

Once-fissured granite is quite common, re-compacted by invasion of later granitic material. This is the fact, whether theoretically possible or not.

A. R. HUNT.

SOUTHWOOD, TORQUAY.

May 5, 1913.

THE RAISED BEACHES OF TORBAY.

SIR,—Mr. Jukes-Browne's somewhat sullen, chiefly personal, and wholly unexpected attack reminds me of the notice in the American saloon: "Do not shoot the performer. He is doing his best." As a raised-beach performer I enjoy, or once enjoyed, the very small distinction of having presented to geologists the longest list of shells recorded from any single British raised beach. I have therefore been much interested in the subject, and have endeavoured to keep myself abreast of recent discoveries.

Mr. Jukes-Browne, so far as I know, has never done a day's work on beach or raised beach. His attack is easily disposed of. To save space I will employ parallel columns.

A. J. J.-B., 1913.

"Apparently he [Mr. Hunt] has not realized that the whole question of the age of the raised beaches of Devon and Cornwall has entered an entirely new phase since the discovery that the raised beach of Gower (in South Wales) is older than the local glacial deposits."—*GEOL. MAG.*, 1913, p. 236.

A. J. J.-B., 1913.

"The beaches testify to a subsidence which culminated either just before or during the epoch of maximum glaciation."—*TRANS. DEV. ASSOC.*, 1913, p. 726.

A. J. J.-B., 1913.

"I have discovered what Mr. Hunt meant by . . . a Neolithic flint 'at Hope's Nose'."—*GEOL. MAG.*, 1913, p. 238.

"He [Mr. Hunt] indicates three lines of evidence, viz. those of flint implements, Molluscan fauna, and geographical position."—*GEOL. MAG.*, 1913, p. 237.

A. R. H., 1903.

"Mr. Tiddeman's evidence of the glacial age of the Raised Beaches of the Gower Peninsula has reopened the whole question of the Raised Beaches of the south-west of England."—*TRANS. DEV. ASSOC.*, 1903, p. 318.

I was present when Mr. Tiddeman read his paper on September 11, 1900.

Professor E. HULL, 1913.

"The chart . . . indicating [for Europe and the North Atlantic] a rise of 1,000 to 1,200 fathoms (6,000 to 7,000 feet) during the culminating stage of the Glacial Period."—*PROC. GEOL. SOC.*, 1913, p. 88.

A. R. H., 1904.

"The mere fact of the discovery of Neolithic *flakes* newer than the adjacent beach at Hope's Nose, Torbay, may be worth a bare record."—*GEOL. MAG.*, July, 1904.

There was nothing concealed, so nothing to be discovered.

"Geology, geography, conchology, physics, palæontology, archæology, anthropology, and even micro-petrology [I forgot spelæology, zoology, and chemistry], all seem to incline towards the conclusion," etc.—*GEOL. MAG.*, 1913, p. 107.

I never referred to 'implements'; and there are ten lines of evidence, not three.

When, some time ago, I consulted two imaginary charts, by Mr. Jukes-Browne, of Pleistocene times,¹ I found that in neither did the sea approach the Torbay raised beaches! A sea-beach without a sea is impossible.

Mr. Lamplugh, in the current number of the *GEOLOGICAL MAGAZINE*, seems to have exactly defined the present position of this raised beach question. He observes that “the correlation has still an element of uncertainty”.² That is all I at present maintain, viz., that the age of these Torbay beaches has *not* been “fairly well settled”.

If Mr. Jukes-Browne can justify his charge, by reference to any passage of mine in the *GEOLOGICAL MAGAZINE* (since 1890); that I am a “needless fault-finder”, I will give £5 to any hospital or to any scientific object that you, Sir, may kindly indicate.

A. R. HUNT.

SOUTHWOOD, TORQUAY.

May 3, 1913.

THE ‘CRETACEO-TERTIARY’ OF NEW ZEALAND.

SIR,—I noticed that in the November number of the *GEOLOGICAL MAGAZINE* there was a further criticism of my work on the younger rock system of New Zealand. At this distance it is, I think, inadvisable to detail at great length the exact features of local stratigraphy. This I intend to do in the pages of the *Transactions of the New Zealand Institute*, the publication in which my first article on this subject appeared. I hope, however, that you will find space for a reply on a few of the more general aspects of the question.

1. Insistence is laid on the fact that below the Oamaru Limestone Cainozoic fossils only have been found, while beneath the Amuri Limestone Cretaceous fossils occur. As a matter of fact, in all those districts where the Amuri Limestone has been found there is a thickness of 500 to 2,000 feet of strata that have up to the present time yielded no fossils, while the Amuri Limestone itself is almost destitute of fossils, though those that have been found are of Tertiary aspect.

The explanation that I have put forward, viz. continuous rapid depression until after the deposition of the limestone, makes it evident that in off-shore and in relatively low-lying localities the deposition of limestone would commence far earlier than in localities that were submerged only slightly before the climax of depression. The thick deposits of foraminiferous ooze which is the nature of the Amuri Limestone must, therefore, represent not merely in its upper part the same horizon as the Oamaru Limestone, but in its lower part a considerable thickness of subjacent beds, be they conglomerates, greensands, or mudstones. One may add, too, that the latest critical statement (1892) of Tate classes the Echinoderms of the Oamaru Limestone (twenty-six species, all extinct) as Eocene with a Cretaceous complexion.

¹ *The Building of the British Isles*, 1888, pp. 294, 300.

² *GEOL. MAG.*, 1913, p. 239.