

and are identical with the auriferous rocks of Reefton and the district thence south to Big River; also, with the auriferous rocks of the middle part of Boatman's Creek. The deeper-seated rocks exposed along the gorge of Larry's Creek are mica-schists, resting on granitic gneiss, while to the south-east of Kirwan's Hill there is a development of Cretaceous rocks, comprising coarse breccia, conglomerates, quartz-grits, sandstones, and shales with coal; and these rocks are largely developed to the south and south-west of the auriferous area of Kirwan's Hill.

To the westward the auriferous area of Kirwan's Hill is separated from the better-known area of the middle part of Boatman's Creek by a belt of dark intrusive hornblende rock and an ill-defined area of coal-measures, deeply involved amongst the other older and younger rocks.

Being difficult of access thereto, and surrounded on all sides by non-auriferous rocks, it was not till the season of 1896-97 that any important discovery was made. Mr. Kirwan, the discoverer of the area of loose blocks of auriferous quartz, arriving at his conclusion by experience of what occurs in the Reefton and Rainy Creek districts, regarded the near vicinity of an outlier of the coal formation as a favourable indication for the occurrence of gold-bearing reefs in the slate country, and was thus led to make an examination of the ground in the vicinity of the hill formed of coal-bearing rocks—that furthest towards the source of the Waitahu lies to the south-east of Kirwan's Hill—with the result that on the slope of the hill opposite Coal Hill the field of loose quartz was found, and the discovery of the reefs *in situ* to the west and north was made shortly afterwards.

During the season of 1896-97 little effective work in the way of opening out the different reefs was done, and during the present season, 1897-98, although strenuous efforts have been made to trace the source of the rich gold-bearing boulders of the quartz field, these as yet have been unavailing.

Of the reefs found, none of them as yet afford prospects of gold equal to what are to be obtained from the loose quartz on the northern slopes of Kirwan's Hill. This loose quartz occurs in blocks of all sizes, up to masses 2 to 3 tons in weight, and thickly covers the surface over an area of 10 or 12 chains in length, and an average width of between 4 and 5 chains. The quartz is chiefly, if not wholly, confined to the surface, although masses of the wrecked hill-slope do here and there show portions of reefs held within walls of sandstone and slate rock, identical with the general formation of Kirwan's Hill and the country eastward to Capleston.*

Towards the lower end of the quartz-covered area, and where the loose quartz was richest in gold, a tunnel has been driven west into the hill, in the hope that by this means solid ground might be reached, and the lode from which the richer quartz has been derived would thus be discovered. At a distance of 150 ft. from where started this tunnel failed to pass through the broken country, and discontinued during the winter months; work on this was not continued when prospecting commenced towards the end of November last year. It therefore failed in the object for which it was driven, and, what was very remarkable, scarce a fragment of quartz was found in the rubbly material excavated from more than a few feet below the surface.

At the present time, at the opposite or northern end of the field of quartz, a shaft is being sunk to prove the depth to the solid rock, and this shows the same remarkable absence of quartz from all but the surface of the *débris*-covered mountain-slope. This shaft when visited had reached a depth of 35 ft., and had not passed through the broken angular material met with in the tunnel lower down the slope of the hill.

On the north-eastern part of Kirwan's Hill, and in the ridge thence going east and north-east to connect with Trig Hill, there are numerous reefs that strike south-south-east and dip east-north-east at high angles, and thus should pass but a little to the eastward of the field of loose quartz on the southern slope of Kirwan's Hill. It must, however, be noted that in the north and north-west higher part of the hill no notable discovery of quartz has been made (none were reported to me), and westward, along the road leading to the upper part of Boatman's Creek and Capleston, in the side cuttings of the road, rarely is a piece of quartz to be met with.

All the lodes of quartz found are poor in gold in comparison with the richer of the loose blocks of the quartz-covered surface on Kirwan's Hill, and some there are who refer the source of the gold-bearing stone to a locality at a distance from where they now lie, and consider that the juxtaposition of the reefs *in situ* and the field of loose quartz is merely accidental. After due consideration of this matter I have come to the conclusion that the loose quartz is derived from lodes in the immediate vicinity, and the evidence in support of this conclusion is sufficient.

Wherever the matrix adheres to the quartz, this, as forming part of the foot- or hanging-wall of the original lode, is of the same character as the foot- and hanging-walls of the lodes that have been discovered. The quartz also in character closely agrees with that of the lodes *in situ* that have been discovered, and the correspondence is complete in all except the amount of gold obtainable from the loose and solid stone.

Attempt has been made to explain the presence of the loose quartz on the south-east slope of Kirwan's Hill by supposing that a reef having a low angle of dip occupied practically the surface of the hill-slope, and that by a series of slips this and the foot-wall of the same to an indefinite depth became shattered, leaving the quartz still on the surface of the broken ground.

This supposition of a lode having a low angle of dip stretching across the southern face of Kirwan's Hill is improbable, because of necessity it would have to intersect the southern continuation of the lodes in the near vicinity and the northern part of the field, and, whether dipping to the east, west, or south, the effect would be equal to a sheet of quartz stretched across or through the other reefs. This would reasonably involve the supposition that two systems of fissures filled with

* Since this was written further prospecting has revealed the existence, more to the north, of a stratum of quartz boulders, overlain by a thickness of ordinary slate and sandstone rubble. This lies to the eastward of the two principal prospecting-drives, and contrasts remarkably with the western area of broken country, over which all the loose quartz was at or near the surface.