"On a subsequent occasion I traced these tuffs and breccias, without a break, as far as Paparoa and Paul's Creek, and thence southward to the Tokatea Range, near Coromandel. Another circumstance which tends to prove their identity with the tuffs of the Thames and Coromandel is the discovery in them of gold-bearing veins of quartz in the neighourhood of the limestone deposit.

"The Palæozoic rocks on which the coal-measures rest are, in several places in the vicinity of Waitete, intruded by massive dykes of igneous rock. It is a noteworthy fact that I was unable to find, after a most careful examination, a single fragment of igneous rock included among the materials composing the conglomerates. This negative evidence is of great value, as tending to prove that these igneous intrusions took place after the deposition of the Cretaceo-tertiary coal-beds. The whole of the stratigraphical evidence obtainable at Waitete points to the Post-eocene age of these Kuaotunu tuffs, which can be traced almost continuously to Coromandel on the west and Tapu on the south.

"In connection with their economic importance, it is interesting to note that they are the youngest gold-bearing rocks in the Southern Hemisphere, being younger than the gold-bearing rocks of Otago, Reefton, and the different goldfields of Australia by the whole of the secondary epoch and the upper part of the vast Palæozoic. Even in composition and origin they stand unique, and their homologues are found only in two countries in the Northern Hemishphere — namely, Transylvania, in Hungary, and the Pacific States of America; and in these countries the similarity extends also to their gold and silver contents, which are frequently as refractory and difficult to treat as ours, while their free-milling bullion is alloyed with silver to the extent of about 30 per cent., as it is throughout the Hauraki Peninsula.

"*Palæozoic Rocks.*—These form the basement or floor of this district, and, indeed, of the whole peninsula. They consist principally of hard siliceous, greenish, and grey-coloured sandstones, interbedded with slaty breccias, and occasionally slaty shales. The siliceous sandstones or greywackes are the prevailing rock here. They are everywhere much shattered and jointed, and often streaked with thread-like veins of quartz or hæmatite. On the spurs behind the township, and in most places near the point of contact with the overlying tuffs, they are decomposed into reddish-coloured clays to a great depth, as if they had been subjected at some period to the long-continued action of thermal waters.

"The gold-bearing reefs of this formation are found in the more decomposed portions of these sandstones, and the quartz is often of a brecciated, flinty, or chalcedonic character, which is an evidence of hydrothermal origin.

"These rocks have yielded no fossil remains, and their exact age is therefore still undetermined; but in the Waikato they have been found underlying rocks which contain *Halobia*, *Monotis*, and other Triassic forms, and hence have been placed in the Palæozoic period.

"*Gold-bearing Reefs.*—I have already pointed out that there are two distinct reef-systems at Kuaotunu—one belonging to the tuff formation, and the other to the Palæozoic formation. The major lode of the field is the Try Fluke Reef, found in the former. It possesses well-defined walls, and varies in width from 2ft. to 20ft. Its average width is probably about 6ft. Its course is N.N.E., S.S.W., and its dip easterly, at angles seldom under 60 degrees, more often over 65 degrees. It has been traced through the leases of the Kapai, Try Fluke, Carbine, Red Mercury, Great Mercury, and Irene. It has been proved to continue downwards in the deepest workings so far undertaken upon it. All the workings on this reef have, so far, been confined to the brown oxidized tuffs above water-level.

"The nature of the quartz varies in different parts of the lode. In places it is hard, cavernous, and stained black with manganese oxides; in others it is mullocky, and more friable or crumbling, and is stained rusty-brown with peroxide of iron.

"The gold is alloyed with about 30 per cent. of silver, and it exists principally in an extremely finely divided state. The patches of rich stone, which are so characteristic of the Thames reefs, are not known in this reef, or, indeed, in any other reef in this field.

"The reefs in the Palæozoic sandstones have received a large amount of attention, and most encouraging results have been obtained from the 'Black Jack' and many others.

"There are no known laws regulating the distribution of gold, although some geological conditions are known from experience to favour the occurrence of gold more than others. It is, therefore, impossible for anyone to predict with any degree of certainty where gold may or may not be found in paying quantities. At Tapu and Coromandel it is found that when the reefs descend from the tuffs to the Palæozoic rocks they run out or become non-gold-bearing. At these places the old rocks consist of black jointed slaty shales. At Kuaotunu they consist of siliceous sandstones, and the prospects of the permanency of the reefs in them are altogether more favourable. At the same time it would be wrong to neglect the experience of other places; and in the case of Kuaotunu it would, I think, be prudent to thoroughly prospect the reefs before undertaking the erection of batteries and other expensive works.

"Up to the present time the Try Fluke Reef has proved the chief gold-producer on this field, and, so far as can be judged from the existing conditions, it seems likely to hold this position for a number of years to come; but, to effect this, low levels will have to be driven in most of the mines on its course.

"With the advent of a cheaper motive-power, many reefs that at present would not pay to develop could be worked with profitable results, and there would then exist a fresh incentive to undertake systematic prospecting in new directions, which would no doubt result in other discoveries of a valuable nature."