

"No. 4.—This was a test of 1,165lb. of ore, showing an assay-value of £9 19s., being gold 2oz. 2dwt. 20gr., and silver 9oz. 4dwt., per ton. The ore was crushed wet, and afterwards treated in an iron pan, part with chemicals, and part without chemicals. The saving by both processes was 67·2 per cent. of the assay-value: 51·7 per cent. with chemicals, and 15·5 per cent. without chemicals.

"No. 5.—This was a parcel of 125lb. of ore from the same place as No. 1. It was treated in the berdan-pan without chemicals, and yielded 5dwt. of bullion, 860·4 fine in gold and 139·5 fine in silver, equal to a saving of 96 per cent. of the assay-value. The tests of samples Nos. 2 to 5 were conducted by the owner, Mr. Week.

"Ore from Caledonian Claim, Puhipuhi:—

"No. 6.—This ore consisted principally of soft silicious limonite (brown hæmatite) and very wet rusty-coloured mullock, containing occasional fragments of hard, whitish-grey coloured amorphous quartz, showing traces of argentite. The ore showed an assay-value of £5 4s. 6d. per ton. It was crushed wet, and passed over amalgamated-copper plates, which saved 2oz. 19dwt. of bullion, 298·6 fine in gold and 571·4 fine in silver, equal to a saving of £3 15s. per ton, or 71·5 per cent. of the assay-value. The tailings, which showed an assay-value of 10s., were afterwards treated in pan with chemicals, and yielded 1oz. 10dwt. of bullion, 010·2 fine in gold and 971·5 fine in silver, equal to a further saving of 7s. per ton, making a total saving of £4 2s. per ton, or 78 per cent. of the assay-value. These results were very satisfactory, and proved that ore of this grade could be treated successfully by ordinary amalgamation.

"Three Parcels of Ore from Prospectors' Mine, Puhipuhi:—

"No. 7.—This was a parcel of 3,700lb. of ore from the winze, No. 3 reef. The stone showed an assay-value of 53oz. 10dwt. of bullion, 004·1 fine in gold and 995·9 fine in silver. It consisted principally of hard, whitish-grey amorphous quartz, streaked with wavy lines of bluish-grey argentite, which is a free-milling ore. Small disseminated grains of ruby silver were occasionally but rarely seen. 1,820lb. were crushed dry and 1,880lb. wet, and amalgamated with chemicals for four hours, yielding 75oz. of bullion, 003·2 fine in gold and 769·8 fine in silver, equal to a saving of 45oz. per ton, representing 65 per cent. of the assay-value. The tailings from this working-test showed an assay-value of 18s. per ton.

"No. 8.—This was a parcel of 720lb. from the same place as No. 7. It showed an assay-value of 45oz. 7dwt. of bullion per ton, or £7 7s. 1d. It was crushed dry, and then subjected to a chloridizing roasting with 10 per cent. salt and 3 per cent. iron-sulphate, the latter being added to make up for the deficiency of natural sulphides in the ore. By hot pan-amalgamation with chemicals this parcel yielded 12oz. 12dwt. of bullion, 003·9 fine in gold and 996·1 fine in silver, equal to 39oz. 4dwt. per ton, representing a saving of 80 per cent. of the assay-value. The tailings showed an assay-value of 16s. per ton.

"No. 9.—This was a parcel of 2,530lb. of ore from No. 1 Level, No. 3 Reef, Prospectors' Claim. It was rusty coloured and mullocky, in this respect differing from the ore from the winze, which was quite free from metallic oxides. It was crushed dry, and sampled, showing an assay-value of 32oz. 7dwt. of bullion per ton, 003·1 fine in gold and 996·9 fine in silver, equal to £5 5s. 1d. per ton. By raw hot pan-amalgamation this parcel yielded 36oz. 5dwt. of bullion, 002·5 fine in gold and 799·5 fine in silver, equal to 32oz. 5dwt. of bullion per ton, representing a saving of 78·5 per cent. of the assay-value. The tailings showed an assay-value of 18s. per ton.

"These tests were very satisfactory, and showed that the class of silver-bearing ore present at Puhipuhi can be successfully treated by dry-crushing and pan-amalgamation with chemicals. Chloridizing-roasting may be expected to effect a saving of 12 to 15 per cent. more than by raw amalgamation, when working on a large scale; but with this class of low-grade ore it is doubtful if this extra saving would leave a margin of profit after covering the extra cost incurred in roasting, &c.

"No. 10.—This was a parcel of ore from the Just in Time Claim, Puhipuhi. It weighed 1,800lb., and consisted principally of hard, greyish-coloured amorphous quartz, often stained with iron and manganese oxides. It showed an assay-value of 13oz. silver and 5dwt. 6gr. of gold per ton, equal to a value of £3. It was crushed dry and then raw pan-amalgamated in an iron pan with chemicals, yielding 9oz. 3dwt. of bullion, 966·5 fine in silver and 015·9 fine in gold, equal to a saving of £2 7s. 5d. per ton, or 78·8 per cent. of the assay-value. The fine tailings showed an assay-value of 4s., slimes 3s. 6d., and heavy tailings (partly concentrates) 15s. 3d. per ton. Concentrates of tailings obtained by panning showed a value of £4 4s. per ton. The low value of the slimes would tend to prove that with a system of good settling-pits this class of sulphide ore could be crushed wet and then pan-amalgamated. This system would be advantageous in many ways, as by it very low-grade ore could be treated more cheaply and in larger quantities than by dry crushing.

"Ore from Caledonia Mine, Puhipuhi:—

"No. 11.—This was a parcel of 340lb. of rusty-coloured mullocky quartz, showing an assay-value of £2 15s. 6d., being gold 12dwt. 14gr., and silver 1oz. 16dwt. 7gr., per ton. It was crushed wet, and passed over amalgamated-copper plates, which saved 21gr. of bullion, 810 fine in gold and 190 fine in silver, equal to a saving of 34 per cent. of the assay-value. The tailings were collected in settling-pits and hot pan-amalgamated with chemicals, and yielded 3dwt. 20gr. of bullion, 283·5 fine in gold and 704·3 fine in silver, representing a further saving of 55 per cent. of the assay-value, being a total saving of 89 per cent.

"Salt and copper-sulphate were used in the amalgamating-pan with all these parcels, the proportion of copper-sulphate varying from 4oz. to 8oz. per 500lb. charge, according to the assay-value and nature of ore.

"The Occurrence of Tellurides of Gold and Silver.—During the past year I have devoted much time to the study of some of the causes of the loss of gold which is known to take place in different parts of the Hauraki Goldfields. I have, however, found it impossible to obtain definite information as to the actual or even approximate amount of the loss, as only at two mills are regu-