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Report of 1873

ITEM 2

for yr 1872

MINING INDUSTRY

Statistics of mines and mining
THE STATES AND TERRITORIES OF THE ROCKY
MOUNTAINS,

INCLUDING

DESCRIPTIONS OF QUARTZ, PLACER, AND HYDRAULIC MINING;
AMALGAMATION; CONCENTRATION; SMELTING, ETC.

BY

[254]

ROSSITER W. RAYMOND, PH. D.,

U.S. COMMISSIONER OF MINING STATISTICS, PRESIDENT OF THE AMERICAN INSTITUTE OF MINING
ENGINEERS, LECTURER ON MINING GEOLOGY AT LAFAYETTE COLLEGE, ETC.

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NEW YORK:

J. B. FORD AND COMPANY,

1,500 tons of ore have been extracted, the greater part of which still remains on the dumps. It assays about \$30, and came principally from an excavation raised from this tunnel some 80 or 90 feet. The ore is an argentiferous zincblende, averaging about 7 per cent. of zinc, and carrying about one-third of its value in gold. It also contains a quantity of iron-pyrites with traces of copper-pyrites. The pink carbonate of manganese is met with in the hard rock in the vicinity of the rich clay pockets. The country-rock is a soft, greenish-blue porphyry.

A 20-stamp mill was erected in 1872, with a White's revolving roasting-furnace. Three hundred tons were worked, when operations were suspended in consequence of the furnace failing to do its work, the chlorination not exceeding 47 per cent. of the assay value. Wet crushing was then tried, but abandoned, the clayey nature of the ore preventing its settling in the tanks. The funds of the company being exhausted, the mine and mill are at present idle, with the exception of two miners engaged in explorations from the lower tunnel. The work of these two men has shown that the ore is increasing in quantity below the level of the tunnel; and it is the intention of the company to erect hoisting-works this spring, it being the general opinion that this mine will prove a good investment if properly worked in depth.

Mogul district.—Of this district, lying north of the Monitor, the Morning Star used to be the representative mine. It has not been worked for three or four years. Good cupriferous silver-ore, associated with a very large amount of iron-pyrites, has been from time to time taken out and sold in San Francisco at from \$100 to \$150 per ton. A parcel sent to Swansea sold as high as \$300 per ton. There is a very complete set of steam hoisting-works and pumps, and it is said work will soon be resumed.

The leading mine of this district at present is the *Leviathan copper-mine*, for a full description of which I am indebted to Mr. W. T. Rickard, F. C. S., of London. I give his account in full:

The Leviathan mine is situated five miles north of the town of Monitor, in the Great Mogul mining-district. The property is covered by fine timber, and the Leviathan Creek running through the claim, and communicating with the Carson River, furnishes an abundant supply of pure water all the year round. Following the course of this creek, a toll-road has been surveyed, which, when completed, will enable the mine to ship ore at all seasons of the year, at very moderate rates, to the San Francisco market, via the Central Pacific Railroad branch through Carson, an extension of which is expected to be made shortly to the Aurora and Cerro Gordo districts, which will then place the Leviathan within twelve miles of railway communication—a most important feature in copper-mining operations.

The claim consists of 3,800 feet, running north and south, having an average surface-width of 1,000 feet; the geological formation being metamorphic sandstone, which can be traced over two miles in a north and south direction, beside other outbursts in different parts of the locality, all of which are more or less metalliferous. This sandstone reposes on a formation of blue clay, with water-worn boulders of trachyte, varying in size from a pebble to masses of several tons' weight. The formation dips 30° E. The west country-rock is trachyte, that on the east gray porphyry.

This mine was opened in 1863 by some poor working miners, who drove in a tunnel about 400 feet, with an air-shaft some 150 feet beneath the croppings. Finding neither gold nor silver, and not considering the copper which had been struck worthy of attention, they abandoned the undertaking, and it remained in abeyance till 1869, when operations were resumed by the late Edward Dorsett, of London, under my superintendence, with a view of developing the very promising indications for copper. This work has opened out an immense deposit of unusually rich ore, two-thirds of which have proved, from sales of some 500 tons taken out during the exploratory operations, to carry over 30 per cent. copper. The quantity now in sight has been variously estimated, by some of the best judges in California and Nevada, at from 1,500 to 2,000 tons.

