

the base of the Hunua Range, and in the higher beds is essentially rhyolitic, and must be regarded as of Pliocene age; therefore not likely to be mineralised so as to give probability of its bearing quartz-reefs, and, as regards the material in an unaltered state, not at all likely to carry alluvial gold.

Samples of the breccia-conglomerate were taken for the purpose of being further tested in Wellington. These, for the present, have been mislaid, and the results of the analysis of these cannot for the present be given; but the tests made on the ground were amply sufficient to show that no payable gold exists in the deposit examined.

22nd March, 1899.

ALEXR. MCKAY.

SIR,—

In the matter of Professor Hutton's communication of the 14th October, 1898, I have the honour to report that between the 19th and 26th of November last the Assistant Geologist (W. A. McKay) visited Pelorus Sound and made examinations with a view to the determination of the different rocks present, and more especially to ascertain the source of the boulder of sandstone with foot-print thereon, forwarded by Mr. H. Wynn Williams to Professor Hutton.

The results of the examinations made tend to show that no Tertiary rocks are present in the immediate neighbourhood of where the boulder showing the foot-print was found. The fundamental rocks of the area east and south of Clova Bay are silky argillaceous schist (phyllite) and a semi-metamorphic rock that prior to alterations consisted of fine-grained breccias and sandstones. Both these rocks are not younger than the Devonian period. A raised beach of modern date is found on some parts of the shore of Clova Bay, but the material of this is generally coarse and angular with patches of finer material as incoherent sands. The alluvial deposits of the various creeks are of the same character, and thus neither of these younger deposits can have been the primal source of the boulder impressed by the foot of a bird as described by Professor Hutton. This has therefore been derived from a distance, or if the beds on which the foot-print was stamped did at one time exist in the vicinity of Clova Bay they have been removed, and, excepting one solitary boulder, no trace of them remains.

Since the following report was written a letter received from Mr. Williams states that fossiliferous strata of probable Tertiary date occur about eight miles from Clova Bay, and it is therefore just possible that the specimen found on Manaroa Run, Clova Bay, has been derived from a distance. Some thirty examples of the rocks of the district round Clova Bay were collected. These are all of Palæozoic age, and had it been that even a remnant of Tertiary sandstone remained the probability is great that this would be represented in the collection made.

I have, &c.,

The Under-Secretary, Mines Department.

ALEXR. MCKAY.

#### MEMORANDUM OF INSTRUCTIONS for Mr. W. A. McKay, Assistant Geologist.

By the first opportunity you will proceed to Picton and there make inquiries as to the best means of reaching Manaroa, on the east shore of the outer part of Pelorus Sound, where, on the property of Mr. H. Wynn Williams, your work will begin. The position of Mr. Wynn Williams's homestead is marked on the plan herewith supplied for your guidance, and on which you will mark the boundaries of the different formations that may be present. The principal object of your examinations will be the collection of further samples of foot-prints of struthious birds in the soft sandstone of the creek near Mr. Williams's house. As Mr. Williams found and forwarded to Professor Hutton the original of these impressions, and having an interest in the matter, he will probably aid you in pointing out the locality whence he obtained his specimen. The formation containing these foot-prints is probably not of great extent, as to the eastward the western slopes of Mount Stokes (see plan) is composed of foliated schist, a metamorphic rock totally unlike the sandstones in which the foot-prints occur, and to the westward, the peninsula in that direction is also probably formed mainly of schist. Your first work, therefore, will be to study the sandstone at and near where the foot-prints have been found. Observe and note carefully the strike and dip of the rocks. Follow the sequence upwards to the uppermost beds present, describing the different varieties of rock, and collecting samples of the same (samples to be not less than 4 in. by 3 in. when squared and well dressed), which must be ticketed or labelled on the ground, and a catalogue of the same made as the collections accumulate. Search carefully in the different exposures of the younger formation for remains of marine life, sea-shells, &c., and, failing to find such evidence in the overlying rocks, follow the sequence downwards bed by bed, if possible, till the lowest resting on the schist is reached. Wherever the rocks are of a flaggy character, be sure that you split many of them in the hope of finding foot-prints of some kind in the partings of the rock, and in the lower part of the section be as careful to search for marine fossils, and to make collections of rock-specimens as has been stipulated for the upper part. You should have no difficulty in mapping the younger formation containing foot-prints, but see that you do not confuse it with the deposits of modern raised beaches which are present in other parts of the Sound, and are liable to occur at Manaroa. Professor Hutton is of opinion that the foot-prints occur in strata of considerable age, and this may prove to be the case, but marine fossils will be required to show this. On the other hand, it may be that the strata is comparatively recent, and scarcely to be distinguished from the modern deposits alluded to. This doubtful relationship should spur you on to search for the evidences the rocks contain of their ages. The older rocks consist of schist foliated with quartz, and a semi-schist without quartz foliæ. The first of these it is that which you are likely to find in the west lower slopes of Mount Stokes, and adjacent to the sandstones, more especially engaging your attention. Examine the older rocks for lodes of quartz and other indications of the presence of metals.