

In the treatment of Nos. 3 and 4, the potassium-cyanide seemed to act on the copper-pyrites in preference to the silver-sulphides. In the extractor, metallic copper was deposited on the zinc in considerable quantities. The whole of the bullion was practically deposited in the first three boxes, while most of the copper showed on the clean zinc in the lower boxes. From this it would appear that the zinc exerts a selective influence, precipitating the gold and silver first, and the copper afterwards. If this reaction is constant it would enable the operator to keep the most of the copper out of the bullion when treating ores containing a proportion of copper-sulphides.

At the request of Mr. L. Melhose, one of the owners, a mixed sample of Nos. 1, 2, and 3 was analysed, with the following results :—

Silica ...	...	...	...	...	...	...	87.63 per cent.
Copper-pyrites ...	...	...	...	...	...	...	0.56 "
Iron-pyrites ...	...	...	...	...	...	...	1.20 "
Zinc-blende ...	...	...	...	...	...	...	1.42 "
Galena ...	...	...	...	...	...	...	0.37 "
Alumina ...	...	...	...	...	...	...	1.62 "
Iron-oxides ...	...	...	...	...	...	...	3.95 "
Water and loss ...	...	...	...	...	...	...	3.25 "
Total ...	...	...	...	...	...	...	100.00

Nos. 1 and 2 were thoroughly-oxidized surface ores, containing no metallic sulphides, consequently the whole of the copper- and iron-pyrites, galena, and zinc-blende must be credited to No. 3, which contained more base sulphides than an inspection of the analysis would imply.

Analysis of No. 4 :—

Silica ...	...	...	...	...	...	...	90.15 per cent.
Copper-pyrites ...	...	...	...	...	...	...	3.78 "
Iron-pyrites ...	...	...	...	...	...	...	4.40 "
Galena... ..	...	...	...	...	...	...	0.25 "
Zinc-blende ...	...	...	...	...	...	...	0.26 "
Alumina ...	...	...	...	...	...	...	0.13 "
Water and loss ...	...	...	...	...	...	...	1.03 "
Total ...	...	...	...	...	...	...	100.00

In the case of parcels Nos. 1 and 2, the laboratory extractions were as follow :—

	No. 1.	No. 2.
Gold ...	96.7	94.0
Silver ...	87.4	60.0
Value ...	95.0	89.0

*Remarks.*—In the case of the oxidized surface ores the extraction was very high, and easily effected. With parcels Nos. 3 and 4 the extraction was much lower, although quite payable. The small recovery in these cases was directly traceable to the mineralised character of the ore, which contained, as shown by the analysis, a considerable percentage of copper-pyrites, which acted on the potassium-cyanide. The laboratory results, however, show that higher extractions than those obtained on a working scale may be looked for. The results, however, prove that the different grades and qualities of ore from the Monowai Reef can be successfully treated by the Cassel cyanide process.

*No. 2.—Ore from Ohui, East Coast (forwarded by McGregor and Party).*

This was a parcel of moderately-hard quartz, quite free from metallic sulphides, and containing only a small proportion of iron-oxides and clayey matter. The whole of the ore, weighing about 2 tons, was dried and then dry-crushed. The first portion crushed, amounting to nearly a ton, was treated by the Cassel cyanide process, and the second portion (nearly the same in weight) was subjected to raw hot pan-amalgamation with chemicals, partly for comparative purposes, but chiefly on account of the difficulty experienced in separating the cyanide solutions from the leached pulp, a result due to extreme fineness to which the ore was reduced in our two-stamper battery. The assay-value of the second portion was much higher than that of the first, due to the inclusion of three bags of selected gold-bearing quartz.

No. 1: 2,115lb., treated by Cassel process :—

	Assay-value.	Oz.	dwt.	gr.	Recovery.
Bullion ...	...	40	6	10 per ton.	...
Gold ...	...	4	4	10 "	85 per cent.
Silver ...	...	36	2	10 "	46 "
Value, £19 10s. per ton.					80 "

No. 2: 1,980lb., treated by pan-amalgamation :—

	Assay-value.	Oz.	dwt.	gr.	Recovery.
Bullion ...	...	53	12	0 per ton.	...
Gold ...	...	8	14	21 "	67 per cent.
Silver ...	...	44	17	3 "	43 "
Value, £38 6s. 9d. per ton.					64.5 "