

saved and assayed, and stored until sufficient slimes have accumulated to make a cyanide charge. Should these slimes belong to several owners the amount obtained is distributed proportionately, after deducting the school charges. With careful amalgamation ore that is worth roughly an ounce to the pound (approximately £2 15s. per pound) will, with Thames stone, yield tailings worth £75 per ton; with Coromandel ore, about £12 per ton. This difference in values is due almost invariably to the presence of pyrargyrite with the Thames gold and its intimate association with blende. Ordinary grinding is not sufficiently fine to liberate the gold from these mineral particles, and it is therefore found in the tailings. Cyanidation will not extract more than 75 per cent. of the bullion from these tailings without further grinding.

Three separate parcels of river-sands from the bed of the Ohinemuri River were treated by concentration. These averaged a little over 1 dwt. of gold and 1 oz. of silver per ton. In every case concentration gave a product valued at from £4 to £7 per ton. The experiments showed that if these tailings could be cheaply lifted from the river-bed concentration would give a product from which the bullion could be obtained with comparatively low capital cost.

Two parcels of slags, one bank smelting residues and the other cyanide bullion slags, were treated by amalgamation.

One parcel of sand was treated by agitation with cyanide in B. and M. tanks, and a fair recovery obtained. Further treatment of this parcel will be made by amalgamation and cyanidation.

One parcel of complex sulphide ore was treated in three lots, and a series of experiments made to determine the adaptability of the ore for amalgamation, concentration, sand treatment, and slime treatment. During the treatment of this parcel over eighty estimations of gold, silver, zinc, lead, and copper were made to determine the relative values of the various grades.

Table showing Parcels of Ore treated at Thames School of Mines Experimental Plant, 1916.

Locality.	No.	Weight of Ore or Material, in Pounds.	Nature of Ore or Material.	Value received from Bank.
Thames	253	28	Silver residues	£ s. d. 14 7 6
Waikino	{ 254/1	869	River-sand
	{ 254/2	176	"
Paeroa	255	672	"
Thames	256	70	Picked stone	228 4 4
Coromandel ..	257	60	"	94 5 7
Thames	258	130	"	400 3 4
"	259	80	"	262 9 4
"	260	700	Slags, ashes, &c.	47 10 0
Te Aroha	261	1,700	Cyanide slag	33 0 10
Coromandel ..	262	200	Quartz	9 2 0
Thames	{ 262/1	2,293	"
	{ 262/X	567	Sulphide ore
	{ 262/D	1,390	Quartz
"	263	750	Sands and slimes	13 18 0
"	264	242	Picked stone	298 17 6
Totals	9,927	..	1,401 18 5

Notes on Treatment Results.

Parcel No. 254, river-sand from Waikino.—No. 1: Net weight, 869 lb.; assay value, 1 dwt. 13 gr. gold, 1 oz. silver: value, 8s. per ton. 369 lb. was washed through a 20-mesh screen and the undersize concentrated on a Wilfley table. 17 lb. of concentrate was obtained, assaying 1 oz. 7 dwt. gold and 5 oz. silver per ton. Value of concentrate, £7 18s. per ton. 500 lb. was then concentrated without previous sizing, but, as expected, this treatment was not successful, a concentrate being obtained which contained much river-gravel.

No. 2 was similar river-sand composed of a mixture of 79 lb. river-gravel and 97 lb. battery sand. Assay value, 2 dwt. gold and 1 oz. silver per ton. 12 lb. of concentrate was produced, containing 13 dwt. gold and 3 oz. 7 dwt. silver per ton. The latter was not a clean concentrate.

From a metallurgical point of view there is no difficulty in treating these sands. The commercial value depends on the facilities for lifting them from the river-bed, and their quantity. The plant required would comprise lifting, sizing, and concentrating machinery. On account of the high silver to gold proportions in the bullion the treatment of the sands, unless on a very large scale, would not pay: the economic value lies in the concentrates. The treatment of the concentrates would be either by tube-milling and cyaniding, or preferably roasting, amalgamation, and cyaniding.

Parcel No. 255, river-sand from Paeroa.—Three parcels of 2 cwt. each. Each parcel was separately concentrated and the concentrate returned to owner. Assays of concentrates: No. 1, 1 oz. 1 dwt. gold, 4 oz. 10 dwt. silver, per ton; value, £6 13s. per ton. No. 2, 18 dwt. gold, 7 oz. 7 dwt. silver, per ton; value, £4 6s. 7d. per ton. No. 3, 12 dwt. 16 gr. gold, 5 oz. 3 dwt. silver, per ton; value, £3 0s. 11d. per ton.