The auriferous rocks of the Waitekauri, of Martha Hill and the Silverton Hills, in the neighbourhood of Waihi, have been determined as belonging to the Kapanga group of volcanic rocks, and they certainly are quite distinct from the Thames–Tokatea group as developed in the Karangahake area. They more resemble the Beeson's Island group as developed in the southern part of the peninsula, the breccia ash-bed of the two being often very similar. The rocks of Waitekauri and Waihi consist essentially of dark augite andesites, somewhat prone to decomposition, associated with greenish-grey or light-grey breccia and ash-beds. In such rocks occur the Golden Cross Reef, Waitekauri, the Martha and Welcome lodes, Martha Hill, and in these also are situated the workings of the Waihi Grand Junction, Waihi West, Waihi Consols, and Waihi South Claims, in the immediate vicinity of Waihi.

On the Silverton Hills the Waihi Consolidated, Waihi-Silverton, Amaranth, and Union Claims are in the same rocks; and more to the eastward, in the Queen of Waihi Claim, the workings demonstrate the presence of a moderately-fine breccia such as appears in those of the Waihi Grand Junction.

In Martha Hill and over the Silverton Hills the various quartz lodes are clearly deposits in rents and fissures by thermal agency, and although on the Martha Hill there is no trace of sinter-quartz deposited at the surface, there cannot be a doubt but that such once was present. On the south-west part of the Silverton Hills there are great bodies of quartz of a flinty type, which might be regarded as having accumulated at and near the surface, such quartz containing much fossil wood and lesser plant-remains on the Ascot Claim and terrace east of Mackaytown.

As regards the permanence in depth of these lodes, the workings in the Waihi Claim on Martha Hill give every assurance that not only does the quartz live down to considerable depth, but that also the gold contents of the lode are not diminished in the lower part of the lodes.

East and north-east of Waihi and the Silverton Hills, andesic rock is found in Waihi Monument Hill. On the hills to the north and over the low ground south-west of Waihi Monument and east of Waihi Monument, for about two miles in a south direction, andesite is found on the coast-line. Otherwise the range of hills from which the east and north-east sources of the Ohinemuri drain are almost composed of spherulitic rhyolite, which, clearly younger than the andesic rocks on which it rests, is yet evidently older than the earthy and fluxion rhyolites of the plain.

The auriferous quartz-lodes of this district, including Karangahake, Owharoa, and Waihi, are productive along a line or belt of country about a mile in width, to the north-east and south-west of which the lodes, if traceable, are not of a payable character. Whatever may be the meaning of this linear arrangement of the gold-mines of Karangahake, Owharoa, and Waihi, the fact is sufficiently remarkable, and remarkably agrees with a similar phenomenon in the Coromandel district in which a belt of productive country, about a mile in width, extends from Coromandel Wharf to the crest and eastern slopes of Tokatea Hill. Similar instances of the projection of auriferous belts of country, or of country carrying auriferous lodes, might be pointed to as occurring in other parts of the peninsula. These will be considered in a further report. Meanwhile, it is remarkable that these belts of auriferous country, in both the cases mentioned, and probably in all the others, run across the strike of the reefs, and where, as at the Thames, the strike of the reefs is north-east, the direction of the auriferous belt is south-south-east.

On the Thames Goldfield, between Tararu and Hape Creeks, the first work was to determine the position of the different rocks and the nature of these, whether as lava-streams, dyke intrusions, or fragmental ejecta.

The lowest rocks in the district are carboniferous slates and grey siliceous mudstones, sometimes regarded as felsite tuff. These rocks form Rocky Point, a little north of Waiohanga Creek, and also appear in the valley of Waiohanga Creek, 250 yards inland from the beach. There are no quartz-reefs in these rocks within the Thames Goldfield, and their chief interest is that as the oldest rocks they form the floor on which the volcanic rocks carrying auriferous quartz-reefs have accumulated.

Over these rocks succeed, towards the south, gritty sandstones, composed largely of grains of felspar, and frequently of small angular pieces of slate, which in character are similar or identical with what is seen underlying the felsite tuff at the north side of Rocky Point. It is very doubtful whether these rocks belong to the volcanic series, and that they are largely composed of broken crystals of felspar does not prove such a connection.

Above the sandstones and slaty breccias there is a grey andesite rock, which on the beach and in the adjacent hills to the mouth of Tararu Creek is succeeded by heavy accumulations of volcanic breccia. These rocks are known as the Tararu Breccias, and their position at the base of the Thames–Tokatea Group has been generally accepted. Sometimes they have been regarded as present in other parts of the field where breccia-bands appear, but of their occurrence in the central part of the Thames field or in Hape Creek there is no proof. The fact is, there are at least five or six heavy bands of coarse breccia-beds belonging to different horizons present on the field, and of these it is the Tararu Breccias that play the least important part.

The section along Tararu Creek shows five of these breccias that strike across the valley and trend through the hills in the direction of the auriferous area at the Thames.

The Tararu Breccias reach up the creek no further than the first crossing of the creek, south-west of which they should pass through Mr. Walker's grounds till obscured by the alluvial deposits forming the shingle-fan or delta of Tararu Creek. The second band of breccia reaches the coast at the north headland of the little bay into which falls Shellback Creek. The third, which is seen in Tararu Creek, at the first crossing above Tinker's Gully, strikes across the valley of Tinker's Gully to the ridge between that and the source of Shellback Creek, and thence passes into the valley of Moanatairi Creek, the lower part of this band crossing from thence into Waiotahi Creek by way of the east slope and higher part of Messenger's Hill. Thence to Una Hill the same breccias and ash-beds run along the east side of the Moanatairi Fault. In Tararu Creek there are yet two other breccia bands—one appearing at the junction of Ohio Creek