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SEVENTEENTH YEAR OF PUBLICATION

# The Canadian Mining Review

Established 1882

Vol. XVIII—No. xi. OTTAWA, NOVEMBER 30th, 1899. Vol. XVIII--No. xi.

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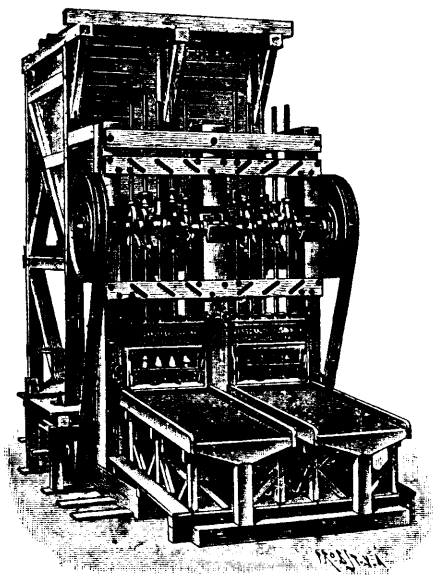

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Under the provisions of chap. 1, Acts of 1892, of Mines and Minerals, Licenses are issued for prospecting Gold and Silver for a term of twelve months. Mines of Gold and Silver are laid off in areas of 150 by 250 feet, any number of which up to one 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 quarts 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.

Licenses 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

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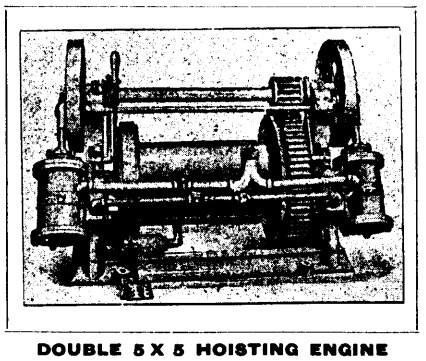
Commissioner Public Works and Mines,

HALIFAX, NOVA SCOTIA.



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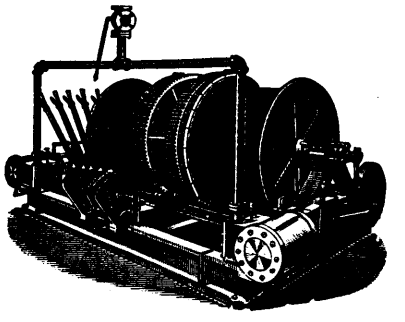

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Established 1882

THE OLDEST AND ONLY OFFICIAL MINING AND ENGINEERING JOURNAL PUBLISHED IN THE DOMINION OF CANADA.

B. T. A. BELL, Editor and Proprietor. Secretary, Canadian Mining Institute, etc.

Published Monthly.

OFFICES { Slater Building, Ottawa; Windsor Hotel, Montreal.

VOL. XVIII., No. 11. NOVEMBER, 1899. VOL. XVIII., No. 11.

## Mining in Nova Scotia, 1899.

During the fiscal year ended September 30th the progress of mining operations in Nova Scotia has been distinctly encouraging.

In coal mining, as far as learned, the output was 2,642,147 tons, compared with 2,281,454 tons during the preceding year. The following table shows how these increases were divided:—

| Counties. | Tons—2,240 lbs. | |
|---|---|---|
| | Year 1898. | Year 1899. |
| Cape Breton | 1,436,401 | 1,731,398 |
| Cumberland | 409,940 | 437,121 |
| Pictou | 421,325 | 460,236 |
| Other Counties | 13,788 | 13,392 |
| | 2 281,454 | 2,642,147 |

This increase is gratifying in itself, but the statisticians say it is nothing in comparison with the increase that will follow the full working of the gas plant at Everett, Mass., and the starting of the great iron and steel works at Sydney during the next two years.

In Cape Breton the business has been marked by several special features. The first was the fire at Caledonia colliery, causing the death of eleven men. The pit was, fortunately, saved at the expense of flooding the greater part of its workings. The Dominion Coal Company abandoned the working of the Hub Seam, it is stated, on account of the percentage of sulphur being a little over that permitted in blast furnace coke. It has, however, commenced the sinking of a new shaft to command 75,000,000 tons of the Phalen seam, and the opening of a slope in the Emery seam, which is considered to be superior in quality to any they are now working. At the end of two years it is anticipated that the company will be able to meet an annual demand of 3,000,000 tons of coal.

The General Mining Association completed the sinking of its Jubilee shaft. The seams intersected are of good quality, but the determination reached to begin the extraction of pillars in their submarine workings will furnish a supply of coal ample for present purposes. Preparations are being made to open one of the large seams on their Boularderie area, so that with the Jubilee pit they will be prepared at any time for an output offering a favorable comparison with that of the Dominion Coal Company.

The Messrs. Burchell have continued developing their mine at New Campbelton, and are prepared to share in the general increase of trade. At Broad Cove operations have been lessened pending a readjustment of the interests of the company.

A company has been formed to take over the Port Hood areas, and they expect to open mines at once. The submarine areas at Broad Cove are in the hands of Messrs. McKenzie & Mann, and preparations are on foot to open them. The railway from Port Hawkesbury now being rapidly constructed along the shore into the Inverness coal fields, will materially assist in this promise of development.

In Pictou County there is little of special note to be recorded. Both the Acadia and Intercolonial mines have worked steadily, and have large reserves of coal to draw upon.

In Cumberland County the Springhill and Joggins mines have worked steadily, and are prepared for increasing business. The former company has for the past two seasons prospected systematically its southern basin, and has proved there the presence of numerous seams, affording a reserve of coal equal to that which they are now engaged in working. The enormous extension of coal proved by these explorations is comforting, as it assures the future of the district, and the stability of Springhill town, rapidly approaching the position of the second largest in the Province. In brief, it may be said that the future of coal mining in Nova Scotia is most promising.

*Gold Mining.*—In this brief summary it is impossible to notice in detail the numerous districts. It may be said by the practical miner that the general boom has not as yet benefited our gold mines. There is such an anxiety to sell, that the owners of promising properties have this last season, in very many cases, either tied themselves up in "bonds," or are lying back waiting for purchasers. In the Stormont district, the Richardson and Hurricane Point mines continue to be large producers, the former yielding 2,150 ounces, and the latter 1,212 ounces. The total yield of the district was 8,000 ounces.

In the Sherbrooke district the yield was 5,118 ounces, a number of the mines being idle pending a scheme for consolidation.

At Wine Harbor it is believed that the famous Plough lead has been found again, in its original richness. Tangier has again received attention, and the operations promise a large production in the future. Montagu and Lake Catcha have done little beyond development work. At Waverley an American company has reopened the barrel quartz vein, and the returns are so promising that they are preparing to crush on a large scale. Renfrew, Uniacke and Oldham have done little beyond prospecting and tribute work. In the Caribou district, the development work of the Guffey-Jennings has proved satisfactory, and large outputs are expected. The low grade ores of Moose river have continued to receive attention. At the Dufferin mine, Salmon

River, a large plant has been erected, and extensive blocks of ore opened out. The results of the commencement of systematic milling are awaited with much interest. The returns so far show 1,085 ounces.

Work in the district west of Halifax presents few new features. Mr. Libbey continued working his mine and chlorination plant at Brookfield, the returns being 2,985 ounces. M. T. Foster has opened a promising lead at Block House, from which several hundred ounces were taken. The Cashon mine, at Leipsigate, returned 900 ounces. In other localities a good deal of prospecting work has been carried on. As far as can be learned the returns for the year will be about 25,000 ounces, as compared with 31,114 ounces in 1898. In view of the extensive development work that has been carried on at a number of localities this season, this decreased output can be readily accounted for; and it is confidently expected that next season will see the commencement of an enlarged and permanent output.

*Iron Mining.*—Directly, the advance has not been important; indirectly, the year has been most interesting. The Londonderry establishment continued idle, except the foundry, and changed hands during the Fall, preparatory, it is said, to a campaign during the present high prices. The Nova Scotia Steel Company continued their operations, and enlarged the capacity of their steel works. A large proportion of their ore came from their mine at Bell Island, Newfoundland. The Mineral Products Company, working the Bridgeville Charcoal furnace, have been making ferro-manganese, the manganese being supplied from New Brunswick. Some attention has been paid to iron ore deposits, especially in Cape Breton, but no sales are reported. The feature of the year has been the formation of the Dominion Iron and Steel Company, which has acquired an enormous supply of excellent iron ore at Bell Island, Newfoundland, arranged with the Dominion Coal Company for a supply of coking coal, and is now building an immense establishment for steel works at Sydney, Cape Breton. The plant will comprise four large modern furnaces, and a plant commensurate for the conversion of their product into steel in various commercial forms. It is expected that the proximity of cheap steel and cheap fuel will attract to Sydney establishments for the utilization of the crude steel and pig iron. The production of iron ore amounted to 25,000 tons.

The development of the Brookffeld silver-lead mine at Cheticamp has shown good values, and arrangements are being made for building a smelting furnace. Other discoveries in this district also promise well. The Copper Crown Company has built a smelter at Pictou, and has opened mines at Wentworth, New Annan, etc., which are reported to yield large quantities of fair-grade copper ore carrying gold. Work has also been done at Coxheath, Cape d'Or, Dalhousie, and other places.

The gypsum and barytes production has remained at about last year's figures. The Dimock quarry, at Windsor, has now an efficient tug and barge system for its export trade to the United States.

*Manganese.*—Mr. Miner T. Foster shipped about 90 tons of good grade manganese from his mines at New Ross, Lunenburg Co., where there is reported to be an extensive manganiferous district. Some development work was done at Tennycape, and about 5 tons shipped The infusorial deposits of St. Anns, Victoria County, and of Bass River, Colchester County, continued working during the past year.

The operations of the Dominion Iron and Steel Company has led to the opening of numerous limestone and stone quarries in Cape Breton, and has taxed the resources of all the brickyards.

*Copper and Lead.*—The attention directed to the copper ores of Nova Scotia has so far been attended with most promising results, and it is anticipated that in addition to the mines now being worked to supply the Pictou smelter, there will soon be regular operations in progress in Cape Breton and Inverness Counties. The development of these coppe· and lead resources, which are believed by many impartial observers to be wide-spread and abundant, should lead to a mining and smelting business surpassing in importance every other provincial industry.

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## The Late Sir William Dawson.

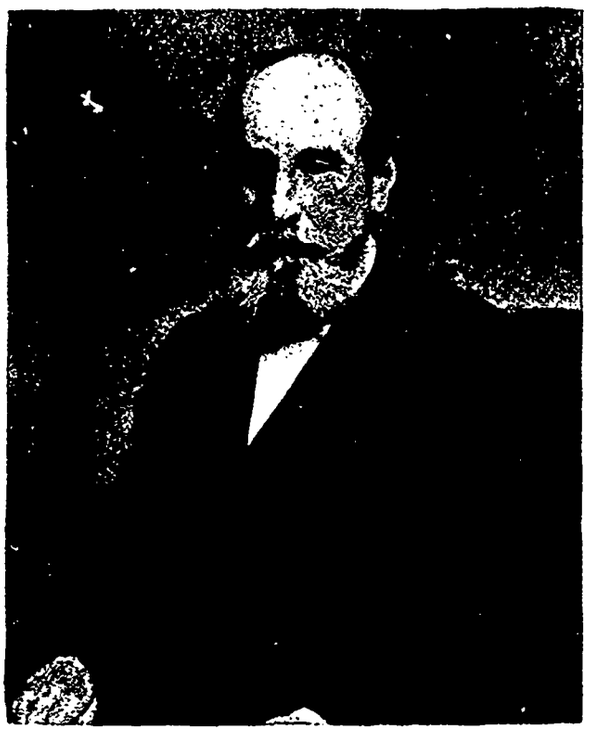
Sir William Dawson, the eminent Canadian geologist, passed away at Montreal on 19th instant. Sir William had been in failing health for some time. About sixteen months ago he sustained a slight stroke of paralysis which greatly enfeebled him, and confined him indoors for a considerable period.

The venerable ex-Principal of McGill University was born in the town of Pictou, Nova Scotia, in 1820, where he received his early training and education. One of his favorite hobbies was the collection of natural history specimens peculiar to his province. At the age of twenty he went to the University of Edinburgh to make more extended studies. In 1842 we find him assisting Sir Charles Lyell, then one of the ablest of living geologists, in his examination of the geological resources of Nova Scotia. Subsequent to this, young Dawson returned to Edinburgh and made further studies, especially in the science of chemistry and kindred branches. His first paper on "Field Mice" was read before the Wernerian Society of Edinburgh in 1841. Then followed papers on various branches of science, but he was soon back to his birth place, where he was appointed by Sir Edmund Head a commissioner to regulate the affairs of King's College. Educational matters now occupied most of his time. But his favorite study, geology, soon made its way out and he lost no opportunity of carrying on investigations into the coal, iron and gypsum deposits of Nova Scotia. The Edinburgh *Philosophical Journal*, the Royal Society publications, and the other leading magazines and periodicals, were now open for articles from his facile pen. Papers bearing upon the economic resources of Nova Scotia show the interest and active part which he took in the development of natural resources in those early days. With never-flagging zeal he pursued his geological studies, which led to important discoveries.

He was then called upon to deliver lectures on geology and natural history in Pictou Academy and Dalhousie College, and was entrusted with a "Report on the Coal Fields of Southern Cape Breton" for the Nova Scotia Government.

In 1854 he was elected Fellow of the Geological Society of London, to whose quarterly journals he frequently contributed numerous useful and interesting papers. He discovered and described the oldest known reptiles at the time: the remains of the earliest land snails known. In 1855 Mr. Dawson published his well known work "Acadian Geology" on the geological structure, organic remains, and mineral resources of Nova Scotia, New Brunswick and Prince Edward Island. This admirable and indispensable work to the student of geology has since gone through several editions, and is now more than double its original size. In his researches on the vegetation of the Devonian period, prior to the Carboniferous, or Coal measures, Dawson's name stands foremost. It was to his friend and colleague, Sir Charles Lyell, that his "Acadian Geology" was dedicated.

In the same year, 1855, Mr. Dawson was called upon by the authorities of McGill University to take the principalship of that institution. A comparison of the condition of the University in 1855 and that which it now occupies is sufficient warrant to any one of the long-sightedness and wise policy of the Board of Governors, as well as a distinct mark and standing monument to his industry, zeal, and practical ideas on educational matters. Besides his more scientific works on geology, and hundreds of papers on divers facts and observations, Sir



THE LATE SIR WM. DAWSON, L.L.D., F.R.S., C.M.G.,
Who died at Montreal on 19th instant.

William published a number of popular works, amongst which we may mention the following: "The Origin of the World," "The Story of the Earth and Man," "The Dawn of Life," "Fossil Men and their Modern Representatives," "The Chain of Life in Geological Times," etc.

In his researches on *Eozoon Canadense*, conjointly with Sir William Logan, Dr. W. B Carpenter, Dr T. Sterry Hunt, and many others, Dawson created for himself a reputation and a name which will always stand high. Amongst the text books which he wrote we find his "Acadian Geology" and "Manual of Zoology" especially adapted to Canadian students: "Lecture Notes on Geology," a most useful and comprehensive digest or resume of geology. We have, besides, numerous other works, amongst which are his Reports on the Devonian and Carboniferous Plants of Canada, prepared and published by the Geological Survey of Canada, by Act of Parliament.

In 1862 Dawson was elected Fellow of the Royal Society of England, the highest honor which a British scientist can obtain from his confreres and admirers In 1882 he was elected President to the Royal Society of Canada, founded by the Marquis of Lorne. He has been President of both the American and British Associations for the Advancement of Science more than once He was a Master of Arts of Edinburgh University, an LL.D of McGill, whilst in 1884 Her Majesty was pleased to bestow upon him the Order of Knight Bachelor, in recognition of his valuable services to science, and his *alma mater* in the same year created him an LL.D. of that University.

As a geologist and an educationalist, Sir William Dawson occupied a very high place. His flowing words and store of knowledge made him interesting and attractive at all times. In the domain of archæology and archæological remains, Sir William made extensive researches in Canada, described many of the implements and remains of the earliest dwellers on this continent, connecting therewith almost invariably the related topic so brimful of interest as to the "Antiquity of Man."

In the world of higher Biblical criticism, of reconciling "Science and religion," Sir William Dawson has done much to clear up numerous and important as well as intricate questions, which required careful comparisons and accurate observations. "Facts and Fancies of Modern Science," "Modern Ideas of Evolution," and similar works of captivating interest and philosophic turn of mind are amongst his best known works, whilst his works and papers on Egypt and Syria are not less profitable.

## Mining Stock Investments.

One of our readers largely interested in the mining business sends us the following pertinent comment upon the methods of certain stock fakirs operating in Canada. He says: "Two brokers swapping 10,000 shares of Dead Sure for 10,000 shares of Busted Flush is not mining, although the swap, with similar transactions, are daily recorded in prominent characters in the mining columns of the daily press as 'business done;' yet it leads the public to believe that large sales are being made in certain stocks. The trick is repeated from day to day with a few extra touches in the newspapers. The public begin to nibble, then bite, and finally voraciously plunge, and the Peace Dove mine runs up from 80 cents to $3 50. The cunning manipulators make a million or two and shortly Peace Dove finds its level at about $1 25. The manipulators then look around for another deal. Middle Moon mine seems a likely thing for another such handsome return and Middle Moon is now in the process of incubation. The Tail Point–Peace Dove–Middle Moon combination is a big one, it has been 'worked' on a clever scale and has been vastly profitable to the manipulators There have been hundreds of such propositions on an infinitely smaller scale in Canada which rarely rose above 30 or 40 cents and eventually fell to nothing at all, yet in spite of the numerous wrecks and the indisputable evidences of stock manipulation the thing is not completely killed and the public are still being coaxed to buy shares in all kinds of mining companies. So long as the fools will part with their money, just so long will the slick tongued gentry with the millions in sight be with us, but the moment people become sensible and enter a mining venture in exactly the same way they would treat any other business—that is, with caution and by employing all reasonable methods for a full and exhaustive enquiry, and being guided by sound and reliable professional advice, then and not until then need they expect to meet with a real investment, and not until then need we expect our vast mineral resources to be profitably and economically operated.

While the people generally throughout Canada and particularly in the Province of Ontario have been 'done' by the horde of mining 'fakirs,' it is still more unfortunate for Canada that English people have not escaped a 'soaking.' The Golden Twins, the Golden Cache, the Quesnelle Dredging scheme, the Horne-Payne fizzle and other similar schemes have 'done' the British public out of thousands of pounds. The political trick was mostly the bait that caught the crowd in the above projects—that is, having ministers of the Crown and prominent members of the legislatures figuring as promoters and directors. Fortunately this has been overdone, and nothing now is so likely to discredit a company in England as the appearance of the name of a Canadian politician among the promotors."

*Apropos* of these remarks it might be well to quote from a recent article from the *Engineering and Mining Journal* on the same topic:—"Legitimate mining investments may be divided into two general classes, the purchase of stock in developed and paying mines, and the taking of shares in new enterprises still largely to be developed. The first class, of course, appeals to those who need an immediate return on their capital, and as a rule this will be only a moderate one, since the stocks of well known dividend-paying mines naturally command high prices. The second class offers many opportunities to those who can afford to run a certain risk in view of the chances of large profits which such investments offer. It is in this class, of course, that caution is to be exercised, and here the dishonest promoter finds his chief opportunity.

There are certain points which long experience with promoters and prospectuses enables one to detect at once as evidences of honesty—or otherwise. The most common fraud in such documents is to represent a claim or a prospect, which may or may not have value, as an established mine In these cases it is often difficult to detect the misrepresentation without some personal knowledge of the district, which the average buyer of stock seldom possesses. It is usually safe, however, to distrust a prospectus which deals entirely in generalities, or which bases its claims to the value of a property on the neighborhood of some well-known mine. An array of prominent names in the directory is not always a safeguard, as the stockholders of the Rev. Mr. Jernegan's Electrolytic Marine Salts Company, or the Joseph Ladue Gold Mining Company could tell us. The name of a well-known and reliable expert is of value; but it is to be noticed that a prospectus in which such a name appears is usually much more moderate in its claims than those which are based on doubtful properties. The man who writes a fake prospectus has a certain advantage over the author of an honest one, since he is not limited by any attention to facts which might be embarassing. Generally it is the more modest prospectus which deserves attention.

The investor who proposes to put money into a company should insist upon the fullest confidence. Plain statements of facts and of actual conditions are always in order, and command confidence, though they may be, at first sight, less attractive than 'glittering generalities' and vague promises. While it is difficult to lay down any general rules,

these two—the full explanation of facts and the authority of responsible experts—are features which always deserve attention.

This rule of full confidence in the stockholder applies to old as well as new companies. The investor should beware of all concerns in which the management think secrecy necessary. They are always liable to unpleasant surprises; and it is not good business to hold stock in a 'blind pool,' the value of which is necessarily at the mercy of the managers.

## The Yukon Royalty.

The following is the text of the Petition presented to the Federal Government on behalf of the British and Canadian Companies engaged in mining in the Yukon:—

1.—ROYALTY OF 10 PER CENT. ON THE GROSS OUTPUT OF THE MINES.

An exhaustive investigation made by the undersigned shows that only a limited number of properties on Eldorado, Bonanza, Dominion and Hunker Creeks can produce sufficient gold to pay a royalty of 10 per cent. on the gross output, and they submit that the imposition of such a heavy tax has greatly militated against the successful operations of a great many mining claims. In the consideration of this important question your petitioners have not lost sight of the fact that the Canadian Government must necessarily raise the large revenue required to defray the cost of administration of this territory as well as the cost of improvements to the various avenues of transportation, but they are fully convinced that a royalty of not exceeding 5 per cent. on the net output of the mines would, with the immense impetus which this reduction of royalty would give to mining enterprises, fully meet the requirements of the Government.

It may be, however, that your petitioners are too sanguine as to the immediate results, and that your Honourable Council cannot at present see its way clear to grant at once this substantial reduction. If such be the case, your petitioners pray that, in any event, the royalty adopted be collected on the net output of the mines, and not on the pross output, and they submit that the collection of that tax could safely be entrusted to honest and competent assessors, as is done in England for the collection of the income tax. In cases of false returns the assessors should be empowered to raise the amount on which the tax has to be paid, leaving to the miner to prove the net output of his property before the courts, and in addition the Government could impose a heavy penalty.

Your petitioners feel certain that a substantial reduction of the royalty at present in force, the highest royalty ever collected in any gold mining field in the world, would operate to the advantage of the best interests of the country at large, and would, more than anything else, materially assist in the development of the immense wealth of this extensive region.

A royalty of 10 per cent.—in fact, any royalty based on the gross output of a mine—is a truly oppressive tax, one which bears unequally on different individuals, owners, perhaps, of two adjoining properties, as it may happen that the cost of opening up one claim may be three or four times as great as the cost of opening the adjoining claim, owing to the physical conditions, and yet both owners are at present taxed 10 per cent. on the gross output of their properties, which includes cost of labour and plant—that is to say, they pay at present a tax of 10 cents per hour of labour employed by them.

In this connection your petitioners ask to be allowed to quote the remarks of the chairman of one of the important English companies operating in the territory, and they do so respectfully and only with the intention to show the feeling of intelligent and important business men in the old country concerning the question of royalty.

'The payment of a 10 per cent. royalty on our gross gold product in addition to the cost of our license, and also the cost of recording our claims, and also the practice of reserving to the Crown every alternate claim on all new discoveries which might affect us, strike the board as oppressive and as operating against legitimate mining enterprise, and is beyond all precedent in other gold producing regions. In the early days of the Victorian gold fields the Government exacted a license fee of 60s. per month and collected these fees by means of their mounted police, and conflicts of a serious kind frequently arose. At last the diggers rose in rebellion at Ballarat, the most important mining centre, and detachments of British regiments were sent up to assist the troopers. This led to bloodshed, and to the ultimate success of the rebellious movement, for the Government found themselves in a highly unpopular position, and they shortly amended the mining act to the extent of reducing the miner's license to £1 per annum, and instituting an export duty of 2s. 6d. per ounce, which regulations stand to the present day. The argument in favour of this heavy and exceptional system of taxation on the part of the Canadian Government is, no doubt, that in regard to the cost of Government administration and public works, it makes the gold fields self-supporting, but a policy of foresight would suggest that a premium should be offered to stimulate the mining industry, such as large rewards to the discoverers of new gold fields, as in Australia, rather than that grinding taxes should be imposed in such inhospitable regions, which must retard, if they do not destroy, settlement.'

This quotation is cited, as mentioned above, merely to show the view taken by mining men in England.

2.—SECURITY OF TITLE.

Your petitioners respectfully submit that the existing rules and regulations are such that the title to mining property in the Yukon territory is not secure in any sense. There are under the existing mining laws many regulations which provide for absolute confiscation of property through causes beyond the control of the owner, and for which the following remedies are suggested:—

1. Many cases which could be cited have occurred where claims have been recorded, worked, record renewed, and so forth, and the supposed owner found himself without title.

The remedy suggested is that a certificate of grant under the Torrens system, which is in force in British Columbia, Ontario and Manitoba, be issued by the Mining Recorder, such certificate conveying an absolute title to the grantee, subject to yearly renewal of license, &c.

The existing insecurity in title to property has, to your petitioners' absolute knowledge, seriously militated against the investment of capital this year.

2. Under the present regulations a company may, through the carelessness, temporary absence through unavoidable causes, dishonesty or oversight of its representative, render itself liable to confiscation or sacrifice of title; for instance, through the employment of a female cook at a mining camp who does not hold a miner's license; or, again, through the non-renewal on a particular date, from causes beyond control, of license or certificate.

Your petitioners suggest that the law should be amended to such an extent as to permit the Gold Commissioner to exercise his own judgment or discretion in dealing with particular cases as they present themselves..

With regard to the renewal of license and re-entry it is suggested that a similar method to the one in vogue in the Transvaal be

adopted, providing that such renewal or re-entry may be made upon payment of a small penalty within (say) three months after expiration, after which the claim should for three months be advertised for sale by auction at the office of the Recorder of the district.

3,—REPRESENTATION OF CLAIMS.

