

chance that, if economically worked, and with improved gold saving appliances, it might leave a profit, notwithstanding the great expense connected with the procuring of fuel (brown coal from Shag Point) for a steam engine.

## APPENDIX 12.

## REEFS OF SHAG VALLEY.

In visiting this locality, Mr. Rich, of Bushy Park, and Mr. Harvey, of Dunedin, kindly acted as my guides and informants. The first reef I saw has been worked on both sides of a steep gully; on the one side, the most extensively, by Duncan, Glover, Reed, and Company; on the other side by the Shag Valley Lease and Freehold Company. It consists of irregular larger and smaller bunches of quartz, ranging from less than an inch to several feet in thickness, lying between the beds of the country, a hard, bluish-grey phyllite, which strikes N. 30° W., and shows an undulating dip north-eastward, at a mean angle of about 15°. Work was suspended on account of the uncertain thickness and auriferous character of the reef. A few chains higher up the gully a similar reef, or rather a succession of interlaminated bunches of quartz, has been worked by adits and open cuttings at several places on the eastern hill-slope; but here also work had to be given up for the same reason as in the former case. Some of the quartz bunches paid very well, but ran quickly out, and it took all the profit made, and more, to prospect for others. In the neighbourhood of this plain there are the ruins of a small battery of five heads of revolving stamps.

*The Shamrock Reef.*—This lies half a mile north-eastward from the last-mentioned workings, up the range, and consists of a bunch of rather good-looking quartz, 2 to 3 feet thick at the surface, but running out at 4 feet in depth: as proved by a small shaft sunk on it. In strike it is traceable either side of the shaft for some distance, though apparently growing thinner. A trial crushing of two tons of the quartz is said to have paid 1 oz. 18 dwts. of gold. As this return must no doubt have left a good profit over working expenses, it seems strange that the reef has not been opened farther.

*Main Reef of the Shag Valley Lease and Freehold Company.*—This is the most important reef opened in the district. It lies not far from the Shamrock Reef, and has been worked by large open cuttings, extending, with few interruptions, for 6 to 7 chains in length, along the slope of a steep range. It lies between the beds of the country, striking N. 40° W., and dipping north-eastward into the range, at angles varying from 25–35°. Its thickness ranges from 2 feet to (in places) over 4 feet, and it has the foot wall pretty well defined throughout, but its hanging wall is broken and full of small leaders. It consists mainly of quartz, which in large, solid bunches and veins lies mostly along the foot wall, whilst towards the hanging wall there is a deal of mullock intermixed. The quartz is good-looking, seamy, and slightly impregnated with pyrites. Regarding the yields from this reef, and the operations of the company, Mr. Harvey gave me the following particulars:—After auriferous stone was discovered in the reef, and satisfactory prospects obtained by tin-dish trials from several places along the outcrop, as far as the workings at present extend, 4 tons of the stone were sent to Ballarat, Victoria, and crushed at a good machine, with a result of 16½ dwts. of gold per ton. Another trial crushing of 1½ ton, executed at the Government battery, Dunedin, gave 1 oz. 6 dwts. of gold. Encouraged by these satisfactory results, the company erected crushing machinery, and gave the supply of 1,000 tons of stone from the reef in contract; but the first 500 tons paid at the rate of 4 dwts., the second at the rate of only 3 dwts. of gold per ton. These low returns did not, of course, by far cover the expenses, and the working of the mine was stopped in consequence.

The crushing machine of the company stands in the gully, near the first-mentioned workings, about half a mile away from those last noted, and is very well constructed. It consists of two batteries, each of five heads of revolving stamps, supplied with self-feeding hoppers, and driven by a steam-engine, the necessary supply of water being obtained from a good-sized reservoir, constructed a little higher up the gully. In front of the batteries lie common amalgamated copper-plate tables, and below these follow the blanket-strakes 14 feet in length, with a fall of three-quarters of an inch per foot. A revolving barrel is provided for the treatment of the blanket-sand.

Whilst considering the company to have acted very unwisely in erecting expensive machinery before the reef had properly been opened and prospected, to say 50–80 feet in depth, I am of opinion that it certainly deserves this trial, now that the machinery for testing the quartz is available. For, as regards the great discrepancy between the gold returns of the last and those of the trial crushings, it seems likely in a great measure to have arisen through the contract for the provision of the 1,000 tons of quartz to the mill, inasmuch as the old workings plainly show that far more mullock (from the hanging wall) was taken than quartz. And from what Mr. Harvey told me, it seems also doubtful whether these quarry-like openings are actually at those places which furnished the stone for the trial crushings.