

The numerous reefs of quartz in this Karangahake area of the Thames-Tokatea group trend between north-north-west and north-north-east, and appear to converge to a point within the Hercules Claim towards its north-eastern part, where are three distinct yet closely associated hills showing massive developments of quartz that has evidently accumulated at the surface through the agency of thermal water forming hot springs. The range between the Rahu Saddle gives abundant evidence of quartz accumulated by the same agency, a triple line of such deposits appearing on the northern part of the range, the western of which should correspond with the Woodstock Main Reef on the claim of that name, and the eastern with the Welcome lode in the Crown Mines, the north continuation of which is through the Ivanhoe and Shotover Claims. The thermal and surface character of much of the quartz on the range north of the Ohinemuri Gorge is proved by the presence of plant-remains that occur abundantly in the bedding planes of the quartz rock. The thermal character of the quartz on Karangahake Mountain, in the southern end of this area, is abundantly evident, and as the thermal waters have burst through, altered, and charged with silica the Miocene mudstones of the Rahu Saddle, we have thus an evidence that some of the lodes of the Karangahake district were not formed till towards the close of that period.

About a mile east of Karangahake, and where the deeper part of the Ohinemuri Gorge terminates, the auriferous rocks of Karangahake belonging to the Thames-Tokatea group are overlain by those of the Beeson's Island group. Here the rocks of the younger group consist of breccia conglomerates, associated with massive beds of carbonaceous mudstones, dark or almost black in colour, but weathering light-grey. On the Rahu Saddle these rocks are altered, partly by the agency of hot water and also by a sheet of dark augite andesite that overlies them there. On the banks of the Ohinemuri the mudstones dipping to the eastward are followed by a considerable development of dark augitic andesite lava flows but little altered, followed by a rock of the same nature that has been much altered, with which is associated greenish breccias, and finally by another thick band of dark andesite that terminates the group within 150 yards of the mines at Owharoa.

So far there have been no quartz-reefs found in these rocks within the Ohinemuri Valley. On approaching the Owharoa mines they are much decomposed, and finally disappear below the trachytic and rhyolitic group, in which are developed the gold-bearing reefs at that place.

On the ridge of hills between Owharoa and the Waitewheta, above its gorge, the younger rhyolite formation is prolonged to the westward, so that there is but a narrow strip of the Beeson's Island rocks that there make the connection between the larger areas to the north and the south.

At Owharoa, in the direct line of section, at the pool in the river, about 100 yards below the main shaft being sunk by the Ohinemuri Syndicate, the decomposed upper part of the Beeson's Island group is followed by a light-grey felspar rock that on weathered surfaces and in the road-cuttings decomposes to a rusty-brown colour. This rock in itself is not decisive of the change that shortly takes place, but is totally unlike any of the rocks that further down the valley are referred to the Beeson's Island group, and agrees well with others yet to be described as part of the acidic rocks of Owharoa, and which, consisting mainly of crystallized felspar, have to be spoken of as felspar rock. The felspar rock of the pool is followed by a dark—almost black—rock, consisting mainly of hornblende with an abundance of small spherulite. This, again, in the workings of the Radical Mine is followed by grey felspar rock, with spherulitic structure frequently present. Further to the eastward the section at the surface is not clearly displayed, but the material mined in the sinking of the shaft on the Ohinemuri Syndicate's property and in the driving of the crosscut north-west therefrom is often spherulitic, while on the south-west side of the river, and a little more to the south-east, the rocks are overlain unconformably by a younger group of rhyolite rock that spreads itself widely over the Upper Ohinemuri Plain, and is lodged in a trough-like or V-shaped depression, probably produced by faulting, that runs parallel to the Ohinemuri River to and beyond the source of Waikino Creek, opposite the Victoria Battery.

There has been much speculation as to the nature of the rocks forming the walls of the auriferous reefs at Owharoa, and on the publication of my last year's report surprise in certain quarters was expressed that I should have considered them as belonging to the acidic group or rhyolite formation. This induced me to make a more than ordinarily careful examination of the locality during the present season, which has fully confirmed my determination of last year.

Spherulitic structure is not known in rocks of the andesic group throughout the peninsula, and, so far as can be gathered, in other countries where such rocks occur, this structure is rarely present, and hence has come to be regarded as a sufficient proof of the higher silicated volcanic rocks. In this respect the proofs are ample that the Owharoa rocks belong to the acidic group.* How far they are likely to correspond in time and character with the spherulitic rhyolite found on Karangahake Mountains, a close examination of the specimens collected (which has yet to be made) must show.

Over these Owharoa rocks come the rhyolites of the vicinity of Waikino and the Upper Ohinemuri Plain. These spread over the lower grounds to and beyond Waihi. A considerable variety of rocks occur in connection with this development of the acidic rocks, but the greater bulk consists of two rocks: First, a brecciated-looking rhyolite, which, however, appears to be the result of irregularity in cooling of the original lava stream; and secondly, overlying this, a grey-earthly cryptocrystalline rhyolite, seldom fluxional in structure, and often porphyritic with crystals of sanidine or blobs and crystals of quartz. These latter rocks sometimes appear as dyke-like masses bursting through the brecciated-looking rhyolite, and both extend to and beyond the Silverton Hills east of Waihi Township. They also reach up the Waitetaki, to within half a mile of the township; and there, at the base of the group, a stratum of pure pumice is developed.

* The percentage of silica in these rocks in all samples determined is above 66 per cent.