Your petitioners suggest that an amendment be enacted whereby the owner of a claim may, in place of working continuously for three months, as provided for in Clause 39 of the placer regulations, be permitted, as per the conditions of Clause 32 of the quartz mining regulations, to make a payment to the Government of the sum of $100. It is submitted that this would secure to the Government a very valuable source of revenue, which is to-day non-existent, the money expended on representation of a claim being frequently paid to aliens who leave the country at once, while the individual miner would be further benefitted, in that he would be able to postpone the development of a distant claim until the cheapening of transportation, the provision of means of access and the importation of machinery might enable him to prosecute his industry to greater advantage.

4 —SURVEYING BASE LINES, &c.

At the present moment owners or recorded owners of claims and property are entirely at the mercy of the Dominion Land Surveyor, who may or may not perform his duties satisfactorily. Many cases exist where claims and properties duly staked, recorded, represented, also renewed have been wiped out of existence by the arbitrary base line of the surveyor and his false or biased judgment, as to for instance the dividing line between a hill and a bench claim.

Your petitioners suggest that all mining locations, creek, hill and bench be a square of 500 feet, or that in all events, the surveyor shall be compelled when making his survey, to run his base line for the protection so far as possible of claims or properties already staked and recorded, and possibly sold to an innocent purchaser, and that further, all such claims shall be protected between their four stakes.

5.—STAKING OF CLAIMS.

Your petitioners suggest that all miners be permitted to stake once on every creek, in place of once in every district, or that in all events a person be permitted to cancel or abandon or sell his claim, and re-stake in the same district.

6.—PUBLIC WORKS.

Your petitioners desire to express the appreciation of the action of the Dominion Government in constructing the telegraph line with all haste, and further congratulate the Council of the Yukon in regard to having undertaken the most important work of the construction of wagon roads and trails. At the present moment several hundred tons of valuable mining machinery, brought in at great expense, are lying idle in the City of Dawson owing to the entire absence of any trail or road in the country Supplies, such as can be handled by pack-trains, are now with difficulty delivered on the creeks at the enormous cost of 1 cent per lb. per mile, while packages of any weight must await the snows of the coming winter.

Your petitioners earnestly pray that the Dominion Government will support and assist by every means in their power this absolutely necessary and essential work, the initiation of which has been so wisely undertaken by the Yukon Council.

In the opinion of your petitioners the work of improvement of the Rivers between Dawson and Bennett should be prosecuted with all possible expedition, especially at Five Fingers and the Rink Rapids and in Thirty Mile River, also in the neighbourhood of White River and above Fort Selkirk, where the channel should be marked with beacons forthwith.

Your petitioners desire to assure your honourable council that this memorandum is submitted solely in the interest of the country, with the hope of removing the feeling of oppression and insecurity which now exists in this territory, and they earnestly hope that their suggestions will be carefully considered.

It is confidently expected that the above petition will have the desired effect, intelligence having been received from Ottawa that the Hon. Mr. Sifton, Minister of the Interior, has considered this matter very carefully, and has expressed great surprise that he was not informed of these grievances by his own Administrator at the Yukon.

Considerable changes will take place shortly, and the present mining law will be much altered, so as to enable capital to come into the country with safety.

## A Nova Scotia Promotion.

A concern calling itself the Nova Scotia Uniacke Mining Syndicate is being privately hawked about by means of a prospectus dated 28th ult., which is headed by the announcement that it "will not be advertised." The promoters are to be congratulated on their discretion. It appears that on June 19 last a Mr. Ephraim Alcock Jones, of Linthorpe, Middlesbrough, mining engineer—who is one of the trio which is to direct the concern in the future—purchased the property to be acquired by this syndicate. He promised to give the owners £9,000 in cash and £600 in shares for it; and he paid a deposit. He sold it to the Nova Scotia Endeavor Syndicate on August 24 last, for a sum not stated: and, the very next day, the Nova Scotia Endeavor Syndicate re-sold it to a trustee on behalf of the Nova Scotia South Uniacke Mining Syndicate for £20,000 in cash and £30,000 in shares. Between June 19 and August 25 last, the property has, therefore, increased in price to the extent of no less than £11,000 in cash and £29,400 in shares The property consists of the South Uniacke Mines (locally named the Withrow and Quirk), and the only report thereon furhished by the promoters is made by Mr. Ephraim Alcock Jones himself, the vendor, as well as one of the promoters and directors of the concern. It may, therefore, be dismissed as worthless as a guide to the intending investor in its shares. Some parade is made in the prospectus of a copy of the certified Government Return of one of the mines, the "Withrow." This return states that from January, 1896, to March, 1899—that is to say, for thirty-nine months—4,394 tons were crushed, producing 4,102 oz. 18 grs. This would give an average crushing of not quite 113 tons per month, yielding about 102 oz., or, deducting the three months when no crushing took place, an average of 122 tons, yielding 114 oz per month. As a matter of fact, however, the average for the first three months of this year was only 92½ oz. per month, and the most suggestive feature of the return is that it omits to give any crushing results from April 1 of this year until the date of the prospectus. Had such a crushing been proceeding during that period? If so, why is the return not stated? As the prospectus gives, in red ink, the assurance that "these mines are going concerns," it must be presumed that this is either a misstatement or that some reason existed why the returns for the last five months have been omitted.

The capital of the company is £50,000 in 50,000 shares of £1 each, of which £20,000 are offered to the public at par "payable 2s. 6d. per share on application, 5s. on allotment and the balance (if required) in calls not exceeding 2s. 6d. per share at intervals of not less than four months." 30,000 shares are to be allotted to the vendors and the £20,000, being the proceeds of the 20,000 shares now offered, if subscribed for and as and when paid up, shall also go to the vendors. But, says this prospectus, "of this amount £10,000 will be placed at the disposal of this company for development and working capital.'

There is a remarkable ambiguity about all this. If the vendors are to receive £20,000 in cash and are to lend the company one-half of it, how is this going to be done, in view of the manner in which payment of this £20,000 is to be spread over eighteen months? Simple calculation will suffice to show the absurdity of this proposition Let us assume that the calls are made at the stipulated intervals from August 28 last, the date of the prospectus. This, then, is the manner in which the money will be received:—

| | s. | d. | £ |
|---|---|---|---|
| On application, 20,000 shares at | 2 | 6 | = 2,500 |
| On allotment | 5 | 0 | = 5,000 |
| On December 25, 1899 | 2 | 6 | = 2,500 |
| On April 25, 1900 | 2 | 6 | = 2,500 |
| On August 25, 1900 | 2 | 6 | = 2,500 |
| On December 25, 1900 | 2 | 6 | = 2,500 |
| On April 25, 1901 | 2 | 6 | = 2,500 |
| | 20 | 0 | £20,000 |

In other words, the company will, if all goes well, start as "a going concern" with £3,750 in cash, being one-half of the £7,500 produced by the payments on application and allotment. Until December 25 it will have to do as best it may with this amount and then only a paltry £1,250 will be received. All this, provided, of course, that the public bites, which I earnestly trust it will not do, for the whole thing looks uncommonly like a "ramp" from beginning to end.

To place the matter in chronological order:—

1899.

June 19—Jones buys the property for an eventual payment of £9,000 in cash and £600 in shares, but only pays "a deposit."

Aug. 24—Jones sells this property to himself, Teasdale and others trading as the Nova Scotia Endeavor Syndicate for a price not named.

Aug. 25—Jones, Teasdale and others, trading as aforesaid, sell the property to themselves and to Mr. Lark as directors of the Nova Scotia South Uniacke Mining Syndicate for £50,000 in cash and shares.

Aug. 28—The public is asked to contribute £20,000 of this amount, in instalments, on a report made by Mr. Jones himself and on a certified Government Return, showing amount of quartz and the yield of gold therefrom for two years prior to April 1 last, since when no returns are given.

If this plain statement of facts alone be not sufficient to induce the public to let Mr. Jones and Mr. Teasdale find the money for themselves, then nothing that I can say will prevent their losing every penny they may put into the concern. And there are, of course, certain deductions to be drawn from this statement of facts which the reader will no doubt be able to supply for himself.—*The Critic.*

## ONTARIO NOTE AND COMMENT.

It is the turn of diamonds now. Prof. Hobbs, in *Appleton's Popular Science Monthly* for November, alleges that some seven genuine diamonds of good size, and a number of smaller ones, have been found in the clays and gravels south of the great lakes, but mostly in Wisconsin. The drift in which the stones reposed was brought from the north by glacial agency during the ice age, or ages of the long past. By retracing the path of the glaciers, as shown by the rock striations, Prof. Hobbs reaches the conclusion that the ancestral home of the diamonds was the territory southeastward and eastward of James Bay, and hazards the inference that exploration in that neighborhood may yet reveal "a region for profitable diamond mining."

The professor's argument for a Canadian diamond field is based wholly on the belief that the Wisconsin gems have been carried southward by the glacial drift, and not at all on the nature of the rock formations north of the boundary line. It is worth mentioning, however, that in his report on the geology of the Rainy Lake region, made in 1888, that accurate geologist, Prof. Andrew C. Lawson, now of California, speaks of the bosses of serpentine as suggesting the possibility of diamonds, particularly if serpentine rocks should be found near the carbonaceous schists that sometimes occur in the Keewatin formation. Nothing, as yet, has come of Prof. Lawson's hint, but as the Geological Surveys both of Canada and Wisconsin have taken the matter up, we may expect further light upon it ere long. Meantime there is little fear of a rush to the supposed diamond fields, notwithstanding their immunity from the Boer attacks now giving so much trouble to Cecil Rhodes and his fellow-owners of South African diamond mines.

Two years ago there was a short-lived excitement about placer mining on the Vermilion river, whose gravels were reported to contain gold. The report was proven to be correct, but the gold was so fine and there was so little of it that the excitement died out as quickly as it had risen. Since then prospectors have pushed farther north and west, and on the head waters of the Onaping river a party of miners financed by an American syndicate have been at work all summer, having succeeded in taking in a quantity of machinery before the break-up of the ice last spring. Not sufficient work has been done to prove the quality of the ground, but it is said that the gravel is richer and the gold coarser than on the Vermilion. The area over which colors have been found, both on the Vermilion and the Onaping, is very great, but the district is not a poor man's country, the indications being that only workings with machinery on a large scale have any chance of profit.

The fashionable combination to-day is certainly of fabulous mineral wealth and the mercury frozen in the thermometer. The Klondike bids fair to have an eastern rival, which some enterprising newspapermen from Fort Francis, Ont., and Boston, Mass., have located on the eastern shores of Hudson Bay. At least two prospecting parties visited that forbidding region this summer, and both have great tales to tell of the mineral deposits encountered in their travels. The existence of extensive beds of iron ore on some of the islands in Hudson Bay has long been known, and to these are now added deposits of argentiferous galena, copper ore and coal. On the rivers running into James Bay from Ontario lignite and gypsum occur in considerable quantity, but lignite is a poor substitute for true coal. If beds of the bituminous variety from which float samples have already been seen have really been discovered, the newspaper Argonauts deserve well of the country.

Development is proceeding satisfactorily on the copper properties owned by the Rock Lake Mining Company in Coffin township. The shaft is now down to a depth of 220 feet in good ore. At the surface the vein was 17½ feet wide, at 100 feet it was 24 feet, and at 200 feet it increased to 36 feet. The company is increasing its capital stock from $1,000,000 to $3,000,000.

Appearances are sometimes deceptive, but it looks as if the Canadian Copper Company were to have serious rivalry in the nickel business. Dr. Ludwig Mond, of London, Eng., the inventor of a process for producing nickel from the ore, vouched for by so good an authority as Prof, Roberts-Austen, has purchased Mr. Rinaldo McConnell's properties in Denison Township after thorough exploration by the diamond drill. The price paid was $200,000 cash, and the transaction involved lands in Garson Township, on which little work has been done.

We learn that some very promising nickel deposits in the Lake Temagami district discovered by Mr. Dan. O'Connor, of Sudbury, have been sold by him to the Canadian Copper Company, for a round sum. Dan. has also interested Toronto parties in a large mispickel find near Net Lake in the same region.

The diamond drill owned by the Provincial Government, which for some time past has been working on the McConnell nickel properties in Denison, has been engaged by the Mattawin Iron Mining Company to explore a number of iron ore locations on the Mattawin River, near the line of the new Ontario & Rainy River railway. Messrs. Mackenzie & Mann, who are building the railway, are interested in the company. The iron ore deposits are said to be large and of good quality.

At the Hammond Reef gold mine, manager Tedford will have the new 40 stamp mill running very shortly, and then this big dike will have a chance to justify the nice things which have been said of it. It is greatly to be hoped that the Hammond Reef will prove equal to the occasion, for it is the first of the enormous bodies of low grade ore which abound in Ontario to undergo development work on anything like an adequate scale.

In another particular, too, the Hammond Reef is a pioneer. The motive power for working the mine and mill will be produced at the Clearwater falls, some miles distant and conveyed by electric wire to the location. The Seine river country is full of fine water powers, many of them capable of utilization at moderate cost, and this fact will undoubtedly have an important bearing on the economical working of the gold mines of that section. Wood for fuel purposes is not particularly plentiful or particularly good in quality, and nature never did a kinder thing than when she placed these water powers right alongside the mines in which they will be profitably employed.

The Olive gold mine is increasing its capacity to 25 stamps, and it is the intention to mill a considerable width of the dike itself in which the vein is situated that has hitherto yielded all the rock crushed. The company is preparing to develop a water power on the Sand Island River several miles away, from which energy will be transmitted electrically to the mine. The new O. & R.R. railway will pass by the doors of the Olive.

A bad accident recently occurred at the Colonial Copper Company's mine near Hastings, by which Peter Weese was instantly killed, and William Galbraith very badly hurt. Gross carelessness in thawing frozen dynamite at an open fire in a blacksmith's shop was the cause. The recklessness with which this powerful explosive is frequently handled is deplorable, and not even fatal accidents like the present appear to carry sufficient warning to those whose business it is to use it.

The Bureau of Mines has got together a fair representation of Ontario's minerals for the Paris Exposition. The collection will go forward as part of the Dominion exhibit arranged by the Geological Survey Department. We may be sure that the whole display will be one that will cast no discredit on the mineral wealth of our Province and Country.

Discoveries are reported of native copper in conglomerate on Black Bay, Lake Superior, and also of fresh deposits of zinc ore in the neighborhood of the Zenith mine near Rossport station on the C.P.R. A tract of magnetic iron sand in the township of Pic has been bought from private owners and from the Crown by a Chicago firm, who express their intention of smelting the sand into pig iron.

The return from the Mikado gold mine for the month of October reads: "For 28 days, crushed 982 tons (of 2240 lbs.) yielding 657 ozs of gold, and from cyanide 549 tons (of 2240 lbs.) 203 ozs. of bullion." Calculated at the average mint value of the Mikado's gold product of last year, the value would be $12,642.

## EN PASSANT.

In another place we give the official returns of the crushings in Nova Scotia, reported for royalty, during the first nine months of the fiscal year. From these it will be seen that the Blue Nose Company, of Sherbrooke, easily heads the list with 3,080 ozs. 11 dwt., from 8,957 tons milled, followed by the Brookfield Mining Company, 2,344 ozs. 18 dwt. 5 grs., from 7,099 tons milled, and the Richardson with 2,149 ozs. 10 dwt. from 16,031 tons milled. The returns from the Dufferin, 1,086 ozs. 4 dwt. 2 grs. from 12,749 tons are disappointing, but may be explained by the fact that the milling material has been entirely from development work.

The persistent booming of doubtful enterprises by the Toronto *Globe* has been the subject of frequent comment in these columns. An editorial in a recent issue, ostensibly on the value of Western Ontario as a mineral country, is largely devoted to a puff of the McGown property near Parry Sound. The statement is made that the syndicate owning this property has recently refused an offer of $3,000,000, supposed to come from the Copper Trust, which desires to own the property for the purpose of keeping it idle and preventing competition with its own mines. It is further intimated in this article that the McGown location is destined to be as great a producer "as the Rio Tinto of Spain, the Calumet and Hecla of Michigan, or the Le Roi of British Columbia." As one would expect, this remarkable utterance does not escape notice and we find the *Engineering and Mining Journal*, in a recent issue, pointing out "that this property was not long ago offered to different persons who declined to buy, even at a very low rate. The principal document offered in support of its alleged value was a report from 'a celebrated mining engineer,' whose principal knowledge of the country and of his 'profession,' a correspondent writes us, had been acquired as 'assistant cook in a lumber camp.' Other reports—not made for the parties who are selling stock, but by engineers familiar with the country—agree in stating that there is nothing whatever in the property to justify such statements as those of the Toronto *Globe* and others which are being freely circulated. The whole country is simply a prospect, but so far nothing to induce the belief that any considerable deposits of copper ores have been found. To claim that the property will develop in depth is a pure assumption with nothing so far to support it. The exploitation of this concern, which is generally considered a 'fake' in the district where it is located, is strongly resented by those who own and are developing legitimate mining propositions in the same region They rightly consider that the creation of a bubble which is sure to burst before long, will be a great injury to their own interests."

How much reliance may be placed upon the mining information published from time to time in the columns of the *Globe* may be best gathered from a perusal of the following letter sent to a friend of ours in British Columbia, which may be taken as a fair sample of the methods pursued by this representative of the Canadian "boomster" press:

COLUMBIA, B. C., Oct. 20, 1899.

DEAR SIR,—You may remember meeting me at Spokane during the fair. As I told you then I represent the Toronto *Globe* in this part of the country, and am ready to undertake writes up of good mines. If any of the properties you represented want to get before the public, I feel sure the *Globe* is your medium. Our circulation is never less than 50,000 on Saturdays, and just now is twice that on account of war news. Price for Saturday Illustrated Supplement is $60 a column of 1100 words, or $420 a page of 7 columns. We make cuts free if photos are supplied, but charge for space taken up as if it were reading matter.

Yours truly,

CHAS. A. BRAMBLE.

In the light of this letter one can appreciate the value of the *Globe's* mining information and the highly colored and frequently grossly exaggerated statements which adorn its pages from its "special correspondents." It readily explains the methods by which men of the calibre of S. J. Ritchie are permitted to flood its columns with a vindictive and pernicious advocacy of an export duty on Canadian nickel. Such a policy is hurtful to the best interests of mining; it is distinctly discreditable to the *Globe* and is a reflection upon the character of Canadian journalism.

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The stamping capacity of the Ymir mill, B.C., is being increased to 80 stamps. Messrs. Fraser & Chalmers, Chicago, have been given the contract for the forty additional stamps.

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The outlook for Canadian phosphate steadily improves. A contract has been made recently by a continental house for delivery at Cascades station on the Ottawa and Gatineau Valley Railway of 2,000 tons. Prices show an upward tendency.

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As pointed out in these columns the contracts for the furnace plant of the Dominion Iron and Steel Company have been placed with the Riter-Conley Manufacturing Company of Pittsburg, Pa. This company took the contract for all the work on these furnaces above the ground, the price being about $2,500,000. This has been followed by the placing with the same concern of a contract for the building of a steel plant for the Dominion Iron and Steel Company, the contract price being close to $2,500,000, or $5,000,000 for both contracts. The contract just placed calls for everything necessary in the way of mills and furnaces for the immense plant, and to make it complete and ready for operation. It includes ten 50 open hearth furnaces and a large blooming mill, the latter to be built by Mackintosh, Hemphill & Co., machinery builders in Pittsburg. In addition, all the necessary machinery needed to operate the plant will be furnished by the Pittsburg concern. It will be eighteen months before this large work is ready for operation, but the work will be pushed as fast as possible.

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Accidents in mines resulting in death have become so numerous of late that the inquiry whether something cannot be done to lessen these casualties is natural. In most cases it would appear that the trouble is in a great measure due to the carelessness of the injured men, though the safeguards in mines are not numerous. By daily familiarity with the workings miners become careless and subject themselves to danger where a strange miner or one wholly unfamiliar with mine workings would sustain no injury. Miners boldly work under ground known to be dangerous; they walk about on wet timbers far above the sill floor without the least concern, where any other person would cling timidly to a post for support; and in many other ways miners take what appear to the uninitiated to be desperate chances. Some of these elements of danger cannot easily be eliminated from the business of mining, but others may to a great extent be guarded against. The injury which comes to men through carelessness in passing up or down a shaft on skips or cages may be avoided by employing enclosed cages for the men. Guard rails may be placed around shafts at stations; strict rules can be enforced concerning the keeping and handling of powder under ground, and various other provisions made to lessen the danger to men, but there is no way to wholly avoid the danger attending the catching up of a bad piece of ground, though it may be reduced to a minimum by taking the necessary precautions. Danger from blasting in the bottom of shafts may be avoided by the employment of the electric apparatus, but some mines do not even provide a ladder for the escape of men, depending solely upon the hoisting engine to raise them quickly from danger. While many of the accidents are due to neglect and parsimonious management, the greater number are due to the personal unconcern of the miners themselves, who when recognizing danger take no steps to have the condition bettered.

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The directors of the Hamilton Iron and Steel Company have decided to practically rebuild their furnaces and make other improvements at a cost of $50,000. When completed the furnaces will have a capacity of 250 tons of iron a day.

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Mr. H. M. Whitney, president of the Dominion Iron and Steel Company, and the Dominion Coal Co., at a reception tendered him at Sydney some time ago, summed up the prospects contingent upon the establishment of the new iron works at Cape Breton in these words: "I believe that the establishment of these iron works will be the means of introducing the town of Sydney to the length and breadth of the whole world. I cannot control my enthusiasm when I think of the future. The dormant energies of the country will be awakened. Here, right at our very door, is the basic source of all prosperity. We know that on yonder spot all the elements that go to produce iron and steel, can be assembled cheaper than any other spot on the face of the earth. We have limestone almost at our feet, immense coal fields right at hand, and magnificent iron areas within a few hours' sail from the centre of production. It has been demonstrated that Cape Breton coal is the best in the world for metallurgical purposes. The establishment of the iron and steel works signifies more than the works alone. Industries that depend upon the production of those metals are bound to follow. I have no doubt that there will be a gradual extension from one thing to another, and, unless I am greatly mistaken, before many years the production of this vast concern will stretch from the Atlantic to the Pacific, and the material manufactured be exhibited in all the marts of the world. To the province of Nova Scotia will be restored its old shipbuilding industry, for, when there is coalition in the manufacture of iron and steel, all industries depending upon these two metals must naturally prosper."

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Before another issue of the REVIEW is in the hands of our readers Mr. W. A. Carlyle will have severed his connection with the Le Roi management and be well on his way to Spain to assume the direction of the Rio Tinto mines. Mr. Carlyle began his career in mining engineering at McGill University, Montreal, in 1883, and graduated with first rank honors in natural science. He was further honored by having conferred on him the British Association Gold Medal. During his collegiate course Mr. Carlyle spent two seasons on the Geological Survey of Canada, and one on the engineering staff of the Canadian Pacific Railway Company. Mr. Carlyle then went to Colorado, where he was four years, engaged as surveyor and engineer for one of the largest mines in Aspen, at that time the most prominent camp in the State. He left Colorado to accept the Chair of mining and metallurgy at his alma mater, and was for the four succeeding years lecturer and

professor in these subjects, having the degree of Master of Engineering conferred on him in 1892. In 1895, Mr. Carlyle resigned his position at McGill to accept the position of Provincial Mineralogist of British Columbia, and two years later tendered his resignation of this office to become mining engineer in charge and general superintendent of the British America Corporation, also becoming during the same year manager of the famous Le Roi mine. Under his direction most gratifying progress has been made in the development of the properties controlled by the B. A. C., and it was with sincere regret that company accepted his resignation on September 7th. In common with every one who has the pleasure of Mr. Carlyle's acquaintance, the REVIEW extends its heartiest congratulations on his appointment, and, while deeply regretting his departure from the Dominion, heartily wishes him every success in his new and important position. Mr. Carlyle is one of many instances where Canadian engineers born and bred have been called upon to assume positions of the greatest responsibility in the mining profession all over the world.

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The returns this year from the property of the Consolidated Cariboo Hydraulic Company will figure about $100,000, a disappointing result largely due to an unfortunate slide and a very unfavorable season in Cariboo. A sensational story of the robbery of a large amount of amalgam is contradicted. It appears that the office safe was rifled and some $219.00 in cash taken.

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The production of mica in the Provinces of Ontario and Quebec will this year be the largest in the history of this industry in Canada.

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Commenting upon the strong statement of the grievances presented by the Yukon mining companies in their petition to the Dominion Government, and which we reproduce elsewhere, the London *Mining Journal* in a recent editorial says:—"With the opinions and sentiments expressed by the petitioners every sensible and far-seeing person will agree, for it is only those who wilfully blind themselves to facts who can fail to see that none but the richest mines can afford to pay such an excessive royalty as 10 per cent. upon the gross output, and that, as the petitioners say, "the imposition of such a heavy tax has militated against the successful operations of a great many mining claims. . . . A royalty of 10 per cent., in fact, any royalty based on the gross output of a mine, is a truly oppressive tax, one which bears unequally on different individuals, owners perhaps of two adjoining properties, as it may happen that the cost of opening up one claim may be three or four times as great as the cost of opening the adjoining properties, owing to the physical conditions, and yet both owners are at present taxed 10 per cent. on the gross output of their properties, which includes cost of labor and plant; that is to say, they pay at present a tax of 10 cents for every hour of labor employed on them." This is forcibly and clearly put and can fail to convince only the most obstinate and prejudiced person. The burdens are unequal, and as inequality is of the essence of injustice so is this tax an unjust one. Looking at it, therefore, not from the practical and business point of view, but from the ethical, it is the duty of the government to remove or reduce it, for the simple reason that it is the duty of a government to do the just and the right thing. It ought, moreover, to legislate according to abstract reason, and reason would counsel it to do that which would directly promote the welfare of a great industry and indirectly advance the prosperity of the commonwealth. If investors see that the profits of any mine are likely to be swallowed up by an excessive tax then common sense advises them to keep their money in their pockets in preference to presenting it to an avaricious government, and, therefore, the mining industry suffers from the lack of pecuniary support. Any ordinary intelligence would see that it were better for a government to receive a 5 per cent. tax from ten mines than a 10 per cent. tax from five mines. But the greater probability is that, by a reduction, it would receive a 5 per cent. royalty from twenty mines, and thus the policy of reason and justice would help to swell that revenue for which it is supposed to have such a profound regard.

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It is a somewhat remarkable fact that Tennessee phosphate is being imported and laid down in Buckingham, Que.,—the centre of what used to be our great apatite mining industry—for less than the same grade can be bought for from the mines in the county of Ottawa.

