

prizes pay fairly well, and some of them pay enormously. It is the chance of large profit and sudden acquisition of great wealth that tempts men to invest. When a great strike is made, hundreds and thousands invest in the same neighborhood hoping for similar luck. These fortunate discoveries have been called "the devil's decoy ducks" as they draw many to the spot and often to the slaughter. It must be admitted that mining success is often a matter of luck. Some of the largest properties have been discovered by accident or have become valuable by almost the last stroke of work before their proposed abandonment. Many of the discoveries have been made by unprofessional men, and the theories of skilled engineers have often been worthless. Miners say "The mineral is where you find it and one man can see into the ground as far as another."

When we remember that it is said that only four or five men in a hundred succeed in commercial business, we must not be too exacting as to the record of success in mining. The men who gamble in stocks or corner produce probably lose as largely in proportion as those who invest in mines and they lack the moral satisfaction of having promoted production or employed labor. Public spirited men have every patriotic and philanthropic motive to invest in mining.

England owes her supremacy to her coal and iron mines. It was due mainly to the desire to obtain the precious metals that America was discovered, and the development of the Pacific slope and the construction of the transcontinental railways is largely due to the mining industries. Australia and South Africa have been opened up largely by miners. The miner has also often discovered possibilities for the production of agricultural wealth. A mine gives work directly and indirectly to a large number of people. The man who has lost money in the actual working of mines can comfort himself with the assurance that his effort has tended to the development of his country and has benefited hardy laborers. It has not, as is often said, been merely thrown into the ground.

The investment in railways is probably no more remunerative than the investment in developed mines and offers fewer opportunities of brilliant success. Mining will always attract adventurous enterprise and as the tendency of the times is to conduct its operations upon a business basis, its hazards will be continually reduced.

It may be proper to ask, why is it that so large a proportion of mining enterprises are successful? The answer will be that in addition to natural risks there is added a large element of human risk; faith in nature cannot always be supplemented by faith in man. Ignorance, bad management, dishonesty, extravagance often spoil favorable chances. The blind competition and vexatious opposition among rival enterprises sometimes ruins undertakings that by a spirit of co-operation and a reasonable combination might have been carried to success.

Instead of the present wasteful system of individual operations, there should be larger enterprises by which a whole district should be operated co-operatively under one central management, composed of the ablest engineers and political business men, or in some cases it might be undertaken by the local or general government.

Dr. Raymond in his report on The Mines of the West in 1869, in a criticism of the methods employed at the Comstock, so powerfully describes the cause of many mining failures, that his words are worth reproducing. He says, "One great cause of trouble is the fact that mining has not on the whole been profitable to individual adventurers. And of this fact the Comstock Lode has furnished a striking example. Nearly \$100,000,000 have been extracted from that one lode within the past nine years, yet the aggregate cost to owners has been almost as much. The reason is simple. Unnecessary labor has been employed and vast sums of money wasted in extravagant speculations and litigations, and the root of the whole evil lies in the system of scattered, jealous, individual activity, which has destroyed, by dividing, the resources of the most magnificent ore deposit in the world. Thirty-five or forty companies each owning 10 to 1,400 feet along the vein, and each almost without exception, working its own ground independently; 40 superintendents, 40 presidents, 40 secretaries, 40 boards of directors, all to be supplied with salaries, or worse yet with perquisites, or, worst of all, with opportunities to speculate; an army of lawyers and witnesses, peripatetic experts, competing assayers, thousands of miners uniting to keep up the rate of wages; these things explain the heavy expense of Comstock mining. Aside from this immense drain of money amounting to 20% of the whole production, the labor actually performed has been, for want of united action, often useless. There have been tunnels enough run by different companies into the Comstock Lode, to make, if put together, the whole length of the Surtio tunnel. Hardly one of them is good for anything to-day. The Bullion Company, which has the deepest shaft on the lode, never had any ore, but has spent more than a million dollars in prospecting, while some neighboring mines, like the Little Kentucky, have been in bonanza for long periods. Now this division of a vein which gives the rich chimney to one owner and the barren intervals to another, is not conducive to economy. The result has been that both owners waste money. All the explorations in the barren mines of the Comstock could have been executed with the money flung away by the mines that have had, for a time, rich ore."

