

The inference drawn at first sight appears to be decidedly derogatory to the gold mining industry.

Seeing that there are an innumerable quantity of unexplored quartz "leads," running parallel to those on which good pay streaks have been found, I am of the opinion that it would be more advisable to ask investors to place their capital for the exploiting of these "leads," rather than to work abandoned "leads" possessing a good record.

Some people may argue that in every probability there are other pay streaks which occur below those already worked, and if the mines were developed to a depth of, say 600 to 800 feet, these streaks should be discovered. Assuming this to be the feasible theory, it would be a very difficult matter to secure capital to sink simply this object in view, as the development of Nova Scotian mines below 300 feet, through a hard dense quartzite, is an expensive business.

If the government of the country takes any interest in their gold mining industry, and if those in charge of the Department of Mines, by making the necessary inquiries, and gathering together the requisite information, arrive at the conclusion that the prospects of deep mining are favorable, would it not be putting it in a practical form, if they—the government—were to offer a bonus as an encouragement or rather inducement, to any investors attempting this form of speculation?

I am informed that the governments of Queensland and Victoria, on two or more occasions, voted sums of £1,000 and upwards, to promote the principle of deep mining together with other branches of industry closely allied to the same.

While on the subject, I would like to take this opportunity of calling attention to the mines inspection, as conducted by the representatives of the Department of Mines.

I have been engaged in mining in this province for nearly a year, and have never been officially called on, by either the inspector or deputy inspector, although, I believe, an inspection of the mine has recently been made by the deputy inspector.

I anxiously await the publication of Mines Report, 1893, when the work will probably be particularized in the deputies' annual report.

Candidly, what good does the publication of small matters of this kind do? In fact, it surely assists in keeping capital out of the country; for what speculator would for one moment think of the importance of gold mining in Nova Scotia after reading the extract from the official Mines Report (1892), as published in the *Critic* of April 14?

There is undoubtedly plenty of room for improvement in this direction. It appears to me that either the government or its officials might plead—"We have done those things which we could not but have done, and we have left undone those things which we ought to have done."

I may state in conclusion, that many of the rich deposits of tin-oxide in Cornwall were discovered at a great depth, and that districts, where this mineral is found practically near the surface, and looked on as shallow districts, where the chances of deep mining are not as favorable as in the former districts.

I make this statement, with a view of calling attention to the many large quartz "leads," existing in the province, which on account of their not showing gold at their outcrop, have been apparently passed by as worthless.

Discussion.

MR. HARDMAN—This Society is much indebted to Mr. Thomas for his valuable paper. I want to endorse Mr. Thomas' conclusions in almost every respect, but at the present time I cannot agree with his conclusions in regard to pay streaks. It may be true, and it may not be true, and the following case may be the "exception proving the rule." Last week in Oldham on the Standard Company's property at a depth of 520 feet we got the top of our pay streak, I simply state the fact that on one lead, at any rate, the pay streak has been cut at 520 feet depth on the incline.

MR. POOLE—At about what angle of inclination? MR. HARDMAN—At 43 degrees.

MR. POOLE—The Wellington was on an angle of that inclination, was it not?

MR. HARDMAN—The Wellington was sunk 300 feet on the incline of 45 degrees, then the pay chute was lowered for 300 feet to the westward at a dip of 35 degrees. The length of the winding rope was 600 feet, but the depth on the incline was 500.

MR. WOODHOUSE—I would like to ask any gentleman present who has been looking up the theory of pay streaks and taking vertical depths, whether he has found gold 400 feet below the surface?

MR. POOLE—How deep is the Salmon River mine?

MR. STUART—300 feet.

MR. HARDMAN—Taking our 520 feet on the incline would make about 340 feet vertical.

MR. WOODHOUSE—I think Mr. Thomas can give us some pretty valuable advice on this point. He is down about 300 feet. One of the deepest points in Montague was on the Rose lead, worked by Mr. Lawson—at one place it is 345 feet and the other 380 feet.

MR. THOMAS—The Rose lead is 365 feet, and the other lead worked was cut off by a dislocation.

MR. WOODHOUSE—Was that 365 feet vertical?

MR. THOMAS—Pretty nearly vertical.

MR. HARDMAN—In this particular chute I have reference to it is as one continuous streak for nearly 1,700 feet in length, and will extend to probably 2,000 feet.