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The total shipments from the Cape Breton collieries of the Dominion Coal Co. for ten months ending October reach the large figures of 1,293,716 tons. The shipments for the whole of 1898 were 1,118,241 tons. From this it is seen that the shipments for ten months of 1899 are 175,000 tons greater than the shipments for the twelve months of 1898. Assuming that 207,000 will be shipped during November and December, and nothing but an accident will hinder this, then the total sales for the year will reach 1,500,000 tons or three hundred and eighty-two thousand more tons than in 1898. This is a phenomenal increase and the more astonishing seeing it is the increase of one coal company alone.

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The market for graphite is so good that it seems strange there should not be more activity in the development of this mineral in Canada. At present the mines at Grenville, Que., operated by an *American syndicate, are the only ones in operation, although we hear* it is likely the North America Company will shortly resume milling again. There is no reason why the large and undoubtedly valuable deposits of this mineral in Canada should not be developed into a successful industry.

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At a recent meeting of the South African Association of Engineers, an interesting paper, in which the southern deeps of the Rand were discussed at some length, was read by Mr. John Yates. Thirty years hence, according to Mr. Yates, these deep-deeps will be the mainstay of the mining industry—always provided, of course, there are no new discoveries of reefs or any very remarkable outcrop developments. The question of temperature is an important factor in the development of these deep-deeps. Mr. Yates mentions 12,000 feet as the limit of work by temperature, but he points out that this depth would be impossible without the most perfect ventilating appliances, and adds that even then the crowd of workers would probably make 7,000 feet the limit. At the Rand Victoria and the Victoria East the deep-deep shafts are expected to reach a depth of between 4,500 and 5,000 feet, before the reef is struck. Mr. Yates thinks that there need be no change in the present method of stoping, and he indicates that, as the cost of shaft-sinking to such enormous depths would be extremely heavy, one shaft will probably be found sufficient, the equivalent of 1,000 claims, instead of, as at present, one shaft for about 250 claims.

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The production of blue asbestos does not appear to be as profitable as our Canadian industry, for, notwithstanding the large increase in the uses of this valuable mineral, the accounts of the Cape Asbestos Company again show a loss, this year amounting to £3,541 stg.

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The dynamite factory at Pretoria represents an original investment of £600,000. The Transvaal Government about five years ago

granted this company the sole right to import, make and sell explosives in that State for a term of fifteen years. The monopoly is much opposed by the mining companies on the Rand and elsewhere, who claim that, if it were cancelled, No 1 dynamite, for which they now pay $17.84 per case of 50 pounds, could be laid down at the mines for $11.96, including a reasonable import duty.

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Mining companies which declare dividends without earning them do so with but one purpose in view—to sell stock to the uninitiated investor, using a portion of his money in the payment of more dividends, gradually boosting the stock and working it off at a good profit to the manipulator. In comparison, a lottery business is an honest, legitimate enterprise.

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Prof. Roberts Austen, in a recent paper, points out that there are blast furnaces which will produce 690 tons of pig iron in twenty-four hours, with a consumption of little over 154 cwt. of coke per ton of iron, and the gases of blast furnaces are used not only as sources of heat, but directly in gas engines. There are Bessemer converters which can hold fifty tons, while 100 ton furnaces are projected. The open-hearth furnaces are fed with one ton of material in a minute, by the aid of a large spoon worked by an electro-motor. There are gigantic "mixers" capable of holding 300 tons of pig iron, in which, moreover, a certain amount of preliminary purification is effected. Steel plates are rolled of over 300 feet in area and two inches thick, and there are girders which justify the belief of Sir Benjamin Baker, that a bridge connecting England and France could be built over the channel in half-mile spans. There are ship-plates which buckle up during a collision, but remain water-tight. There are steel armor-piercing shot which will penetrate a thickness of steel equivalent to over 37 inches of wrought iron. The points of the shot remain intact, although the striking velocities are nearly 2,800 feet a second. There are wires which sustain a load of 170 tons per square inch without fracture. Hadfield, whose labors he hoped to see continued far into the twentieth century, has given us manganese steel that will not soften by annealing; while Guillaume has studied the properties of certain nickel steels that will not expand by heat, and others that contract when heated and expand when cooled. Nickel, chromium, titanium, and tungsten are freely alloyed with iron, and the use of vanadium, uranium, molybdenum, and even glucinum is suggested. Huge ingots are placed in soaking pits and forged direct by 120-ton hammers, or pressed into shape by 14,000 ton presses, and there are steel castings that weigh over thirty-five tons.

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To illustrate the cheapness with which gold dredging is carried on in New Zealand, and the returns there obtained on small capital, a late number of the New Zealand *Mines Record* gives the returns of 11 dredges working within a radius of eight miles of the town of Alexandra. The total secured was 601 ounces gold, valued at $11,150, giving an average of $1,014 per dredge. As $250 a week each is a high estimate for the cost of running these dredges—many of them falling below $200—the average profit looks very satisfactory; especially as the average capital of the companies owning them is only about $30,000. Of course there was a variation in the gold won, but the dredge reporting the lowest quantity more than paid expenses, while the highest return showed a gold production of $2,680 for the week. The period chosen was a fair average week, with no special finds to swell the returns.

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The life of a wire rope may be affected in various ways, as, for instance, by the duty performed, the care taken of it, the amount and degree of bending it is subjected to, its exposure to water, and more especially to water containing salts and acid, etc., all of which, excepting, perhaps, the first, are more of less uncertain factors upon which to base any kind of calculations. The principal causes of wear are abrasion and excessive bending strains. Abrasion results in the flattening or tearing apart of the wires, while undue bending is manifested in the fracturing of the outer wires at the wearing points. More wire ropes are probably worn out from undue bending than from abrasion, owing to the fact that space very often forbids the use of sheaves of proper size, and the additional cost of large sheaves, especially in mining plants, is frequently a serious objection to their use. For good results, of course, the bending strain added to the direct tension due to the load should not exceed the elastic limit of the wires. The strain due to the bending is very often considerably greater than that due to the useful effort or load, and the importance of the size and proper disposition of the sheaves used is a matter that should be carefully considered. It has been considered that the degree of bending makes no difference; in other words, that the tension due to bending will be the same: whether the rope merely touches the sheaves or wraps all the way round it, which would be so under the assumption that the rope bends to the curvature of the sheave; but the fact is that the curvature is dependent on the tension, and with certain relative proportions between the tension and bending angle the curvature is not always the same as the sheave in contact, but sometimes greater, which explains how it is that large ropes are frequently run round comparatively small sheaves without detriment, since it is possible to place these so close that the bending angle on each will be so small that the resulting curvature will not overstrain the wires.

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Recent dividend announcements of English companies operating in Canada are: LeRoi Mining Company, 5 p.c.; Ymir Gold Mines, 5 p.c.; New Vancouver Coal Mining and Land Company, 3 p.c.

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The directors of the Duncan Mines, Limited, have issued a report and statement of accounts for the period from 16th October, 1897, to 31st July last, from which it would appear that there has been realized a profit of £42,000, chiefly represented by shares held in other companies.

A schedule of the various properties owned, and in which the company is interested, is supplied. In estimating their value the directors have written down such of them as their engineer and mine manager have considered it unprofitable to develop at the moment. The expenditure on capital account has amounted to £126,527. A large portion of this has been expended on the development and equipment of the properties which have been floated as a separate company under the name of The Granite Gold Mines, and in the purchase, of various shares. These investments have been set down at the sum of £93,832, and the directors have been careful to value them at a figure which is much below not only what they consider their intrinsic worth, but also their average market prices. In addition to the Granite Gold Mines, the Duncan Mines have, in conjunction with another company, promoted the Queen Bess Proprietary Co., which has already declared two dividends. They hold a large interest in that company. The strike of miners in the Slocan and Kootenay districts has prevented active operations on the major portion of the company's mines, and has caused a cessation of work at the Queen Bess Mine for several months, but Captain Duncan, who recently took charge of that mine, has been enabled to resume tentative operations there by means of contract work—a system which he has carried on with success at the Granite and Royal Canadian groups during the strike.

At the meeting of shareholders of the London & Globe Finance Corporation, Limited, the chairman, Lord Dufferin, made the following reference to the Le Roi and other subsidiary companies in which the company is interested:—"During the past year we have made several public issues, all of which were fully subscribed. The first of these was the Le Roi Mine, which is generally admitted to be one of the great mines of the world. Its former owners devoted themselves principally to extracting ore, and neglected altogether the due development of the property, both as regards timbering, shafting and the introduction of adequate machinery, During the past year development work has been pushed in all directions; the mine has been largely re-timbered, and it has been equipped with the latest machinery and appliances. On the completion of work now in progress, the output will be very largely augmented, and, what is equally important, we have every prospect of considerably decreasing the cost of smelting Notwithstanding the extensive expenditure which has taken place for the foregoing purposes, the directors of the LeRoi Company have been able to commence the payment of dividends, an *interim* dividend of 5s. per share becoming payable on the 7th of next month; and when once the mine is in full working order, we have little doubt that the results produced will fulfil our legitimate expectations. We have also satisfactory reports from the other properties controlled by the British America Corporation, properties in which we also are largely interested. These we have divided into three groups. Two of these groups, we are assured by our engineeers, will shortly reach the dividend stage, and the third promises well. The general meeting of the British Corporation itself will be held before Christmas, and I have no doubt of of the directors being able to declare a substantial dividend."

England, Germany and the United States, according to *The New York Journal of Commerce*, continue to be the chief markets for the output of the mica mines of Bengal, which are still the main source of the world's supply. From Madras and Calcutta, 1,432,000 lbs. of mica were exported last year, as compared with 150,000 lbs. sent from Canada. An official examination of the Hazanbagh and Guya mica mines has recently been made by the British Government experts, who report that 5,587 people find employment and that the exports by sea are about 50 per cent. of the total production. Mica is being consumed more largely every year, and the trade is in a fair way to assume large proportions. This summer a great many new mica deposits have been worked in Ontario and Quebec and the exports are larger than in any previous year.

The Trenton Iron Company of Trenton, N.J., is installing a Bleichart aerial tramway at the North Star mine near Fort Steele, B.C. The line will be about 6,200 feet, with a carrying capacity of 10 tons an hour.

The Anglo-Canadian Asbestos Company, Limited, is being wound up. Messrs. R. T. Hopper and Ed. Hanson, Montreal, are the liquidators.

In an excellent contribution to the *Engineering Magazine* for October, Mr. Thomas Tonge has something to say on the evolution of mining and ore treatment in Colorado. The great improvements in smelting and the reduced charges in that country have given a great impetus to other phases of ore treatment and to mining in general. "A fifteen-stamp mill of to-day, with shallow mortars and rapid drop, treats more ore than the sixty-stamp mill, with deep mortars and slow drop, of the type which was in vogue in the "sixties." The usual capacity of the old-fashioned stamp mill was about one ton of ore per day per stamp, as they were then solely dependent on the stamp mill for the recovery of the gold values. The usual capacity of the modern stamp mill is from three to four tons of ore per day per stamp, the method being, (1)—to catch all the gold possible on the plates; (2) to catch the maximum of the remaining gold on concentrating tables succeeding the stamps and plates; (3) to ship the concentrates to the smelters. At the Perigo Mine, Gilpin County, ore averaging as low as $3 per ton is mined and treated at a profit by means of a thirty-stamp mill, which saves a large percentage of the value, the tailings being concentrated and the concentrates shipped to the smelters. In Gilpin County alone there are thirty stamp mills containing a total of nearly one thousand stamps. In the vicinity of Telluride, San Miguel County, there are several large mills of one hundred stamps and upwards each. For some classes of ore, such as lead-silver ores, crushing rolls have superseded the stamp mill. Their superiority lies in not pulverising the ore too fine, and in reducing without "sliming"; the "slimes" resulting from stamping these ores carry off the values.

For every ton of ore rich enough to pay the cost of mining, wagon haul, railroad freight, and smelting charge and still leave a profit, there are at the very least ten tons of lower-grade ore, which could only be so treated at a decided loss, great or small. Such lower-grade ore is therefore concentrated, and in no branch of the mining industry in Colorado has greater progress been made, especially in recent years, than in concentration. The result is that an immense tonnage, formerly outside the range of profitable handling, is now being treated at a steady margin of profit.

The ore shipments over the Kaslo & Slocan Ry. for the month of October show a decrease of 1,187,890 pounds from that of September. The principal reason of this is accounted for by the Lucky Jim mine having laid off a number of men. The number of pounds of ore shipped last month was 1,016,000 tons and were from the various mines as below:

| Mine. | Pounds. |
|---|---|
| Lucky Jim | 453,000 |
| Whitewater | 212,000 |
| Jackson. | 194,000 |
| Rambler | 40,000 |
| Native Silver Bell | 70,000 |
| American Boy | 41,000 |
| Silver Bell, South Fork | 6,100 |
| Total. | 1,016,100 |

Arrangements are reported to have been completed for the immediate construction, by the Southern Smelting Company of Denver, Col., of a second smelting plant at Grand Forks, B.C. A smelting plant and nickel reffnery will also be put up shortly by the Canada Mining and Metallurgical Company on the Sault line of the Canadian Pacific.

Mr. J. Moncrieff Turnbull, B.A. Sc., a '99 graduate of McGill, has been appointed mining engineer to the Schroeder mine, Yreka, Cal. Mr. Turnbull was formerly employed in British Columbia.

The report and accounts of the Vancouver Group Mining Company, Ltd., for the year ended 28th February last, have been received. The company owns and is developing, under direction of Mr. Leslie Hill, the Vancouver No. II, Zilor, Mountain Boomer, and Silver Star claims, near Silverton, B.C. During the period under review 320 tons of sorted ore have been shipped to the Puget Sound Reduction Company at Everett, Wash. The smelter returns are very satisfactory, ranging from 154 ozs. silver and 55 per cent. lead up to 204 oz. silver and 63 per cent. lead, and the net prices realized from $87 to $105 per ton. This property should be an addition to our English dividend-paying mines in the near future.

## Popular Fallacies Regarding Ore Deposits.

ALBERT WILLIAMS, Jr.

*Argentiferous Galena.*—Many persons still believe that the relative silver tenor of galena may be estimated in a rough way by the color and fineness of the grain. It is difficult to trace the source of this belief, but the fact remains that a microgranular, "off-colored," finely disseminated galena is an especial favorite of many miners and prospectors; while "chunky" galena of the typical pure lead-gray color and luster, fracturing in large cubes, is not, as a rule, expected to contain much silver The idea is generally taken on faith. The assured fact might naturally be accounted for on the probability that pure galena (which is generally another term for galena richer in lead, but poorer in accidental impurities, including silver) would be apt to form larger crystals; while the impure (and richer) varieties would crystalize imperfectly. The variation from the standard hue might also be presumed to be a ground for inferring impurities (such as silver). However plausible this explanation may be, the facts do not warrant any reliance on these distinctions as a test of relative values. The examination of a large number of specimens, and the communicated experience of other observers, have convinced me that the exceptions are entirely too numerous to prove the rule. Suites of galena from the Wood River mines, Idaho, would alone suffice to dispel the illusion. These ores embrace a wide range in variety of appearance, with a rather unusual uniformity in the silver tenor. For example, solid galena from the Idahoan mine, having a coarse structure which produces large slabs of mineral, assays between 125 and 150 ounces of silver per ton. Another mine in this region, the Mayflower, shows a steely, close-grained galena, containing more or less antimony, and sometimes apparently admixed with fine, fibrous stibnite. This occurs associated with a more regular galena; but between the two pronounced varieties there is little to choose as to their relative silver contents.

*Auriferous Pyrite.*—In the same way it is often asserted that barren pyrite, or pyrite containing gold in too small quantity to be workable, may be distinguished from the richer pyrities by its brighter color and large cubes. There may be somewhat more reasonable grounds for for this belief than in the case of argentiferous galena, but the known exceptions are very numerous. Finely dessiminated pyrite is often confounded in practice with marcasite and mispickel; so that comparative results are to be regarded with some suspicion except in cases where the gangue mineral is thoroughly identified. In this connection it may be remarked that the argentiferous pyrite found in the Grand Prize, Belle Isle and other mines of Tuscarora, crystalizes in large cubes and is of very bright color. On the other hand, it is quite true that most of the exceptionally large pyrite crystals, such as reach, say, an inch cube in size, are usually practically barren of either gold or silver.

*"Lively Quartz."*—A rusty, decomposed and honeycombed quartz, especially in gold-bearing veins, is a favorite which is often disappointing. Prospectors speak of it as "lively"—that is, a promising gangue. A dull, tough and solid quartz, carrying no pyrite nor oxide from pyrite, is, in some places, locally known as "bull" quartz, and is in especial disfavor. Many of the rich Arizona gold ores, however, are to be classed in the latter category; and the high-grade dore ore from the croppings of the Custer mine in Idaho, although unusually exposed to weathering, is a very tough, agate-like quartz. Decomposition and marks of infiltration are characteristic of most mineral veins (including poor ones), but it is by no means safe to judge of relative richness by these signs alone.

The prejudice in favor of weather-stained, decomposed quartz probably arose from the fact that the standard of excellence in mines was established by the showing from exposed croppings of certain of the best known and earliest discovered of the California gold veins. A miner whose experience has been gained in such mines would naturally look for similar indications in the quartz elsewhere. As has been observed in a preceding section, the ore immediately at the surface is apt to be richer than that found a few feet below. Many mines which show "lively" quartz at or near the surface, contain in depth a dead quartz which has been protected from atmospheric decomposing agencies.

As regards the marks of infiltration and their bearing on richness, it should be noted that the most perfect quartz crystals occurring in rugs, or open fissures, are generally barren themselves, though they may be accompanied by rich ores; in fact, the handsomest specimens of quartz crystals are not found in gold mines.

From the appearance of different varieties of quartzose ores, it may be distinctly inferred that two distinct methods of vein enrichment are proved. First—A deposition of the precious metals simultaneously with the quartz; and, second, a secondary infiltration of the partially decomposed quartz, which may have been originally barren, by solutions charged with gold and silver. In some cases both causes may have operated in the formation of the same vein, thus giving rise to marked differences in the appearance of the ore.

*Stains Mistaken for Silver Minerals.*—Some pyritous gold ores are deeply stained by certain valueless minerals which, prior to assay, are often assumed to be silver-bearing. Many a custom mill has earned a bad reputation by not being able to extract silver from ore which did not contain it; the shippers of small lots of ore being careless in the matter of sampling and assaying, and assuming any bluish or blackish stains to be silver minerals. One of the most frequent causes of deception is the occurrence of finely disseminated mispickel. This mineral, when sparsely scattered in microscopic particles through a white quartz, gives it a bluish-black tinge, such as is seen in many low-grade argentite and stephenite ores. Other minerals, not so readily recognized before the blowpipe as mispickel, produce similar effects. Tyndall has emphasized the fact that minute particles of matter of very different kinds give similar lines to the medium in which they are diffused, though when in mass they may present contrasted colors. This occurs to a certain extent with minerals finely disseminated in quartz.

In Colorado, where telluride ores, such as sylvanite, hessite, petzite and coloradoite, form a notable source of the precious metals, there is a tendency to call strange or obscure minerals "tellurides," the cause evidently being the known fact that the true tellurides are, next to metallic gold and silver, the richest of ores. In Utah, Idaho and Arizona the popular determination of azurite and malachite stains is "bromide of silver," or sometimes "chloro bromide," the fact being that bromides and chloro bromides are really of infrequent occurrence, though so often reported. Lead ochre, in the same way, occasionally becomes "iodide of silver."

*Chloride Ores.*—Horn silver, in aggregations large enough to be tested with a knife, is easily identified. But in the greater part of chloride ores the mineral is recognized with difficulty, and may entirely escape the notice of one not familiar with the local characteristics. The miners become wonderfully expert in the ability to judge and sort the ores to which they are accustomed; but frequently systematic assays are the only reliance in selecting ores for stoping and for the mill. Cerargyrite finely diffused in quartz or "vein porphyry," is apt to escape detection altogether, unless its presence is indicated by associated minerals more readily recognized. When cerargyrite in this diffused state is the only metalic mineral in an ore, a hard specimen which would give fair assays might seem to the stranger to be a palpable hoax. It is evident that the assayer to whom a fragment of common grindstone had been sent for assay by a waggish prospector, and who returned in his report a high value in silver, had been familiar

with this class of ores, and may not, after all, have been so ignorant as the story has represented him to be.

*Sulphide Ores.*—As a rule it is much easier to estimate the probable tenor of these ores by merely looking at them, than in the case of chloride ores. There are, however two important exceptions First—When the ore mineral is masked by large quantities of more prominent but worthless metalic minerals: and second, when free milling silver ore, such as argentite, is so microscopically diffused in the gangue as not to perceptibly affect its color. The low-grade "sugar quartz" of the Comstock is an instance of the latter class. Some of this contains so little metal that it will not pay the expense of milling; while another portion, presenting an apparently identical appearance, having the same granular texture and whiteness, may be sufficiently rich to yield a fair though small profit above the cost of extraction and milling. Those most familiar with this ore are often puzzled by it, and are obliged to rely largely upon assays.

In developed mines and districts the obscure ores do not give much trouble; for the means of assay are at hand, and the miners have become practical in judging them. In new regions, however, the case is different, and the most experienced prospectors are often misled by the appearance of the ore.

It would be unfair to infer, from the confusing and irreconcilable prejudices and partialities which have had more or less sway, that the whole subject of precious metal mining is involved in doubt and perplexity. On the contrary, a great deal of solid fact is now established, room for which has been gained only by clearing away a mass of misconceptions. Much remains to be learned; in fact, the study of precious metal deposits is only beginning. But whatever the explanation of geologic features, or the theory of genesis of ores, it must be admitted that on the purely practical side, great advances have been made. Each year less money and less effort, relatively speaking, are thrown are thrown away on guess work or hopeless undertakings than in the year preceding: and as the wondrous varieties and possibilities of occurrence are becoming better known, the whimsical notions of earlier days steadily disappear. The best miner is least trammeled by prejudice and rule of thumb. And is it not safe to add that the best geologist is he who frankly admits that his science is still in its infancy? Unquestionably, all occurences are governed by law, and it is, perhaps, not visionary to hope that the precious metal deposits may be as well understood at no very distant day as the coal and iron beds are now, in spite of the great complexity of the former. But, for the present, it is best to meet the issue squarely and confess that even this stage is far from having been attained.

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## Some Notes on Mine Surface Sampling.*

By S. H. Pearce.

I have been asked many times to read a paper on Mine Surface Sampling, but I have refrained from so doing, mostly on account of the incompleteness of my own knowledge of the subject, but I am in hopes that the after discussion will educe further information, and lead to beneficial results to us all.

In dealing with the question of sampling our ore here in its various stages, from the time it enters the mill, to its being deposited on the dump or in the dam, it is not the least difficult part of the matter to decide what shall be left out and what shall be included, for while not wishing to bore those of you who are well acquainted with much I have to say, there are many who have but a hazy idea of what is involved, and I can assure you, that apart from all technical considerations, I feel I shall have achieved a great part of my object, if I can awaken a more lively interest in the subject among those who are connected with sampling in any of its branches.

The primary object of sampling is to obtain, in as small a bulk as may be convenient, a portion which shall represent the whole, in what ever particular that may be desired; for instance, in the case of wall paper, it might take some square yards to demonstrate the pattern, whereas an inch or so would be sufficient to give you the quality of the paper itself, provided that it were all uniform; and in sampling any material where the constituents are unevenly distributed, this want of uniformity is the greatest drawback to obtaining a representative sample, no matter for what purpose it is required; and the difficulties may be further enhanced by circumstances.

I think I might illustrate this to you by an experiment you can make for yourselves. Suppose you take a quantity of coins of one kind, you will have no difficulty to get a representative sample, but if you mix in some others the matter becomes more complicated in ratio to the number of varieties you introduce. You know beforehand that a handful taken indiscriminately from a large heap is not likely to give you more than a very approximate idea of what the heap consists of, but if the operation be repeated (which you can try for yourselves on a small scale) and the results averaged out, it is probable that a fairly close result will be obtained. Use is to be made of this law of averages in order to overcome most of our difficulties, which should be carried to such a point as is found to give sufficiently correct results.

The subject matter before us is anything but uniform in regard to the one constituent we wish to determine, for in the case of rock to mill we have a mixture of all values, from waste rock, containing practically nothing, to reef matter containing as much as fifty ounces to the ton, to say nothing of some free gold itself, which varying values are very unevenly distributed.

To further complicate the matter, we have an enormous variation in the size, which varies from dust, to pieces as big as a man's head in some cases, and probably no two pieces having the same value.

As a third difficulty, we have the enormous quantities of material to sample daily, which amounts to as much as a thousand tons in the case of a 200 stamp mill.

These are the main difficulties in sampling rock to mill; there are some others, but they are comparatively unimportant. If we consider them, we find that the only way to overcome the first two is to make a large enough proportion, which unfortunately the third condition renders impossible. We may fall back upon averaging, and trust, however much the daily samples may be out, that if they are averaged over a sufficiently long period, it may give us what we want. In regard to this point, I regret to say I have not sufficient data to prove that such is absolutely the case.

This is, of course, very unsatisfactory, but I am giving you notes of difficulties, and I shall gladly welcome other experiences more happy than my own which have been, generally, that the utmost care and trouble has resulted in obtaining at best, a sample that has a fairly constant factor of error; this, however, I put down to some peculiarity either in the method or circumstance.

There are three ways, more or less generally adopted in sampling rock to mill.

1. From the trucks to mill.
1. From the cam floor chutes.
3. From the feeders.

### From Trucks to Mill.

This sample is generally obtained by taking a shovelful from each truck, and if it were fairly and regularly performed, I believe it would give very fair results; but the difficulty comes in with the large quantity necessarily taken. A shovelful weighs about seven pounds, and even with a 100 stamp mill, where 1 ton skips were used, the daily sample

*Paper read before the Chemical and Metallurgical Society of South Africa.

would amount to 1¾ tons, which is a considerable amount to crush and quarter down for assay. Even were this of no consideration, there would be a tendency for larger lumps to fall off the shovel and an unfair proportion of fines taken, and as these are usually the richer part of the material being considered, the sample would be generally too high, which, according to my experience, is the trouble in most cases, and a discrepancy in the gold returns, causing uneasiness among those most interested. To obviate the taking of the large quantity mentioned, it is not unusual to put a kaffir on to taking a handful or a lump as the fancy takes him. The can be no regularity or much dependence placed upon a sample so obtained.

FROM CAM-FLOOR CHUTES.

