MINUTES OF EVIDENCE.

FRIDAY, 22ND JULY, 1870.

James Hector, Esq., M.D., F.R.S., in attendance, and examined.

1. *The Chairman.*] This is a Committee appointed to inquire what steps, if any, should be taken to ascertain and develope the producing and manufacturing interests of the Colony. The Committee believe that, from your scientific acquirements and extensive knowledge of the Colony, you are eminently qualified to give them much information calculated to advance the object of their inquiries. You will perceive the subject referred to them is a very wide one. We therefore purpose to divide it into distinct branches, and to take up one at a time. The first subject of inquiry will be the Mineral resources of the Colony; and on this branch of inquiry we purpose devoting our attention, first, to the gold-mining resources of the Colony. Will you kindly inform the Committee what is your opinion of the extent of the gold-bearing formation area within the Colony,—whether this has been worked to any material extent,—and whether the development of this particular branch of industry may be promoted by any legislative measures?—I produce to the Committee a copy of the geological map of the Colony. The gold fields, commencing with Otago, extend over an area of about 10,000 square miles, crossing the Island obliquely, thence stretching through the County of Westland into the Province of Nelson, and may be considered to embrace the whole western slope of the Island within that area. There is a probability of another auriferous area in the south-west, between Te Ano Lake and Foveaux Strait. Throughout the whole of the area thus indicated, which amounts to between 15,000 and 20,000 square miles, gold has been obtained in greater or less quantities. In addition to the above gold fields proper, there are several isolated localities lying beyond that district where gold has been obtained; for instance, the Mataura River, the Waitaki, and Wakamarina. In the North Island, the gold-bearing district is limited at present to the Colville Peninsula. Indications of gold have been found in other parts throughout the length of the North Island, from Wellington to the North Cape. The total area occupied by rocks which may be auriferous from their nature is very small as compared with the area in the South Island. However, as in the North Island all mining is of the character of lode or vein mining, the area of the rocks exposed to the surface does not indicate the extent of the diggings in the same way as it does in the South Island, where the veins or reefs from which the gold has been derived have rarely been discovered, the gold being obtained from alluvial deposits which are spread over a wide area. The chief characteristic of the alluvial diggings in New Zealand as contrasted with other countries, and especially with Victoria, is that the oldest alluvial drifts, from which all the more modern drifts are redistributed, rise to a higher level than the present water level of the country. The richest diggings have therefore been where such deposits, rising at a higher level, have been discovered, and have been capable of being worked by water brought from a distance by races or other means; or where, on the other hand, such rich patches have been cut through by the formation of the natural watercourses of the country. The careful and judicious administration of the water-rights is, therefore, a point of the greatest importance to the successful exhaustion of these fields. Hitherto, the yield of gold from these alluvial diggings, after the first excitement which attends a new rush, has always been in proportion to the number of men employed; and on this ground alone, I am inclined to the opinion that in no sense can they be considered as being worked out, the falling off in the yield having been produced simply by the continual migration of the diggers from one district to another.

2. To what extent do you consider these gold fields have been developed or been worked out?—They have been worked to that extent at which, except in a few localities, they cease to pay unless properly organized measures are taken to supply sufficient water; but there are large areas both in Otago and Westland which would yet prove remunerative if a proper water supply were provided—although not remunerative with certainty to the same extent as those richer re-assorted leads which first attracted attention. I produce a map of gold fields on the western slopes of the Middle Island. I may observe that anything I say as regards Westland applies equally to Nelson.

3. Are there any great difficulties in the way of conducting adequate water supply?—No, I think not. There are greater facilities than are usually met with in most countries. All the streams have a rapid fall, and run in channels cut into the surface, which also has a decided slope in the same direction. The country, as a rule, is terraced so that water-races can be carried for long distances with the requisite fall without meeting great obstacles. This especially applies to the West Coast District. The rainfall there is enormous, but that operates almost as much against the works of the digger as in their favour, because it carries away their dams, and tends to clear away the water from the upper level ground, from which a supply of water could be obtained.

4. *Hon. Mr. Gray.*] Is the soil of such a nature that the water can be conducted in channels formed in the soil itself, without the use of pipes or wooden flumes?—I cannot give a general answer to that. In some cases the ground is perfectly able to carry the water, and at the present time in Otago there are many miles of water-races cut in the ground; and such is also the case in Westland. But there are extensive tracts where the ground is loose and shingly, where timber flumes would have to be provided. The ground is of about the same average character as that in California, where the whole of the digging country is traversed by water-races in every direction. I think pipes would be suitable in many cases.