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PIOCHE DISTRICT

Pioche Mines Co.

The morning of June 8th was spent in calling upon Pioche mine operators and officials. Mr. John Janney, Pres. & Gen. Manager of Pioche Mines Company, gave us much information regarding recent developments. Mr. Janney has for some years been effecting a consolidation of a number of the well-known old mines of Pioche, located mainly in the quartzite area, which has been so productive in years gone by. The loss of this company's fine new mill by fire was a serious setback.

Combined Metals Reduction Company.

In the afternoon we drove out to the new Caselton Shaft, a few miles west of town, and called on Superintendent L. G. Thomas, who arranged for Foreman Henry Coleman to take us through the mine via the No. 1 Shaft at Pioche, the following morning. Mr. Thomas gave us a verbal picture of the geology of the district, and of the very important part geological work has played in the blocking out and development of great ore reserves at Pioche.

The Pioche Range is composed of Cambrian sedimentary rocks, consisting of limestone, shales and quartzite. The quartzite is the bottom member of the sedimentary series, and is over 1500 feet thick. Conformably overlying it are alternating beds of shale and limestone to a depth of 1500 feet or more. The older mines were in fissure veins in quartzite, on a raised block of the sedimentaries from which the limestone members have been eroded away.

Into the sedimentaries have been intrusions of granite, and also subsequent Tertiary volcanics, both of the acidic and the basic types. In the quartzite the fissure vein matter was quartz containing chloride of silver, lead carbonate, a little gold, and but little sulphides.

The mineralizing solutions ascended through fissures and deposited their minerals in certain preferred strata of limestone, by replacement, thus forming the extensive bedded ore deposits. There are four distinct ore horizons, and, according to Lincoln, three types of bedded ore deposits: gold-silver-lead beds at limestone-shale contacts, extensive silver-lead-zinc beds in limestone, and extensive manganese-iron-silver-lead-zinc beds in limestone.

Until recently the extent of the sedimentary ore beds was unknown, and mining them was attended with much greater difficulty than now. This was because of the fault system, which displaced numerous blocks of the sedimentaries. Segments were moved either upward or downward, in each case an unknown distance. This unknown factor of displacement has now been to a great extent eliminated by geological, miscroscopic and chemical study of the numerous shale and limestone strata, whereby each can be identified and recognized anywhere in the mine or district. By this means it is learned whether the displacement is either up or down, and the approximate amount of movement is known. In the Combined Metals Mine ore displacement of the bed was 200 feet vertically. Others are only a few feet, yet in each instance the vein has been recovered and the development proceeded. The excellence of the work of identifying the numerous shale beds will be understood when it is explained that nearly all of them look exactly alike. The mi microscope

reveals differences in structure; analyses show differences in proportions of calcium and silica, and certain skeletal forms of silica crystals occur in one bed that do not appear in another. Even the color of the acid solutions is an aid in this work.

Several thicker beds have physical characteristics which enable an easy identification, and these are designated as the A, B, C, and D beds. There are ore horizons, the greatest of which is the "D" bed, named the C-M, or Combined Metals bed. It is a thick, bottom limestone member, next to the quartzite, and has been extensively replaced by ore, due to some quality which made it preferred by the mineralizing solutions. Other beds have local named: the "Prince Lime", "Chism Shale", "False Prince", "Susan Duster", "Davidson Lime", etc.

To Mr. Earle B. Young, geologist of Salt Lake City is given much credit for this work, in which he has been assisted by an able staff.

Several fissures traverse the area and adjacent to these the mineralization in the C-M has been complete. Major among these is the Greenwood Fissure, having an east and west strike. Fissures therefore are looked upon with favor, and a humorous whim has been to name them after mine officials, the "Buckler", the "Snyder", etc., while faults, cutting off ore bodies, are named after shift-bosses or persons of lesser rating in the organization.

From 7 a.m. until 1:30 p.m. we remained underground with Mr. Coleman, and can substantiate the statement that in excess of 70,000 tons of ore have been blocked out. During February and March, 200 to 300 tons per day was hoisted from the 1200' level using a 2½ ton skip with a counterbalance and working 2 shifts. The surface equipment consists of a steam plant, hoist and compressor.

In the Caselton Shaft the C-M ore bed was cut at 840', and has been drifted upon 800' in low grade manganese-zinc-lead-silver ore.

The drift on the 1200 foot level of No.1 shaft is now out 5,000 feet westerly toward the Caselton workings whence it is being driven for a connection. Present ventilation is by a suction fan, through 16-inch pipe. Mine haulage is by a Mancha locomotive. Park City slushers are used to draw ore to the chutes, tuggers for raises from stopes to levels. There is no ground squeeze, movement or swelling. There are many large open stopes. Filling is used only for storing waste to avoid hoisting. In two places some interesting timber cribs have been built by Mr. Coleman to hold up the top of stopes over 20 feet high. The ore was shipped to the Combined Metals Red. Co. flotation plant at Bauer, Utah, of which plant the National Lead Co. owns 75%.

The average content of ore shipped was .03 ounces gold, 8 ounces of silver, 8% lead, and 18% zinc. The zinc can now be effectively separated by a flotation method invented by Mr. E. H. Snyder, principal owner of the Combined Metals.

Mr. J. H. Buehler, Gen. Supt. of the Bristol Mines Company, which is affiliated with the Combined Metals Red. Co., stated that some 5 million tons of low grade ore had been developed in that mine. The incline shaft on the Stella claim is 21,000 feet long, and is still 500' from the objective, which is a strong N & S fissure. Water was encountered at 500 feet and continuous pumping has been necessary. The ore is termed magno-siderite; and is a combined manganese iron carbonate, containing lead and zinc as sulphides. The ore in this big incline contains 46% of manganese-iron carbonate from top to bottom, while the lead and silver content ranges from 1 oz. silver and 1% lead at the top,

to 5 ozs., and 5% at the bottom of the incline, and is increasing as depth is obtained toward the objective. There are three distinct sets of fissures at Bristol. Those striking NE bear lead and zinc; NW, lead and silver, E and W manganese, iron, lead and silver. Combinations of these metals occur where the fissures cross. Up to the 15th of May the mine shipped 100 tons per day to the Bauer plant.

Having successfully solved the problem of zinc separation, Mr. Snyder is now working to separate the manganese which much of the ore contains. Future plans are for a large reduction plant near Pioche, probably below the Caselton Shaft. At present the Caselton shaft is making 312 gallons of water per minute on the 1,000 foot level, which pleases the management because it is highly necessary to the projected mill. The shaft is to be sunk to 1550 feet to get below the developed ore bodies in No. 1 Mine to the east. All Combined Metals ore will be hoisted through this shaft when the project is completed.

The Caselton Shaft is new and modern in all respects and will greatly reduce costs. It has three compartments, an 80-foot steel headframe, and is equipped with a 200 HP Nordberg electric hoist and 2,000 cu-ft. compressor. Power is generated at Jackrabbit, 18 miles north, where a central Diesel-driven electric plant for both the Combined Metals and Bristol mines is located.

There are great ore reserves seen at Pioche, already developed, and miles of adjacent area, yet undeveloped but sufficiently explored to lead to the belief that it is underlaid by continuations of the zinc-lead-manganese ore beds. It gives ground for an opinion that this will in time become one of the worlds greatest producers of zinc, with manganese as a valuable byproduct.