

"REPORTS ON WORKING TESTS.

"No. 1.—This was a parcel of 562lb. of ore from the Jubilee Mine, Waitekauri, forwarded for treatment by Mr. Edward Kersey Cooper, the owner. It consisted of grey-coloured crystalline and semi-crystalline quartz, containing about 15 per cent. of base metallic sulphides, which were principally iron and copper pyrites. The ore was crushed wet at the request of the owner, and passed over amalgamated copper-plates. The tailings and blanketings were collected in settling-pits, and afterwards treated by raw hot pan-amalgamation. Samples of the wet pulp were taken from the screen at regular intervals during the period of crushing, dried, sampled, and assayed, in order to determine the original value of the ore. The ore showed the following value per ton:—

| | | | | | | | |
|----------------|-----|-----|-----|-----|-----|-----|--------------|
| "Bullion | ... | ... | ... | ... | ... | ... | Oz. dwt. gr. |
| | | | | | | | 4 10 8 |
| Gold | ... | ... | ... | ... | ... | ... | 1 10 6 |
| Silver | ... | ... | ... | ... | ... | ... | 3 0 2 |
| Value, £6 10s. | | | | | | | |

"The amalgamated copper-plates saved only 1·5 per cent. of the original assay-value, which may fairly be attributed to the presence of so large a proportion of heavy metallic sulphides, and the finely divided state of the gold in the ore.

"The tailings, slimes, and blanketings yielded by pan-amalgamation 1oz. 6dwt. of bullion, 251·6 fine in gold and 709·4 fine in silver, equal to a value of £1 2s. 3d. per ounce, representing an additional saving of 87 per cent., or a total saving of 88·5 per cent. of the original value of the ore. The results of this test proved conclusively that this class of ore can be successfully treated by pan-amalgamation in charges without the use of chemicals, except when silver is present in paying quantities.

"No. 2.—This was a parcel of mullocky quartz forwarded by Mr. Robert Kelly, of Tapu. It weighed 100lb. dry weight, and showed the following assay-value per ton:—

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|--------------------|-----|-----|-----|-----|-----|-----|--------------|
| "Bullion | ... | ... | ... | ... | ... | ... | Oz. dwt. gr. |
| | | | | | | | 5 0 20 |
| Gold | ... | ... | ... | ... | ... | ... | 1 1 3 |
| Silver | ... | ... | ... | ... | ... | ... | 3 19 17 |
| Value, £4 16s. 6d. | | | | | | | |

"The dry pulp was subjected to raw hot pan-amalgamation with chemicals, and yielded 4dwt. 8gr. of melted bullion, 232·4 fine in gold; and 767·6 fine in silver; equal to £1 0s. 10d. per ounce; representing a saving of 89 per cent. of the original value of the ore.

"No. 3.—This was a parcel of 1,403lbs. of ore from the Hape Creek side of Una Hill, at the Thames. It was forwarded by Mr. Phillip Smith, a tributer. The ore consisted of a grey-coloured quartz and soft grey clay or pug, containing numerous nodules of solid copper and iron pyrites. The gold existed in a very finely divided state, principally associated with the copper pyrites, fragments of which were found to assay as high as £65 per ton. The ore was dried, then dry crushed, and afterwards subjected to a thorough oxidizing roasting. It showed when sampled the following value per ton:—

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|---------------------|-----|-----|-----|-----|-----|-----|--------------|
| "Bullion | ... | ... | ... | ... | ... | ... | Oz. dwt. gr. |
| | | | | | | | 6 13 14 |
| Gold | ... | ... | ... | ... | ... | ... | 3 15 15 |
| Silver | ... | ... | ... | ... | ... | ... | 2 17 23 |
| Value, £15 11s. 2d. | | | | | | | |

"The roasted pulp was treated by pan-amalgamation in three small charges, and yielded 3oz. 11dwt. of bullion, 601·2 fine in gold, and 372·8 fine in silver, equal to a value of £2 9s. 2d. per ounce, representing a saving of 90 per cent. of the original assay-value of the ore. A parcel of the same ore when treated by the ordinary battery process yielded at the rate of 1oz. 5dwt. to the ton, or about 23 per cent. of the value.

"No. 4.—This was a parcel of highly mineralised ore from the Alburnia Mine, Thames. It was forwarded for treatment by Mr. Thomas Radford, the manager. This ore was highly charged with iron and copper pyrites, and also contained a considerable proportion of antimonite. Its colour was mostly dark-blue or black, and it was somewhat clayey and friable. The parcel weighed 763lb. gross weight, and showed an assay-value of £184 4s. 5d. per ton, calculated on dry weight.

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|----------|-----|-----|-----|-----|-----|-----|--------------|
| "Bullion | ... | ... | ... | ... | ... | ... | Oz. dwt. gr. |
| | | | | | | | 89 10 11 |
| Gold | ... | ... | ... | ... | ... | ... | 44 7 6 |
| Silver | ... | ... | ... | ... | ... | ... | 45 3 5 |

"The gold existed principally in a very finely divided state, entangled with the base sulphides, and the silver in the forms of stephanite and pyrargyrite—the complex sulphides of silver and antimony.

"The ore was dried, dry crushed, and then subjected to a thorough chloridizing roasting. The loss due to drying, stamping, roasting, and handling reduced the parcel to 640lb., of which 630lb. were treated by hot pan-amalgamation for four hours, and yielded 19oz. of melted bullion, 0·6317 fine in gold, and 0·1160 fine in silver, valued at £2 10s. 10d. per ounce. This represents a saving of 67oz. 11dwt. 2grs. per ton, equal to a saving of 93·2 per cent. of the assay-value. Considering the character of the ore, this must be considered a very satisfactory return.

"No. 5.—This was a parcel of brown friable ore from Waiomo, forwarded by Mr. W. Eddowes.