This sample is obtained by taking a shovelful from each chute, at regular intervals, usually hourly.

It seems to give very fair results on some mines, but it has the same drawback as the last in regard to the quantity taken; in this case, however, the rock in the bins in travelling down to the chutes has a tendency towards separation of the fines to the bottom and the coarser to the surface, and the probability is that the sample will have too much coarse rock. It is possible that this in a great measure will counterbalance the tendency for the lumps to fall off the shovel, and so account for those cases where more favorable results have been obtained.

FROM FEEDERS.

This sample is also taken at intervals of time like the last. There are two ways in which it may be taken, *i.e.*, by small shovelfuls from the disc of the feeder, or by holding a tray made to fit the edge of the disc under it, to catch that which falls from it.

In either case the sample will generally be found too high, as owing to the amount of vibration in the mill, there is always a certain amount of concentration on the disc which affects the sample; in the first case the concentrated matter is included in the sample because the surface of the disc is smooth and the shovel scrapes it all clean off, in the latter case it was thought that this would be obviated, but it seems that such is not actually the case, as when taking the sample the mortar box supply is cut off, and the extra violent blows given to the feed lever causes the same effect in that it shakes the accumulation off the disc into the sample.

In speaking generally of all these rock samples, it would appear that they will give too high a result, and I may say further that the smaller the sample taken, the more erratic will the results come out daily; this is to be avoided as much as possible, as it is by no means satisfactory for the manager of a mine to see that the assay for any day is low, and that the amalgam returned is unusually good; I fancy he would like still less the reverse to be the case.

It has also been my experience that the larger the mill the more steady will be the daily assays; in this case I do not think that this is due so much to the quantity taken, as that it is taken from more places, and has a better chance of being mixed.

QUARTERING DOWN, OR REDUCING THE BULK OF THE SAMPLE.

Every mine should be equipped with a proper sample room, fitted with suitable crushing machinery, which if not actually needed for rock to mill samples, is at least required for mine samples; and though it hardly comes under my subject, a few remarks on the same may not be out of place.

## Nova Scotia Gold Crushings.

We are indebted to the Mines Department of the Province of Nova Scotia for the following approximate returns of the gold yield of the various mines, as reported for royalty, during the period from 1st of January to 30th September. As will be seen the returns are not quite complete:

| Name of Company or Mine. | District. | Tons Crushed. | Yield of Gold. | | | Months Crushing. |
|---|---|---|---|---|---|---|
| | | | Ozs. | Dwts. | Grs. | |
| Miscellaneous Tributers | Oldham | 1,089 | 664 | 16 | 12 | 9 months. |
| Bluenose Gold Mining Company, Limited | Sherbrooke | 8,957 | 3,080 | 11 | ..... | 9 do |
| New Glasgow | do | 1,106 | 215 | 13 | ..... | 3 do |
| Crow's Nest Mining Co | do | 2,760 | 143 | 18 | ..... | 5 do |
| Moose River Gold Mining Co., Limited | Moose River, Caribou | 1,937 | 188 | ..... | 18 | 9 do |
| Touquoy | do do | 4,650 | 211 | 13 | 22 | 9 do |
| Colonial | do do | 1,934 | 83 | 2 | 12 | 9 do |
| Reynolds Mine | do do | 1,035 | 60 | 15 | ..... | 4 do |
| Guffy-Jennings Gold Mining Co | Old Caribou | 1,581 | 221 | 18 | ..... | 6 do |
| Elk Mine | do | 319 | 66 | 1 | ..... | 7 do |
| Withrow Mining Co | South Uniacke | 789 | 479 | 4 | ..... | 6 do |
| Modstock Mining Co., Limited | Stormont | 1,716 | 1,126 | 15 | ..... | 5 do |
| Hurricane Point Gold Mining Co | do | 1,804 | 1,212 | 16 | ..... | 8 do |
| Richardson Gold Mining Co | do | 16,031 | 2,149 | 10 | ..... | 8 do |
| Economy Mining & Milling Co | do | 633 | 370 | 6 | 12 | 5 do |
| Walton & Britton | Kemptville | 93 | 50 | 12 | ..... | 8 do |
| Brookfield Mining Co., Limited | Brookfield | 7,099 | 2,344 | 18 | 5 | 9 do |
| Napier Mining Co., J. J. Trook et al | Wine Harbor | 257 | 56 | 8 | ..... | 5 do |
| Guysborough Gold Mining Co., Limited | do | 1,065 | 784 | ..... | 12 | 6 do |
| Tangier Gold Mining Co. | Tangier | 545 | 242 | 10 | ..... | 3 do |
| Montreal-London Gold and Silver Development Co., Limited | Salmon River | 12,749 | 1,086 | 4 | 2 | 9 do |
| Miscellaneous Tributers | Montagu | 921 | 515 | 15 | 9 | 9 do |
| Owen Gold Mining Co. | Leipsigate | 327 | 150 | 17 | ..... | 6 do |
| | | | 28 | Silver | (by assay). | |
| Cashan-Hines Mining Co | do | 2,178 | 644 | 9 | ..... | 8 do |
| | | | 96 | 7 | Silver | (by assay).. |
| John H. Anderson | Lake Catcha | 288 | 274 | 5 | ..... | 8 months. |
| J. B. Neily | do | 479 | 289 | 13 | 16 | 7 do |
| Plough Lead Co | Wine Harbor | 252 | 526 | 7 | ..... | 4 do |
| Harrigan Cove Mine | Harrigan Cove | 272 | 156 | 10 | 11 | 8 do |
| Blockhouse Gold Mining Co., Limited | Blockhouse | 391 | 677 | ..... | ..... | 4 do |
| | Total | 73,257 | 18,071 | 11 | 11 | |
| | | | 124 | 7 | (Silver). | |

The old style of kaffir, and pestle and mortar on the veld, useful enough in the past, and in the present as a stand by, cannot to-day be considered as sufficient to meet the requirements of a modernly equipped mine, when it is considered advisable, if not necessary, to employ a man on mine sampling alone. I have no doubt that many of you are aware, even if you have not actually experienced, the kaffir's partiality for throwing away the unsieved portion when he considered he had pounded the sample long enough, and that, alas! all too soon. Besides this, where many samples are taken, the saving in labor alone is, or should be, a sufficient inducement to provide the equipment.

Here, too, is one of the other cases that our President mentioned in his address, where cleanliness is next to godliness, and it is perhaps more essential here than in any other department, and yet I am grieved to say, in most instances, any kind of lean to shed, I almost said pig sty, is considered good enough, and to the detriment of accuracy, for which the unfortunate assayer is blamed. I do not think any words are too strong to condemn such a policy.

A properly equipped sample room, an example of which may be seen on the Nourse Deep, should be large enough for all purposes, being, say 16 feet square, fairly draught and dust tight, and have a floor, not of earth, which cannot be cleaned, but of cement, or iron plates on which a large sample may be quartered down, and have at least two crushing machines, one for reducing say to ½ inch cube, and the other for fine grinding. There should be a quartering table, and counters and shelving, as well as the panning tank, if such is required, and all articles such as sieves, brushes and other little things supplied freely As a hint I would suggest that a newspaper makes a poor substitute for a duster.

In regard to quartering down, I lay before you a small table, which if not exactly accurate, may be taken as a fairly safe guide to the limit to which it is advisable to go in reducing the bulk of your sample.

| | | | |
|---|---|---|---|
| 2 | inch | cube to | 1,200 lbs. |
| 1 | " | " | 300 " |
| ½ | " | " | 80 " |
| ¼ | " | " | 20 " |
| ⅛ | " | " | 5 " |
| 1/16 | " | " | 2 " |

I have not been able to find any data published on the subject, and these figures are based more upon experience and convenience than upon theoretical calculations, and I shall be glad if some of you will give your experience, as I certainly think the matter worthy of more than a passing interest.

The old practice of quartering is, I think, as good as any other. It may be a little tedious, but it is at least free from the objection attached to most of the machines used for that purpose, viz., the difficulty of cleaning them out, which practically compensates for the extra time taken.

The operation is, I think, well known to all of you, and I need not do more than advise you to spread as thinly as you can, and be very careful to eliminate the whole quarter each time. Use a brush for that purpose if necessary, so as not to leave any fine matter behind, which may perhaps contain free gold. Mixing between each operation cannot be performed too thoroughly, and here I should like to state, that in cases where the ore has been very finely ground, it is more difficult to mix than coarser material, and in such a case I think it not an unnecessary precaution to mix by passing through a sieve, as the particles adhere in cakes, and merely roll over each other in the usual course. I know instances where this is the only way to ensure duplicates agreeing.

### SCREEN SAMPLE.

This sample, although a factor for the determination of the value of the ore milled, is hardly under the same heading, inasmuch as a small amount of the gold contents have been extracted, and therefore is incomplete owing to the fact that this amount has to be added to the result.

It is obtained by taking a certain quantity of the pulp as it passes through the battery screens, at regular intervals of time. In this case at least one of the disturbing factors is removed, and the ore is now reduced to a finer state of division, and is, moreover, better mixed, under these conditions a much smaller sample can be taken, with more reliable results. There are still many difficulties even here, some of which you may see if you closely observe the way in which the crushed ore is discharged from the mortar box. First, bear in mind that the constituency of the matter is now more complicated, in that mercury and water have been added. The difficulties will be found to exist mainly in the limited space there is to use a receptacle of any size for the sample, so that you have to guard against overflowing, and consequent concentration, the area of the screen is large, and there is a tendency for the lighter stuff to be thrown straight out, and over the sampling vessel, but the greatest difficulty of all lays in the fact that the heaviest material and the richest, creeps down the face of the screen, and unless the vessel is held there close, so that there are no spaces between them, the sample will be very much below what it should be. There are some other factors in the shape of an occasional inclusion of amalgam in the sample, and the fact that the sampling vessel is twice as long in the upper or light particle carrying part of the pulp, if no appaeciable time is allowed for the vessel to rest against the mortar lip.

The difficulties being known, the remedies should suggest themselves. In regard to the splash I should suggest the adoption of a splash board to throw the pulp downwards on to the iron lip, and so help to carry away the heavy matter continuously. I would advise the use of as large a vessel as may be convenient, and not be afraid to take a good big sample. I also think it a good thing to try and arrange the time of sampling, so that it comes just before the time for adding the mercury to the boxes, so as to avoid as much as possible the inclusion of amalgam.

I certainly consider this sample as being the nearest daily check upon the value of rock milled. It has the disadvantage of being minus the gold caught in the boxes, and this has to be remedied by adding that amount, divided by tonnage, to the assay at the end of the month; this will include die sands, screen tanks and lip sands

### PULP LEAVING MILL.

This is usually sampled, either by the automatic sampler, or by hand sampling. The latter operation consists of passing a cup, or other suitable vessel, along the stream flowing from the bottom of the plates. In some mills an arrangement of mercury traps prevents it being taken at all; in many others the space is not sufficient to allow of a large enough cup being used, in which case the cup overflows, and the sample is concentrated. There is also the danger of the cup touching the edge of the plate, where there is always amalgam present, the least fragment of which, I scarcely need state, renders the whole day's sampling of no value.

This sample, under proper conditions, is a very good one, and I should always recommend its adoption as a check upon other methods, if there is any question at all as to the value of the pulp leaving the mill

The automatic sampler is, I think, pretty well known to most of you, and is the most useful of all sampling apparatus. Briefly described, it consists of a mechanical contrivance for taking a section of the pulp stream, by means of a slotted pipe, which is mechanically passed twice through the stream at each operation; for its motive power and automatic action, it depends upon a supply of water, which gradually fills up a small receptacle; this, upon reaching a certain height, changes the centre of gravity, overbalances, tips out the water and returns to

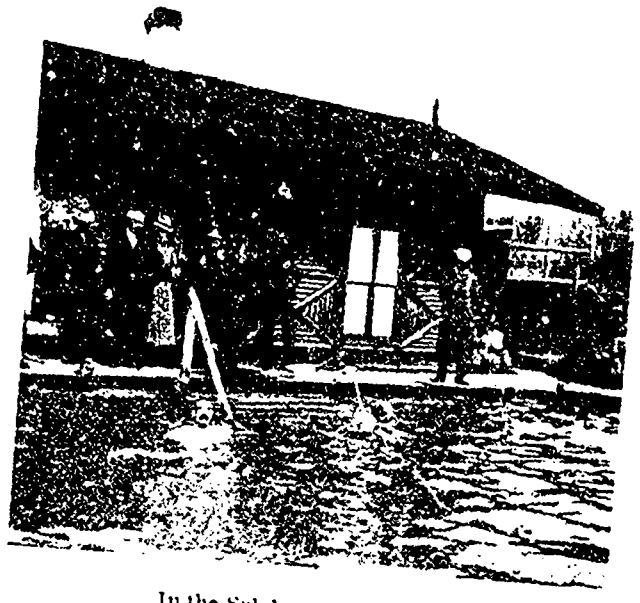
A GROUP TAKEN AT THE LE ROI MINE.

R. B. Ross. Mayor Goodeve. W. A. Carlyle. J. P. Crerar. A. W. Stevenson. W. Mann
D. Bently. Percy Taylor. S. J. Simpson. J. D Sword, R. Meredith. Leslie Hill. R. A. Palmer Feodor Boas.
Harold Grant. John E. Hardmann. B. T. A. Bell. J. H. Larmonth.

# WITH THE CANADIAN MINING INSTITUTE IN BRITISH COLUMBIA.

SNAPS BY OUR REPORTER

The Treasurer at Anthracite, N.W.T.



In the Sulphur Pool at Banff.

Merecith

Bell

On C P.R. Steamer, Kootenay Lake, B.C.

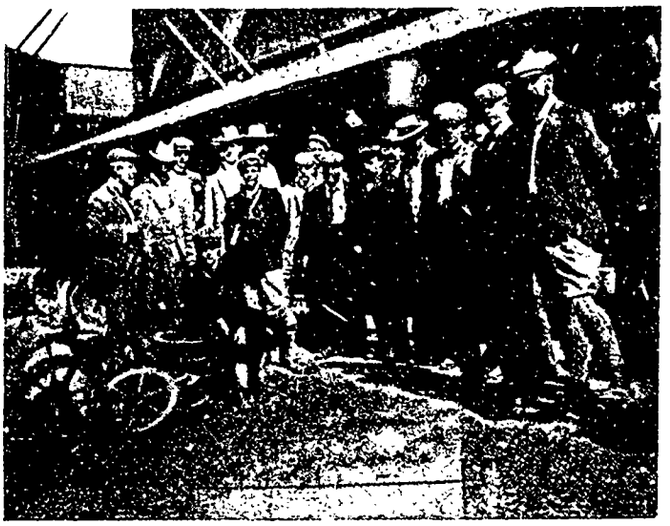
Mr A M Hay  Feodor Boas  R B Loss

Group on C.P.R. Steamer.

Crerar.  Beatty.  Knowles.  Gilman.
Meredith  Stevenson  Mecham.  Simpson.

# WITH THE CANADIAN MINING INSTITUTE IN BRITISH COLUMBIA.

(SNAPS BY OUR REPORTER)



Group at Hall Mines Smelter,
Nelson, B.C

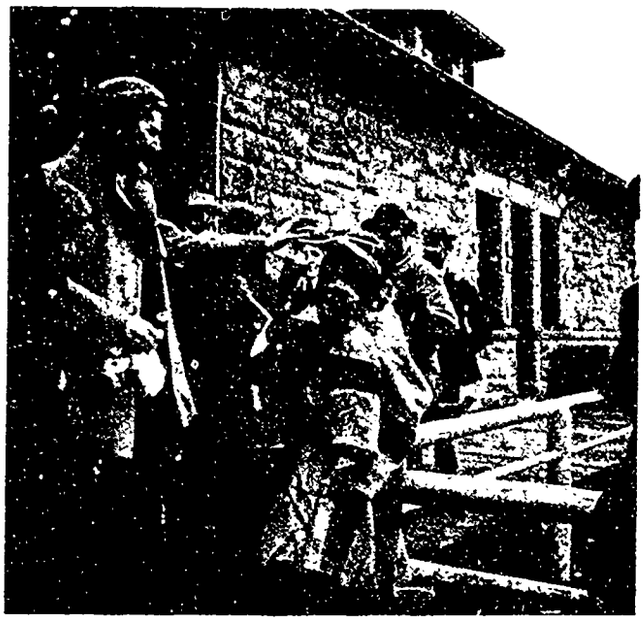
Mr. R. A. Hedley, Metallurgist,
Hall Mines Smelter, Nelson, B.C.

Group of Members examining outcrop of Auriferous Pyrrhotite on property of LeRoi Mining Company, Rossland.

# WITH THE CANADIAN MINING INSTITUTE IN BRITISH COLUMBIA.

(SNAPS BY OUR REPORTER)

Anthracite Colliery—H. W. McNeill Co. Limited.



An Official Pow-Wow at Calgary, N.W.T.

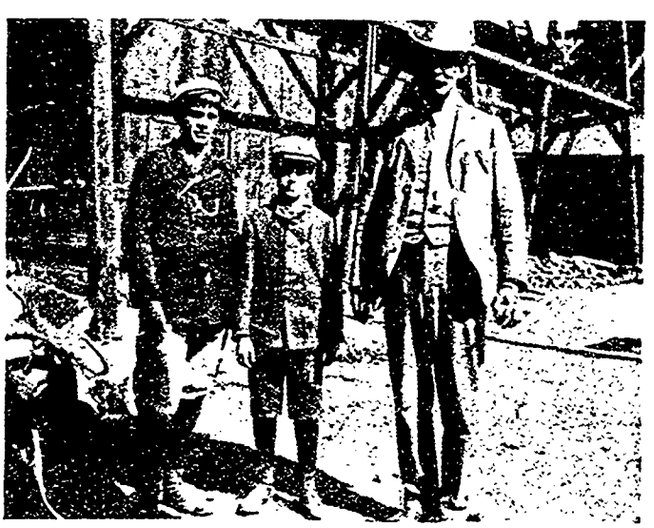
Mr. A. W. Stevenson, Treasurer,
On Kootenay Lake Steamer.

The Secretary's Rosenante,
On Toad Mountain, B.C.

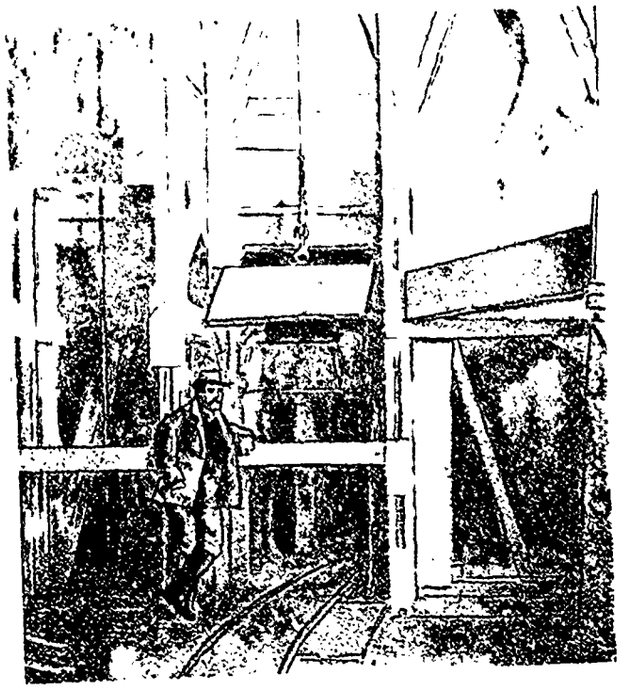
The "Professor" and the "Colonel" inspect an Infernal Machine.

The "Idol's Eye" among the Slag Pots.

Group on Toad Mountain, B.C.



Mr. H. C. Hammond and sons, at Hall Mines, B.C.



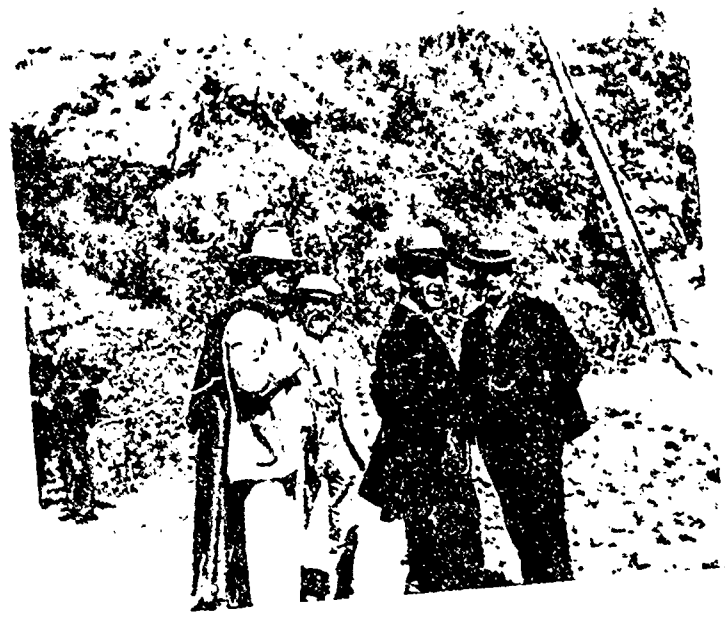
In No. 5 Tunnel, Main Shaft.
Silver King Mine, Nelson.

Heading—Silver King Mine.
Nelson.

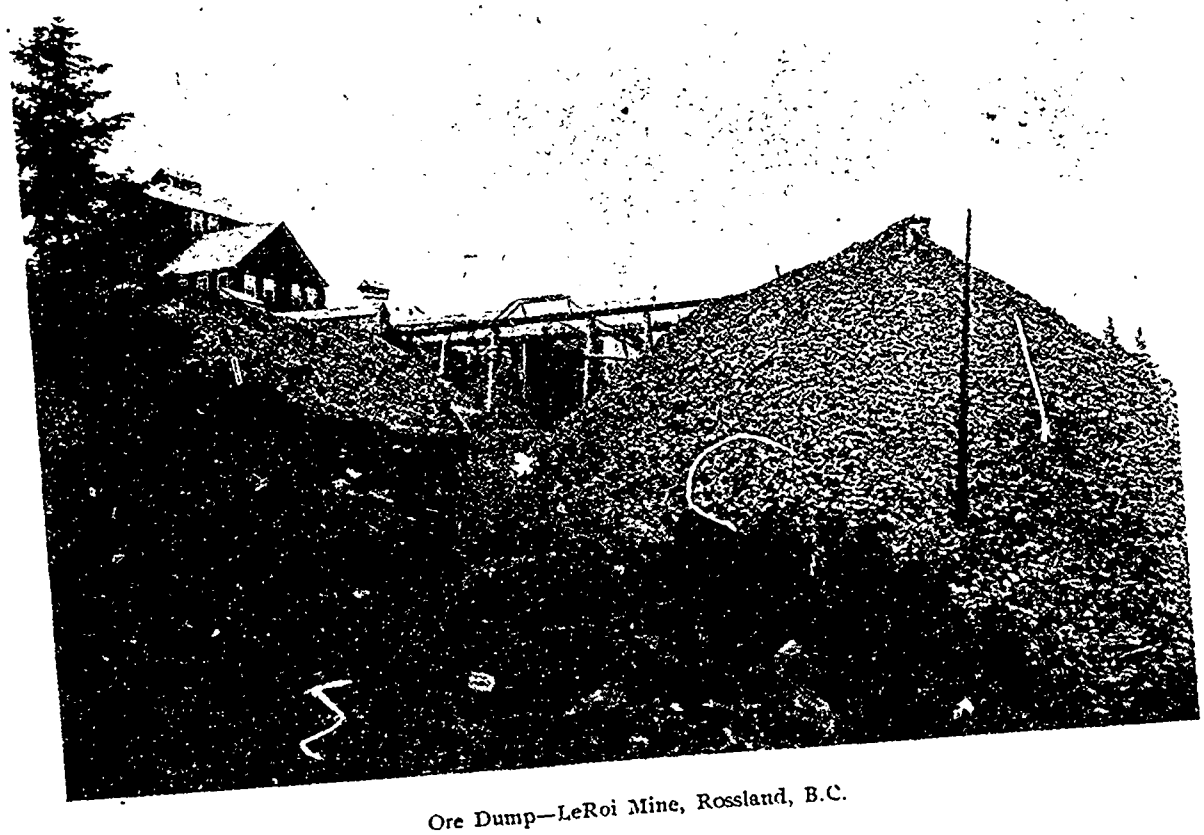
No. 5 Tunnel—Silver King Mine
Nelson, B.C.

Mule Haulage, No. 5 Tunnel.
Silver King Mine, Nelson, B.C.

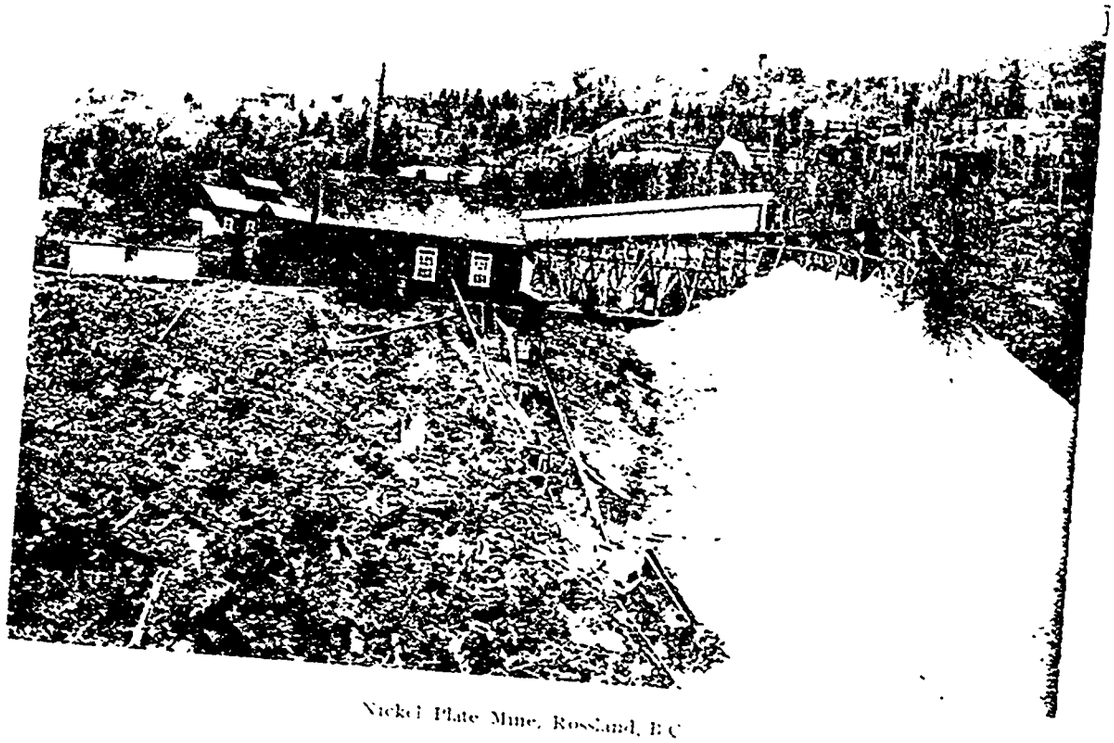
A. W. Stevenson.
S. S. Fowler.



