

And these, whether there still exists a force to check the further descent of silt, or that this has been removed, or *never existed there at all*, are, I venture to maintain, the result of the process I have described. And of this even Mr. Mackintosh, I think, will convince himself, if he will only cut through a few of them, and fairly examine their composition.

Of course I must not be understood as denying that many banks in valleys have been formed on either side of a running stream by its erosion, whether during floods, or when the stream ran at a higher level than at present. It is the "marine" origin of the terraces in question, to be seen scoring the flanks of our Chalk and Oolite hills, often up to their summits, which I have controverted. And although Mr. Mackintosh has now withdrawn the phrase "raised sea-beaches," as applicable to them, and substitutes those of "raised coast-lines, tidal terraces, or current-marks" (p. 26 *supra*), I do not think he thereby mends his position in any degree.

G. POULETT-SCROPE.

#### GLACIAL EPOCH IN NEW ZEALAND.

SIR,—I observe that several writers who discuss the debatable land between Geology and Physical Geography assume that in the Southern Hemisphere signs are found of a Cold Period, analogous to the Glacial Period of the North, and any difference of opinion on the subject is only as to whether the extreme cold affected both hemispheres at the same time, or alternately. I am aware that descriptions of this Glacial Epoch, and the formations by which it was supposed to be recognized in New Zealand, was given by Dr. Haast, prior to 1864; but towards the close of that year he completely changed his views on this most vital point in New Zealand Geology, and adopted the explanation of the former extension of the Glaciers in the New Zealand Alps, which was first suggested by myself in 1863.

Those who are interested in this subject will find the more modern view fully stated in the English translation of Hochstetter's work, the essential points being given in my own words (Hochstetter's New Zealand, 1867, p. 505). As the author does not give this important passage as a quotation, reference may be made to the Journal of the Royal Geographical Society, 1864, p. 103; while at page 92 of the same volume of the Journal, the opposite hypothesis of the submergence of the island and contemporaneous ice-cap during a Glacial period, is clearly stated by Haast.

This latter theory is quite irreconcilable with the observed facts, and the former extension of the glacier is sufficiently accounted for by the gradual reduction of the surface area exposed above the perpetual snow-line: firstly, by its erosion into valleys, ridges, and peaks; and secondly, by its gradual subsidence—a subsidence which has operated for the most part continuously—though interrupted by irregular and local elevations. Some of these have occurred since the arrival of colonists, even to the extent of nine feet. But beyond fifteen to twenty-five feet above the present sea level, no marine

deposits are found of later date than the Pleiocene. The Pleistocene deposits in New Zealand are sub-aërial, with the exception of the raised beaches referred to, and the evidence of progressive submergence is discovered in the contour of the land above and below the sea level, submerged forests, and other indications of unmistakable import.

JAMES HECTOR.

*Geological Survey Office, Wellington, New Zealand,  
31st October, 1869.*

ON THE OCCURRENCE OF SCHORL IN DRIFT, NEAR OXFORD.

SIR,—A small pebble of quartz was found by my brother a few years ago at Sandford upon Thames, near Oxford, having a black spot on its surface. On breaking it, I found that it contained the termination of a small crystal of Schorl, or black Tourmaline. It may possibly have been derived from the North-west of England. Tourmaline, according to Greg and Lettsom, does occur at Tenter Gill, Carrock Fells; also at Saddleback, near Force Crag. I have given the specimen to Professor Phillips, at Oxford.

S. G. PERCEVAL.

HENBURY, 5th January, 1870.

OBITUARY.

FREDERICK COLLIER BAKEWELL, a well-known writer on geological and physical science, died 26th September, 1869. He was the son of Robert Bakewell, the eminent geologist, whose "Introduction to Geology," published first in 1814, was the earliest comprehensive work on this subject. Mr. F. C. Bakewell was very early connected with the Press, having been editor of the now almost forgotten *Courier*—the *Times* of its day—and later, as scientific writer for the *Morning Post* and *Daily News*, etc., in which capacity for many years he attended the meetings of the "British Association for the Advancement of Science." His earliest work was "Philosophical Conversations," a practical introduction to every-day science for young people; and in 1835 he published "Natural Evidences of a Future Life," which he was revising for the press at the time of his death, and which will shortly appear in a new edition. Among his other works were "Electric Science, its History, Phenomena, and Applications" (1853); "Geology for Schools and Students;" "History of Modern Inventions," etc. He interested himself recently in a discussion as to the Shape of the Earth at the Poles; and in 1867 published a small pamphlet entitled, "A Dynamical Theory of the Figure of the Earth," a brief notice of which was given in the *GEOLOGICAL MAGAZINE*, Vol. iv., p. 430. Mr. Bakewell possessed an extraordinarily inventive genius, and occupied himself in the construction of many interesting and novel appliances. His greatest and favorite invention was that of the Copying Electric Telegraph, for which he was awarded the Council Medal at the Exhibition of 1851, some modification of which will probably, sooner or later, be adopted for the transmission of messages.