plants the available quantity of fine metal cannot be increased with existing facilities.

"Anent the important Chinese demand for copper which has arisen within the past year, we have direct information from an excellent authority in China on the subject. From the advices received we are able to state that the increased demand for American copper in China is due to two reasons. In the first place, the coinage of a new issue of copper coins is under way in that empire, and the Chinese have established a number of large mints for making the coin which they call a ten cash piece. These coins have become extremely popular, and a great quantity will be required to meet the demand. Additional requirements have been created by the construction of several cartridge case factories for the government.

"European consumers have shown reserve in making new commitments of magnitude lately, also, and they have been drawing largely on their stocks, or depending on deliveries falling due to supply current necessities. It would appear, therefore, that both the American and foreign markets are ripe for extensive business whenever prices impress buyers as satisfactory."

Messrs Henry R. Merton and Co. have published their statistics of the world's copper production for 1904. The aggregate output was 613,125 tons for twelve months, comparing with 574,740 tons for the preceding year, 541,295 tons for 1902, 516,628 tons for 1901, and 479,514 tons for 1900 The production in 1898 was 258,026 tons, and ten years ago it was 324,505, the quantity per annum having nearly doubled during the last decade. Of last year's total the United States of America produced 334,170 tons, and 47,035 tons came from Spain and Portugal, 50,945 tons from Mexico, 34,160 tons from Australasia, and 30,110 tons from Chili. Ten years ago the Australasian supply was only 9,000 tons.

THE MARKET FOR ASBESTOS.

Commenting on the registration of a syndicate for mining asbestos in the Transvaal, "South African Mines" (Johannesburg), states that samples submitted to experts in England and America have brought the response that there is a ready market for this class of material, the transatlantic price current being £15 per ton, and that of England £25.

The consulting engineer assumes that the syndicate has from an inch and a-half to four inches over its area, and if the affiliated rocks are not too hard, no fears are entertained regarding the profitable aspects.

THE GOLD YIELD OF 1904.

Some of our European contemporaries have been collecting data as to the output of the precious metal in 1904. The entire yield is reported to be:—

Australasia	$87,500,000
United States (and Alaska)	86,000,000
South Africa	85,000,000
Russia	22,500,000
Canada	16,500,000
Mexico	11,000,000
India	10,500,000
All others	34,500,000
Total	$335,000,000

The predictions are for an increasing supply during the next five years with a maximum of $450,000,000. The Transvaal is to supply the bulk of this increase, its annual amount being placed at $150,000,000. These authorities put the Yukon, Colorado and Australia as on the decline in production.

INDUSTRIAL NOTES.

The Montreal Steel Co. is about to enlarge its plant. It has been found that another department will have to be added to the works, to manufacture a certain kind of steel employed in various Canadian industries, amongst others by the Canada Car Co., etc.

The St. Eugene Mining Company has ordered a new 30-drill compressor from the Jenckes Machine Company. This machine is to be shipped, installed and in running order by the first of August. This additional equipment will provide 50 drills, there being now in use compressor capacity for 20 rock drills.

Another recent sale made by the Canadian Westinghouse Company, Limited, was that of a 500 k.w. enclosed type turbo-generator unit to the Canadian Pacific Railway Company. This unit is to be installed at Fort William, on the Canadian Pacific, and is to be used for supplying power to the various grain elevators at that point. The unit is to operate 3 phase, 600 volt, 7,200 alternations, 3,600 r.p.m.

According to the Rossland Miner, Mr. W. H. Aldridge, manager of the Canadian Smelting Works, at Trail, states that the capacity of the lead refinery at Trail is to be trebled to meet the demands made for the pig lead and silver which are produced there. In the past, a large amount of the silver and lead produced there has been exported from the works to the Orient, and when the output is increased this work will grow considerably.

The Molly Gibson, which is developing in a very satisfactory manner, is, so it is said, about to install a concentrator to treat the low grade ore, and to remove zinc to avoid a penalty at the smelters. The high grade ore will be shipped to the smelter for treatment as before. The company has recently been reorganized, and its affairs now permit of immediate prosecution of the plans outlined. The new company now controlling the Molly Gibson mine is the La Plata Silver Company.

