

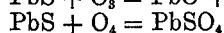
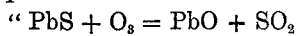
a reverberatory furnace and afterwards pan-amalgamated. They showed the following value per ton:—

" Bullion	...	...	...	...	...	...	Oz. dwt. gr.
							10 16 19
Gold	...	...	...	...	...	...	2 0 8
Silver	...	...	...	...	...	...	8 16 11

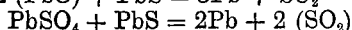
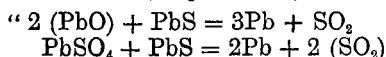
Value, £9 7s. 9d.

" The 420lb. treated in the pan yielded 40oz. amalgam, which proved, on a partial analysis, to consist principally of lead amalgam. When refined the amalgam returned 1oz. 5dwt. of melted bullion, 225·8 fine in gold and 745·4 fine in silver, representing a saving of 75 per cent. of the gold and 56·2 per cent. of the silver, or 72·2 per cent. of the value.

" The concentrates contained, in addition to iron pyrites, about 6 per cent. of lead in the form of galena, which was reduced to metal in the reverberatory furnace during the operation of oxidizing roasting, as shown by the following equations:—



and—



" The presence of the lead will render it impossible to treat these concentrates profitably and economically by roasting and subsequent amalgamation, since the reduced lead will always find its way into the amalgam and quicksilver, where it exercises a most injurious effect.

" No. 19.—This was a parcel of 500lb. of the above concentrates, which were treated by raw pan-amalgamation with chemicals. The return was 1oz. 1dwt. of melted bullion, 348·1 fine in gold and 632·5 fine in silver, representing a saving of 73 per cent. of the gold, and 21·3 per cent. of the silver, or 61 per cent. of the original assay-value.

" No. 20.—This was a parcel of moderately hard brown quartz from McNeill's claim at Matarangi. It contained free gold in an extremely fine state of subdivision. It weighed 2,180lb. It was dried, dry crushed, and sampled, and showed an assay-value per ton of—

" Bullion	...	...	...	...	...	...	Oz. dwt. gr.
							5 15 23
Gold	...	...	...	...	...	...	3 3 0
Silver	...	...	...	...	...	...	2 12 23

Value £13.

" The ore was then subjected to pan-amalgamation, and yielded 6oz. of bullion, 0·4500 fine in gold, and 0·3795 fine in silver, representing a saving of 88 per cent. of the gold, and 87·5 per cent. of the silver, or 88 per cent. of the assay-value. This is a very satisfactory result, and is of great value, as showing that this ore can be successfully treated by dry crushing and pan-amalgamation in charges.

" No. 21.—This was a parcel of 100lb. of ore from the City of Dunedin Mine, situated at Tararu Creek, Thames. It was a portion of parcel No. 6 from this mine, and was subjected to a thorough oxidizing roasting, and then pan-amalgamation in a charge. By this means 2dwt. of bullion were recovered, 416·4 fine in gold, and 443·6 fine in silver, equal to a value of £1 12s. 3d. per ounce, representing a saving of 71·3 per cent. of the silver, and 93·6 of the gold, or 91·3 per cent. of the value. The comparative results obtained from the raw and roasted ore are as follows:—

		Gold.	Silver.	Value.
" Percentage of recovery from raw ore	...	61·0	47·0	60·0
Percentage of recovery from roasted ore	...	93·6	71·3	91·3
Increase of recovery due to roasting	...	32·6	24·3	31·3

#### " WOODSTOCK REFRACTORY ORE.

" Last October two parcels of first-class ore, from the Woodstock Mine at Karangahake, were forwarded by Mr. J. McCombie for experimental tests. Although these tests were conducted on a laboratory scale they involved a large amount of time and careful manipulation, more especially as it was deemed necessary to conduct simultaneous checks of the experiments for comparative purposes, so as to insure accuracy of results. In the performance of these experiments I have to acknowledge much valuable assistance from Mr. A. T. Day, who is a most willing and reliable assayer.

" No. 1, *Free-milling Ore*.—This was a dark-blue, almost black, mullocky clayey ore, containing a large percentage of extremely fine black decomposing iron-pyrites. The ore was carefully dried, pulverised, sampled, and assayed, with the following result per ton:—

" Bullion	...	...	...	...	...	...	Oz. dwt. gr.
							56 4 4
Gold	...	...	...	...	...	...	23 1 5
Silver	...	...	...	...	...	...	33 2 23

Value, £97 4s. 3d.

" The dry pulp was then subjected to a careful oxidizing roasting at a dull-red heat. It was found that no loss of bullion was incurred in the operation of wasting. The roasted pulp was then treated by hot-pan amalgamation with chemicals for three hours, and it was found that 91·8