

exhibited, he was able to show their exact relation; and the evidence thus gained beyond what was formerly known goes to prove that the Carmel was a valley in Pre-glacial times, in which roamed herds of Reindeer and the hairy Mammoth, and that some of these have left their remains in certain estuarine deposits formed over the lower levels of the valley. The next evidence is the depression of the valley, with its estuarine beds, under sea level, as clearly indicated by the bed of sand with marine shells of Arctic types, marking as it were, by their presence, the dawn of the Glacial period. Mr. Craig had also obtained evidence, from other pits and bores sunk in the valley, that the marine sand and estuarine beds had suffered denudation at several points before the Boulder-clay and upper drifts (50 feet in thickness) were deposited above them, the Boulder-clay at these points resting upon the Carboniferous sandstone of the district. Mr. Young concluded his remarks by stating that he could not give a decided opinion at present as to the exact age of the "Mammoth" bed at Kilmaurs, but the evidence seemed to point it out as a Pre-glacial remnant of the oldest Post-tertiary strata yet discovered in the West of Scotland. J. A.

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#### CORRESPONDENCE,

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##### THE SOUTH COAST OF FURNESS.<sup>1</sup>

SIR,—In Mr. Maw's article in the February number of the GEOLOGICAL MAGAZINE, he does not mention a whitish-grey sandy clay which emerges through the beach gravels about high-water-mark between his two cliffs. The same clay (four years ago) could be seen at intervals for two miles along the east shore; and about that distance from Rampside, I found it, in cutting down to the shell-beds, 200 yards inland, six feet below the surface. On the west shore, near the next cliff, a little over a mile from Rampside, it is bluer, and of a rather more soapy nature, containing smoothed pebbles, a little striated.

I fail to see anything new in Mr. Maw's notice of the shell-beds, except it be in his having carried them to the top of the cliff, a height of more than forty feet (see his Fig. 2, *a*). This is interesting, if intended to signify the fact, as I had not ascertained that they anywhere rose above the 25 feet contour. I had certainly observed that grass-sods falling from above, were charged with minute shells, but I judged they might have been carried over the head in storm-spray.

With respect to the age of our Furness shell-beds, I had hoped that the very carefully drawn up list of species given by me on page 216 of the last Number of the Geologist, 1864, and reprinted in the North Lonsdale Magazine, 1866, would have sufficiently indicated their Post-glacial character: not one arctic shell being there recorded. That list is not a long one, and perhaps it might be augmented: still, owing to their comminuted state in many places, it was a work of time and trouble; and if it be, as I have believed it to be, the only one published, it is not without a certain value. I

<sup>1</sup> Owing to want of space last month this and the following letter were unavoidably postponed.—EDR.

am of opinion that the Bay of Morcamb<sup>1</sup> is a much less ancient inlet than the Frith of Clyde, and the Kyles of Bute, where Mr. Smith, Mr. Sowerby, my revered friend Dr. Landsborough, and numerous acute observers have worked so successfully: the coeval shore line of this part of Britain, viz. Cumberland and Lancashire, doubtless stood a long way further out.

E. HODGSON.

ULVERSTON, 15th March.

“GEOLOGICAL NOTES FROM NORWICH.”

[Proceedings of the Bristol Naturalists' Society, Vol. iii., Nos. 7, 8, and 9, 1868.  
Noticed in GEOLOGICAL MAGAZINE for April, p. 177.]

SIR,—Permit me to reply to the somewhat stringent remarks of H. B. W. in your last number, and to suggest that it would have been much kinder if H. B. W. had ascertained whether the short abstract were a correct *resumé* of the original paper.<sup>2</sup>

The different statements made at Norwich respecting the geology of that county were so conflicting and contradictory as to call forth a remark to that effect from the President of the Geological section (see *Norfolk News*, Aug. 22, 1868). So puzzling were they that I, in common with many others, felt really “out of my element,” and “at sea,” and therefore had recourse to “literature” for information to which also I would refer H. B. W. For instance, I found that the Norwich beds are said to have been seen to directly overlie the Red Crag at Chillesford (*vide Elem. Geol.* pp. 196, 198). Again, the same authority states that the Bridlington beds have about the same age as the Chillesford (*loc. cit.* p. 198).

With regard to my statement respecting the *Potamides*, I still see no reason why they should not be that sub-genus, nor can I discover any difference between the Bramerton shells and many that I obtained from the fluvio-marine beds of the Isle of Wight. The shells of the *Potamides* cannot be distinguished from the *Cerithia* (*vide Wood's Crag Mollusca*, p. 68) in their conchological character, but the former lived in estuarine or freshwater, while the latter lived in marine habitats.

With the Bramerton fossils are found some freshwater shells, and therefore the conclusion that they were *Potamides* is a very likely one.<sup>3</sup> Mr. Wood also makes a statement to that effect (*Crag Moll.* p. 68). Sir Charles says (*Elem.* p. 196), “It is clear that these beds have accumulated at the bottom of the sea near the mouth of a river.”

With regard to the antiquity of the Red Crag, I simply stated that the Red Crag was the oldest Pliocene formation, *with which I had then to do*, and H. B. W. may fairly have conjectured this, for, probably, there are few to whom the Coralline Crag is not familiar.

<sup>1</sup> This is written Morcamb in Beck's work “*Annales Furnesiensis*,” the best work we have.—E.H.

<sup>2</sup> We are exceedingly sorry to learn that the Bristol Naturalists' Society are in the habit of issuing their Proceedings without first consulting authors whose papers they intend to publish, and obtaining their corrections to the same. We would earnestly recommend Mr. Stoddart in future to insist upon seeing and revising his own papers before publication, in whatever Journal they may appear.—EDIT.

<sup>3</sup> *Potamides* does not occur in the Norwich Crag.—EDIT.