Among recent contracts awarded to Allis-Chalmers-Bullock, Limited, Montreal, were three 450 h.p. induction motors, one 100 h.p. induction motor, rope driven, for use in the Royal and Glenora mills of the Ogilvie Milling Co.; six type E-24 Ingersoll-Sergeant rock drills for the British Columbia Copper Co.; two Ingersoll-Sergeant submarine drills for the Montreal Harbor Commissioners; one Gates X Crusher, with engine and other equipment, to Michael Connolly, for his contract at St. Raymond, Que.

In our Industrial Notes of last month we announced that the new thirty drill compressor which the St. Eugene Consolidated Mining Company had purchased, was from the Jenckes Machine Company, Sherbrooke, P.Q.; this is an error, and the sale should have been credited to the Canadian Rand Drill Company, of the same place. The Jenckes Company do not build compressors, and the error was therefore patent to those who knew either of the above firms. The quality of the compressors built by the Canadian Rand Drill Company is too well known to need further announcement.

The Westinghouse Machine Company has recently announced substantial extensions in its sales organization. These extensions are the result of the rapidly increasing business, making necessary the more thorough covering of southern and western territory. In addition to the original New York, Boston, Pittsburg and Chicago offices, new branches have been established at Cincinnati, Denver, San Francisco, Charlotte, N.C., and Atlanta, Ga. With these added facilities, the extensive mining territory of the West and cotton industries of the South may receive more active attention. The steam turbine and gas engine business of the company has increased rapidly during the last few years, and the prevailing activity in this branch of power development augurs well for the future.

Mr. H. H. Henshaw has been appointed general manager of Allis-Chalmers-Bullock, Limited, Montreal. Born at St. Hyacinthe, in 1865, he first entered the office of Mr. Walker, chief accountant of the Grand Trunk, in 1880. He remained there until 1886, when he was appointed secretary-treasurer of the Royal Electric Co. During the next four years, when the company carried on its manufacturing department, Mr. Henshaw came in contact with manufacturers, electricians and engineers all over the country, and after it disposed of its manufacturing interests he not only retained his relations with them but made many new acquaintances in the business world. He remained as secretary-treasurer of the company until its absorption in the Montreal Light, Heat & Power Co., of which he also became secretary-treasurer, and remained in that position until the present appointment.

The business of Allis-Chalmers-Bullock, Limited, Montreal, has increased so rapidly recently that it has been necessary to make a number of important additions to the staff. Mr. T. F. Kenny has been appointed Mechanical Engineer. He graduated from the Department of Mechanical Engineering at McGill University in 1896, and then spent two years with the British Columbia Iron Works. For the past six years he was Mechanical Engineer for the Jenckes Machine Co. Mr. James F. Forbes has been appointed to take charge of the Pumping Engine Department. He is a native of Philadelphia, and has had large experience with the water companies owned by the Delaware Company, of New Jersey. Later he became superintendent at Dennison and Uhricksquille, and had charge of the construction of a slow sand filter plant and also of a mechanical gravity filter plant. Under his superintendence the pumping facilities were largely increased and rearranged to suit the filter plant. Since 1902 he has been travelling salesman with the National Meter Company, making Chicago his headquarters.

The Abner Doble Company, of San Francisco,. announces that arrangements have been made with the John MacDougall Caledonian Iron Works Company, Limited, of Montreal, Canada, whereby the latter become sole licensees for the manufacture of the Doble system of water wheels in the Dominion of Canada. The tangential water wheels and needle regulating nozzles manufactured by the Abner Doble Company are well known for their excellence of design and workmanship, and considerable engineering interest has recently been shown in relation to the four 8,000 horse-power wheels which that company has built for operation in California power plants. The McDougall Company have the most extensive machine works in Canada, their plant including machine shops, pattern shop, foundry, forging works and structural material shop. Their plant is therefore well equipped for the manufacture of water wheels and other hydraulic machinery. They already have in hand the building of a 100 horse-power wheel to operate under 170 feet head, taking water through a 3½-inch jet, and having a speed of 130 revolutions per minute. The Canadian licensees are prepared to furnish the steel pipe, structural work, and all machinery necessary for complete power plant, and the Doble Company requests that all engineers or parties interested in water power developments in Canada address the McDougall Company direct. They have retained the Abner Doble Company as their consulting engineers.

REPORT ON PATENTS—APRIL.

(Specially Reported for the Canadian Mining Review.)

