"With the exception of iron pyrites, which is abundant, the auriferous veins and lodes are, as a rule, remarkably free from the ores of other metals, small quantities of stibnite, blende, arsenical pyrites, and copper pyrites being the only ores found; and even of these the copper pyrites and blende are comparatively rare, and, as well as the stibnite, appear to have been introduced subsequently to the gold. The gold is nearly always found in or associated with quartz, although probably it also occurs in places in the bed-rock, but encased in iron pyrites. A series of analyses are necessary to determine this point. The gold in the quartz may be conveniently arranged under two typical forms, which may be regarded as the extremes of a series connected together by many intermediate varieties. Often, however, the two forms may be combined in one specimen.

"The first form is when the gold is finely peppered, generally in small grains, but sometimes in flakes, through amorphous quartz. In this case it is so intimately mixed up with the quartz that it is impossible to doubt that the two were deposited simultaneously, and from the same menstrum. In well crystallized veins this kind of gold is often seen to be plentiful in the amorphous, or semi-crystalline quartz at the base of the crystals; as soon as the crystals of quartz begins to be regularly formed the gold ceases. This is the commonest form in which gold is seen at Shortland, and it is found in all the best claims, both in the quartz veins, and in the irregular nodules that occur so plentifully in the mullock reefs or lodes. The nodules in these mullock lodes often show no trace of gold on the outside, but when broken are seen to be thoroughly impregnated with it. The second form is where the gold lies in fine threads or scales on the surface of the quartz without penetrating it. This is seen only in the smaller veins, generally where the points of the two sets of quartz crystals, starting from either side of the vein, approach so near as almost to touch each other. Here, entangled, as it were, between the points of the crystals, most beautiful specimens of leaf and filiform gold are found, while the quartz on either side is often quite barren. In these cases it is evident that the gold must have been introduced after the deposition of quartz had ceased; and, as the veins in which it is found are almost always not far from the surface, and the quartz is generally stained red by the oxide of iron, there can be little doubt but that the gold is a secondary deposit and derived from the decomposition of auriferous iron pyrites. Many claims in which most magnificent specimens of this form of gold have been found have not paid for working, all the gold contained in the vein being apparently visible to the naked eye; while, when the gold is of the form first mentioned, exceedingly good results are often obtained from stone in which little or nothing can be seen.

"It may be taken as a general rule applicable to the whole field, that all the veins and lodes show more gold, and crush better, when taken from the red iron-stained upper portions, and that as they descend into the blue undecomposed parts the yield is less satisfactory, not that they contain a less quantity of gold, but because that the undecomposed pyrites contains a large percentage of it that cannot be got out by the ordinary processes at present in use; and also on account of the injurious effect of the pyrites itself on the mercury, preventing it amalgamating with some of the gold that is in a free state, and that would readily be attracted by clean mercury. The pyrites also cause the mercury, when used in the battery-boxes, to break up into very fine globules, which float over the tables and cannot be caught, but which probably carry away with them more or less gold.

"The quality of the gold differs considerably in different parts of the field, and even from the same claim it often varies a good deal. Out of twenty-eight assays from various parts of the Shortland district, kindly furnished to me by the assayer of the Union Bank of Australia, the highest gave 19·5 and the lowest 9·625 carats fine, both being from the Waiotahi Creek; while from the Lord Derby Claim, also on the Waiotahi, some stone yielded nearly pure silver, being only 2·75 carats fine, and worth only 9s. 8d. an ounce. The average of the twenty-eight assays is 15 carats fine. . . .

"The gold is very widely distributed through the district, although certain parts appear at present to contain it in more considerable quantities than others; but the mines have not yet been long enough worked to pronounce with much certainty on this point. The fact before mentioned, that probably six hundred out of twelve hundred claims had seen gold, shows well how widely it is distributed through the country, for it must be borne in mind that, unlike most quartz-mining districts, the reefs here are not continuous for far, and that the greater part are but thin irregular veins, so that the country was not taken up along lines of leads only, but, *en masse*, nearly the whole of the country between Hape and Tararu being pegged off. . . ."

"*Tapu District—Description.*—The Tapu Creek is situated about twelve miles north of Shortland, and in size about equals the Tararu. At its mouth it forms a small harbour, available for coasters and small steamers. On this harbour the Township of Hastings is situated. Rather more than one hundred claims have been taken up in the district, and it has at present a population of about five hundred. The north side of the stream is for the most part covered with bush, and rises to a height of 950 ft. above the sea. The south side is almost entirely fern, and does not attain to quite so great an elevation as the other, the highest point in the Golden Horn claim being 880 ft. The north side is chiefly composed of the blue slates, nearly vertical, and with a strike of east 10° south. They attain an elevation at the Southern Cross and Diggers' Rest Claims of about 810 ft., and are capped by a horizontal layer of white decomposed tufa, stained red in places. These slates cross to the south side of the creek, but are quickly cut off by two faults, one of which runs north-east and south-west, and the other north-west and south-east. The rest of the district is composed of trachytic tufa and breccia. I have only seen one dyke in the district, which is situated on the beach on the north side of the harbour, just where the alluvial sands joins the rock. It runs north-west and south-east, and is about 10 ft. thick, and is composed of pale-green, nearly compact, greenstone, with occasional small crystals of hornblende. Until recently only one machine (Buckland and Gibbon's) was at work in this district, and consequently but few claims as yet have had any considerable crushings. . . .