

THE SMELTING OF TIN ORE AT THE MOUNT BISCHOFF TIN SMELTING WORKS, LAUNCESTON.

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THE ores received at the Mount Bischoff works for the half-year ending 30th June, 1899, are given below, and this is about an average of each half-year's work :—

820 tons, Mount Bischoff, first quality (crushed ore), assaying	72·1 per cent.
69 tons, Mount Bischoff, 2nd quality (crushed ore), assaying.....	67·5 „
541 tons ores smelted for the public (chiefly alluvial) assaying.....	71·7 „
1490	

From a smelter's point of view these ores are, as a rule, remarkably pure, there being no impurities in them to prevent the metal being refined up to market quality. The impurity in the Mount Bischoff ores is principally iron, and that in the alluvial ores is silica, and it is a mutual advantage to smelt both together, the iron in the former combining with the silica in the latter to form slag. When the alluvial ores are smelted by themselves it is often necessary to add iron in some form.

The furnaces used are of the reverberatory type, the draught being supplied by a chimney. A charge is made by mixing 50 cwt. of the various ores with about 10 cwt. of small coal; this is thrown into a hot furnace and the doors carefully closed to exclude air. The time taken to completely reduce the charge is eight hours, during which time it is subjected to several rabblings or mixings. When properly smelted the metal sinks to the bottom of the furnace, and the slags or impurities float on the top; the metal is then tapped into a float or brick-lined vessel and allowed to cool for some time, and the slags are skimmed out and reserved for further treatment; another charge is thrown in, and the operation repeated. The metal in the float is ladled into a large kettle, where it is refined by sinking billets of green wood under the surface; the heat of the metal converts the moisture or sap of the wood into

steam, and causes the contents of the kettle to be violently agitated; this has the effect of releasing any entangled portions of oxide or dross, which float to the surface and are skimmed off. Samples are taken at various times, and, when sufficiently refined, the metal is ladled into moulds. This metal assays 99.80 per cent.

The slags from the ore vary in richness, according to the quality of the ores smelted and the working of the furnace. These slags are broken up and mixed with small coal and lime and again smelted, the metal produced from them being very impure from the large amount of iron present. The iron is got rid of by smelting with the next charge of ore.

A few small parcels of ore contain traces of arsenic and copper, and sometimes lead, antimony, and zinc. These have to be treated separately. When arsenic is present every trace must be got rid of by roasting before smelting, otherwise, it causes the metal to be hard, and there are no means of eliminating it once it is alloyed with the tin.

Metal is sent from the works in the form of ingots, weighing 75 lbs. : this is for shipment to England. Smaller ingots are also made for consumption in the colonies.

From the ore sent to the works for smelting for private people or companies a deduction of 2 per cent. is made to cover loss in smelting; that is, for 20 cwts. of ore, at 72 per cent., 14 cwts. of metal, or 70 per cent., would be returned to them. This allowance is for ores of 70 per cent. or over; when the quality falls below that, a larger reduction is made, as the loss in smelting increases rapidly as the ores get poorer.

30th June, 1900.