787,736.—Filtering-Cell for Separating Slimes in Ore Treatment. Gustavus A. Duncan, Deadwood, S. D. In combination with a filtering-bag, a frame lodged in the bag for holding it extended, comprising vertical spacing-bars at relatively short intervals in the length of the cell; nipples set through the bottom bar of such frame and extending through the bottom of the bag and made water-tight thereat, and an exhaust and supply pipe to which such nipples are connected, extending underneath the cell.

787,878.—Process of Treating Slimes in Ore Reduction. Gustavus A. Duncan, Deadwood, S. D. A process which concists in accumulating the slimes upon the exterior of a filtering-cell immersed in the slime-bearing liquid, by suction from within the cell and exhausting the liquor from about such accumulated slimes, surrounding the cell having the slimes thus accumulated thereon with fresh metal solvent liquor, and drawing such liquor by suction within the cell through the slimes so accumulated on its exterior, and subsequently detaching the residual slimes from the cell.

787,540.—Process of Roasting Ores. Seely B. Patterson, Phillipsburg, N. J. A process which consists in establishing and continuously roasting a body of ore, intermittently feeding charges to the top of the body, intermittently subjecting the body throughout its length to the action of hot air, in the intervals repeatedly subjecting the lower portions of the body that have been subjected to the hot air to the action of steam, and withdrawing the roasted ores from the base of the body.

787,604.—Ore-Crusher. Frederick E. Woodbury, Milwaukee, Wis. The combination with an ore-crusher comprising a receptacle in which ore is crushed, means for crushing the ore and a grate through which the pulp is discharged, of a catch-box having an opening into said receptacle inside the grate, an opening below provided with a screen, and means for producing an upward pulsating current of water through said screen and catch-box into said receptacle.

787,814.—Separation of Metals from their Ores. Jacob D. Wolf, London, England. A process which consists in agitating pulps with oil until the oil has taken up all the metallic-mineral contents with some gangue, separating the mineral-bearing oil from the pulps, removing suspended particles of gangue from the oil by passing it through warm water and separating metallic minerals from the oil.

April 25,1905.

788,315.—Method of Electrolytic Separation. William Hoopes, Pittsburg, Pa. A method of separating metal electrolytically, which consists in passing an electric current through a solution of a compound of such metal in anhydrous ammonia, and applying a refrigerating medium to the solution to prevent or retard evaporation of the solvent.

788,211.—Combined Dredge and Mining-Sluice. Charles H. Lewis, Baltimore, Md. A combined dredge and mining-sluice, which comprises a rotatable vessel provided at or near its forward end, with a series of angularly-placed and projecting scoops in communication with the interior of the vessel, and having at its rear end an out-opening.

788,330.—Apparatus for the treatment of Ores. Robert G. Reilly, Albuquerque, N. Mex., assignor of two-thirds to Thomas J. Curran, Albuquerque, N. Mex. A vertical smelting-chamber comprising a lower and an upper section, the lower section being provided with lateral apertures above thereof, air-chambers adjacent to the lower section and communicating with the said apertures, air-chambers adjacent to the upper section, means for forcing cold air into the said upper and lower air-chambers, and agitating devices arranged in the upper air-chambers and having bars aranged to project through apertures in the walls of the upper section of the smelting-chamber.

787,926.—Process of Treating Iron, Cast-Iron and Steel. Jean Lecarme, Paris, France. The process of hardening and transforming into steel of variable qualities the entire or part of the surface of objects, rotary cutters, screw taps and other tools, and bells and other sonorous instruments made of iron, cast-iron, or mild steel, said process consisting of coating the objects on the surfaces or parts to be treated with a composition containing charcoal in powder, cyanide of potassium, and a combustible agglutiant body and then heating these bodies to a bright red excluded from the air.

May 2, 1905.

788,912.—Process of Extracting Metals. John A. Just, Pulaski, N. Y., assignor to Just Mining & Extraction Co., Rochester, N. Y., a Corporation of New York. A process consisting in chlorinating the chloridized ores in the presence of acidified calcium-chloride solution, precipitating the gold and silver and separating them, and recovering the calcium-chloride solution for re-use.

