

Monowai Company.—About five years ago Messrs. Hansen and party took up a mining claim, and since then have formed a company to work the ground. The lode is cut near the surface. It is about 10ft. in thickness; but the ore is of a refractory character. In some portions of the lode there are patches of zinc-blende, galena, and copper-pyrites. The manager informed me that the assay-value of the ore was about £6 per ton. Five tons of it was treated at the School of Mines, Thames, which yielded from £3 3s. to £16 per ton, but he thought the lode would have an average value of about £4 per ton. A level has been put in about 90ft. below where the lode was cut near the surface, and the lode was found here to be nearly 30ft. wide, having about 8ft. of good ore on the hanging-wall side. The mine-workings are about three-quarters of a mile back from the Waiomo Creek, where the reduction plant is placed.

Gem Mine.—This mine belongs to the Monowai Company, and is situated about a mile distant from where the reduction plant is placed on the side of the Waiomo Creek; and at an elevation of about 700ft. an adit has been driven for over 200ft., which is termed No. 1 level, giving from 30ft. to 50ft. of backs. The lode varies considerably in width, but it may be set down as having an average of 2ft. The manager informed me the value of the ore was about £3 per ton, but very little gold could be seen in the stone. Another level was being constructed at the time of my visit about 45ft. lower than No. 1 level.

Reduction Plant.—The reduction plant belonging to the Monowai Company consists of a rock-breaker by Baxter, of Leeds, ten heads of stamps, and a complete cyanide plant. The whole of the work was done by A. and G. Price, the well-known ironfounders and mining-machinery makers at the Thames, and all the workmanship in connection with it is first-class. It is erected at the foot of a main spur leading down from the range to the Waiomo Creek, on the site on which the Paroquet plant was formerly erected. The stamps and mortars are of the American pattern, the ore being fed by two automatic Challenge ore-feeders. The ore is first dried in a kiln similar to those used by the Waihi Company, and the pulverised ore, after passing through the screens, which have a thirty mesh, falls into boxes in front of the mortars, and thence it is lifted by elevators into dust-bins, which are placed at such an elevation that the ore can be drawn from them into the percolation-vats. These vats are 22ft. in diameter and 4ft. 6in. deep, and capable of treating about 25 tons of pulverised ore. The sumps are 14ft. 10in. in diameter and 4ft. 6in. deep. The mixing-tank being 10ft. in diameter, having a depth of 4ft.; and the dissolving-tank is of iron, 4ft. diameter by 4ft. deep. The gangue, after leaving the percolation-vats, is run out with water and passes down a chute and over copper-plates coated with quicksilver. It is found that this latter system of the final treatment of the tailings is the means of saving a good deal of gold. It is well known that unless gold is in a very finely divided state, the cyanide solution will not dissolve the whole of it. The action of the cyanide will leave the surfaces of any coarse particles of the gold that are not dissolved in a clean, bright condition, so that when it comes in contact with mercury it is readily amalgamated.

Broken Hill Mine.—This mine adjoins the north-west boundary of the Monowai holding. The lode is about 2ft. in thickness, and an open cutting has been made near the surface for the purpose of taking out some of the ore to have it treated, it being similar in character to that found in the Monowai ground. A parcel of 3,300lb. of ore was tested at the School of Mines, Thames. One ton of this was treated with a cyanide solution, the assay-value of the ore being £3 12s. per ton. A saving of 76 per cent. of this value was effected. The remaining $\frac{1}{2}$ ton had an assay-value of £7 per ton, and was treated with chemicals and hot-amalgamation, which resulted in a saving of 59.3 per cent. of the assay-value.

The refractory character of the ore on the Waiomo field is such that there has not been a large percentage of the bullion in the ore saved owing to the quantity of copper-pyrites. Mr. Arthur G. Wilson, of Waihi, has furnished the Monowai Company with a report which has an important bearing on the treatment of ores of this character with cyanide solutions. Mr. Wilson states:—

“On looking over the returns it will be noticed that there is a large shortage in the actual recovery as compared with the assay extraction both with the Gem and Monowai ores. In the case of the Gem, it may be remembered that the interim clean-up was only a partial one. As a matter of fact, some £63, or 22 per cent. of the total value of the ore treated, was left in the extractors, less leakage. With the Monowai, the shortage in the actual recovery is much more pronounced, as only some 35 per cent. of the total value in this ore was cleaned up, and a few words of explanation are necessary. When the ore was being treated the zinc in the extractors was continually becoming covered with metallic copper, which, of course, prevented the complete precipitation of the gold. To overcome this difficulty the extractors were frequently emptied and the contents coated with lead. The zinc thus coated was found to work properly, but with all the handling thus entailed the zinc naturally became broken up very fine, and the gold became distributed throughout all the various cells in the extractors instead of being confined to a great extent to the top cells, as is the case under normal conditions. At clean-up time it was found that the zinc actually carried more bullion than the so-called slimes, and the greater part of the fine zinc in one extractor was melted up. We were compelled to leave the fine zinc in the other box quite intact owing to the tedious nature of the operation which would have been involved in its melting. Some £186, or 28 per cent. of the Monowai ore, was thus left in the extractors (unavoidably), less any loss due to leakage, so that but for the trouble with the fine zinc the percentage of the total value actually recovered would have risen to about 63 per cent. I append an approximate table, which shows clearly, both with the Gem and Monowai ores, the manner in which their original values have been distributed, and that the total of some £249 (less leakage) remains in the plant, to be carried forward in the next run. The assays show an extraction of 80 per cent. of the total value (gold and silver) of the Gem ore and 63 per cent. of the total value of the Monowai ore before treatment. With this latter ore silver makes 15 per cent. of the total value, and the loss in the tailings is principally in gold—thus: Total value in ore saved by assay, £63 2s.; total value left in residue—gold £22 9s., silver £13 8s.: total, £98 19s.