

most of whom express themselves satisfied of the existence of a rich field for speculation in *bona fide* operations.

The Richardson Company have got the first division of their machinery into running order, having had their engine working a few days last week. As is usual with new machinery, several little hitches have occurred, which have however, been rectified, and they were to begin to work their ore yesterday. Of course it will be a few days before they can give any returns.

The Hon. Billa Flint has also completed a crushing mill, in the Village of Bridgewater, which is now running, though the same remarks which I have made concerning the Richardson mill will also apply to that at Bridgewater.

The Barrie Mine Company are also erecting a mill. They intend to grind their ore with Burr stones similar to those of a flouring mill.

On the whole, our prospects are assuming a very promising aspect.

GOLD.—Mr. H. G. Thurber, of Stirling, exhibited to us yesterday a small piece of greyish quartz, completely studded with gold. It was picked up, he said, by Mr. J. West, of Hungerford, while hunting deer late in the fall, about sixty miles north of Madoc, and is as rich a specimen as we have seen. He describes having seen extensive reefs of quartz running east and west, and from which he obtained several specimens similar to the one exhibited.—*Belle-ville Intelligencer.*

DISCOVERY OF A LEAD MINE.—We were shown yesterday, by Mr. John H. Harding, specimens of ore found a short distance to the west of Quispamsis Station on the railway to Shediac. One of the samples is almost pure lead—such as is used in the "sheet lead" with which tea-chests are lined, and for a hundred other purposes; the other samples were smaller, but scarcely inferior in purity. A quantity of the ore has already been taken out. The seams—four in number—give some feet in thickness of the lead. It is not improbable that silver will be found in the ore.—*St. John, N.B., Spectator.*

GODERICH SALT COMPANY.—The *Signal* says: "We understand that the Goderich Salt Co. will declare a dividend of 25 to 35 per cent for the past half year. Really splendid, considering that over and above that everything is paid for and a stock of wood on hand. If we had twenty wells paying as well wouldn't some one make money pretty fast."

AN AMERICAN SCHOOL OF MINES.—On the 16th Mr. Stewart moved in the Senate, his bill for the establishment of a School of Mines. He said the propriety of legislation on this subject was to be determined by the necessity to Government of an increased supply of the precious metals and its effect upon the currency and the national debt. Explorations for the last eighteen years had demonstrated the vast extent and richness of our mineral veins; but placer veins, hitherto so productive, were now on the decline. The development in the Comstock lode in Nevada had given such an impetus to vein-running as to increase the products of the California quartz mines from \$2,000,000 in 1860, to \$11,000,000 for the past year, and had led to rich discoveries in Montana, Idaho, and other Territories. But there were many failures, and the business was not profitable, owing chiefly to the want of scientific knowledge, which in the case of rebellious ores was indispensable, and which the heavy loss of some 35 per cent. now submitted to in the paying lodes, shows to be greatly needed, even in those mines which are now worked to the greatest advantage. Vast expenditure of money and labor needlessly diminished the chances of a continuous supply of the precious metals—a supply which the speaker thought it not unreasonable to suppose might be increased to \$200,000,000 annually by the application of scientific methods and processes. From exploration to coinage, at every step, scientific knowledge was required, and it was a mistake to suppose that the miners under-estimated its value; on the contrary, graduates from Freiberg monopolize the most lucrative places, and enjoyed universal respect and confidence even among the humblest miners. The precious metals are the heritage of the entire nation,

and it would be vandalism on the part of the Government to allow them to be wasted. In experiments to obtain information they should be accessible to all. The principles of the bill were in perfect harmony with the practice of the Government, which has frequently appropriated money for the diffusion of scientific knowledge, and the plan proposed is fully sanctioned by the experience of other nations.

Here the Senator went at length into the history of the mining schools of Europe, showing how largely the world is indebted to them for the present supply of precious metals, and that their graduates now monopolized, both in Europe and America, the most important and lucrative places in mints, assay offices and mines. It was a reproach to the United States that with more extensive mines than any other country, with better natural aptitude among the masses, and greater need of money at the present time, they are dependent on Congress for the necessary scientific information. The plan proposed for diverting the mining tax to the support of the institution really involved no expenditure by the Government, for this tax was admitted to be an unwise imposition, only to be borne if made to increase the production. The location of the institution among the mines, and its management by the States and Territories, were excellent features of the bill, securing in the only feasible way its effective and vigorous management. The annual visits of pupils and professors to mines, and the free lectures to miners, would prepare the learners for real life, and disseminate knowledge among the miners. The tests and experiments made at the institution, and statistics collected by it, would remove difficulties, start the idle mills, and prove of immense value to the country.

Mr. Stewart then argued at length the advantages which flow from the increased production of the precious metals in stimulating industry, enhancing values, diminishing the burdens of the debt and aiding a return to specie payments. Immense quantities are needed for shipment to Asia and for manufacturing purposes, and about two per cent disappears every thirty years by wear and loss, and a failure to keep up the supply would be very disastrous in a great variety of ways to the United States, who must continue to take the lead in their production.