788,584.—Process of Reducing Metals from their Solutions. Charles B. Jacobs, East Orange, N. J., assignor to The Ampare-Electro-Chemical Company, Port Chester, New York, a Corporation of New York. The process of separating gold from base metals in cyanide solutions containing gold and base metal, consisting in subjecting the solution to the action of gaseous phosphide of hydrogen, in the presence of free acid, thereby precipitating the gold while retaining the base metal in solution.

788,799.—Ore-Separator. Charles W. Strong, Ward, Colo. The combination of a tank for containing an amalgamating material, a grinding-bell open at its bottom and rotatable within the tank, there being an annular space between the bell and the tank, constituting a feed-space to receive the material for grinding, and grinding rollers carried by the bottom edge of the bell and travelling upon the bottom of the tank, the bottom edge of the bell being spaced above the bottom of the tank to permit of the passage there between of the material under treatment, and the bottom of the tank having a discharge located within the bell.

788,546.—Combined Smelting and Refining Furnace. Chauncey C. Medbery, New York, N. Y. The combination with a heating-chamber, of means for rotating, means for setting it in different angular positions, a fuel-supplying device connected to one end of the chamber, movable therewith and adapted to supply fuel to the chamber in all of its angular positions and while it is rotated; and an opening at the other end of the cylinder.

788,813.—Process of Treating Fine Ores. David Baker and William W. Hearne, Wayne, Pa. A process of agglomerating fine iron ores or residues, which consists in subjecting the same to a temperature which shall cause the particles thereof, due to the impurities contained therein, to fuse sufficiently to become semi-plastic and sticky, and to agitate, by rolling the mass, when in the semi-plastic state.

789,108.—Means for Promoting Combustion of Fuel. Illius A. Timmis, London, England. The combination with the combustion-chamber of a furnace having an exhaust-blast of means for forcing air into the combustion-chamber above and below the fire-bars at a pressure exceeding the suction force of the exhaust.

788,589.—Copper Smelting and Separating. George Mitchell, Los Angeles, Cal. A process which consists in subjecting the raw ore to a reducing atmosphere in a smelting furnace, fusing it therein, avoiding the chemical union of the metal with silica in the smelting-furnace, and withdrawing the molten matte.

PROVINCE OF QUEBEC

The attention of Miners and Capitalists in the United States and in Europe is invited to the

GREAT MINERAL TERRITORY

Open for investment in the Province of Quebec.

Gold, Silver, Copper, Iron, Asbestos, Mica, Plumbago, Phosphate, Chromic Iron, Galena, Etc.

ORNAMENTAL AND STRUCTURAL MATERIALS IN ABUNDANT VARIETY.

The Mining Law gives absolute security to Title, and has been specially framed for the encouragement of Mining.

Mining concessions are divided into three classes :—

1. In unsurveyed territory (*a*) the first class contains 400 acres, (*b*) the second, 200 acres, and (*c*) the third, 100 acres.

2. In surveyed townships the three classes respectively comprise one, two and four lots.

All lands supposed to contain mines or ores belonging to the Crown may be acquired from the Commissioner of Colonization and Mines (*a*) as a mining concession by purchase, or (*b*) be occupied and worked under a mining license.

No sale of mining concessions containing more than 400 acres in superficies can be made by the Commissioner to the same person. The Governor-in-Council may, however, grant a larger extent of territory up to 1,000 acres under special circumstances.

The rates charged and to be paid in full at the time of the purchase are $5 and $10 per acre for mining lands containing the superior metals* ; the first named price being for lands situated more than 12 miles and the last named for lands situated less than 12 miles from the railway.

If containing the inferior metal, $2 and $4 according to distance from railway.

Unless stipulated to the contrary in the letters patent in concessions for the mining of superior metals, the purchaser has the right to mine for all metals found therein ; in concessions for the mining of the inferior metals, those only may be mined for.

*The superior metals include the ores of gold, silver, lead, copper, nickel, graphite, asbestos, mica, and phosphate of lime. The words inferior metals include all other minerals, and ores.

Mining lands are sold on the express condition that the purchaser shall commence *bona fide* to mine within two years from the date of purchase, and shall not spend less than $500 if mining for the superior metals ; and not less than $200 if for inferior metals. In default, cancellation of sale of mining lands

(*b*) Licenses may be obtained from the Commissioner on the following terms :—Application for an exploration and prospecting license, if the mine is on private land, $2 for every 100 acres or fraction of 100 ; if the mine is on Crown lands (1) in surveyed territory, $5 for every 100 acres, and (2) in unsurveyed territory, $5 for each square mile, the license to be valid for three months and renewable. The holder of such license may afterwards purchase the mine, paying the prices mentioned.

