

1894.
NEW ZEALAND.

DEEP QUARTZ-MINING IN NEW ZEALAND

(REPORT ON).

Presented to both Houses of the General Assembly by Command of His Excellency.

SIR,—

Invercargill, 15th March, 1894.

Having completed the examination of various quartz-mining districts in New Zealand, to execute which inspection my services were placed at the disposal of your Government by that of Victoria, I have now the honour to submit my report, which embodies such advice and conclusions as to future prospects and prospecting operations as are warranted by the observed local evidences in the mines compared with quartz-mining experience on the Australian goldfields.

As I apprehend my instructions, the main duty required of me is to advise with respect to the probabilities of success in deep mining for auriferous lodes and reefs on the various fields visited, of which some yielded richly in the past but are at present in a languishing condition, and my remarks are therefore directed to the practical mining rather than to the scientific geological aspect of the subject, only touching on the latter where it has immediate bearing on the former.

Towards arriving quickly at an acquaintance with the principal geological conditions of the country visited, the admirable work executed by and under the supervision of Sir James Hector, K.C.M.G., F.R.S., &c., and the information willingly placed at my disposal by that gentleman, proved of the greatest service.

Mr. H. A. Gordon, C.E., F.G.S., Inspecting Engineer, and Mr. A. McKay, F.G.S., Mining Geologist, both accompanied me in the inspection, affording the full benefit of their long personal local and scientific experience, and in every way facilitating my work.

The quartz fields examined can be divided into three main groups, according to the geological age and the lithological character of the rock-formations containing the reefs.

1. The group contained in the Cape Colville Peninsula and southward, comprising the Thames, Coromandel, Tokatea, Karangahake, Waihi, and Waiorongomai quartz workings, wherein the gold-bearing quartz reefs traverse rocks of Upper Secondary or Lower Tertiary age and of volcanic origin.

2. The Reefton group of quartz reefs in sedimentary rocks of Carboniferous age, with which may also be included the reefs of Lyell, though the rocks there are regarded as Devonian.

3. The reefs occurring in rocks of the old metamorphic series (Archæan)—mica and quartz schists, &c.—as at the Ravenscliffe Mine, on the Waikakaho Creek, near Cullensville, in the Marlborough District, and Waipori, Bendigo, Macetown, Arrowtown, and Skipper's, all in Otago.

FIRST GROUP.

The Thames Goldfield.

In acquiring a grasp of the leading features of this field I obtained most valuable assistance from the excellent map and sections prepared by Mr. James Park, F.G.S., director of the local school of mines. These have, I understand, been forwarded to the Mines Department, and will be published for general information. I was able to verify their general correctness by personal observation, and they will furnish an excellent illustrative accompaniment to this section of my report.

With respect to early workings and general features, much useful information was contributed by Mr. R. McDonald Scott, who came over specially to afford assistance.

Mr. George Wilson, District Inspector of Mines, exerted himself to bring together the mining managers of the field to contribute their experience and suggestions, which they willingly did. Amongst these Messrs. Dunlop, Clarke, Smith, and Radford may be specially mentioned as having greatly facilitated the acquisition on my part of a knowledge of the leading mining features.

The geological formation of the Thames Goldfield is of volcanic origin, and its age is placed by your geologists as about Upper Secondary or Lower Tertiary. The rocks occur on three main classes, as observed by myself, and also indicated on Mr. Park's plan and sections by the numbers 4, 5, and 6, which, for brevity's sake, will be used to distinguish the respective classes. The first