

From what I can learn, the same coal is to be found in several places along the face of the hills between Mrs. Higgs's and the Wairoa River.

His Honor the Superintendent of the
Province of Nelson.

I have, &c.,
THOMAS MACKAY, C.E.

PROVINCE OF CANTERBURY.

MALVERN HILLS.

Dr. HECTOR to the Hon. the COLONIAL SECRETARY.

SIR,—

Colonial Museum, Wellington, N.Z., 22nd May, 1873.

With reference to the application from the Provincial Secretary of Canterbury for further information respecting the Malvern Hills Coal Field, I have the honor to enclose an extract from a report by Captain Hutton, dated 7th ultimo, which is the only information on the subject obtained by the Department since the reports which have already been published. In doing so, I beg to call attention to the opinion expressed by Captain Hutton, that the superior quality of the coal in Hart's and Hill's mines is not in any way due to the local influence of volcanic rocks having altered it, as this view of the subject would make a material difference in the estimate of the amount of valuable coal in the field.

I am not aware of any fresh facts having been discovered bearing on this subject since those disclosed in Mr. Mill's shaft, described in my report of 6th July last, and which indicated that the influence of the volcanic rocks had only extended to a limited distance. The association of volcanic rocks with the altered coal at all the localities where it is found in the Malvern Hills, such as the Kouhai, Rakaia Gorge, Hart's, Hills, and the Acheron, while in all other places the seams have the ordinary characters of hydrous brown coal, and the circumstance that specimens of coal from some of these localities can be obtained exactly similar in appearance to the so-called anthracite at the Acheron which Captain Hutton admits to be an altered coal, led me to adhere to the opinion I have previously expressed on this subject, "That the improvement in quality observed in some seams is entirely due to the manner in which they have been affected by volcanic rocks subsequent to their deposition."—(Geological Report, 1871-72, p. 147.)

The apparent exception mentioned in my first report (November, 1869), as occurring at Hart's mine, has since been disproved by the discovery, according to Dr. Haast, of volcanic rocks in contact with the coal measures.

With reference to this subject, I also beg to forward a letter and enclosure received from Dr. Haast, explaining why he used the term "pitch coal" for Mr. Hill's brown coal, in a previous report; and in doing so, I beg to explain that the implied criticism to which Dr. Haast takes exception was quite unexceptional; but the term pitch coal not having been used by him in the report to which my comment referred, and as Dr. Haast has elsewhere used the term as meaning an altered brown coal,* I was anxious to guard against the impression that the seam in Mr. Hill's shaft was either a different kind of coal from that commonly found in the district, or that it was an altered coal. Besides which, the specimen received was noted at the time as "dull, without lustre, and cracking on exposure," which certainly does not answer to any definition of pitch coal, which term I first applied to a New Zealand coal in 1863, on finding Dr. Percy's definition applied exactly to the coal mine at Shag Point in Otago. I have since adhered to the same definition, and have never applied the term to an altered brown coal. I had to define the names given to New Zealand coals in the schedule referred to by Dr. Haast, which was published for the purpose of showing at a glance the comparative values of the seams that had been found throughout the Colony. It was obviously necessary to distinguish our hydrous coals that show no lqueous structure into two varieties, which, following Dr. Percy's definitions, with certain modifications, I termed brown coal and pitch coal.

According to the German nomenclature as given in Cotta's work, Dr. Haast should have used the term, pitch-brown coal (*pech-braun kohle*, p. 329) as in that work pitch coal (*pech kohle*, p. 333) is a totally different thing; but when he forwarded the specimen for analysis, Dr. Haast was evidently under the impression that the coal was of superior quality and different from the unaltered coal commonly found in the district, and from which I understood him to distinguish it by calling it pitch-coal in his letter of advice, which I also attach.

I feel it necessary to enter on the above matter, as any uncertainty whatever as to the extent or value of the coal seams might raise expectations that would not be realized, and perhaps lead to an expense being incurred in opening up these coal seams disproportionate to their value.

I have, &c.,
JAMES HECTOR.

EXTRACT from Report by Captain HUTTON on the Geology of the North-East portion of the South Island.

Malvern Hills Coal Fields.—Although by far the larger part of the coal of this district is inferior in quality to that from several other localities in New Zealand, its extent, its easily accessible position, and its proximity to Christchurch, make it one of the most important coal fields that we possess. The coal formation can be traced above the level of the Rakaia, from the Acheron all round

* "Beds of brown coal * * * * * altered for a considerable distance to anthracite, glance and pitch coal."—(Geological Report, 1871-72, p. 53.) This seems also to be Dr. Zinken's idea of pitch coal, from his description of the Hirschberg mine, cited by Dr. Haast at p. 54.