MR. THOMAS—We had a streak at Montague. I drove a level at 264 feet from the surface and found that throughout, the streak was fairly profitable for every 100 feet. With regard to the Lawson streaks—I think they were the result of intersections—so I would gather from the map and from information received from miners living in the district.

MR. HARDMAN—That lodge would be similar to the streak found in Oldham in 1877 by T. N. Baker. It was made by intersections of angling veins with the main lode—the angle of dip of lode would be 60 degrees.

MR. THOMAS—What would be the law of streaks in the Windsor Junction property at Waverley?

MR. HARDMAN—I do not think there are any facts recorded to show how the shaft is nearly down to 400 feet on the Tudor lode. The shaft is toward the inclination of the streak is 35 degrees to the east—but so far as our own workings went we failed to discover any streak whatever.

MR. HAYWARD—On the Lake View property—Dominion Lead—the streak extended from the surface and was cut off by a break at 360 feet on the incline.

MR. WOODHOUSE—I would like to know the reason why some of the mines have been closed down—I would like to know the reason for closing down these mines. Perhaps the pumps did not compete with the water—or perhaps they did not wish to make any more money.

MR. STUART—I think I know something about the Lawson. I was the last man who worked it. I had just such favorable reports as that made to me—"It is as good at the bottom as any part of the old workings."

Mr. Lawson told me the last was poor and had not paid for several months. But my object in pumping out the mine was to drive some crosscuts in what I call the "style lead." I think that side lead had something to do with the richness of the Lawson mine, yet it did not make the streak entirely, nor was there any regular gold streak. The gold was more in pockets and not in line. They were at different parts of the whole workings, not continuous but distributed over the whole ground that was worked, but the quartz taken out between these workings was not barren. At 360 feet it was pinched to about two inches, and only gave me two pennynights to the ton, but in the western end where the lead was larger, it gave from 15 to 20 pennynights, but the pay ground was short. The plan kept by Mr. Lawson showed conclusively that there was no regular pay streak. He crushed by contract for each crew of men separately each month, and indicated on his plan the exact amount of quartz taken out of each portion of the ground, and the exact amount of gold obtained.

MR. WOODHOUSE—A copy of that plan is in the Mines Office, is it not?

MR. STUART—I think it is.

MR. POOLE—I think it is published in the report of 1876.

MR. STUART—I quite agree with Mr. Thomas in regard to the various reports of the mines which shut down, and that it would be well to compel mine owners to keep a plan on file in the mines office when the mine is shut down; it would prevent a great deal of toil.

MR. CLARKE—It occurs not a provision to that effect now?

MR. STUART—Is there to me that there is something to that effect.

DR. GILPIN—That part has been talked of for some time and my idea was to have a man make it his business to go and get that information and put it on a plan, so that it would be placed on record.

MR. STUART—Would it be too much to have that attached to the inspector's report?

DR. GILPIN—I am afraid it would. At first it would take a great deal of work to get the thing up; after that not so much.

MR. POOLE—Appoint another officer.

DR. GILPIN—There was an amendment put in the Act by James A. Fraser to that effect. To do that would simply mean another officer. Now that the royalty is getting better it has come up again.

MR. STUART—I think it would not be too much to make it obligatory on the mine owner.

MR. THOMAS—In the west of England all mine owners are bound to keep plans and data up to date, and when the inspector comes on his round he sees that the work is done.

Government Aid to Mining—A Suggestion?

MR. JOHN HARDMAN—The title of my remarks as printed by the secretary is "Government Aid to the Mining Industry—A Suggestion?" I was careful to have at the end "A Suggestion," and I beg that it be kept in mind, but from the interview of our committee with the Premier this morning, and from the discussion on Mr. Thomas's paper this afternoon, it is quite evident that the suggestion is an opportune one. As a government function we would have good precedents for the government's undertaking to give aid to the mining industry. I notice that Mr. Thomas in his paper speaks of the sum of £1,000 being voted in Victoria. In the fiscal year of 1886 the government of New Zealand spent over \$50,000 in water races, nearly \$150,000 in roads, and over \$180,000 in actual construction or subsidizing of other works for the purposes of deep mining, and of furthering the interests of mining generally. The total amount appropriated for gold fields alone in that year being nearly \$400,000.