He contended that the mineral wealth is of more advantage to the industry and commerce of the nation than any other product. When exported, it is not lost, and it does not come back in the shape of a manufactured article, many times enhanced in value, to turn the balance of trade against us and support the workers of Europe.

GOLD MINING.—Gold forms the real substance of mining in California. The number of veins is endless. The number of those which have yielded profit are considerable, with a continual increase. One must distinguish between the alluvial washings and quartz mining. Of the former those most easy of access are quite or nearly exhausted; there is room offered for undertaking those more remote, yet such undertakings demand great capital and the work of years to reach the bottom of the old river beds; then, if one finds a rich spot, the capital is paid back many fold, but one must be prepared to lose all if perchance he hits upon a poor place. The chances for the first are indeed greater, but it would not be advisable to embark in such uncertainty when one has an unusually safe method of mining operations. This opportunity of gold bearing quartz veins give a field of mining of which one may easily assert has been first opened by the experience of California.

There has prevailed from the earliest times an opinion, and even to-day in Europe the idea continues, that gold bearing veins diminish in value with increasing depth. In the early days of California the same belief was entertained, but when one considers that before the discovery of California the few gold mines which were worked in Europe, Russian-Asia and South America, are extremely insignificant in comparison with those of California, as well in quantity as quality, it will be confessed that here a new field of mining is set before us in which

experience must first be gained. If such a prejudice could long continue here, it would be only the result of a false method of judgment. The exhaustion of single rich surface openings, limited in extent, the transition with the depth, of deposits of fine gold into gold bearing quartz which one could not extract, but especially through ignorance of mining, and the disproportioned increase of expense for deep working, and the consequent difference of outlay and income, all these were the real reasons for perpetuating such an idea. The consequences of this supposition were disastrous, for quartz mining for years fell into complete stagnation. In the year 1864 it first began to revive, stimulated by the example of the mines in Grass Valley, and in a short time it has made immense progress. The knowledge that has since been gained assures it a great future. Abandoned mines have been taken up again, and contrary to expectation have been found more productive than ever, since they had become acquainted with proper methods for the treatment of the quartz and the use of the Washoe ores.

First of all it is established that lodes bearing gold at the surface contain gold at every known depth, that the value of it frequently remains the same, and more frequently increases than diminishes, that lastly, the gold in the majority of lodes, is diffused according to simple laws, while the ores which contain it are in the form of extended columns.

The columns of ore commonly consist in their whole mass of available material for crushing, and in many cases increase in thickness and value with their depth. Indeed there are veins, the so-called pocket veins, which contain considerable little heaps of native gold in irregularly scattered clusters. These veins, the working of which is very uncertain and attended with great expense, were in former times preferred, and gave especial occasion for the decline in gold mining. Now, less attention is devoted to them, for such veins are sought for as contain gold in moderate masses; veins, which earlier, were for the most part unnoticed. The most remarkable instances of this occur in Grass Valley, where of late more openings have been made than any other place in California. The best known is the Eureka mine of that place. Here the ore contains at the surface only twelve dollars (\$12) per ton of 2,000 pounds, and this for a small extent of the vein. At 100 feet depth, it contains twenty-five dollars (\$25) and at 200 feet depth forty-two dollars (\$42) per ton. Now the works are 300 feet deep, where a great part of the ore pays seventy dollars (\$70) per ton; at the same time the vein matter has increased from two feet in thickness at the surface to five feet, and at a depth of 300 feet has extended in length to 380 feet. The entire mining expenses amount to the unusually high average of fifteen dollars (15) per ton, and 35 tons are crushed daily; so the net profit is very considerable, and increases with every foot in depth. In the year 1863 the owner demanded for the mine \$10,000—in 1864 \$100,000, without being able to sell. In the Summer of 1865 he was offered \$400,000, and since, by the sale of portions, the price has risen to \$800,000. Similar instances have occurred in many other mines in Grass Valley; for example, the Ophir Hill mine and the Jose mine, where, at the re-opening of mines very productive ten years ago and then abandoned, the same facts were confirmed. The Ophir Hill mine increased in value in fourteen months some hundreds of thousands of dollars—experience was similar in other parts of California. In the famous Hayward mine, which is opened to the depth of 1,200 feet, the average of the ore has increased from \$8 per ton on the surface to \$26 per ton at the greatest depth. The thickness of the vein matter is from 4 to 20 feet—its length 600 feet. The expenses amount in this mine to \$5 per ton. The results of this well known mine are only important because they have been worked ten years.

Besides the wonderful regularity, and the persistency of the recurrence of the gold in veins and the certainty of it according to the depth, gold mining has still other advantages. While the silver here appears in inhospitable and distant regions, the gold veins from their position on the west slope of the Sierra Nevada