found as a thin coating to the inside of a quartz geode. This ore is quite scarce at the Eudy mine. It seems to have been replaced by the blende. The smithsonite or carbonate of zinc is found in white scales and in granular masses, coating calamine and blende. It is also commonly found as a brownish earth, whichhardens when dry. It is found near the center and along the west side of the mine. It has often been mistaken for clay. This is also mined at present by a small number of men. The sphalerite or zinc-blende is not mined. It is found throughout the mine, with pyrite disseminated through it. It is not met with in as large quantities here as at the Eudy mine. Greenockite (sulphide of cadmium), hydrozincite, and goslarite (sulphate of zinc) are met with in smaller quantities. The sulphate of zinc is scarcely ever found. A considerable quantity of greenockite has been mined. It is found as a yellowish powder coating blende and limestone. It was formerly separated at the Bethlehem works."

(J. Eyerman, 1883.)

Description by H. S. Drinker

The mines were originally worked as open cuts, commencing at the outcrop, found by Prof. Kopper. The ore was easily and cheaply extracted so long as it was possible to pursue this system. From twelve to fifteen thousand tons per year were taken out in this way, at a cost of about a dollar per ton. At present, the cost of mining a ton of blende is $6, and a ton of earthy ore $12. About twenty thousand tons of both sorts are mined per year.

Pumping.—The chief difficulty encountered in working these mines is the large amount of water which must be kept under control. In 1854 the open cut of the Ueberroth mine, twenty feet deep, was drained by centrifugal pumps, which were subsequently replaced by a double-acting pump capable of raising 200 gallons per minute, from a depth of 40 feet. In 1861, a Woodward pump, now in use at the smelting-works of the company, was put up. This was, however, too small to do the work, and in 1863 a Corliss engine, driving four centrifugal pumps, capable of pumping about 2500 gallons per minute, was put up. In 1866, the West engine, still in use, and capable of pumping 3700 gallons per minute, with 16 strokes, was erected, and the same year the shaft was sunk to a depth of 132 feet. The centrifugal pumps have since been removed, as the loss by friction was found to be 47 per cent.

Total Amount of Water to be Pumped.—The following summary may be interesting as showing the total pumping capacity of all the pumps about the mines:

The new engine, ........................................ 17,000 gallons per minute.
The West engine, ........................................ 5,700 " " "
The Bull engine, ........................................ 1,800 " " "
The small engine, ........................................ 235 " " "

Total, ........................................... 24,735 " " "
or 35,618,400 gallons per day.

The blende, as it comes from the mines, is crushed in a Blake’s crusher, and passed over a sieve with one mesh to the inch. The larger pieces, which pass over the sieve, are separated from the gangue by hand, and the ore sent directly to the work, or roasted in heaps 26½ feet long, 14½ feet wide, and 8 feet high, holding 50 tons. The ore is placed upon iron grates supported by two lateral walls and one central wall, all of stone. The centre wall is three feet thick, being twice the thickness of those on the sides. Wood placed beneath the grates is used for firing. The small stuff which passes through the sieve, when it comes from the crusher, is, at present, laid aside for future treatment. The crusher needs about 10 horsepower, and, with one man to feed it, does the work of four men breaking ore by hand. The silicates and carbonates are washed, sized, and the larger pieces sent at once to the works. The sands are concentrated by budding or jigging. The conical washer, in which the ore is washed, is