

"The ore was crushed wet, and then passed over amalgamated copper plates, which saved 6oz. 18dwt. 3gr. of bullion, valued at £2 1s. 10d. per ounce, equal to a saving of £14 8s. 8d. per ton, or 41·9 per cent. of the assay-value.

"The sluices and tailings which had been collected in settling-pits were subjected to raw hot-pan amalgamation with chemicals, and yielded 14oz. 14dwt. 14gr. of bullion, 209·2 fine in gold, and 752·2 fine in silver, valued at 19s. per ounce; representing a further saving of £14 per ton, or 40·6 per cent. of the assay-value.

"The headings were treated in the berdan pan, which saved an additional 19s. 8d. of bullion, equal to 2·9 per cent. of assay-value, making a total saving of 85·4 per cent. of the original assay-value, as shown below:—

	Gold.			Silver.		
	Oz. dwt. gr.			Oz. dwt. gr.		
From copper plates	3	9	15	3	8	2
From pan with chemicals	3	1	17	11	1	12
From berdan pan	0	4	3	1	0	13
Total saved	6	15	11	15	10	3

"Percentage of gold saved, 89·5; percentage of silver saved, 69·0; percentage of value saved, 85·4. The bullion was sold to the bank at the School of Mines valuation.

"The above working-test was highly successful and satisfactory, and showed that the ordinary battery process combined with pan treatment could extract a high percentage of the bullion.

"No. 3.—This was a parcel of 2,000lb. of ore from Dixon's claim, situated at the head of Shot-over Gully, Thames Goldfield. It consisted of hard bluish-coloured cavernous quartz containing a large portion of iron-pyrites. It showed on its joints and surfaces a thin incrustation of proustite—the arsenical sulphide of silver—and was believed by the owner to be of great value. The ore was crushed wet and showed an assay value of—bullion, 21oz. 8dwt. 12gr. per ton; gold, 2dwt. 12gr. per ton; silver, 21oz. 6dwt. per ton: value, £3 14s. per ton. As the extraction of the bullion from the tailings could only be effected by subjecting them to a thorough chloridizing roasting before treating them in the pan, an operation involving some considerable cost, the test was not carried further, at the request of the owner.

"No. 4.—This was a parcel of 2,360lb. of ore from the New Find at Komata, which has recently been acquired by Mr. T. Russell, of Waitekauri. The ore consisted of wet brown-coloured mullocky quartz from the outcrop of the reef. It showed the following assay-value: Bullion, 37oz. 3dwt. 11gr. per ton; gold, 4oz. 11dwt. per ton; silver, 32oz. 12dwt. 11gr. per ton: value, £23 2s. per ton. It was crushed wet and passed over amalgamated copper-plates, which saved 4oz. 2dwt. 20gr. of bullion, 526·8 fine in gold and 468·4 fine in silver, or £2 3s. 6d. per ounce equal to a saving of £8 11s. 4d. per ton, or 39 per cent. of assay-value. The tailings were treated by raw hot-pan amalgamation, and yielded 20oz. 3dwt. 20gr. of bullion, 108·0 fine in gold and 852·0 fine in silver—representing a saving of £10 13s. 8d. per ton, or an additional 46·2 per cent. of the assay-value, making a total saving of 85·2 per cent, as shown below:—

	Gold.			Silver.		
	Oz. dwt. gr.			Oz. dwt. gr.		
" From copper plates	2	12	10	1	10	10
From pan with chemicals	2	3	14	18	0	5
Total saved	4	16	0	19	10	15

"Percentage of gold saved, 90·0; silver, 60·0: value, 85·2. This bullion was also sold to the bank at the School of Mines' valuation. This was a very satisfactory result, and of great value as showing that this class of ore could be profitably and successfully treated by wet-crushing and subsequent raw pan-amalgamation with chemicals.

"No. 5.—This was a parcel of ore from the Waipu Claim, Puhipuhi. It consisted of hard greyish-white quartz, partly amorphous with a banded wavy structure, and partly finely granular or crystalline, and often cavernous. It contained silver in the form of argentite, pyrargyrite, and proustite. It was dried, and then dry-crushed, showing an assay-value of—bullion, 34oz. 18dwt. 4gr. per ton; gold, 1oz. 5dwt. 1gr. per ton; silver, 33oz. 5dwt. 3gr. per ton: value, £9 9s. 11d. per ton. The dry pulp, weighing 1,900lb. was then subjected to a chloridizing roasting with 7 per cent. salt, and a little ferrous sulphate added to make up for the deficiency of natural metallic base sulphides in the ore. The roasting was a good one, 91 per cent. of the silver having been chloridized.

"Of the roasted ore 1,854lb. was hot-pan amalgamated, with a small quantity of copper-sulphate, and yielded 24oz. of bullion, 042·0 fine in gold, and 898·0 fine in silver, equal to 6s. per ounce, representing a saving of £8 14s. per ton, or 91·5 per cent. of the assay-value. Percentage of gold saved, 96·0; percentage of silver saved, 68·4; percentage of value saved, 91·5. The presence of the antimonial and arsenical sulphides of silver rendered the treatment of this ore somewhat more difficult than previous parcels from Puhipuhi; but this working-test showed that when chloridize-roasted a payable percentage of the bullion can be extracted.

"No. 6.—This was a parcel of 95lb. of so-called concentrates from a new pan erected in the Great Mercury battery at Kuaotunu. They consisted of clean coarse quartz-tailings, and when subjected to a fire-assay were found to contain no gold or silver. The gold at Kuaotunu occurs in microscopic particles, and it would appear that the gold escaped from the pan in the overflow with the slimes, while only the larger particles of quartz accumulated in the pan.

"All the labour connected with these tests—the assaying, sampling, roasting, amalgamating, retorting, &c.—was supplied by the students of the school under my own immediate supervision, and the instruction and experience gained in our experimental plant has in several instances proved of immediate value to them. The percentages of saving have been much higher this year than in