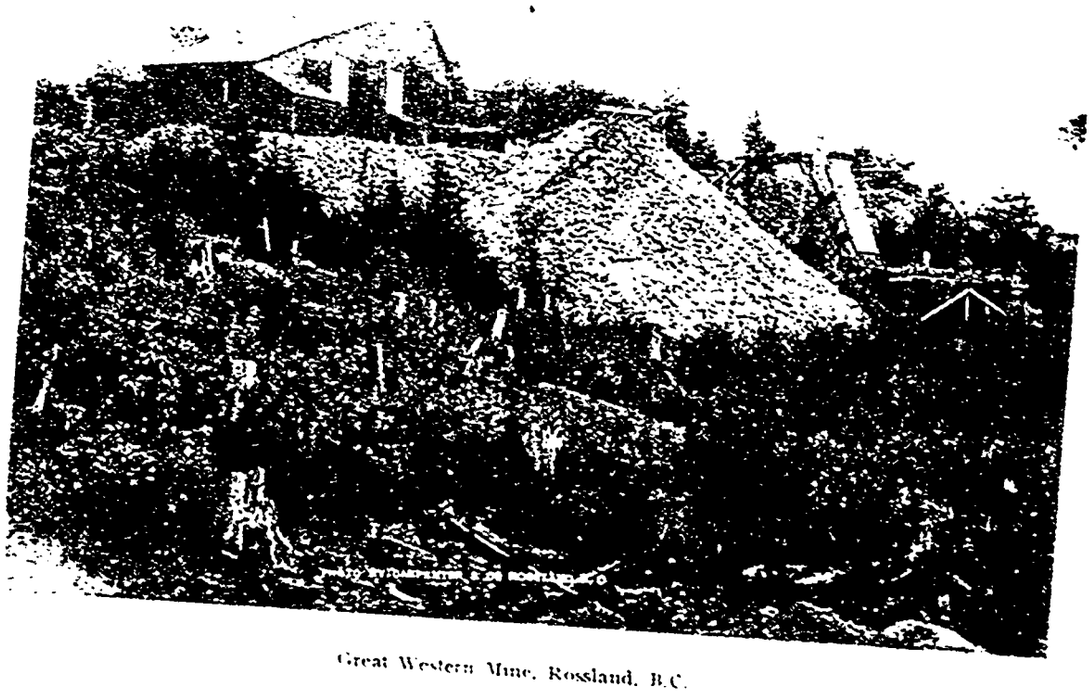
Group at Silica, B.C.
Hardman Stevens
Fraser Larmonth.



Ore Dump—LeRoi Mine, Rossland, B.C.

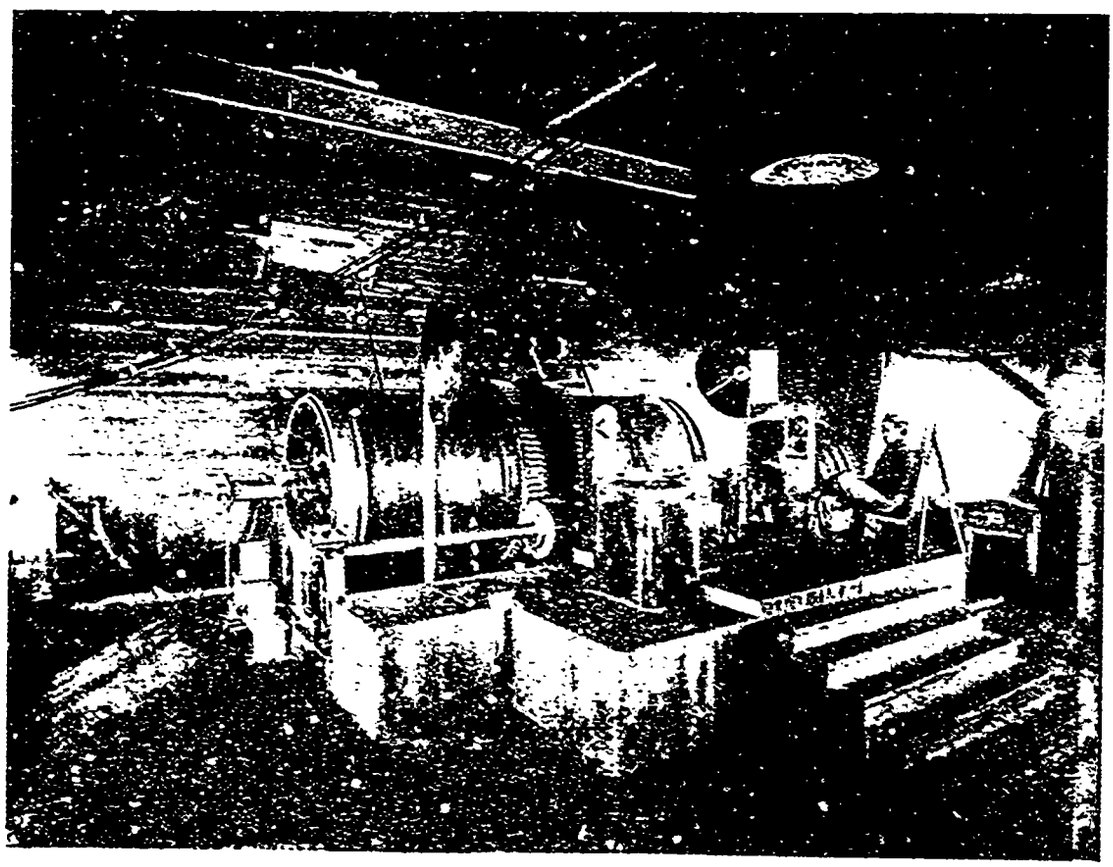


Nickel Plate Mine, Rossland, B.C.

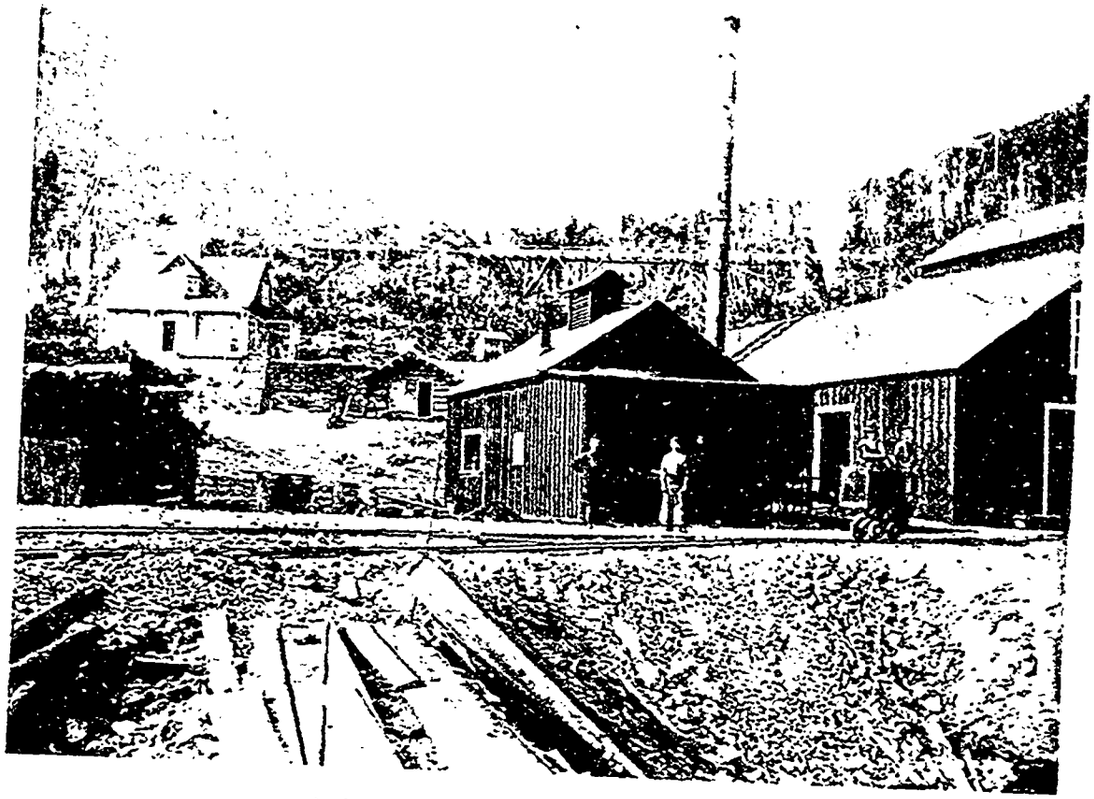


Great Western Mine, Rossland, B.C.

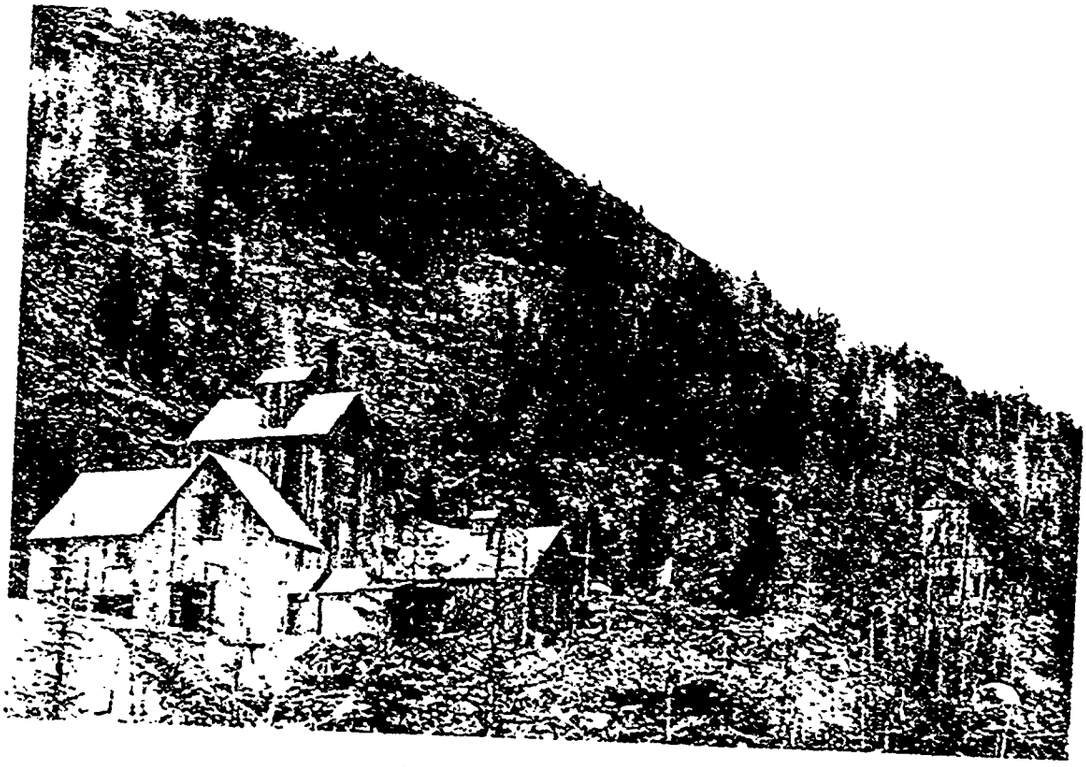
Surface Works at Lily May Mine, Rossland, B.C.



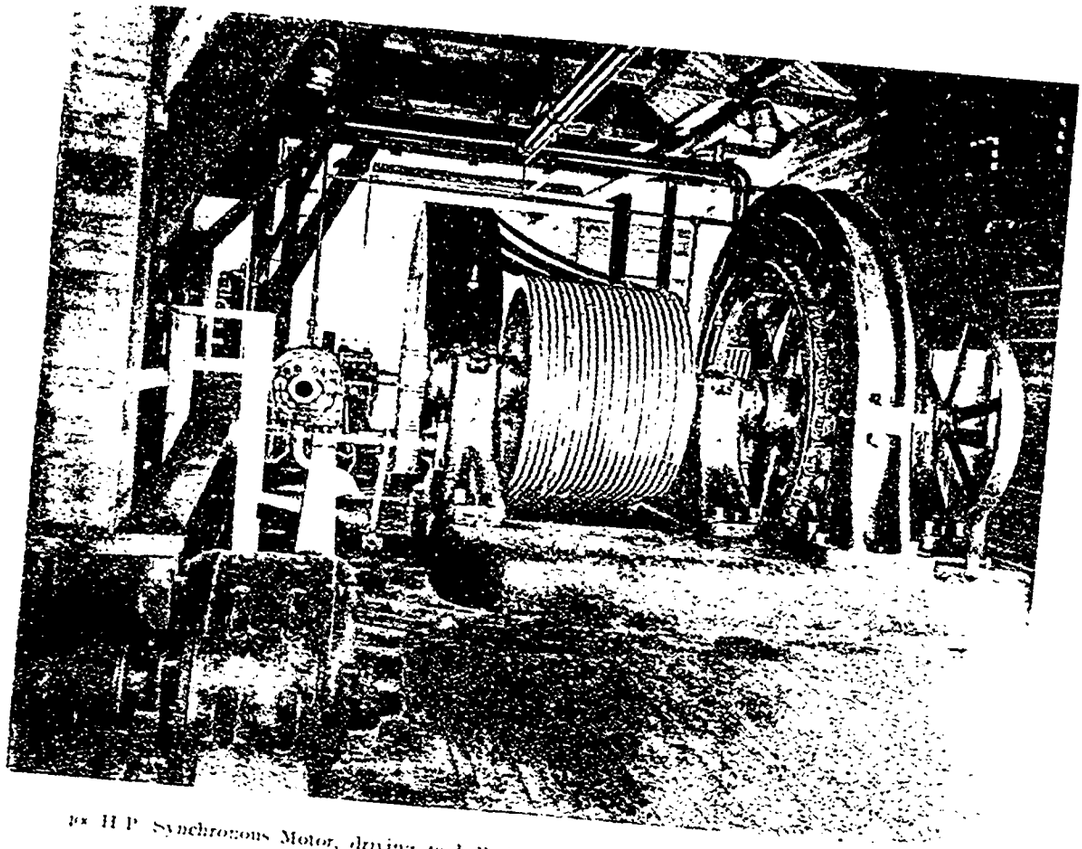
Electric Hoisting Plant, War Eagle Mine, Rossland, B.C.



Surface Works at Josie Mine, Rossland, B C

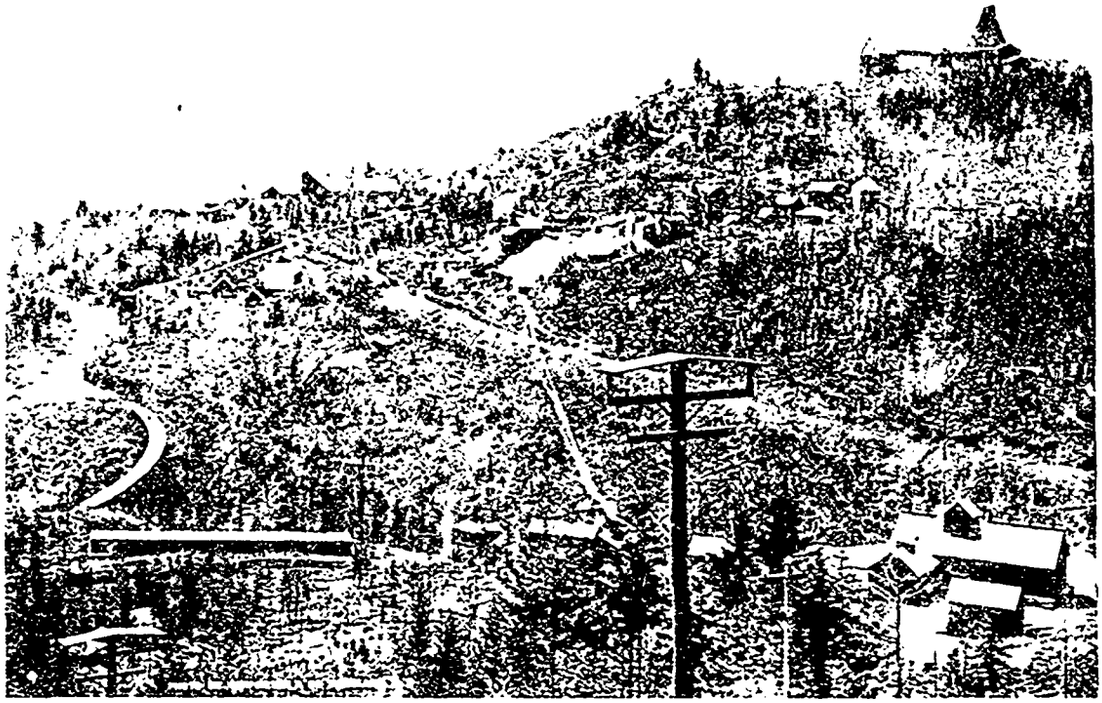


No 1 Mine Rossland B C



300 H P Synchronous Motor, driving 40 drill Compressor at War Eagle Mine Rossland, B C

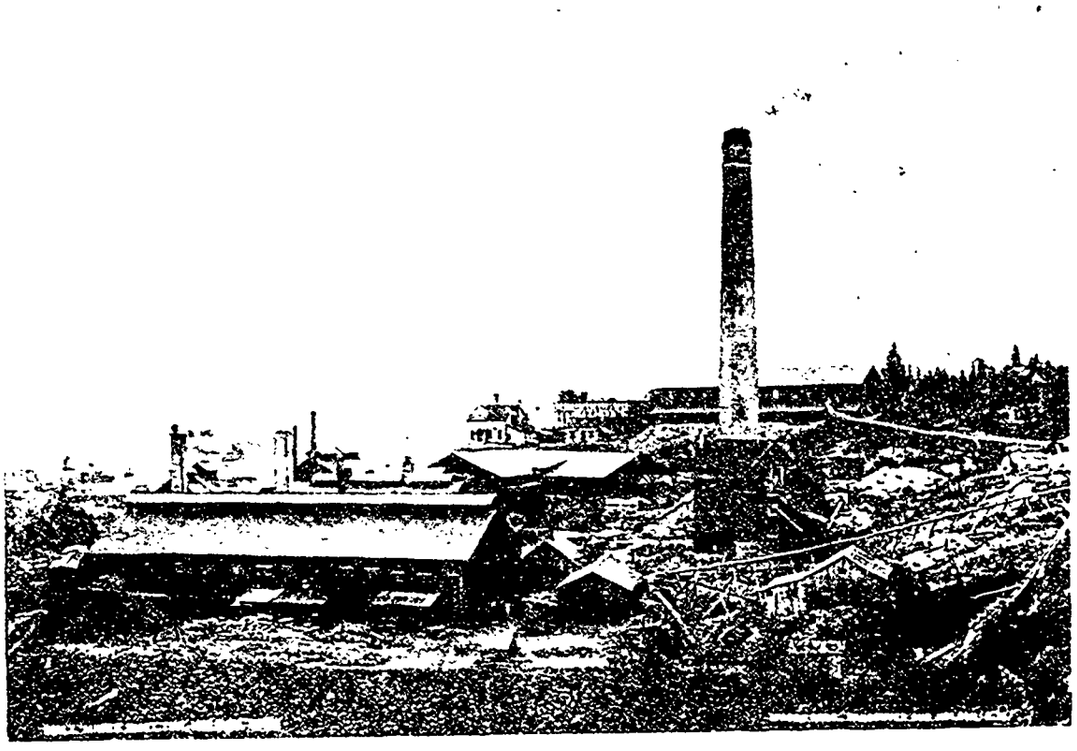

500-ft Level of the LeRoi Mine, Rossland, B C



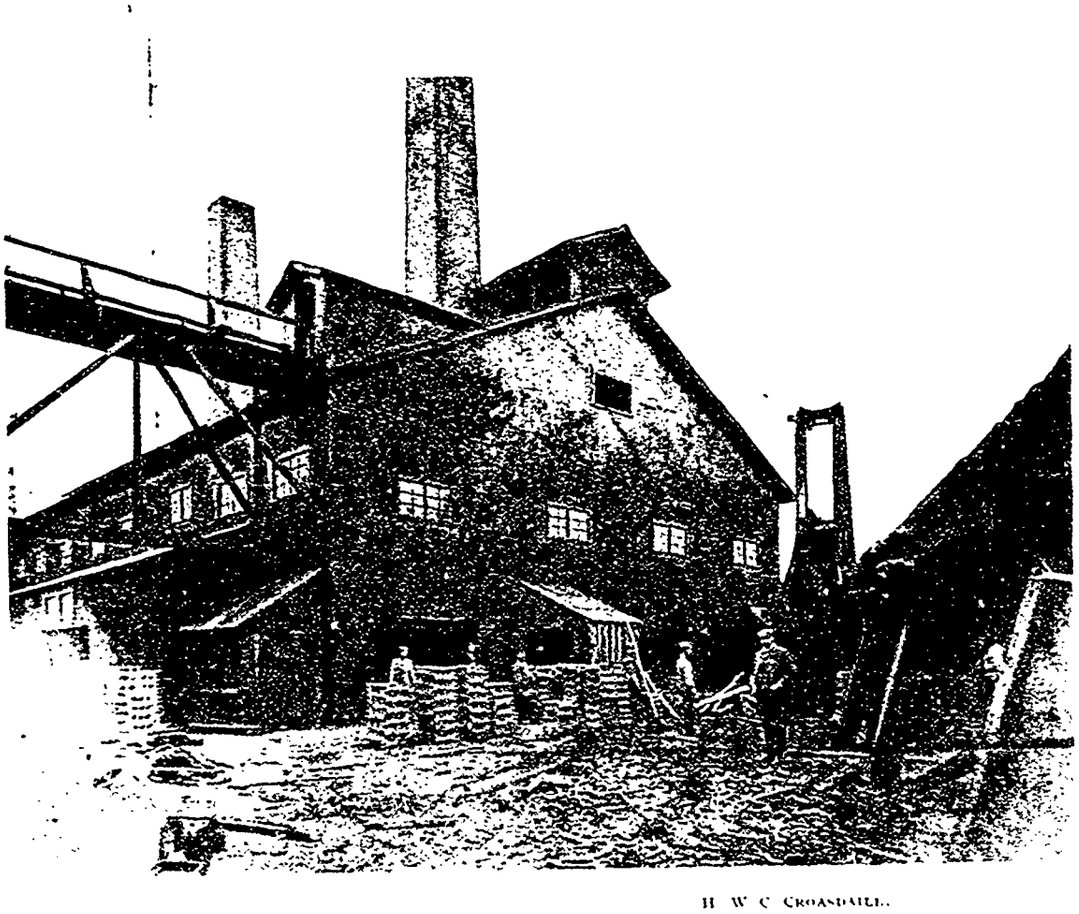
Red Mountain Rossland B.C. showing works of the LeRoi, War Eagle and Centre Star Mines

Columbia Avenue Rossland Red Mountain Mines in the background

Jumbo Mine, near Rossland, B C.

