

are very rarely observed. An adit of 150 feet in length cut it about 85 feet from the surface, on its underlay, and it has at this level been followed by a drive a distance of 250 feet, and worked out about 140 feet in length, by 30 feet high; its flat dip, combined with the soft nature of the hanging wall, having given Mr. Williams some trouble, and taxed his ingenuity in securing the workings in an economic manner, by timbering and walling up with waste combined. From the drive two shafts have been sunk 93 feet on the underlay of the reef to the water level, and proved it to be down to that depth of the same character as in the upper workings. About 160 feet S.E. from the end of the latter, the reef has also been struck, of a very promising character, by a shaft at a depth of 60 feet from the surface. The quantity of stuff hitherto crushed from all parts of the mine amounts to between 800 and 900 tons, which realized at the rate of  $21\frac{1}{2}$  to nearly 25 dwts. of gold per ton. The gold, judging from a good prospect washed in my presence from a tin dishful of the mullock, seems to be pretty evenly distributed throughout the latter, Mr. Williams having observed neither shoots nor patches throughout the extent of the above workings. There have also been two other reefs discovered in the claim, viz. one of about 2 feet in thickness, running parallel to, and at a distance of 40 feet from, the one described. This has been opened for some distance, and the stuff obtained from it—none of which has as yet been crushed—would, according to prospects washed, yield about 10 to 12 dwts. of gold per ton. The second new reef is a cross reef, striking N. and S., and dipping E. at an angle of about  $18^\circ$ . It is from  $\frac{1}{2}$  to 2 feet thick, and would according to Mr. Williams's trial-washings, pay from 1 to  $1\frac{1}{2}$  oz. of gold per ton. From all I have seen of this mine, and considering that the ground lower down the gully offers facility for putting in an adit at a considerably lower level than the present workings, and more in the direction of the strike of the main reef, I think it represents one of the most prominent ones in the district. In anticipation of obtaining the necessary supply of water from the large race of the Carrick Range Water Supply Company, the proprietors had a fine crushing plant (purchased from the Conroy's Gully Reef Company) in course of erection by Mr. Reid, the well-known mining engineer. This plant consists of two batteries, each of five heads of revolving stamps, to be driven by an iron water-wheel, common amalgamating tables, and 14 feet of blanket-strakes. On my representation, they seemed inclined to add deep quicksilver troughs, or to substitute them for the amalgamating tables.

*The Leader.*—This is a mullock reef worked by E. Jones and Company, a short distance from the Young Australian, higher up the gully. It has been opened by adit, and proved for about 150 feet in length, showing a rather irregular course at a mean strike of S.  $15^\circ$  W., and an eastward dip at  $35-40^\circ$ , whilst its thickness varied from a few inches to several feet. The yields from three crushings have been at the rate of 11 dwts., 22 dwts., and from the last 22 dwts. of gold per ton. The gold is very fine, and hardly ever visible in the mullock. Prospects of the reef still good.

*The Stanley Reef.*—This crosses the range a short distance west of the Leader, and is being opened by Buchan and Company. It is also a mullock reef, about  $1\frac{1}{2}$  feet thick, striking W.  $15-20^\circ$  S., and dipping northward at  $60-65^\circ$ . None of the stuff has been crushed as yet, but the prospects washed from it are satisfactory.

*The Robert Burns Reef.*—This lies about a mile west of Carricktown, low down the north slope of a steep spur, near the head of Pipeclay Gully. It is about two feet thick, strikes E.  $20^\circ$  S., and dips northward at  $55^\circ$ . Its walls appear pretty well defined. Crushings have yielded 25 dwts. of gold per ton. The gold ran out in depth, but may likely have dipped eastward in strike.

*The Nil Desperandum Reef.*—It lies nearly in a line with, and only a few chains S.E. from the former, but strikes S.E. and dips vertically. Some satisfactory returns have been obtained from it, but it became also unpayable in depth.

*The John Bull Reef.*—This runs about 9 chains higher up the slope, near the top of the spur, south abreast of, and parallel to the Nil Desperandum, and dips N.E., i.e. towards it at an angle of  $45^\circ$ . Some crushings have given very fair returns. These last three reefs, which have been deserted for some time, ought, according to their strikes and dips and mutual position, to unite not far up the range; and to test the junction of the John Bull and Robert Burns reefs in depth, Griffiths and party are at present engaged in continuing the adit of the old Golden Gate Company (who originally worked the reefs) in the calculated direction. This is, no doubt, a very promising undertaking, for the junction of the reefs may likely prove richer than each reef proved by itself. That one reef should have faulted the other, I see no reason to apprehend. There have been three other small reefs opened in this neighbourhood, on the range towards Adam's Gully, which I did not visit, namely, the *Marquis of Lorne*, the *Enterprise*, and one in Wilson and Tupker's claim. Mr. Buchan informed me that pretty good yields had been obtained from them; and they had still fair prospects. Not far from the Robert Burns Reef, in the gully, stands a small public crushing machine, owned by Logan and Company. This consists of a battery of five heads of revolving stamps, of about 6 cwts. each, driven by a steam engine, with arrangement for introducing hot water into the coffers. The saving of the gold is effected on a common amalgamating table, and 14 feet of blanket-strakes, with 2-inch fall per foot. For the treatment of the blanket-sand, serve a revolving barrel and a shaking table. I have also to notice another public crushing machine, viz. that of the Old Royal Standard Company, standing near Quartsville, at the foot of the Carrick Range. This consists of two batteries, each of four heads of revolving stamps, fed by hand and driven by a steam-engine. As gold-saving appliances are used common amalgamating tables, and 10 feet of blanket strakes, laid at an inclination of about two inches per foot. From what I could see, there seemed to be danger of grease from the stampers dropping into the coffers. This should most carefully be guarded against; for grease not only prevents the quicksilver from acting upon the gold, but has also a strong tendency of flouring it.

#### APPENDIX 8.

##### REEFS AND COMPANIES OF ARROW.

In this district there have not been any reef workings carried on for a long time past. I collected, however, some information on the principal quartz mine once worked, and examined also, conducted by