

DIAMOND DRILL BORES

Full particulars of diamond drill bores, which have been put down in this district, will be found in the Annual Reports of the Secretary for Mines for 1889 and 1890.

QUARRIES.

During the boom period the quarries to the east of Malmsbury were extensively worked, most of the stone going to Melbourne. This stone is a fine-grained anamesite, easily worked, and taking a fine polish. These quarries are mostly idle, a few of them supplying stone for monumental purposes. The positions of all that have been worked are indicated on the plan.

EXPLANATORY DIAGRAMS.

1. Original aspect of the Silurian strata before it was disturbed.
2. The same strata undulating.
3. The strata bent and folded, cavities formed along the anticlinals and synclinals, when filled with quartz forming saddle and trough reefs.
4. Diagram of trough reef showing the meaning of the terms used in reference to the reefs.
5. Diagram of saddle reef, from Mr. E. J. Dunn's report on the Bendigo gold-field, showing the meaning of the terms used in reference to the reefs.

REPORT ON THE QUARTZ REEFS AT REDCASTLE.

(By R. A. F. Murray, F.G.S., Government Geologist.)

I have the honour to report having visited Redcastle, and further inspected some of the quartz reefs referred to in my report of a year ago, besides some others which I did not then visit.

The Redcastle mine appears to be the chief one in which any important developments have been effected since I was last there, but those developments are of a gratifying character, and most encouraging with respect to the re-working of the many other reefs on the field which have lain for many years neglected, though once worked with good results.

In this mine, which I was unable to descend on account of water being up in the lower level during certain works in progress in the shaft, the manager, Mr. C. Nagel, informed me that he had cut the reef at the 350-ft. level to the eastward of the workings which I saw last year; that the walls are clean and 6 feet apart, the filling being alternations of quartz and mullock veins.

The stone raised and ready for crushing is of excellent quality, with gold well distributed throughout, and, as the battery in course of erection will soon be ready, good results may be expected.

The Curly Dog reef, in lease No. 6412, about 3 miles east from Redcastle, was referred to in my last report. It has been worked at intervals for fully a mile in length, and the alluvial gully running close to it has been exhaustively worked for alluvial gold. The greatest stated depth to which this reef has been worked is 200 feet, and it has yielded as much as 10 ozs. of gold per ton, and 4 to 5 ozs. per ton from stone taken 4 feet in thickness. It is recorded that the workings were abandoned owing to want of appliances to contend with the water, and that good stone was left under foot at the south end, where the quartz was clean and solid.

At the north end the reef was worked to 100 feet, where it was cut off by a break, and was not recovered. It appears that there were here several bodies of stone, varying in thickness from 4 feet downwards, and that the gold was fairly continuous along the course of the reef—not in small distinct shoots. From the apparently reliable accounts given of this reef, the work of re-opening and further exploring it is one that would be fully warranted.

THE BEAUTIFUL VENICE REEF.

There are four reefs about a mile eastward of Redcastle, the No. 1 or western line being the Beautiful Venice. The main shoot on this line has been closely worked along the surface for 200 yards, but other shoots of stone in the same course have been worked at various intervals.

The bearing is north by west, and the underlay to the westward, the thickness, as indicated by the old stopes, being 2 feet to 3 feet. The deepest workings are stated to be at 250 feet, where good stone was left under foot. Yields up to 15 ozs. per ton are reported. A supposed southerly continuation of this line was worked at intervals for about $\frac{1}{4}$ mile to as much as 150 feet in depth, with yields up to $2\frac{1}{2}$ ozs. per ton. the reef being somewhat split up into veins. About 100 yards to the east is No. 2 reef, which yielded at the rate of 15 dwts., and was worked to about 50 feet.

No. 3 reef, 200 yards east of No. 2, has been closely worked along the surface, and down to water level, about 200 feet for 100 yards in length. The best shoot of gold-bearing stone is stated to be 200 feet long, and to have yielded up to $12\frac{1}{2}$ ozs. per ton. This reef has a bearing slightly west of north, and a westerly underlay, the old stopes showing a width of 2 feet between the walls.

No. 4 reef, 30 yards east of and parallel with No. 3, and known as Chapman's line, was worked for 400 yards in length at close intervals, and down to 200 feet, auriferous the whole way, and only abandoned on account of water, to combat which the former workers provided no reserve fund.

THE BLACK SQUALL (LEASE NO. 6435).

This reef is south, and on the supposed line of the Beautiful Venice, and the surface workings are 200 yards in length. The deepest workings are stated as being 100 feet in depth, and the reef, as left, was 2 to 3 feet thick, and gold bearing, yields up to 2 ozs. per ton having been won from it. From the description given it would appear that there is an "indicator" on the footwall side, which sometimes accompanies and sometimes diverges from the quartz, which latter is rich or poor accordingly.