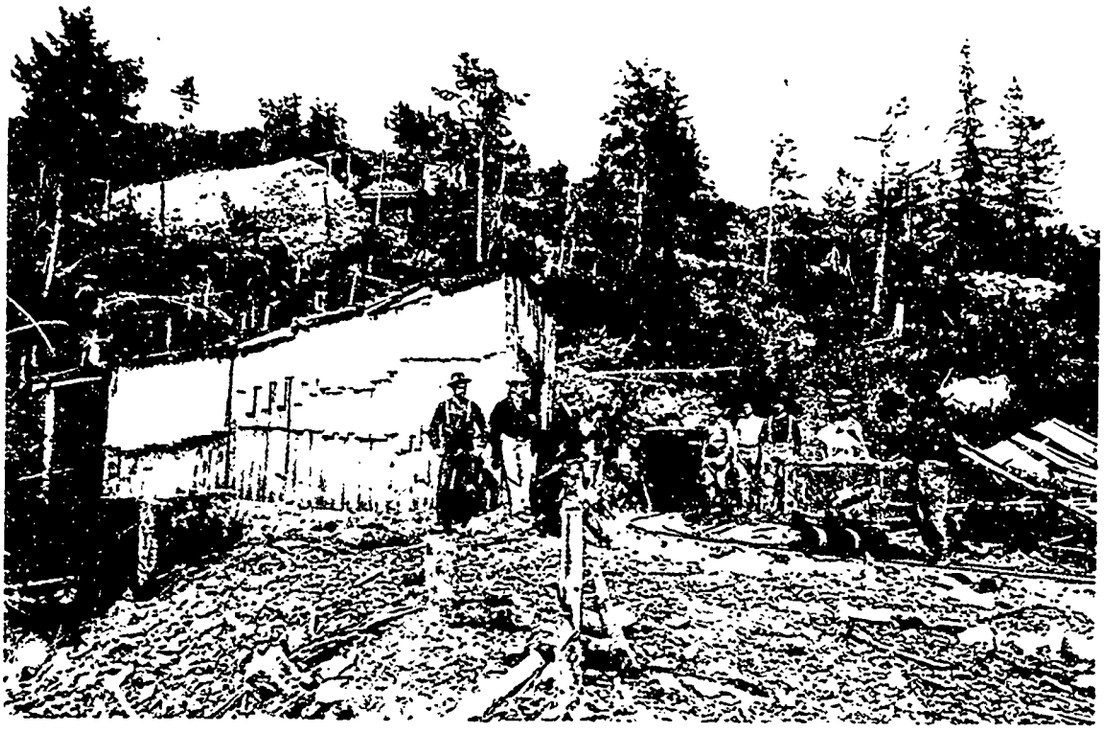


Hall Mines Smelter, Nelson, B C



H. W. C. CROASDAILE.

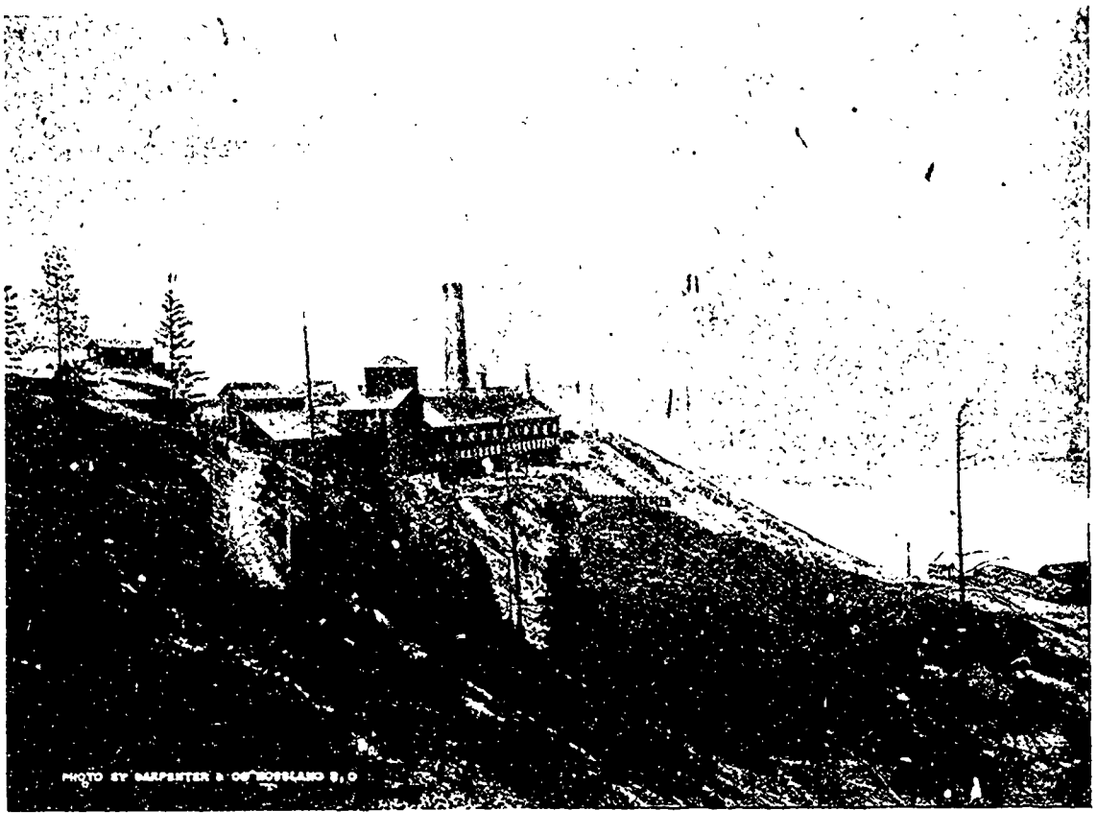
Hall Mines Smelter, Nelson, B.C.



Giant Mine, Rossland, B.C.

Gertrude Mine, near Rossland, B.C.

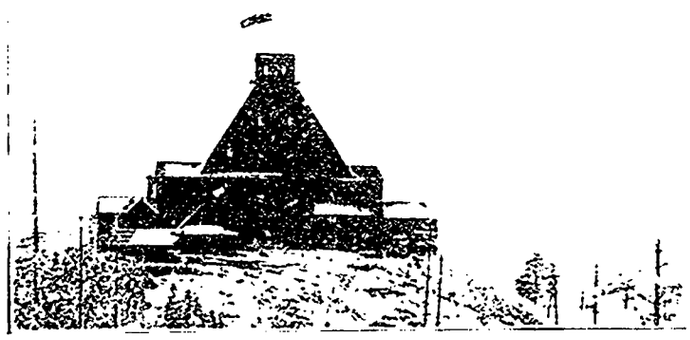
10-Stamp Battery at the Athabasca Gold Mine, near Nelson, B.C.



Canadian Pacific Smelting Works, Trail, B.C.

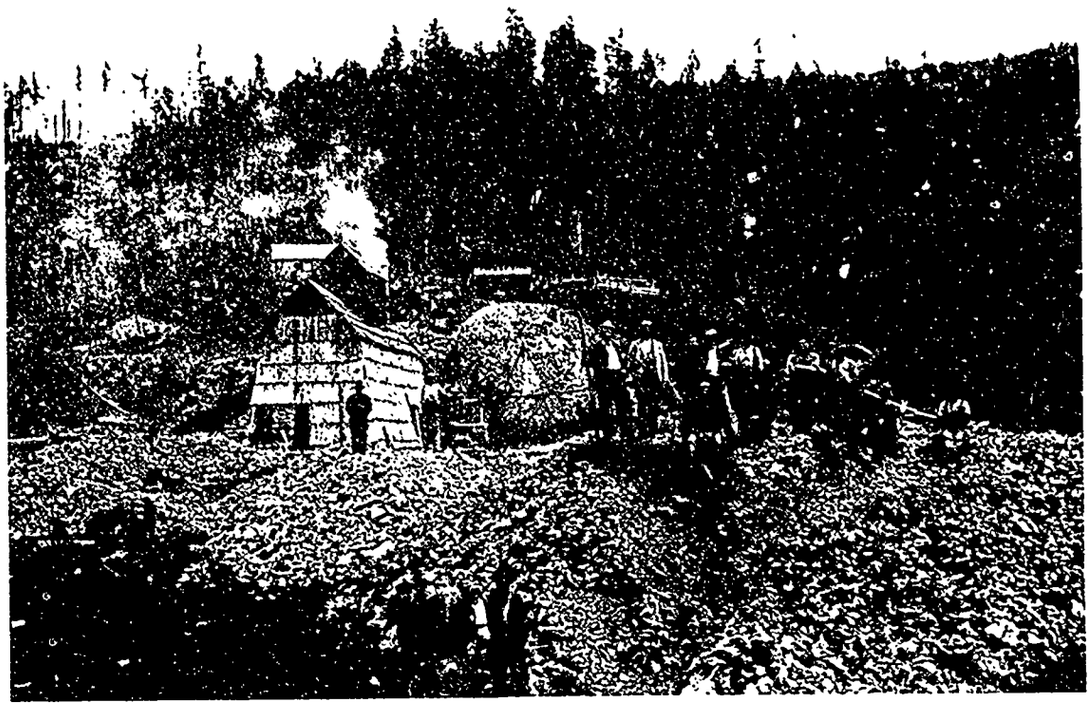
Noble Five Con. Mining and Milling Co., Cody, B.C.

Wright Silver Mine, Lake Temiscamingue, Que. Recently sold to Canada Lead Co., Limited

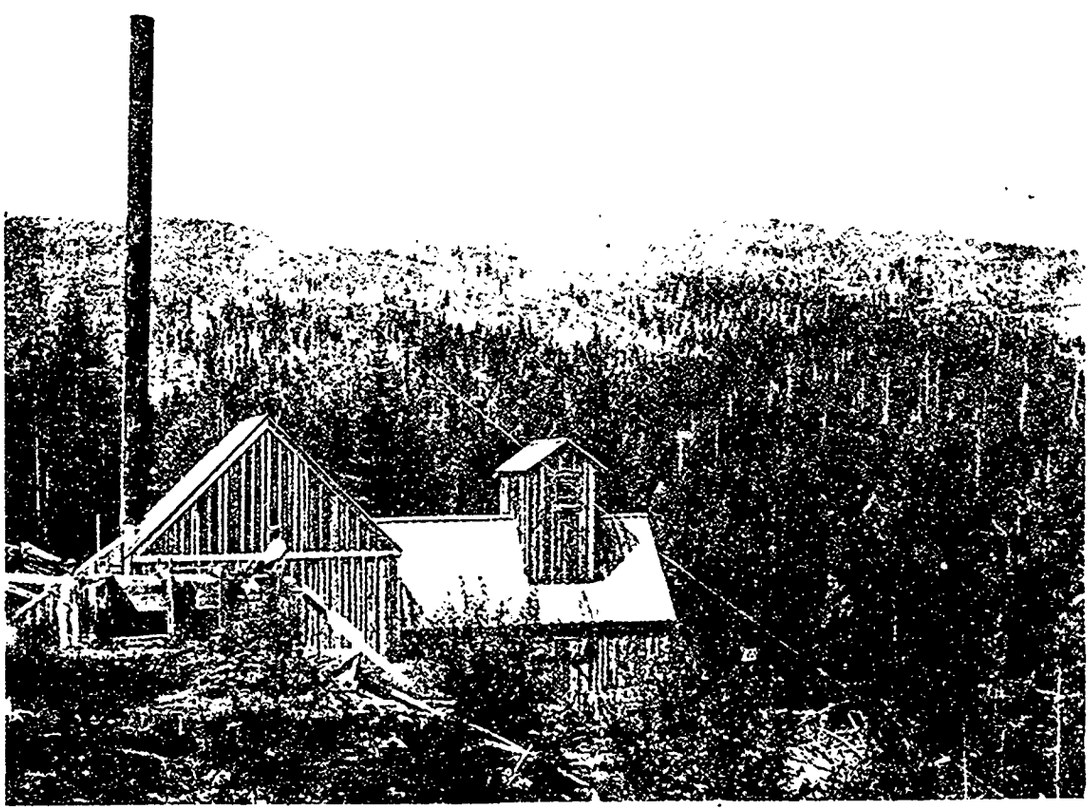


Pit-Head, War Eagle Mine, Rossland, B.C.

Lower Tunnel, Monte Cristo Mine, Trail, B.C.

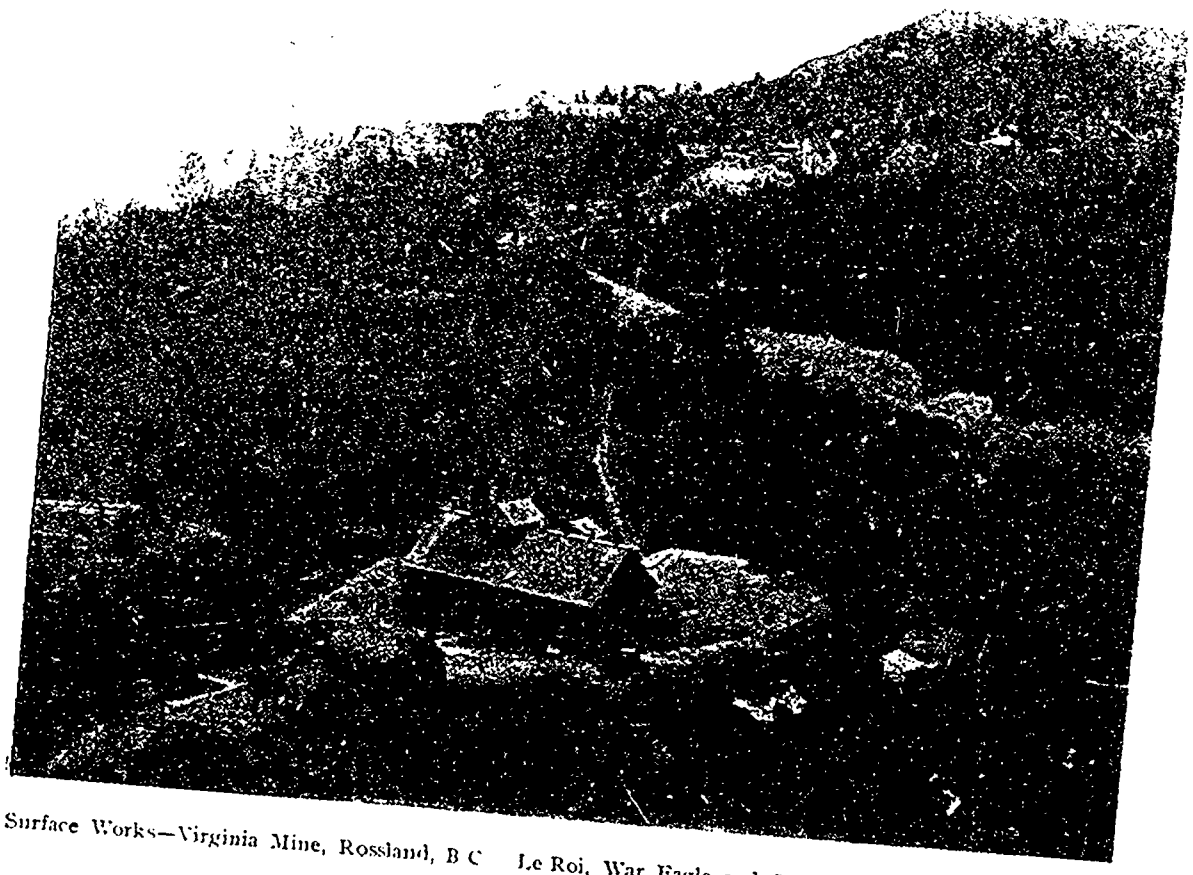


Surface Works—Velvet Mine, near Rossland, B.C.

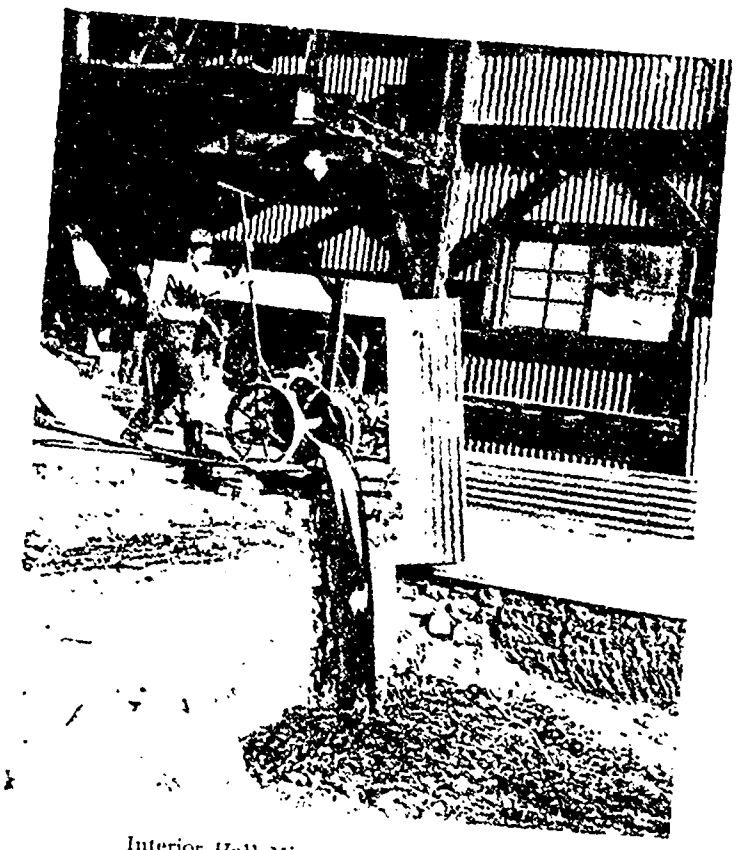


Robert E. Lee Mine, near Rossland, B.C.

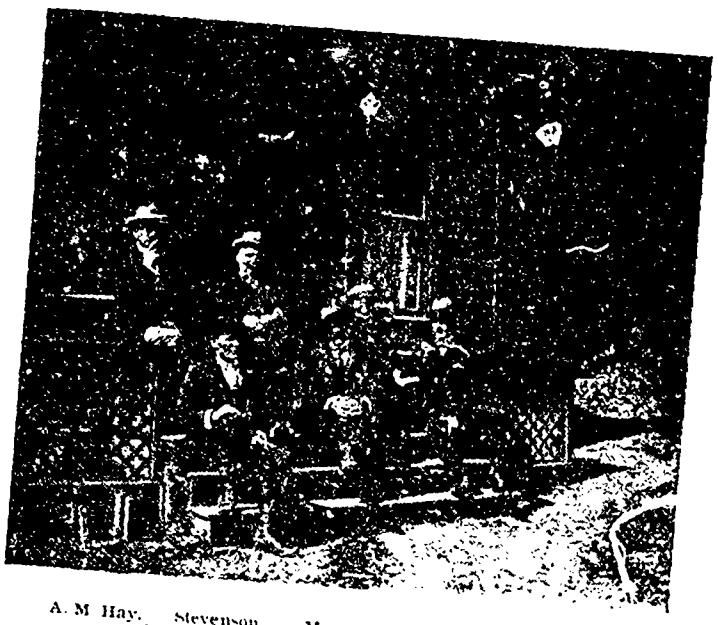
Abe Lincoln Mine, Rossland, B C



Surface Works—Virginia Mine, Rossland, B C  Le Roi, War Eagle and Centre Star Mines in background.



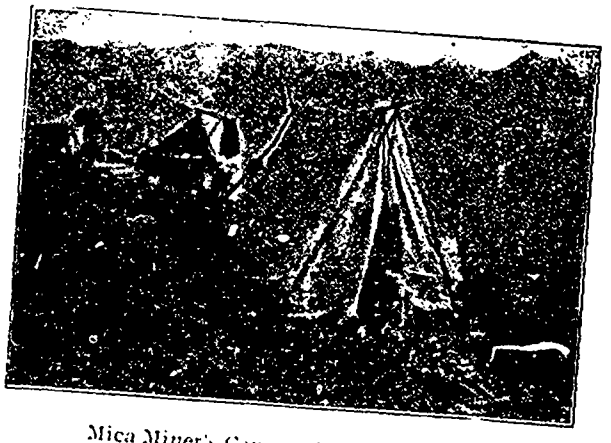
Interior Hall Mines Smelter, Nelson, B.C.



A. M Hay. Stevenson Woodhouse Mann Knowles Larmouth

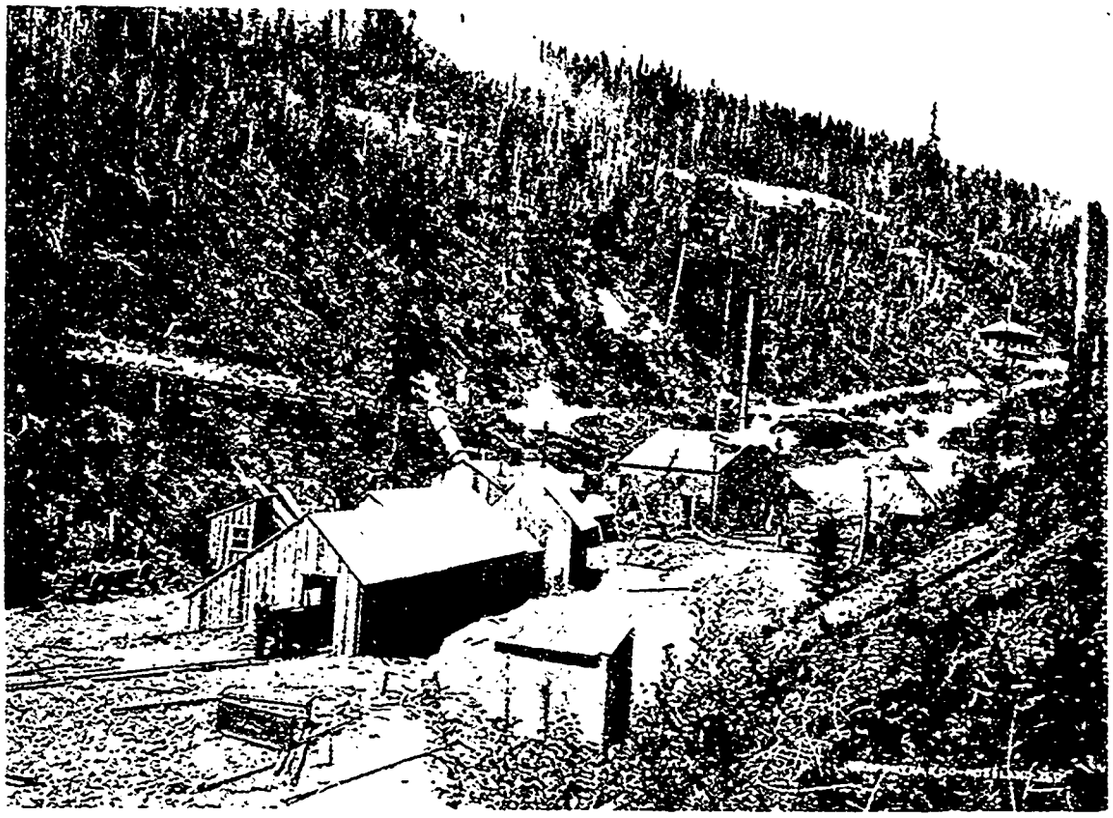
Group at Silica, B.C.

B.C. Bullion Extracting Company's Pelatan-Clerici Cyaniding Plant at Silica, B.C.



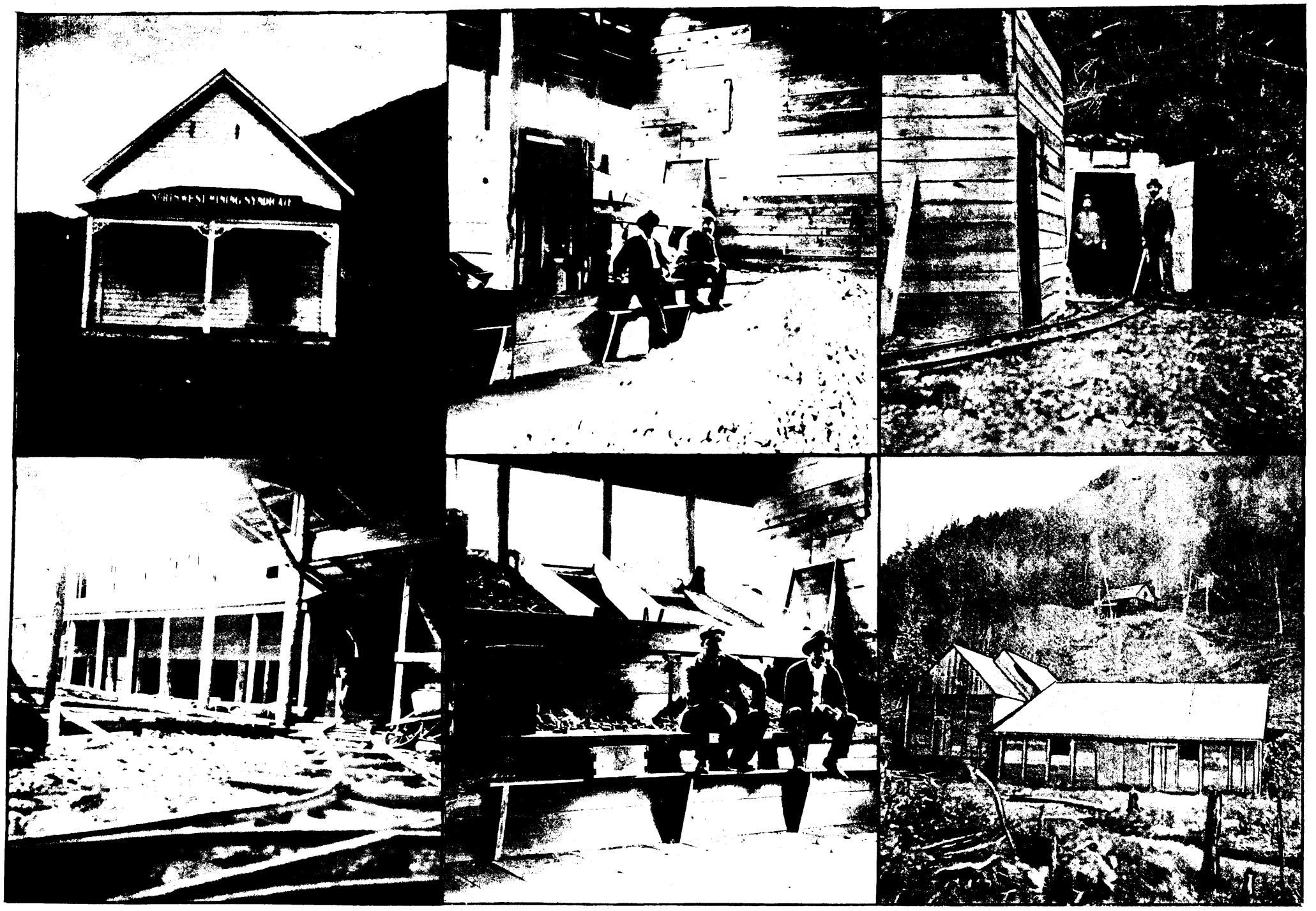
Mica Miner's Camp at Tete Juan Cache

Packing Muscovite Mica at Tete Juan Cache, B.C.



Surface Works, Centre Star Mine, Rossland, B.C.

Surface Works of the LeRoi Mine, Rossland



NORTH WEST MINING SYNDICATE'S BOSUN MINE, NEW DENVER, B.C.

Office.
Exterior Ore-House.

Interior of Ore-House.
Ore-Bins.

Mouth of Upper Tunnel.
Tunnel I and II, Bosun Mine.

MR. J. RODERICK ROBERTSON,
General Manager, London & B.C. Gold Fields, Limited,
Nelson, B.C.

MR. M. S. DAVYS,
Late Mine Superintendent, Silver King Mine,
Nelson, B.C.

MR. H. E. CROAISDAILE.
General Manager,
Hall Mines, Limited, Nelson, B.C.

MR. W. A. CARLYLE, BA. Sc., M.E., Rossland, B.C.
(Who left this month for Spain to assume the position of General Manager of the Rio Tinto Mines.)

MR. J. B. HASTINGS,
War Eagle Con. Min. & Dev. Co.,
Rossland, B.C.

its original position; the amount of water supplied regulating the intervals of tipping.

The two main imperfections are—that a pipe being used, there must be considerable disturbance caused in the stream when passing through it, and therefore the sample is affected; the other is that the position of the slot is necessarily movable, which is a drawback, inasmuch as it can be so arranged to take almost any proportion of either pyrites, sands, or slimes at will, which although perhaps an advantage in one way, is more than compensated by the difficulty in knowing what is actually the proper position that it should be set.

Beyond the machine itself, which requires a clear fall of six inches, there are several little things to be careful of, such as silting up of the launders, which frequently occurs, and any irregularity in the stream are disturbing factors, for which reason it is better that there should be a straight undisturbed run of at least 15 feet before the machine is set up.