Licenses for mining are of two kinds: Private lands licenses where the mining rights belong to the Crown, and public lands licenses. These licenses are granted on payment of a fee of $5 and an annual rental of $1 per acre. Each license is granted for 200 acres or less, but not for more ; is valid for one year, and is renewable on the same terms as those on which it was originally granted. The Governor-in-Council may at any time require the payment of the royalty in lieu of fees for a mining license and the annual rental—such royalties, unless otherwise determined by letters patent or other title from the Crown, being fixed at a rate not to exceed three per cent. of the value at the mine of the mineral extracted after deducting the cost of mining it.

The fullest information will be cheerfully given on application to

THE MINISTER OF LANDS, MINES AND FISHERIES,
PARLIAMENT BUILDINGS, QUEBEC.

Dominion of Canada

SYNOPSIS OF REGULATIONS

For disposal of Minerals on Dominion Lands in Manitoba, the North-west Territories and the Yukon Territory.

COAL.

Coal lands may be purchased at $10 per acre for soft coal and $20 for anthracite. Not more than 320 acres can be acquired by one individual or company. Royalty at the rate of ten cents per ton of 2,000 pounds shall be collected on the gross output.

QUARTZ.

Persons of eighteen years and over and joint stock companies holding free miner's certificates may obtain entry for a mining location.

A free miner's certificate is granted for one or more years, not exceeding five, upon payment in advance of $7.50 per annum for an individual, and from $50 to $100 per annum for a company, according to capital.

A free miner, having discovered mineral in place, may locate a claim 1500 x 1500 feet by marking out the same with two legal posts, bearing location notices, one at each end on the line of the lode or vein.

The claim shall be recorded within 15 days if located within ten miles of a mining recorder's office, one additional day allowed for every additional ten miles or fraction. The fee for recording a claim is $5.

At least $100 must be expended on the claim each year or paid to the mining recorder in lieu thereof. When $500 has been expended or paid, the locator may, upon having a survey made, and upon complying with other requirements, purchase the land at $1.00 an acre.

Permission may be granted by the Minister of the Interior to locate claims containing iron and mica, also copper, in the Yukon Territory of an area not extending 160 acres.

The patent for a mining location shall provide for the payment of a Royalty ot 2½ per cent. of the sales of the products of the location.

PLACER MINING.

Manitoba and the N. W. T., excepting the Yukon Territory.—Placer mining claims generally are 100 feet square; entry fee $5, renewable yearly. On the North Saskatchewan River claims are either bar or bench, the former being 100 feet long and extending between high and low water mark. The latter includes bar diggings, but extends back to the base of the hill or bank, but not exceeding 1,000 feet. Where steam power is used, claims 200 feet wide may be obtained.

Dredging in the rivers of Manitoba and the N. W. T., excepting the Yukon Territory.—A free miner may obtain only two leases of five miles each for a term of twenty years, renewable in the discretion of the Minister of the Interior.

The lessee's right is confined to the submerged bed or bars of the river below low water mark, and subject to the rights of all persons who have, or who may receive entries for bar diggings or bench claims, except on the Saskatchewan River, where the lessee may dredge to high water mark on each alternate leasehold.

The lessee shall have a dredge in operation within one season from the date of the lease for each five miles, but where a person or company has obtained more than one lease one dredge for each fifteen miles or fraction is sufficient. Rental, $10 per annum for each mile of river leased. Royalty at the rate of two and a half per cent. collected on the output after it exceeds $10,000.

DREDGING IN THE YUKON TERRITORY.

Six leases of five miles each may be granted to a free miner for a term of twenty years, also renewable.

The lessee's right is confined to the submerged bed or bars in the river below low water mark, that boundary to be fixed by its position on the 1st day of August in the year of the date of the lease.

The lessee shall have one dredge in operation within two years from the date of the lease, and one dredge for each five miles within six years from such date. Rental, $100 per mile for first year and $10 per mile for each subsequent year. Royalty, same as placer mining.

PLACER MINING IN THE YUKON TERRITORY.

Creek, gulch, river and hill claims shall not exceed 250 feet in length, measured on the base line or general direction of the creek or gulch, the width being from 1,000 to 2,000 feet. All other placer claims shall be 250 feet square.