The Spanish government recently spent over \$200,000 for a new building for a mining school in Lisbon, and in New South Wales they are spending large sums every year—£40,000 I believe. So that we have very good precedents when we go to the government of this country and ask them to help to forward the mining industry. I am not speaking particularly as a gold miner, but I do not see why the lode should not be equally irrevocable and valuable to other kinds of mining. At the outset the question arises if the government is to extend aid to mining, is it to the Provincial, or to the Dominion Government we should apply? I think it will be remembered by some here that in the year 1881 the Provincial and Dominion united in having surveys made of Lawrencetown and one or two other districts and they contemplated making surveys of more districts but the work was discontinued because it was found to be too expensive. It seems to me that we have no claim on the Dominion Government in this matter, as all the royalties are payable to the provincial treasury, and I do not see, therefore, any reason why the provincial government should not bear all the expenses. There have been some previous efforts in this line of asking government help; propositions were made as far back as 1887. Mr. Thomas suggests in his paper that the government should give a bonus. I think the original form in which government aid was asked was that the government should sink a test shaft in such a place as should be desirable in order that the existence of workable veins at great depths might be proved. But a difficulty arose at once; in which district should this shaft be sunk? Each district could put forward claims that would make a decision difficult, if not impossible, and this proved a fatal objection.

The next suggestion was that the first man who put his shaft down to 1,000 feet should receive a bonus of \$10,000 or like sum. But there were certain valid objections raised to this proposition. A shaft sunk in Montague might not tell us about the strata in Kennew, or Wine Harbor, or any of the other districts. Again it was suggested by the late John Kelly that the government should remit the royalty on all gold coming from certain depths. Gold from below 500 feet to 1,000 feet should pay a royalty of only 1 per cent., and from below 1,000 feet should be free of royalty, in other words the amount involved was a bagatelle, and not worth considering.

And more recently still the suggestion has been made that the government should purchase a diamond drill, and bore from 3 to 4 holes in each district to test the existence or otherwise of workable veins. All of you here know that a bore hole might go down within 12 or 13 feet of a pay streak and yet the core show poor ground, the drill again may go through a pinched portion and fail to indicate any quartz lode at all.

In spite of the failure of these several schemes to materialize, yet it is highly desirable that the government should extend such aid and help to the gold industry as would tend to advance the output and increase its knowledge we now possess of the resources of the industry. Therefore, I venture to bring forward at this time an idea which has been gradually taking shape with me, and which I believe would be of permanent value and material benefit to the whole metallic mining interests of the province, and especially to the gold mines.

I suggest the construction of detailed topographical maps of each prominent district, accompanied by a monograph in pamphlet form, which shall explain the map and give fuller letter-press descriptions than the scale of the map may allow.

The details yet remain to be worked out, but the salient points I may describe as follows:—

The map, constructed on a scale of not less than 200 feet to an inch, and preferably 100 feet to the inch would show—first, the area lines, distinctly and clearly indicated by a faint green line, the area numbers being also printed in the same color; secondly, the faults, in a brown shade; thirdly, all known and located lines of faults or breaks by a conventional dotted or broken black line; fourthly, the out-crops, or worked portions of the out-crops, of all discovered veins by red lines; fifthly, all streams, swamps and wet ground in blue lines; sixthly, or hatching; sixthly, showing contour lines, either 10 or 20 feet apart, over the district, in continuous faint black lines.

In addition, the location of each shaft or incline, over 20 feet in depth, should be noted and the position of buildings of a permanent nature, as mills and steam hoists, etc., should be marked.

By a system of letters, with corresponding references in the margin, a great deal of information could be placed in small compass, directly on the map sheet, which should, of course, be detachable from the pamphlet for convenience of reference.

To simplify matters and explain the scheme to you much more graphically than I can talk, I have prepared a map of a portion of the Oldham district, showing about 27 areas out of some 500. (It is to be regretted that owing to the time involved in the reproduction in colors of Mr. Hardman's map, we are not in a position to publish it to the public.—Ed.) I may say here, that the intention of this scheme is to confine the map closely to the limits within which gold bearing lodes have been found, and not to extend the map beyond the working of any district. I regret that the time at my disposal has not permitted me to put the contour lines upon this sketch of Oldham district, but I am sure you will agree with me that they should be an essential part of the map.

The monograph accompanying each map could be made up largely from the provincial records, and the reports of the Dominion Geological Survey, supplemented by information obtained during the actual mapping of each district.