

with the exception of there being a spare blanket-strake (nine in all), are the same for each battery as in the previous case.

APPENDIX 3.

THE GABRIEL'S GULLY REEF, LAWRENCE.

Amongst the once celebrated reefs of the province, this is perhaps one that most disappointed its original proprietors, though there are still some who believe in its being worth more than generally supposed, and who occasionally brave the dangerous character of the old workings, by putting in prospecting drives at favourable places. I inspected what was accessible of the old workings, in company with Mr. Warden Carew and Mr. H. Squires, legal manager of the old company, to whom I am indebted for all particulars concerning the character and behaviour of the reef, of which latter itself nothing could be seen. It lies at the head of a small gully running from the N.E. into Gabriel's Gully, and was discovered by a party working the alluvial at that place. The first workings, by open cuttings and shafts, extend for about 240 feet from the northern hill slope across the gully, a short distance up the opposite slope, and it was from them that the best returns were obtained. Afterwards, to ease the work, the reef was opened at 50 feet in depth, by an adit of 215 feet in length, starting lower down the gully; and 120 feet below this again, a second adit, about 1,200 feet in length, was driven for the purpose, both of opening it at that depth, and also to prospect for another reef supposed to exist beyond. This adit, which I inspected, proved unsuccessful in both points. It ought to have intersected the reef under notice at about 900 feet in, but only a thin, slightly auriferous casing was struck there, which, on being followed by a crosscut on the left of the adit, was found to bend flat and run out in the line of dip of a black carbonaceous bed, overlying common hard phyllite. Several small drives, in different directions from the crosscut, disclosed also no sign of the reef, but it was proved by a winze, sunk in the latter from the upper adit to the level of the lower one, which it strikes in the crosscut a few feet in, that the quartz runs completely out into the just-mentioned casing, within about 20 feet above the crosscut. Judging from the surface workings, the reef strikes N. 15° E., and dips to westward at 70-75°, crossing soft phyllite, striking N. 30° W., and dipping westward at 30-35°. Its thickness ranged from a few inches to 12 feet in the upper adit workings, and the walls were very well defined, the hanging one showing a thin ferruginous casing. The gold occurred in a shoot extending from near the top of the northern hill (where the reef runs completely out into hard phyllite) to the end of the workings in the south, and, though at first shallow, deepened rapidly in depth to about 50 feet down the winze, between the two adits. At the south the reef was found to be displaced by a slide, and on recovering it again about five feet out of its previous line, it soon became poorer, broke, and thinned out. The quartz containing the gold, *i.e.*, that within the shoot, was of a soft, ferruginous character, whilst below it a hard bluish stone came in, in which no gold could be seen. Except low down the winze, as above mentioned, and on the north and south in strike, this bad stone was nowhere lost under-foot in the upper adit workings. Regarding the yields, the stone from the shoot, though in places carrying at the rate of several ounces of gold per ton, paid in average only 4 or 5 dwts. per ton: yet in spite of this low yield, the mine paid a handsome sum in dividends. The crushing machine of the company, lately removed to the Blue Spur for crushing cement, stood at the lower end of the small gully, and consists of two fine batteries of five heads of revolving stamps each, with common copper-plate tables, and blanket strakes attached—a turbine supplying the motive power.

In reviewing all the different points of Mr. Squires's information concerning the extent, lay, and character of the reef, I think there is a strong probability of the latter representing a large block, which dips at a rather steep angle southward in strike, passing the lower adit over-head, and lies therefore on its right-hand side, not perhaps far off, where it would be advisable to search for it by a branch drive. For the hard blue quartz left overhead, and likely to continue downward, and which owes its colour mainly to a dense impregnation of minute particles of pyrites, has not at all a bad chance of containing a payable shoot, judging from assys of specimens made for me by Mr. Morley, at the Melbourne Technological Museum laboratory, which gave at the rate of 14 dwts. of gold per ton.

APPENDIX 4.

THE OTAGO PIONEER QUARTZ MINING COMPANY'S REEF, WAIPORI.

This reef, one of the richest, best developed, and most extensive in this province, I inspected in company of Mr. E. Hill, the manager of the O P Q Company, who kindly afforded me all the subsequent information about the yields and old and new workings, which were not accessible for examination. It strikes N. 25° W., and dips eastward at an angle of 56° cutting through hard grey phyllite, bearing about N.E., and dipping at angles varying between 15° and 30°. The walls are especially well defined, and show strong casings of tough blue clay. It has been opened, and in parts extensively worked, for a length of nearly two miles, and most likely extends considerably further both N. and S. The furthest point opened on the south, by several shallow shafts in Thompson's claim, is at the edge of a wide flat which stretches towards the Waitahuma Heights. Here the reef is about 10 feet thick, shows well-defined walls, and fine gold can easily be seen in the stone. Owing to the low position, there is a large influx of water, which will no doubt require powerful pumps to keep under. As I saw them, the water stood close up to surface in these workings. Proceeding northward, the reef crosses and runs up the eastern side of a gully which was found rich in gold, having no doubt received its supply of the precious metal from the denudation of the reef. There are several old workings—adits and shafts—along this line, from which very good gold was obtained. These were stopped partly on account of the water, partly on account of the quartz running out into mullock in strike. Further north, about half a mile from Thompson's Claim, we came to the site of the operations of the old company, right at the foot of the range that divides this part of the country from the Waipori Valley. A fine vertical main shaft has here been sunk to a depth of 220 feet, about 40 short of striking the reef on the underlay; and by workings extending from it about 200 feet south and 100 feet north, the reef has more or less been taken out right to the surface. It (the reef) was 6 to 8 feet thick in the average,