Claims are marked by two legal posts, one at each end, bearing notices. Entry must be made within ten days, if the claim is within ten miles of mining recorder's office. One extra day allowed for each additional ten miles or fraction.

The person or company staking a claim must hold a free miner's certificate.

The discoverer of a new mine is entitled to a claim of 1,000 feet in length, and if the party consists of two, 1,500 feet altogether, on the output of which no royalty shall be charged, the rest of the party ordinary claims only.

Entry fee, $10. Royalty at the rate of two and one-half per cent. on the value of the gold shipped from the Yukon Territory to be paid to the Comptroller.

No free miner shall receive a grant of more than one mining claim on each separate river, creek or gulch, but the same miner may hold any number of claims by purchase, and free miners may work their claims in partnership by filing notice and paying fee of $2. A claim may be abandoned, and another obtained on the same creek, gulch or river, by giving notice and paying a fee.

Work must be done on a claim each year to the value of at least $200.

A certificate that work has been done must be obtained each year; if not, the claim shall be deemed to be abandoned, and open to occupation and entry by a free miner.

The boundaries of a claim may be defined absolutely by having a survey made and publishing notices in the Yukon Official Gazette.

PETROLEUM.

All unappropriated Dominion Lands in Manitoba, the North-West Territories and within the Yukon Territory are open to prospecting for petroleum, and the Minister may reserve for an individual or company having machinery on the land to be prospected, an area of 640 acres. Should the prospector discover oil in paying quantities, and satisfactorily establish such discovery, an area not exceeding 640 acres, including the oil well and such other land as may be determined, will be sold to the discoverer at the rate of $1.00 an acre subject to royalty at such rate as may be specified by order-in-council.

Department of the Interior,

Ottawa, February, 1904.

W. W. CORY,
Deputy of the Minister of the Interior.

PROVINCE OF NOVA SCOTIA.

Leases for Mines of Gold, Silver, Coal, Iron, Copper, Lead, Tin

—AND—

PRECIOUS STONES.

TITLES GIVEN DIRECT FROM THE CROWN, ROYALTIES AND RENTALS MODERATE.

GOLD AND SILVER.

Under the provisions of Chap. 1, Acts of 1892, of Mines and Minerals, Licenses are issued for prospecting Gold and Silver for a term of twelve months. Mines of Gold and Silver are laid off in areas of 150 by 250 feet, any number of which up to one hundred can be included in one License, provided that the length of the block does not exceed twice its width. The cost is 50 cents per area. Leases of any number of areas are granted for a term of 40 years at $2.00 per area. These leases are forfeitable if not worked, but advantage can be taken of a recent Act by which on payment of 50 cents annually for each area contained in the lease it becomes non-forfeitable if the labor be not performed.

Licenses are issued to owners of quartz crushing mills, who are required to pay Royalty on all the Gold they extract at the rate of two per cent. on smelted Gold valued at $19 an ounce, and on smelted Gold valued at $18 an ounce.

Applications for Licenses or Leases are receivable at the office of the Commissioner of Public Works and Mines each week day from 10 a.m. to 4 p.m., except Saturday, when the hours are from 10 to 1. Licenses are issued in the order of application according to priority. If a person discovers Gold in any part of the Province, he may stake out the boundaries of the areas he desires to obtain, and this gives him one week and twenty-four hours for every 15 miles from Halifax in which to make application at the Department for his ground.

MINES OTHER THAN GOLD AND SILVER.

Licences to search for eighteen months are issued, at a cost of thirty dollars, for minerals other than Gold and Silver, out of which areas can be selected for mining under lease. These leases are for four renewable terms of twenty years each. The cost for the first year is fifty dollars, and an annual rental of thirty dollars secures each lease from liability to forfeiture for non-working.

All rentals are refunded if afterwards the areas are worked and pay royalties. All titles, transfers, etc., of minerals are registered by the Mines Department for a nominal fee, and provision is made for lessees and licensees whereby they can acquire promptly, either by arrangement with the owner or by arbitration, all land required for their mining works.

The Government as a security for the payment of royalties, makes the royalties first lien on the plant and fixtures of the mine.

The unusually generous conditions under which the Government of Nova Scotia grants its minerals have introduced many outside capitalists, who have always stated that the Mining laws of the Province were the best they had had experience of.