With a view of draining the upper works, and taking out ore to better advantage, a second tunnel has been run, 176 feet below the upper one. This is now in 928 feet.

An incline also has been started to connect the two tunnels, and is now completed within 30 feet. When the connection has been effected, perfect drainage and ventilation will be secured; and it is estimated that a minimum of 10 tons per day can be taken out for \$2 per ton.

Up to the present time the explorations in the upper tunnel have not reached the boundaries of the first deposit struck in 1863, though it has been opened out to a circumference of 300 feet horizontally on the floor; and for 60 feet down the incline, ore of 55 per cent. copper, connecting with the same deposit, (bunch or *Stockwerk*,) has been gone through, from 3 to 5 feet in thickness. Twenty-five feet below this is a stratum of sandstone, 20 feet thick, impregnated to the extent of 26 per cent. with pure sulphur.

The copper is mineralized in the form of silicate, black and red oxides, and gray sulphide, with metallic copper in a finely-divided condition. The sulphide predominates in depth, and the oxidized ores near the surface, while over all is found the customary deposit of red oxide of iron, (the "iron hat" of the Germans.)

In addition to the large deposit discovered in the upper works various other deposits or bunches have been found in other portions of the sandstone, which appears mineral-bearing from the croppings to its lowest part, resting on the clay and boulder formation, a thickness of more than 300 feet, evincing thus its identity with those practically inexhaustible deposits of copper found in the celebrated sandstone formations of Bolivia and the Isle of Anglesea.

In consequence of the death of the late enterprising proprietor, operations are at present suspended; but it is expected they will soon be resumed by an English company, with sufficient capital to complete the opening out of the mine, and erect bluestone works for the purpose of utilizing the low-grade ores, which cannot at present be shipped to advantage.

The existence of an apparently unlimited supply of sulphur for the purpose of manufacturing the sulphuric acid required for producing the bluestone, and the absence of lime in the matrix, together with the unusually small proportion of iron found in the ore, offer peculiar advantages for the manufacture of sulphate of copper on the spot, whence it can be delivered to the Washoe market at a cost not exceeding one cent per pound, and find a ready sale to the extent of from 5 to 7 tons per day.

The Leviathan mine has been nearly self-sustaining for the last two years; the ore taken out in merely exploratory operations having realized over \$30,000 by sales to the bluestone manufacturers of Nevada and California. The production of bluestone at a cheap rate, within fifty miles of Virginia City, will doubtless prove a great boon to the Comstock mines, the economical reduction of these ores being greatly dependent on the liberal use of this indispensable article, particularly in reworking tailings.

It may be mentioned in conclusion that copper has been found in a north and south direction in the Pine Nut range of mountains and its spurs, forming the eastern boundary of Carson Valley, all the way from near the town of Dayton to the Leviathan mine.

Up to a recent period the mines of Alpine County have been mostly owned by poor miners and others, who, unable or unwilling to work themselves, have steadily refused to sell unless at highly exaggerated, in fact ridiculous prices. Tired of playing this part they at last offered inducements to Eastern and English capitalists, who found the mines totally undeveloped. This will account for the time which has elapsed since the discovery of the mines without the achievement of satisfactory results.

MONO COUNTY.

This county contains the following mills: The Pioneer, at Montgomery; an arrastra, barrel, and lavadero roasting-furnace now being added; run by water-power; worked last summer 125 tons of ore, assaying from \$100 to \$700 per ton; average \$247 per ton. Extracted about 85 per cent. of assay, and paid well. Also worked over about 100 tons of tailings. Riley's mill, also in Montgomery; small stamps and pans; run by water-power; formerly profitable, idle and dilapidated now. A small mill at Hot Springs, owned by J. Partz; four small stamps; barrel and separators; water-power; process same as Pioneer mill, working about a ton a day, and fairly profitable. W. J. Williams & Co.'s mill was built in 1871; steam-power, ten stamps, two pans, two separators, and a White's furnace.

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