Alluding to these operations Dr. Raymond speaks of "the mischievous feeling that mining is half grab and half gamble; that the only way to make money at it is to dig out what rich ore you can get, and then find a fool to buy the property, or failing that to make a fool of that collective individual the public and to 'unload' yourself of your stock."

It is so generally the custom with those who write of mining to indulge in enthusiastic language and brilliant statements that I may be blamed for presenting to a Mining Convention a paper in which the boom element is so conspicuously wanting. But it may help the reputation of the mining community if we tell the truth occasionally, especially when it can do no harm, and it may help to overcome the popular prejudice as to the veracity of promoters, which is expressed in the adage, "he lies like the prospectus of a limited company."

While admitting the losses in mining, I have tried to call attention to its frequent gains, its occasional sudden fortunes and the fascination as well as usefulness of its ventures. I have wished to point out also that a good deal of the loss might be avoided by more careful and intelligent management and especially by the adoption of the systems of combination and co-operation that are so generally being employed in other industries and which are destined to ultimately replace the individual isolated method of work.

It might be worthy of consideration also whether a mining association might not undertake some practical operations as an object lesson to the world of how mining can be successfully conducted. If all the brilliant ideas and genius that scintillate in a convention's papers could only be applied to productive work the reputation of mining might be so enhanced that it would be more sought as an investment.

ASBESTOS CLUB.—The regular meeting of the members of this Club was held in the Club Room, Black Lake, Que., on Thursday evening, 31st January, when papers were read by Messrs. E. Wertheim, Chicago; H. J. Williams, Theiford Mines, and Dr. Wm. Glen, of the Baltimore Chrome Works, Baltimore. Dr. Glen's paper we hope to reproduce in the next issue of the REVIEW.

Mineral Waters.

By MR. JAS. T. McCALL, Montreal.

It may appear at first sight as if my subject was hardly within the range of those usually dealt with by the Quebec Mining Association, and I venture to think that very few miners in taking out licenses for mining, prospecting, or in purchasing mining rights on any property, would include a spring of mineral water among the valuable deposits they expected to find. A little reflection, however, will show us that natural mineral waters have been a source of great wealth and prosperity to those countries, and more particularly to those districts, in which they have been found. Springing up from the depths of the earth, charged in the most natural manner, and in the most delicate proportions with those chemical substances that give tone and vigor to the human system, these mineral springs must be regarded as of great value, to be placed on a level with gold and silver, iron, copper and lead, asbestos and mica deposits, which have been considered as forming the great mineral wealth of this province.

We all realize, I think, of what immense importance a supply of pure water is to any town or city. Blessed as we are, with a plentiful supply of fairly excellent quality in Montreal, we are not brought face to face with the difficulties which some other cities in Canada, Toronto for example, have had to contend with.

In reading over several papers in connection with my subject, it was noteworthy to find what a strong stand a great many eminent physicians take on this subject. They point out that to impure water supply can be traced the great epidemics of cholera, typhoid fever, diphtheria, as well as those lesser diseases which distress suffering humanity. Most of us will remember the experience of the City of Hamburg during the cholera epidemic on the continent two years ago. It was the contaminated water of the Elbe, the source of the drinking supply of that city, that was responsible for the devastation made among its inhabitants. The same can be said of the great majority of towns on the Continent of Europe. The dangers surrounding a journey through a foreign country, such as Italy, Germany or France, or other Continental States, are manifold, on account of the impure water supply, and to all who purpose making such a trip, let me advise them never to drink ordinary water. If their principles will allow of it let them drink beer or wine, but if they must drink water, let it be bottled mineral water.