The royalties on the remaining minerals are: Copper, four cents on every unit; Lead, two cents upon every unit; Iron, five cents on every ton; Tin and Precious Stones, five per cent.; Coal, 10 cents on every ton sold.

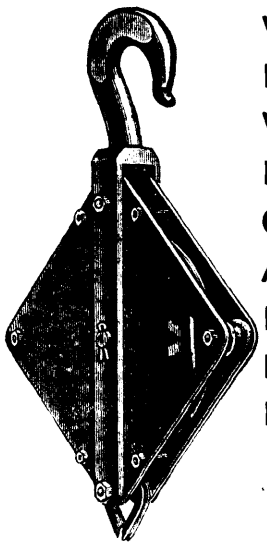
The Gold district of the Province extends along its entire Atlantic coast, and varies in width from 10 to 40 miles, and embraces an area of over three thousand miles, and is traversed by good roads and accessible at all points by water. Coal is known in the Counties of Cumberland, Colchester, Pictou and Antigonish, and at numerous points in the Island of Cape Breton. The ores of Iron, Copper, etc., are met at numerous points, and are being rapidly secured by miners and investors.

Copies of the Mining Law and any information can be had on application to

THE HON. A. DRYSDALE,

Commissioner Public Works and Mines,

HALIFAX, NOVA SCOTIA.



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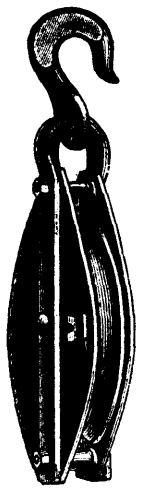

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THE **DOMINION WIRE ROPE CO. LTD.**

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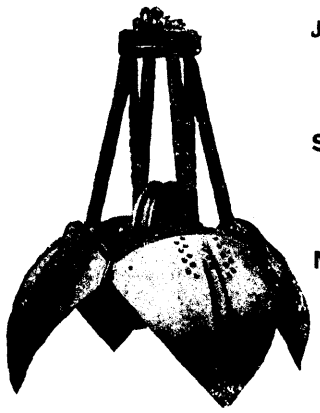
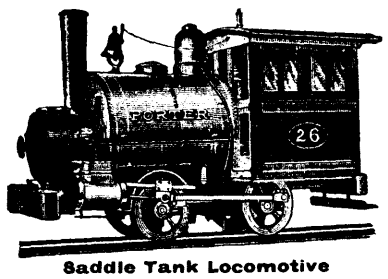


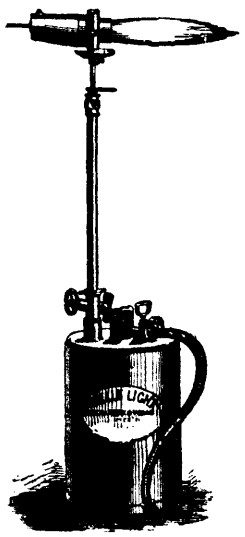
Orange Peel Bucket

JUST A FEW SUGGESTIONS OF SUPPLIES YOU MAY REQUIRE



Saddle Tank Locomotive

FOR SOME ADDITIONAL LINES, SEE THE NEXT ISSUE OF THIS PAPER



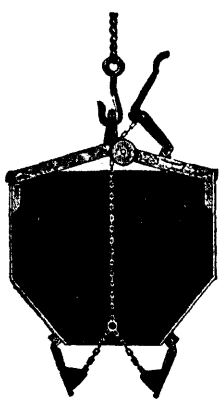
Wells Lights

F. H. HOPKINS & CO.

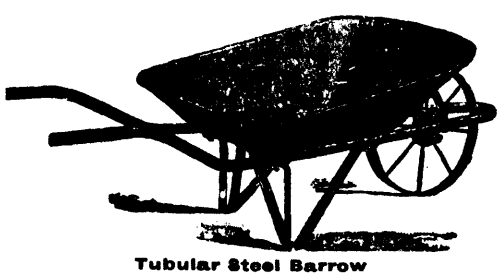
RAILWAY, MINING — AND — CONTRACTORS' SUPPLIES.

MONTREAL.

Jack Screw



Concrete Tub



Tubular Steel Barrow

Ransome Concrete Mixer