The wet pulp sample, when collected from the sample box, which is usually performed by first running off the clear water by means of plugs in the side of the box, and shovelling it all out into a bucket, is by no means an easy thing to deal with. The only really satisfactory way is to dry the whole sample and pass through a sieve before quartering down: this is rather a tedious operation, but it is the only way to ensure a safe division.

In a very few cases, where the circumstances warrant such a proceeding, a bucket may be used, and the surplus clear water be allowed to overflow, and in such cases the pulp settles in quite hard layers (this is so especially in the matter of samples taken by hand, such as "Screens" and "Hand Tails," from the plates), and the water may be poured off quite dry without carrying any appreciable amount of slime, If this is the case, time and trouble may be saved by sampling the buckets with a small rod, which is made slightly smaller at the end, only great care must be taken that clean sections are obtained, and nothing is left at the bottom of the hole. If the material is too wet for this, it is possible to reduce the sample by turning out the contents of the bucket on to a sampling table, mixing thoroughly, and quartering down to a more convenient quantity for drying. I do not recommend either of these methods as being safe practice in a general sense, the results depending a good deal upon the skill and experience possessed by the operator—much the same as the handling of nitro-glycerine.

I think I would recommend an occasional classification of all these wet samples, however obtained, in regard to proportion of different sizes, as a check upon their representativeness, as I have frequently noticed for instance, that a high tailings sample proved upon even a cursory examinination to contain an unfair proportion of coarse sands. and *vice versa*.

*(To be continued.)*

## A New Winding Arrangement for Mines.

Translation from *Genie Civil*, in the Colliery Guardian.

The objects of the new system proposed are:—To give a strictly constant moment by means of a single counterbalancing chain allowing a load to be raised from a depth equal to four times the length of the chain employed; to impart a high degree of security, the chain and cable being unwound gradually; to produce direct action of the compensating weight on the circumference of the winding drum, in the same manner as the weight of the winding cables themselves; to work the chain by an endless rope weighing less than either of the winding cables; to require for the working of the chain a depth not greater than one-half that of the pit; and to work with engines of less power than conical drums of the same minimum diameter for steel cables of circular section.

These objects are to be accomplished by the employment of a single cylindrical drum on which the winding ropes are wound in such a manner that, as the drum revolves, the one rope coils on the drum in the position just vacated by the other, whereby the drum need not be any larger than if only one rope were used. The compensating weight is composed of a chain, one end of which is fastened at a convenient depth, either in the winding shaft or in a neighboring ventilating shaft. The other extremity of the chain is affixed to an endless rope passing over the winding drum, the looped portion in the shaft being equal in length to the depth of the pit, and the working length of the chain equal to one-quarter that depth. The suspension of the chain is so regulated that the load may be raised or lowered 16 meters beyond its highest or lowest normal position without danger to the system. The endless rope carrying the chain is supported by a pair of pulleys over the shaft and is passed around the winding drum (where it occupies a position between the two winding ropes) a sufficient number of times to obtain a firm grip—two and a-half turns are enough for a depth of 1,000 meters and 50 tons an hour. The portion of the endless rope hanging down in the shaft is tapered both ways from the point of suspension of the chain, the result of this arrangement being to reduce the weight of the chain necessary for counter-balancing.

The advantage of this system over conical winding drums is that, whereas in the latter case the moment is the sum of the moments of the load, the cage and the cable, in the new method the third factor is neutralized, and therefore, an engine of lower horse-power can be used. This is important at considerable depths where the moment of the cable approaches and even exceeds that of the load. The moment of inertia is also less than in the case of conical drums, the diameter of the latter having to be very large for depths of 1,000 meters. If the level of the pit is changed, all that is necessary to insure a constant moment is to suitably lengthen the chain and endless rope, and affix the former at a correspondingly greater depth in the shaft, whereas a conical drum would have to be replaced by one of different size. Where it is thought likely that the shaft will have to be deepened, the two cables on the drum should not be laid close together, but sufficient space left for the supplementary coils.

The following details have been calculated for an installation capable of raising 50 tons per hour from a depth of 1,000 meters:—

| | |
|---|---|
| Constant speed of the cages | 11.50 meters |
| Weight on the clutch | 5 tons |
| Weight of the two winding cables, with extra length, formed of seven sections, having a co-efficient of safety 11 in the sections subjected to the greatest strain and 9 in the others | 13,247 kilogs |
| Total weight of the endless rope in four sections | 5,550 " |
| Maximum co-efficient of safety | 19 |
| The minimum co-efficient is 9.5. This cable could be made lighter by increasing the number of sections. | |
| Weight of the chain, six sections | 4,828 kilogs |
| Strain in the dangerous section, per square millimetre | 5.5 " |
| Diameter of the winding cylinder | 6 meters |
| Width | 3.40 " |
| Weight in cast-iron and steel, without axis | 20 tons |

# MINING IN QUEBEC.

The prosperity in the iron industry has directed renewed attention to the iron resources of the Province, and it is not unlikely that the Bristol, Old Ironsines and Haycock mines in Ottawa County, which have been shut down for a number of years will be reopened at an early date.

Considerable activity is noticeable at the charcoal iron plants at Radnor operated by the Canada Iron Furnace Co., and also at the Drummondville furnaces worked by the McDougall estate. The attention of capitalists has again been directed to the well-known deposits of magnetic sand on the St. Lawrence, but it is not known at this writing whether any deal has been made.

Ochre is produced and burned near Three Rivers.

Great activity is noticeable in mica mining particularly in Hull, Wakefield and Templeton. The Blackburn Bros., Wallingfords, Sills Mica Co., A. H. Murphy and innumerable smaller operators continue to produce large quantities, and good prices are being realized

The production of chromite at Black Lake and other points in the Township of Coleraine continues much on the same lines as in former years. The concentrating plant erected by the Coleraine Mining Co. is reported to be working successfully, indeed the company is so pleased with the result of its operations that it is calling up the leases of its tributers with a view to working the properties through its own agency. A number of sales of chrome lands have been made by the Government during the year.

At Thetford, the Bells Asbestos Co., King Bros. and Johnsons continue to be the principal operators in asbestos. Notable improvements have been made in this district in the methods of dressing the mineral. At Black Lake mining has been resumed by the Glasgow and Montreal Asbestos Co. The property formerly worked by the American Asbestos Co. is now known as the Union Mine and is being worked by a German company.

At Danville the Asbestos and Asbestic Co. continue to carry on work on a large scale.

The Eustis Mining Co. and the Nichols Chemical Co. are doing a good business at Capelton in the production of pyrites, and the high price of copper has brought in some American capital for the opening up of some of the properties in the same district.

One or two small companies and a few prospectors have been washing all summer in Beauce, but we have, at this writing, no figures of the gold taken out.

At Gaspé considerable activity is noticeable on the property of the Petroleum Oil Trust, Limited. A few more wells have been put down by the Canada Petroleum Co., and it has been decided to put in immediately a pipe line and refinery.

At Grenville an American syndicate is mining graphite. The property of the North American Graphite Co. is soon to be reopened, so that there are good prospects of an increased output of this mineral which occurs so abundantly in the County of Ottawa.

Silver-lead and felspar are also being worked on a small scale in the Province.

Apropos of mining in the western part of the Province the following statistics furnished by Mr. Resseman, General Superintendent of the

Ottawa & Gatineau Valley and Pontiac & Pacific Junction Railways will be of interest:—

I beg to advise that for the 12 months ending June 30th, 1899, the Ottawa & Gatineau Railway handled the following ore shipments:—

| | |
|---|---|
| Asbestos | 426,150 lbs. |
| Mica | 402,840 " |

Also the Pontiac Pacific Junction Railway handled during the same time:—

| | |
|---|---|
| Iron | 650 lbs. sample |
| Mica | 1,050 " |
| Zinc | 2,310,030 " |

There is ready for shipment at the Calumet mines 400 tons of zinc blende ore, and I also have request to quote rates on shipments of iron ore from both the Old Iron mine at Ironsides, and Bristol mine.

# MICA IN BRITISH COLUMBIA.

It might be interesting to your numerous readers to know what success has attended mica mining in this part of the Dominion. Having devoted some time to the investigation of the occurrence of this mineral and its development, I feel now in a position to speak encouragingly of its future as an addition to the other mineral wealth producers of this Province. Although mica mining in British Columbia has not as yet assumed the proportion I had hoped it would about this date yet it is gratifying to be able to state that, notwithstanding the many obstacles with which we have had to contend since we turned our attention to this class of mineral, we have every reason to feel satisfied with the progress made and the measure of success which has attended our efforts in that direction. The proposition to which I am about to refer has been under development for the past six years in the face of numerous difficulties which were in themselves detrimental to speedy development. Chiefly among these, I might mention is the distance of the locality from rail communications, it being 240 miles from Kamloops; this not only increases the expense of development, but materially shortens the working season. The greatest block to the wheel, however, has been the lack of sufficient funds to handle the propositions in a thoroughly systematic and economical manner, and but for the unbounded confidence we had in the extent of the deposit we no doubt might have given up the struggle. Next year will find us competing in the mica market. While we were concentrating our main force in proving up one of the locations, we took advantage of the knowledge gained from the elements encountered in the prosecution of the work,, to verify the conditions met with in our exploration and investigation to determine the extent of the mica deposits and the possible area it was covering. These investigations have resulted most satisfactory, in so much as it has been determined that this occurrence embraces an area some twenty miles in length. The locality of these deposits is on what is known as the Tete Jaune Cache Section. The Tete Jaune Cache Valley, which is eighteen miles long, with a uniform breadth of five miles, rises 2,700 feet above sea-level; it is prairie-like and very fertile, teeming with a luxuriant growth of nutritious grasses, affording excellent feed for animals. In the mountain ranges skirting the valley to the west, and which take a rise of 7,000 feet above the valley, are found those wonderful deposits of mica crystals in well defined pegmatite veins, running parallel with the valley, but well among the mountain's ragged peaks; the crystals are obtained in blocks, wedge-shaped, ranging in weight from 25 lbs. to 360 lbs., in quality such as specimen enclosed—the genuine Muscovite mica. The vein on which we have centered operations shows a width of twenty feet, and is exposed to the surface for a distance of 3,000 feet, running the full length of two claims. The development of the past two seasons has shown the vein up even beyond our expectation, considering the distance gained. Operations were begun by driving in on the vein from the north side of the mountain, at a favorable point; the situation, however, being some distance from timber line, rendering it expensive to get timber up with the primitive appliances at our command, it was deemed advisable to make an open cut of the drift 60 feet wide, which was narrowed in to 20 feet as we approached the solid; thus with a 20-foot breast and 10-foot wall we ran under cover with a fairly good roof over head. After we had gained four feet under cover, it was noticed that the hanging wall to the west was showing signs of taking a sudden vertical pitch, which it did, thus squeezing together a large mass of mica blocks in that corner in such a manner as to make it almost impossible to mine without doing considerable damage to the crystals. Sinking was then resorted to to the depth of four feet to relieve the pressure; this work proved effective, and a few shots underneath straightened up things in excellent shape and exposed a bee-hive of crystals liberally distributed through the quartz on all sides, breast and walls. The workings are now under cover, but not as yet far enough in the solid to be free from percolation and surface action. The crystals, however, are showing less signs of their effects, hence the percentage of the mercantable material has been rising gradually. From my experience in this class of mining, and judging from the present showing of the proposition in hand, I feel fully justified in the statement that henceforth British Columbia will be a strong competitor in the supply of this mineral. I venture to predict that the day is not far distant when she will control the mica market of the world. I am responsible for the statement that the mica deposits of British Columbia are simply inexhaustible; with capital, which is sure to find its way into them for the improvement of transportation facilities, these mines are sure to form one of the most important mining industries of this Province. We have succeeded in interesting Mr Samuel Winter, of the firm of J. & S. Winter, Moncton, New Brunswick. Mr. Winter visited the locality a year ago and was highly pleased with what he saw. He holds a bond on three of the principal locations, and is now making a determined effort to introduce the capital necessary to handle the property systematically. We have so far made no small shipments. As introductory, a portion of last year's shipment has been forwarded to the Geological Department at Ottawa, to be arranged for the Paris Exposition which opens next year.

Kamloops, B.C., November 11th, 1899. JOHN F. SMITH.

# EAST KOOTENAY, B.C.

A correspondent from Windermere writes:

"We are having fine weather and work going merrily forward. For the first time in the history of Windermere a few people are going to work all winter—in fact, with the snow and difficulties came a sudden access of activity in the Valley, and Nature, I suppose amused at the novelty of anybody being busy around the neighbourhood, pulled up short and has been pouring down brilliant sunshine, so it looks more like August than November. The Red Line, on MacDonald Creek, which MacIntosh scorned, has a winter camp in; one Mullford, of Fraser's and Chalmers, is putting up the "stuff:" ore, yellow iron and grey copper. The "Delphine," on Toby Creek lately bonded by Hammond & Bruce, is working 12 men and will continue doing so: ore, galena and grey copper. The "Silver Tip," also on Toby, working 10 men, bonded by French outfit under management of one J. I. Flentot, M.E.: galena ore. The "Mineral King" (galena) also on Toby, working 4 men, and the "Swansea" (copper) with 6. Truly a most creditable showing."

J. C. Drewry, Managing Director for the Canadian Gold Fields Syndicate, purchased on October 19th a controlling interest in the Moyie Mining Co., which owns the Moyie and Queen of the Hills mine near this place. The Moyie Mining Co. is incorporated for $240,000, divided into 48,000 shares of a par value of $5 each. Drewry purchased 27,000 shares, or nine-sixteenths of the whole. A portion of the shares purchased by him were held by an English Syndicate, and the balance by H. Bell-Irving, the Fraser River salmon canner, and one of the original owners of the property. The Gooderham-Blackstock Syndicate have purchased 6,000 shares, and the remaining shares are at present held in Montreal. Mr. Drewry's deal was a cash one and was on a basis of $200,000 for the property.

The Moyie and Queen of the Hills consist of two full claims and a fraction, and lie immediately between the St. Eugene and Lake Shore mines. The same two big galena ledges, which have already been extensively opened up on the St. Eugene and Lake Shore, traverse the Moyie and Queen of the Hills for their entire length, and the distance which they extend over Canadian Gold Fields Syndicate's property is over 4,000 feet.

Our Kamloops correspondent writes:—

"In the mining district round Kamloops development work has been steadily proceeding during the year with good results in view of the small amount of money expended. On the Pothook, the only property which has had the advantage of much capital, the shaft has been carried down to 350 feet and a large amount of drifting has been done, showing that there is a great body of ore containing copper, mostly native. The value of it would require extensive tests to determine, but it would seem to run a little over one per cent. A carload has been shipped to Trail, the returns from which should be some index to the value of the property. A large body of ore has been recently found on the Evening Star, on which it is hoped that extensive work will be shortly commenced. Some of the properties near Jacko Lake are showing up well, but the main dependence of the camp at present is the line of claims on the north side of Coal Hill, of which the Python is the principal. This mine has a shaft down 100 feet and a drift in the ore-body at the 55 foot level. This drift is nearly 100 feet long, and a cross-cut is being put in at the end to prove the width of the deposit; so far this is 15 feet long and neither wall is found. The ore-body is narrow at the shaft and has a western dip, the vein being nearly E. and W. About 200 feet west of the shaft a surface cross-cut shows it to be over 30 feet wide. The vein has been opened by surface trenches in several places. Over 2,000 feet from the shaft it has been found to be more than 60 feet wide, but is of low grade. This, however, is natural on the surface in a vein the chief contents of which are copper. It has been found further away than this. Evidently there are a series of streaks of copper ore on the vein with barren portions between. Very likely these will be found to be lense-shaped A shipment of ore, handpicked, yielded 5 per cent. copper and $4.50 gold. The property is preeminently a concentrating proposition and should prove a profitable mine if the present indications go for anything. East of this are a number of claims supposed to be on the same vein, of which the Kimberly shows a large body of low grade ore. None of the others have been much developed. The Copper King at Cherry Creek has struck some ore which is believed to be the same as the good streak in the shaft. At Copper Creek work has been done on the Tenderfoot and El Progresso, showing concentrating ore in considerable quantity, which will no doubt be worked in the near future. Their position on the shore of Kamloops Lake should assist these claims materially. North of Kamloops Lake about 25 miles, a number of veins of talcose schist are being opened up at Skomallus. The veins carry gold and copper, their chief value being in gold, and they are very numerous. They were located years ago and lost, being known only to very few men, but were relocated this fall. They appear to promise very well. Harper's Camp, east of Kamloops, on the South Thompson, has shipped half a carload to Trail. The assessment has been done on about a dozen claims near Sicamous."

# GOLD MINING IN NOVA SCOTIA.

At Waverley, a new 60-stamp battery has been contracted for the "Tunnel" property. Manager McNulty has systematically prospected the property with the Diamond drill, tapping several valuable saddle reefs at depth. About 1,000 tons of crushing material from the "Barrel" lode have yielded satisfactory returns. The new mill, which will be operated by water power from Fall river, one and a half miles distant, is being built by the Truro Foundry and Machine Co., and will contain all the latest improvements. Negotiations for the sale of two other properties in this district are progressing.

In the Gay's river district a New York syndicate has acquired, after a long period of negotiation, a large tract of conglomerate areas. Thorough

tests of these conglomerate beds have satisfied the owners of their value, and, it is said, they will put in 100 stamps next season, and work the property on a large scale.

At Salmon river, the Montreal-London Gold and Silver Development company is running its 60-stamps full time. The returns to date have shown low grade material, but it must not be forgotten that the rock crushed has been entirely taken from development. A large force is employed and the milling plant is the most modern in the Province.

At Caribou the Guffey-Jennings Company continues the sinking of their main shaft, which they say will be put down to a depth of 1,000 feet. The 500-foot level has been driven 1,000 feet with satisfactory results.

The Truro mine in the same district, owned and operated by Mr. J. B. Neiley, is reported to be developing well.

Good work is also being done on the Elk property.

The returns for September from Lake Catcha, another of Mr. Neiley's properties, show a yield of 59 ozs. from 63 tons. This mill stuff was obtained from sinking—no stoping.

Returns for the past two months' crushing by tributors in the Montague district show 360 ozs. from 600 tons milled.

In Guysborough County, the Modstock, at Forest Hill, returns for three months 625 ozs. 10 dwt. from 1259 tons milled.

The Richardson continues to pay dividends on its low grade stuff. A recent return shows 300 ozs. from 2,300 tons milled.

The Hurricane Point Company, which paid last year a very handsome dividend on a comparatively small investment, produced for October 138 ozs. from 266 tons put through the mill.

Since my last letter to you Mr. J. B. Neily has added to his large aggregation in the Sherbrooke district the New Glasgow property, which makes a consolidated compact block of 200 areas. No other group of areas in the province represents the same probable value or the same number of paying belts and veins. Two million two hundred thousand dollars have been obtained from the veins on this property in the past, nearly the whole of which was obtained twenty-five or thirty years ago when mining and milling was done in the crudest manner possible. The determination now is to put up a 100-stamp mill. The excavation is already complete and the material ordered, and the early Spring months will be busy ones in this old camp.

The outlook at Wine Harbor is very promising. The Eureka is again running under new management. It is the intention of the company to do a large amount of development work before attempting to pay dividends again, the small rich veins not producing sufficient ore to keep the mill running constantly.

The Plough property is being worked most successfully under the superintendence of Mr. T. E. Low, one of the lessees. The ore obtained from the new vein worked is very rich and pays a handsome dividend monthly. Mr. Weston of the Crow's Nest mine has recently purchased the old Middle Lead and Caledonia properties and is about erecting a large and modern plant. The Napier mine is under option to provincial capitalists.

At Renfrew, the Jubilee mine, after a long period of idleness on account of being tied up with a bond to English people, has resumed work under its original owners. The first clean-up from 45 tons a few days ago gave the handsome yield of 305 ozs. of gold.

It is reported that Messrs. Hill & Ross of Tangier have made an exceedingly rich find on their areas on the west side of the river.

HALIFAX, 23rd Nov. S.

# THE SLOCAN, B. C.

The utter listlessness and stagnation of the labor market still occupies public attention to the exclusion of all else. The game of "freeze out" between miner and mine-owner is proceeding merrily without visible signs of termination, notwithstanding the severe losses which each are sustaining.

While there is really nothing to justify the belief that satisfactory arrangements may be arrived at in the near future, there is a growing conviction that matters are approaching a climax. Both parties are not unnaturally weary of the strife, and the business people of the community long ago prayed for any kind of a settlement rather than be forced to submit to the continual financial strain which a cessation of work entails. While rumors of every description are being freely circulated, it is difficult to obtain positive information from any reliable source. At one time it is announced that the mine-owners decline absolutely to entertain the idea of resuming on the $3.50 basis, and then again one hears that the exigencies of the money and stock markets compel them to make an immediate move of some kind or another.

One thing is certain, that if anything is to be done at all this winter they will have to decide without delay, or the snow, which, like "time," waits for no man, will put a temporary stop to their deliberations.

An important meeting of the Silver Lead Mines Association is scheduled for Tuesday next at Sandon, when decisive action one way or another is looked for. It is significant also that new branches of the Miners' Union continue to be formed, the latest addition being at New Denver, which is assuming growing importance as a mine centre.

A possible solution of the difficulty is suggested by the Payne directors, who are credited with the intention of testing the constitutionality of the Act by proceeding to work ten-hour shifts as formerly, regardless of consequences. That such a move, in the present condition to which we have sunk, would meet with popular approval goes, I think, without saying, there being no question as to the company having the hearty support of everyone, with the exception of the most bitter and rabid opponents of capital; but whether this course will be acually adopted or not is unknown.

It has been pointed out too that matters might be adjusted by a repeal of that section of the Act which relates to the infliction of a penalty for working beyond the specified time, but the Government having once committed itself in such a determined manner is unlikely to do anything in the direction of reform. Meanwhile everyone, the inhabitants of the district and shareholders alike, are allowed to suffer for the stupidity which dictated the passing of legislation without first inquiring into its probable effect upon the industry which it was intended to benefit.

# ROSSLAND DISTRICT.

ROSSLAND, B. C., November 17th.—As the year 1899 is drawing to a close, it is now interesting and profitable to note some of the changes which have taken place in this city and camp in the past ten and a half months. As might have been expected, both the population and output of the camp have steadily increased. There cannot be the slightest doubt that at present Rossland contains within its city limits upwards of 8,000 people, and what is still more gratifying is that there is work for everybody that wants it. The pay roll of the mines for last month was upwards of $150,000 and 1,500 men were employed. The growing pay roll of course means increased production. For the last fortnight the shipments amounted to 11,640 tons, and from now till the end of the year they will probably average 6,000 tons a week. The total shipments from January 1st to November 11th were 150,324 tons, so that the output for the year will approximate 200,000 tons. The total shipments in 1898 were 116,000 tons.

The mines making shipments daily are the Le Roi, War Eagle, Centre Star and Iron Mask. The Evening Star, Virginia and I. X. L. are making more or less regular shipments, and several other properties have marketed small lots of ore during the year. Arrangements are now about completed to add two or three mines to the list of regular shippers. A tramway is being built from the Red Mountain Railway track to the Josie and Number One mines, and by the New Year at latest these two properties will be sending down 200 tons a day or more. The Columbia and Kootenay has an immense tonnage of ore blocked out and will begin regular shipments shortly. The I. X. L. will hereafter be heard from each week, and when the reorganization of the Evening Star is completed it will be a large producer.

### MACHINERY AND POWER.

Another indication of the steady growth of the camp is the marked increase in consumption of the power supplied by the West Kootenay Power and Light Company. As is doubtless well known to all readers of the REVIEW this company's generating station is at Bonnington Falls, on the Kootenay River, 35 miles north-east of Rossland. A year ago it supplied power to the local electric lighting company and one or two small mining plants only. Now it furnishes power to operate plants on the War Eagle, Iron Mask, Gertrude, Le Roi, St. Elmo and Mascot, while contracts have been made for power for the large compressors recently ordered for the Le Roi Centre Star and several other properties, involving altogether about 2,500 horse power. The older established plants are all still operated by steam. When the plants now being constructed have all been installed the mines of Rossland will be equipped with air compressors having a capacity of 400 drills.

### AS A MINING CENTRE.

During the past year Rossland has also made for itself a name as a mining centre. The energies and money of its citizens are not confined to the development and operation of mines in its immediate vicinity. Throughout East Kootenay (notably in Moyie, Fort Steele and Windermere), in all the camps of the Boundary country and as far west as the Similkameen district, throughout the Salmon and Pend d'Oreille River valleys, in the Centre Creek camp, in the Lardeau country to the north, and to a less extent in the Ainsworth, Nelson and Slocan camps, Rossland companies, syndicates and individuals are working a very large number of properties. Nor is their attention confined to British Columbia. In almost every camp in eastern Washington, in one or two districts in Oregon and Idaho, and even in California are mines or prospects owned and operated by Rossland people. This is certainly a very good showing for a community not yet five years old.

### GROWTH OF THE STOCK EXCHANGE.

As a consequence of the great number of mining companies more or less closely identified with Rossland and the enormous volume of business done in their shares, it became necessary some months ago to follow the lead of Montreal and Toronto and organize a mining stock exchange. At first the business done through the exchange was very trifling, but now upwards of 50 stocks are called daily and the shares frequently amount to 500,000 or 600,000 shares a week. This means a cash business of about $2,500,000 a year.

### RISE IN REAL ESTATE.

After about a year of inactivity the price of real estate in Rossland has been rapidly advancing for several months past. During the summer and fall a great many investments were made by English companies and individuals in business property Lots that a year ago were valued at from $5,000 to $7,000 have changed owners at prices ranging from $9,000 to $15,000 and in every case these purchases were based on a nett rental of at least 15 per cent. per annum. Ex-Governor Mackintosh has also invested extensively and now owns some of the best business property in the heart of Rossland, which pays him a return of about 20 per cent. on his money. Several ad-

ditions to the townsite have also been put on the market and the demand for residential property was so great that they were in each instance sold out in a few days.

NEW BUILDINGS.

For a long time it was the reproach of Rossland that it was lacking in good homes, but this is so no longer, as the past summer has witnessed the erection of a vast number of beautiful and costly residences in every part of the city—except of course the business section—and at the present time it is almost impossible to rent either a house, apartments, an office or a store

Leaving out of account the residences, costing hundreds of thousands of dollars, which have been erected during the past year, the most notable buildings now just finished or in course of construction are the three-story fire-proof building of the Bank of Montreal, which cost about $50,000; the Rossland Club, which cost $16,000, and the County Court House, which will cost $45,000 when finished.