An apparently southerly continuation of this reef, faulted to the eastward, has been worked to 70 or 80 feet for a short distance, the stone being 4 to 5 feet thick, with gold and also some antimony.

THE TARAGUNYAH (LEASE No. 6429).

There are three reefs in this ground, known as the eastern, the middle, and the western reefs.

The eastern reef is a shoot about 100 yards long, and the stone worked was 9 inches thick, the stated yield being 5 ozs. per ton.

The middle reef is the principal one of the group, and is 200 yards west of the eastern; it has been worked for 300 yards, the stone being about 2 feet thick at most, but yielding 4 ozs. to 5 ozs. of gold per ton when worked. The greatest depth attained is stated to be 120 feet, where water compelled abandonment. This reef, like the others in the district, bears slightly west of north, and underlies westerly, though nearly vertical.

The western reef is 80 yards west of and parallel with the middle reef, and appears to be a short shoot about 100 feet long, dying out at either end.

Although the above information as to former yields, depth to which the reefs were worked, and causes of abandonment, is obtained from statements made, I have no reason to question its accuracy, as it was given by those who actually worked in the ground in former times. Judging by the visible amount of work done, I feel justified in recommending renewal of operations on a better basis than in former years, and am confident that, as in the case of the Redcastle mine, the gold shoots in the reefs above described will be found to continue in depth.

NOTES ON THE GEOLOGICAL FEATURES OF AN AREA IN SOUTH GIPPSLAND.

(By James H. Wright.)

In working out a detailed exposition of the geological features of any large area in South-western Gippsland, the geologist is sure to encounter a number of difficulties and drawbacks that require not only a strong spirit of perseverance, but also a certain amount of physical endurance to overcome. The dense vegetation almost everywhere covering the ground renders travelling, when taken out of the beaten tracks, slow and laborious work; while, at the same time, it considerably interferes with his chances of observation, by concealing the surface of the ground, and by greatly circumscribing his view. The climate is notably a wet one, and this circumstance tells doubly against progress in a country so rankly overgrown. The surface is broken up into ranges and gullies innumerable, and, while the latter are usually filled with an almost impenetrable vegetable growth, it is in them chiefly that the most useful geological data can be gathered. An eminent geologist from New Zealand, who some years ago made a brief tour of inspection through a portion of South Gippsland, on the conclusion of his trip expressed to the writer his opinion that the two prime requisites for the work were stout boots and a sound judgment; and this view will doubtless be confirmed by all who follow up the study of the rocks in the densely-wooded hills and tangled gullies of the locality. Not the least important obstacle to progress in the unravelment of the geological record is found in the numerous faults that ramify the country in every direction, and add another element of complexity to the work.

Having devoted a considerable amount of attention to this interesting field, I purpose to set down in this paper the result of my observations as dealing with the basin of the Morwell River, and those of its western tributaries, and with portion of the Narracan Creek basin. The extent of country to be dealt with embraces about 100 square miles.

Throughout the area to be described there is a marked absence of fossils. With the exception of a few leaf impressions and the imperfect vegetable remains found in the lignite beds, no organic testimony has been met with on which to base a classification of the rocks in their proper systems. Their order had therefore to be determined by stratigraphical evidence. The following grouping of the rocks is based on such physical testimony. The order of sequence has been arrived at after careful examination of the whole area, in addition to which advantage has been taken of whatever data have been obtained in the diamond drill and hand bores put down. The grouping is as follows:—

7. Upper brown coals, &c., of Morwell and Latrobe basins.
6. Middle brown coals formed prior to the date of the intense disturbance of Tertiary times.
5. Delburn sandstones.
4. Ferruginous conglomerates.
3. Older basalt.
2. Lower brown coals, quartzite.
1. Mesozoic sandstones, &c.

The several groups will now be briefly treated under their respective headings, the localities where they occur being indicated as a guide to any who may be desirous of following up these investigations. Following this the leading faults will be traced, and the evidence bearing on their existence noted. Finally some deductions will be drawn as to the influence of these dislocations on the configuration of the existing surface, and their correlation shown in respect to a fault of primary magnitude.

MESOZOIC.

Throughout the area under consideration no rock older than the Mesozoic occurs at the surface, and it is more than probable that its whole extent is underlain uninterruptedly by rocks of this age. Although the numerous vertical displacements of these rocks and their folded condition throughout precludes our arriving at any reliable estimate of their thickness, the diamond-drill bores which have been put down at various points show that the carbonaceous strata extend to very considerable depths. The bore at North Mirboo, which attained the depth of 2,700 feet, failed to get through the Mesozoic series; while the deep bore in the Narracan Valley, though carried down to 3,000 feet, in like manner did not reach the underlying formation.