A recent writer referring to the saying, "See Naples and die" claims that this originated through the dreadful water of that city finding so many victims.

The drinking of mineral waters for medicinal purposes dates very far back, and the famous wells of England used to be the fashionable resort of the wealthier classes during the eighteenth century. After a season of gaiety and high living in London, the fashionable ladies and gentlemen went down to Bath or Buxton, or some other similar well, to have a course of the waters to wash away the ill humours and bad blood that had resulted from their previous style of living. This is now changed to a large extent, and the fashionable world go to the Continent, where such baths as Hamburg, Baden Baden, Carlsbad, etc., are thronged with people in pursuit of health.

It will thus be seen what a source of wealth these springs and baths are to the districts in which they are found.

Our association is at present purely a Quebec institution, and I will not, therefore, refer to points outside of it; my object now is to point out that we have in this province a vast wealth of mineral waters, as fine, if not finer, than any to be found on the Continent of Europe or in the United States.

My chemical knowledge is not sufficient to enable me to give you a scientific division of the various kinds of mineral waters found in this Province, but for my present purpose it is sufficient to divide them broadly into two kinds, medicinal and table waters. The division is not a very accurate one, for table waters are and must be of very great medicinal value, but the distinction is easily understood, and cannot be mistaken.

Let me first of all draw your attention to the medicinal waters, by which I mean those whose chemical ingredients are of so strong a taste or odor, or present in such quantities as to make their functions more especially medicinal than otherwise. Nearly every district has mineral springs of some kind, be they sulphurous, alkaline, or saline in their composition, but very few have ever attained more than a local celebrity.

Among these I would mention the following most important, Richelieu Water—a well owned by Mr. J. A. Harte, of Montreal. This is an alkaline water of great medicinal value in cases of acidity of the stomach. Its taste is not such as to make it unpalatable, although it is pretty high in salts.

Varennes—This is a strong saline water, of the same nature as St. Leon.

Abenakis—This is a strong saline water.

St. Genevieve—This spring is also owned by Mr. Harte, and may be considered a fairly strong purgative.

The Caledonia Springs are in the Province of Ontario, although pretty close to the Province of Quebec, so they are not within the scope of my paper, although in passing I would mention that there are three wells there, saline, sulphur and gas. This water has obtained considerable celebrity on account of its medicinal qualities, and the hotel at the Caledonia Springs is regularly frequented during the summer months.

I have brought up some specimens of these waters found in the Province of Quebec, and will be very glad to submit them to you for the purpose of testing.

The most famous of these, at least the one that has been brought most prominently before the notice of the public, is the spring at St. Leon. This is situated near Louiseville, on the Quebec section of the C.P. Ry. The principal ingredients are: Chlor. Sodium, Chlor. Potassium, Chlor. Magnesium; Bi-carb. of Lime, Bi-carb. of Magnesium, with Lithium and the Iodides and Promides of Sodium.

These are present in such quantities as to warrant us in classing this as a fairly powerful water. (These are of course modified by other chemicals, such as bi-carbonate of iron.)

Prof. Baker Edwards, in writing in connection with the analysis, says.—

"This rare water combines marine chlorides, bromides and iodides, also rare alkalines, lithium, barium, strontium, very powerful alterative metals, their actions modified by the chalybeate, carbonates of iron and magnesium, all super-saturated with carburated hydrogen gas so as to protect them from alteration by oxidation or air. Nothing rarer could be conceived."

The medicinal value of this water has been long recognized, and it has been reported on very favorably by a great number of well known physicians, especially for the relief of disorders in connection with the kidneys or intestines.

The St. Leon Water Co., have a large hotel at the Springs, and it is a favorite resort of Montreal and Quebec people, and is especially patronized by the French.

As far as I have been able to find out there are very few of the mineral waters of the Province that may be classed distinctively as "table waters." A table water must first of all be palatable. We are all quite willing to take medicine when we