Among the big improvements projected are a fire-proof hotel to be built at a cost of $100,000 by an English company; a Federal building for which an appropriation of $15,000 for a site has been made by the Dominion Parliament, and several brick blocks in the business centre to re-place frame buildings.

CIVIC IMPROVEMENTS.

The municipal authorities have not been idle either. They have graded a mile or two of badly needed streets; laid miles of sidewalk; purchased the plant supplying the city with water, which they are now improving and extending at a cost of $75,000, and are now engaged in planning a campaign of improvements for next year which will include a sewerage system for the whole town, macadamized streets in the business section and a good system of street lighting throughout the city.

RAILWAY TO SOPHIA MOUNTAIN.

It is pretty certain that next spring will see the construction of the first branch railway out of Rossland. This will be a standard guage line to Sophia Mountain to handle the output af the mines of that section—notably the Velvet and Portland. The C. P. R. now has a corps of engineers surveying the road, and it has been ascertained that a very easy grade can be secured. Those well posted on the resources of the surrounding districts have no doubr that in the course of a year or two branch lines will be constructed by the Great Northern and C. P. R. in other directions.

GIANT AND EVENING STAR.

Two important deals have just been consummated in connection with the Giant and Evening Star mines. The control of the former has been acquired by United States Senator George Turner and his associates (who were all members of the old LeRoi company) at the price of $125,000 for the mine. Nick Tregear, ex-superintendent of the LeRoi, has charge of the work of developing the Giant, which has always been considered one of the best prospects in the camp. The Giant is a 50 acre claim lying on the south slope of Red Mountain, and just west of the Number Five, which has in the past year developed into one of the best mines in the province. It is almost needless to remark that the people of Rossland are glad to see Senator Turner and his friends investing part of the money they got out of the LeRoi in the purchase and development of another Red Mountain property.

George B. McAulay, of Spokane, the largest stockholder in the Cariboo mine at Camp McKinney, has just purchased the Evening Star for $150,000, or at the rate of 10c. per share. The Evening Star occupies the summit of Monte Christo mountain and is partially developed, having shipped 1,000 tons of ore this year. Mr. McAulay intends to equip it with machinery and open it up in proper shape, being confident that it is one of the best properties in the camp and likely to develop into another War Eagle or LeRoi. He has been mining in the United States all his life and is seldom mistaken in his estimate of a mine or prospect.

MACKINTOSH'S NEW COMPANY.

It is rumored around town that Ex-Governor Mackintosh's new company will be floated shortly. It is said he has some of the wealthiest and most enterprising men in Eastern Canada associated with him and the new company, following the lead of Messrs. Gooderham and Blackstock, will be a purely Canadian corporation. It is understood the Governor has options on a large number of first class properties all over the Pacific coast, but it is not thought that he has any particular property in this camp in view.

MR. CARLYLE'S DEPARTURE.

As I write the citizens of Rossland are arranging to bid farewell to W. A. Carlyle, who leaves to-morrow for Spain. A public address is to be presented to him this evening, and $1,000 has been raised by subscription with which to purchase in London a service of plate for him. Mr. Carlyle has been a staunch friend to this district ever since his arrival in the province as Provincial Mineralogist, and all are sincerely sorry to say good-bye to him, even though he goes to such a splendid position as that of General Manager of the Rio Tinto with a salary of $30,000 a year. His successor has not yet been named, but Major Collins, of London, consulting engineer for all Whittaker Wright's companies, will assume direction of all B. A. C. properties for the time being.

THE LE ROI MINE.

The Le Roi is the deepest mine in the camp. The main shaft is down 900 feet and the Black Bear shaft is down 700. The 800 and 900 levels are being driven to connect with this shaft, which is several hundred feet west of the main shaft. The mine is shipping over 300 tons per day. A tramway from the railroad to the second-class dump is nearly completed and as soon as it is finished about 200 tons a day more will be shipped from this dump. Perhaps nothing better illustrates this altered condition of mining than the shipment of this dump to a smelter. It contains about 150,000 tons of an average value of $8 per ton. In the days of waggon transportation ore had to be better than $30 to stand shipment. With the construction of the Trail smelter and narrow gauge railway it became possible to work $20 ore. Now with a freight and treatment rate of $4.50 per ton, $10 ore pays if found in large enough bodies, and when the mine owns its own smelter, as does the Le Roi, there is a good profit even in $8 rock. A new 50-drill compressor has been ordered for the Le Roi, and with its installation the working force and shipments will both be greatly increased.

WEST LE ROI.

The working properties in the West Le Roi group are the Josie and Number One. Both will begin regular shipments in the near future. The former is developed to a depth of 300 feet below the main tunnel level or a depth of 550 feet altogether. The latter is opened to the 400-foot level by a doub e compartment shaft which is now being enlarged to one of three compartments to facilitate the hoisting of ore.

EAST LE ROI.

Exploratory work is being carried on in both the Nickel Plate and Great Western and it is said fair results are being obtained.

COLUMBIA AND KOOTENAY.

The Columbia and Kootenay is opened by six tunnels, the lowest giving a depth on the vein of 750 feet. At a point 1500 feet in on this tunnel a large shaft is to be sunk to open the mine at greater depth.

WAR EAGLE.

The main shaft of the War Eagle is down 850 feet, and this mine also produces something over 300 tons per day. Only one side of the big electric hoist is being operated, and the big compressor has at last been got to work satisfactorily. The showing of ore on the 750-foot level—the deepest in the mine—is fully as good as any the property has ever been able to show. Mr. John B. Hastings no longer gives his personal attention to the management of this mine and the Centre Star. Mr. Kirby is general manager of both properties, with Mr. Davis as underground superintendent and Jack Fitzwilliams as captain.

CENTRE STAR.

The Centre Star is shipping nearly 1,000 tons a week on the average. It is opened to a depth of something over 500 feet. Pending the construction of its new 40-drill compressor, a battery of small compressors has been installed temporarily at the shaft mouth.

IRON MASK.

The Iron Mask mine is looking particularly well at present. It is opened to a depth of 400 feet, and in the lowest level shows the largest and richest ore chute ever encountered in the mine. It is shipping about 250 tons a week.

THE I. X. L.

The I. X. L. is one of the most interesting and promising properties in the Rossland camp at present. It is an old claim—in fact one of the earliest locations—adjoining the unlucky O. K., which was recently bought in at Sheriff's sale by the Old National Bank of Spokane for $40,000. It is a free milling property, but as it is located alongside the Red Mountain Railway, and the freight and treatment rate on its ore at Northport is only $4.50 per ton, its product is shipped direct to the smelter. While a good deal of work was done on the I. X. L. years ago, its real development was only begun a few months ago. Since then the levels have been run on the ledge for about 150 feet, with an upraise from the second level to the surface. These workings have exposed about 6,000 tons of ore of an average value of more than $20 per ton. Three carloads (75 tons) have been shipped in the past month, giving returns of from $25 to $45 per ton. A cross-cut is being driven to catch the ore body about 40 feet below the No. 2 tunnel, which will be completed in another fortnight. It is then the intention to install machinery and open the mine thoroughly with a big working shaft. The company has some $16,000 in its treasury.

VIRGINIA AND MONTE CRISTO.

The deep workings have been temporarily abandoned in the Virginia and work is being concentrated on a new shaft which is being sunk on a fine ore body recently discovered. Seven or eight carloads of ore have been shipped from this shaft yielding satisfactory values.

The Monte Cristo is said to have an immense tonnage of low-grade ore developed, and next week shipments are to be resumed from the property, which has been idle about a year.

OTHER WORKING PROPERTIES.

The California and St. Elmo are installing compressors preparatory to resuming development work on a large scale. The Deer Park, Sunset No. 2 and Homestake keep steadily plugging away. The Green Mountain, Mascot, White Bear and Lily May are other mines which are being developed on a more or less extensive scale. The Abe Lincoln and Paris Belle are to resume shortly. It is also rumored the Georgia is to be started up again with plenty of money back of it.

OUTLYING MINES.

On Sophia Mountain the Velvet is pretty well opened to a depth of 250 feet, and the new crosscut tunnel will shortly be on the ledge at a degth of 450 feet. The adjoining property, the Portland, is showing up a lot of high-grade ore. Several other groups in the vicinity are working, and on the east side of the mountain the Mountain Trail is being equipped with a 50-ton concentrator.

To the north the Ethel group on Murphy Creek, and a number of new properties near Sheep Lake and in the Norway Mountain district have been outfitted so as to continue work all winter.

The Bunker Hill group is, so far as I know, the only one working in the Pend d'Oreille valley.

I think there is no donbt that the present winter will see more real development work being done in the mines directly tributary to Rossland than ever before.

H. W. C. J.

# MINING IN ONTARIO.

## Lake of the Woods.

A remarkably open November, there being no frost whatever up to date. The effects of the cold snap in October having entirely disappeared, steamboating on the Lake of the Woods is still unchecked, except that the Keenora has made her last trip to Fort Frances.

*Bad Mine.*—Another deal is on, this time with the Bullion Mining Company, who have agreed to take the property at $20,000 if it suits them, at the expiration of three months. In the meantime the optionees will prospect it by sinking the shaft 50 feet deeper, which will make it a little over 100 feet. It does not appear that any money is to be paid down.

No ore, except for assaying, will be allowed to be removed from the property.

*Mikado.*—A fifty-lamp electric lighting plant has recently been installed. On the 13th inst. the office building was burned by the exploding of a lamp.

*Crown Point.*—Good camps have been put up and work on the building that is to accommodate the new five-stamp mill is being vigorously pushed. The main shaft, which is 8 x 16, is down over 70 feet; it is a 3-compartment shaft and is well timbered. The shaft on the big vein is down about 25 feet.

*The Bully Boy.*—Captain Jones, late of the Regina mine, with a gang of 15 men has been despatched to Camp Bay to begin work on the Bully Boy mine. Sinking will begin at once in the main shaft, already down 113 feet. Sinking will also be done on S. 57, adjoining the Bully Boy location. A test milling sample of 200 tons will be treated at the Keewatin Reduction Works.

*The Orion Mine.*—Camps have been put up and the new hoist is in operation. Some samples recently taken to St. Paul for assay gave very good results in gold.

*Gold Panner.*—Work is being done on two parallel veins 45 feet apart, each of which is 7 feet wide, and shows well in free gold.

*The Briggs.*—The new steam hoisting outfit, together with pump, fanner and sawmill have been taken in to the mine, and the new plant will soon be set up and in operation.

About 350 tons of ore from Quarry Island, near the Sultana, has been shipped to the Keewatin Reduction Works, for treatment.

Sam. Mitchell sold a property near Gold and Spider Lake, to the Upton Syndicate.

The Crow Lake & Camp Bay Railway is in operation, the first shipment of freight being for the Gold Estates Company.

Mr. H. C. Sims, M.E., brother of Mr. E. A. Sims, of the Imperial Bank here, has arrived from Toronto, and will, it is said, become manager of the Imperial mine on the Mikado Peninsula.

Mr. Atkinson, of Nova Scotia, the new snperintendent of the Gold Hills Company, has arrived, *en route* to the mine to take charge.

*General.*—The Pritchard's Harbour Copper Mining and Prospecting Company have a party on their property on Black Bay, Lake Superior, prospecting for copper. A good camp has been built. A layer of a brown, flinty rock, evidently an altered sandstone, carrying flakes, and thicker masses of native copper, is being examined by a drift into the face of the bluff. This copper-bearing layer or bed occurs in the mass of the amygdaloid, to which it is fused at many points, which seems to point to the conclusion that the molten lava, from which the amygdaloid has been formed by infiltration into its nesicles, broke through the pre-existing sandstoneless, some portions of which became imbedded in the lava, and were metamophosed into their present jaspery condition through the effects of the great heat of their enclosing matrix. In some places the amygdaloid is brecciated with angular fragments of varying size, of the brown sandstone, and it was probably owing to an observation of some example of this structure, that the recent visitor to the locality in question is reported by a Toronto paper as saying that the copper occurred in "conglomerate in the amygdaloid formation," the "conglomerate" in question was evidently this brecciated amygdaloid.

I hear that the copper property in Blake Township, belonging to Brimson *et al* is to receive further investigation "in the near future," at the hands of Boston people.

Rat Portage, 21st Nov., '99. J. M.

## County of Frontenac.

*Mica Mines.*—The Webster Mica Company makes its headquarters for this district at Sydenham Village, in the Township of Loughborough, where its storehouse and office are in charge of Mr. J. E. Chown. The Company buys mica extensively throughout the Townships of Loughborough, Storrington and Bedford.

Kent Brothes, bankers, have opened in Kingston a storehouse and office on Ontario Street for their mica business. The output is likely to be large until winter compels miners to withdraw from open pits and pockets, of which there are a great number. Very few mines are in a condition for winter operations.

*Iron Ore.*—The Equitable Mining Company has quit work for the present on its Dog Lake properties, and has a few men working on an island in Opinicon Lake. So far, very little exploratory work has been done on Dog Lake, and it is difficult to find out what has justified the creation of a Company with so large a capital stock, for the operation of mines which, so far, have turned out, one is safe in saying, about 500 tons of ore. There is no doubt, room for many mines around Dog Lake, and there may be more extensive deposits than any yet opened, which will require considerable capital for their development. The Company have not, however, acquired much of the available iron mining property in that quarter. The discovery of a large mine in the Potsdam sandstone on Dog Lake will be the forerunner of several such enterprises in the county, most favorably situated for transportation.

### Dominion Coal Company.

A new low level pier is being constructed in Louisburg harbor to accommodate freight and passenger traffic. The total length is 750 feet and has a width on top of 34 feet, which will carry double tracks to the extreme end. The superstructure is carried on 50 bents of creosoted piles which are driven at 15 feet centers, these being supported by three creosoted cribs at 105 feet centers. The upper timber work is so designed that it will carry a trestle in case it may in the future be necessary to ship coal from this pier.

A belt conveyer is being erected on the west side of the old shipping pier at Louisburg. It will consist of an endless rubber belt 1600 feet long, running under a pocket having a capacity of 6,000 tons. This will enable the company to ship about 800 tons per hour more than at present.

The hoisting shaft for Dominion No. 2 is now down 68 feet, and the air shaft 45 feet. For the past two weeks the rate of sinking has been 2½ feet per 24 hours, against 3 feet per day previously.

The company have now started to bank coal at the central banking station near the Hub colliery. They expect to store 250,000 tons during the coming winter.

**Sale of the Walker Graphite Mines.**—The property of the Walker Mining Company in the township of Buckingham, Ottawa County, Que., is to be offered for sale by the Sheriff at Hull on 28th instant. The property comprises a large area of graphite lands, stamp battery, and a good outfit of machinery. These lands were first worked about 20 years ago, and since then a large amount of capital has been expended fruitlessly at various periods. The property is undoubtedly valuable and there is little doubt it can be made to pay, provided it is worked intelligently. It is understood that a company is ready to take over and work the property.

**Magnetic Concentration of Ores.**—The magnetic separation of finely divided ores formed the subject of an instructive paper, read before the Iron and Steel Institute by Professor J. Wiborgh, of Stockholm. Magnetic separation is, of course, only applicable to ores in a finely pulverized condition, but in the form of dust it presents some difficulties in the furnace which have not yet been successfully overcome. The cold blast system of smelting seems better suited for powdered ore than the hot, but even with the former the ore is liable to scaffold in the furnace. To get over this drawback it has been suggested that the powdered ore should be damped and pressed into blocks, and used in that form, or the ore may be mixed with lime, and hardened by absorption of carbonic acid from the air. Another plan is to mix the ore with hydrocarbonaceous material, or with powdered coal, and to coke it in the usual way. This latter method is simple and is not expensive, and seems to have succeeded to a certain extent. It will be understood that the magnetic separation removes much useless matter, and enables a good concentrate to be obtained from ore that is poor in iron, and much waste in working is avoided. If a really good and cheap method of combining the pulverized ore into handy lumps were discovered, there can be little doubt that machinery for the magnetic separation of ore would be much more largely employed.

Nearly every establishment furnishing mining machinery has one or more trusted, experienced men, practical mining engineers, who know what is needed in special cases or general requirements, and who can see that anything needed, large or small, from a stamp shoe to a complete plant, is properly furnished. Such men can install any required machinery and their advice and aid are of value, and in all cases where a mine needs machinery of any kind those in charge of the mine would do well to have a talk with such a man.

**Manager Appointed by the Dominion Iron and Steel Co., Limited.**—Just as the REVIEW goes to press we learn that Mr. A. J. Moxham, of Johnstown, Pa., has received the appointment of General Manager to the Dominion Iron and Steel Company, Limited. Mr. Moxham is an Englishman who has been prominently identified with the manufacture of iron and steel in the United States for many years. He is a man of extraordinary force and business capacity, and has earned a high reputation as a successful operator.

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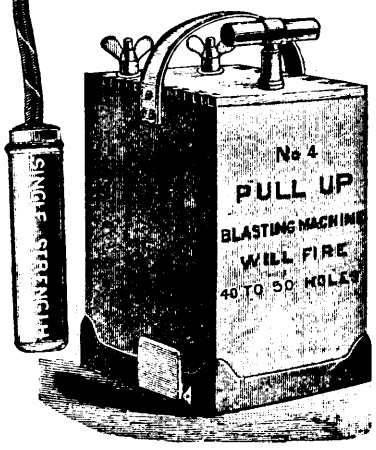


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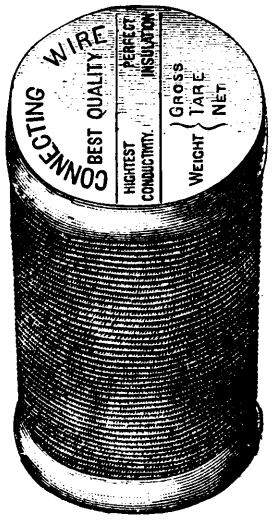


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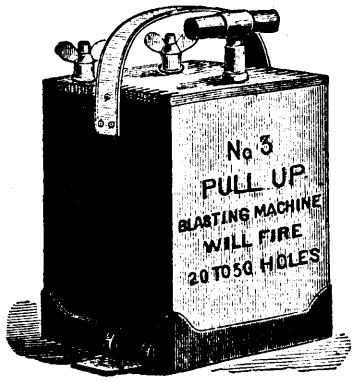


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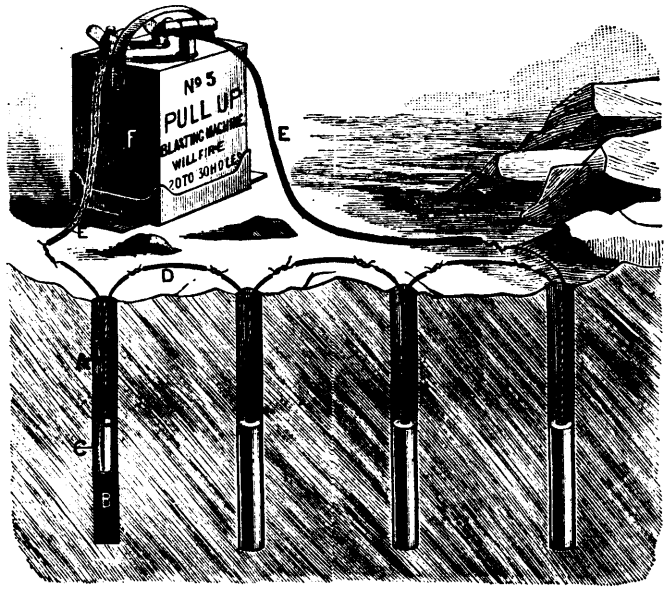


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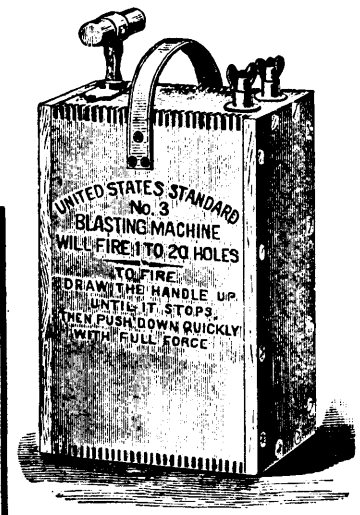


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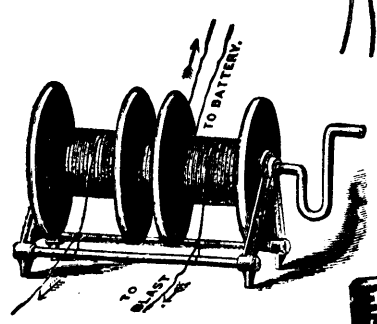


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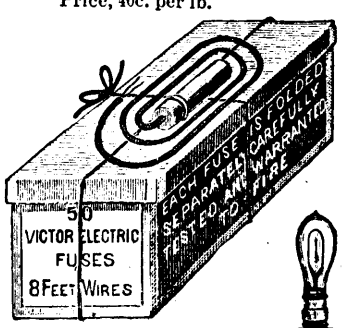
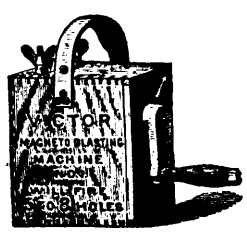



**50 Fuses in each box.**

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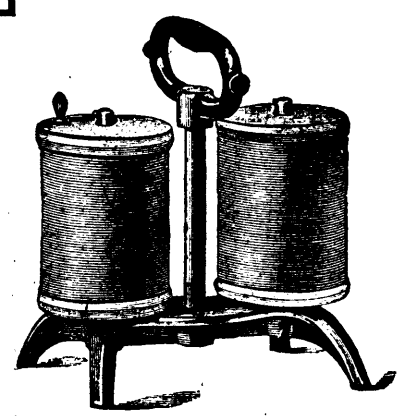

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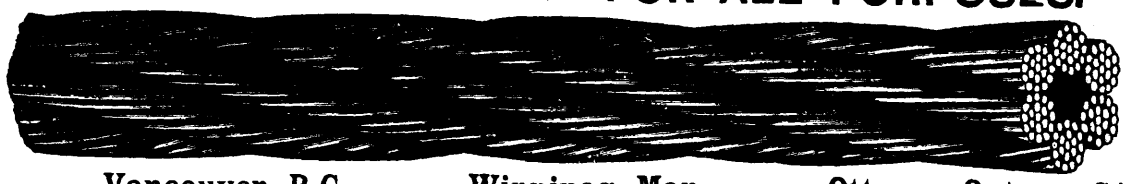

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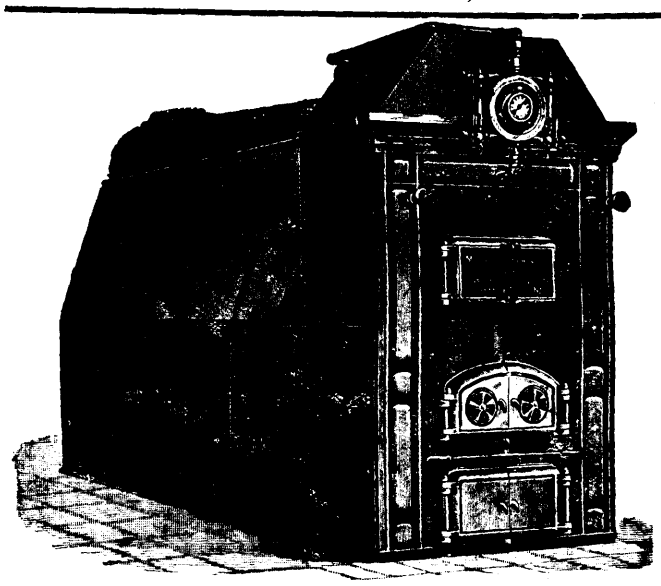

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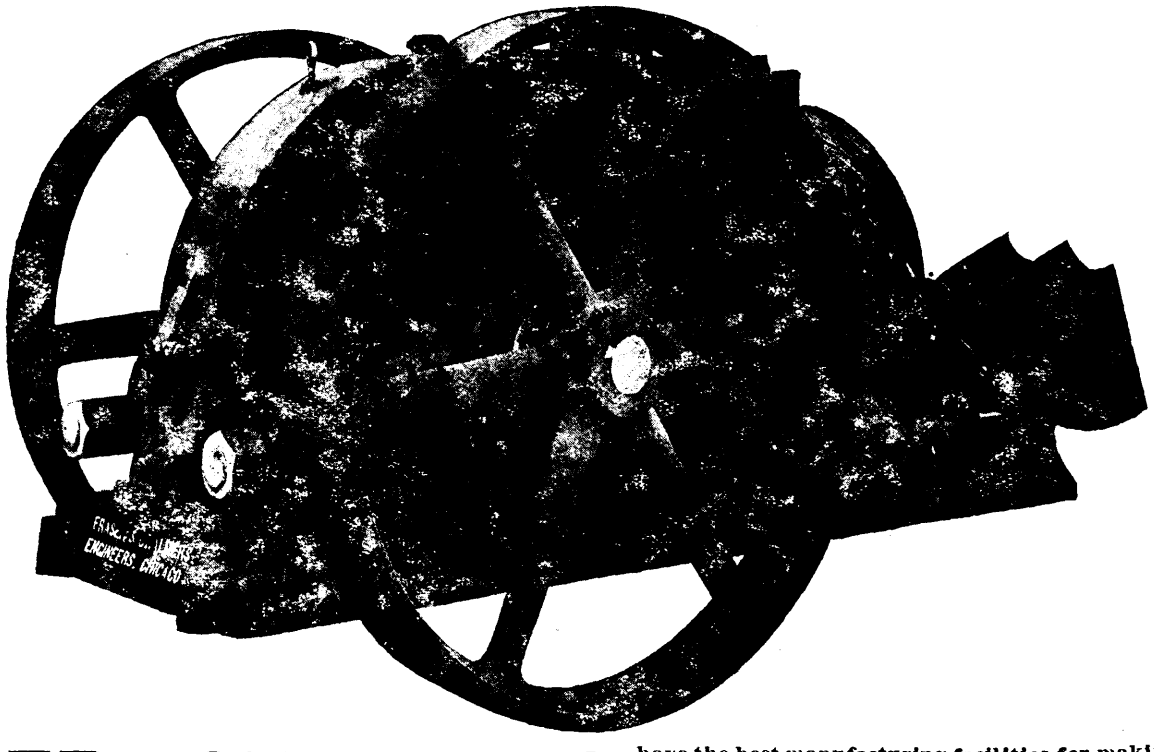

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