

many too many shells, both species and individuals, for a beach." A curious puzzle, but a beach it nevertheless is.

The late Sir Joseph Prestwich embodied my Thatcher collection in his table of the "Mollusca of the Raised Beaches" (Q.J.G.S., vol. xlviii, p. 300).

Anyone interested in the investigation may be pleased to add three species to Sir J. Prestwich's total of 64,¹ viz., *Scalaria communis*, from the Thatcher, on the authority of Mr. D. Pidgeon, and *Pecten maximus* and *Venerupis*, sp., from the Hope's Nose beach, on the authority of the late Mr. Godwin-Austen.² Mr. Godwin-Austen described the *Venerupis* as *decussata*, but as that is not a British shell it was probably *V. irus*.

I hope to publish Mr. Pidgeon's criticisms and to discuss them in the transactions of a provincial society. He was one of the acutest of observers, and his detection of the perfect preservation of the sculpture of the Raised Beach shells was one of the most important observations ever recorded on the subject, and one by no means easy to explain.

A. R. HUNT.

TORQUAY, May 8, 1902.

SUB-OCEANIC RIVER VALLEYS.

SIR,—To those who have given some attention to the above subject the following statement may prove interesting.

In the recent work, "The Scenery of England," by Lord Avebury, F.R.S., I had the gratification on turning over its pages to find sympathetic reference to my investigations into the phenomena presented by the submerged river valleys of the British Islands and Western Europe, but coupled with a caution "that perhaps I had carried the argument further than the facts entirely warranted."

In thanking Lord Avebury for his kindness in presenting me with a copy of his book, I referred to this caution, which I regarded as quite natural, and added that it would give me much pleasure to afford his Lordship an opportunity of examining the Admiralty Charts themselves, in order that he might judge for himself whether I was justified in my conclusions as to the position and depth below the surface of the ocean to which these "drowned river valleys" descend.

Accordingly a day was kindly arranged for the examination of the Charts, which Lord Avebury examined with the greatest and most intelligent care, and at the end he expressed his gratification at the result.

His Lordship is now, I understand, preparing a new edition of "The Scenery of England," and a few days since I had the pleasure of receiving from him a letter in which he says: "After looking at your maps I am omitting the sentence in p. 106 in which I express a cautious doubt" in regard to your conclusions. This candid acceptance of my views may, perhaps, have some weight with those geologists who have opposed my views, but who have not taken

¹ Q.J.G.S., vol. xlviii, p. 301, Prestwich writes 64 species, but the list shows only 63.

² Trans. Geol. Soc., vol. vi, p. 442.

'the only course by which they can be properly tested; that is to say, by tracing for themselves the isobathic contours on the Admiralty Charts by means of the soundings.

Before concluding I wish to call attention to a remarkable corroboration of these views which has recently appeared from another quarter. In his elaborate work on the Glacial Geology of the Christiania Region of Norway, in which the variations of level at successive epochs are elaborated, Professor Brøgger¹ says: "the occurrence at great depths of the Norwegian Sea of the high-arctic fossil shallow-water Mollusca of the 'Yoldia fauna' is explained by the hypothesis, that the sea-bottom during the time of the greatest ice-sheet of Europe must have been uplifted at least 2,600 mètres higher than it is at the present." It is remarkable that this amount of uprise corresponds very closely with that determined by myself; namely, 1,200 fathoms (7,200 feet) as the elevation of Western Europe during the intensest cold of the Glacial period. The maximum elevation was coincident with the stage of maximum cold of that long period; they were, in fact, cause and effect. We require no other explanation for the cause of the intense cold, and the subsequent changes of climate, than the oscillations of level of land.

EDWARD HULL.

THE UPPERMOST CHALK OF THE BALTIC.

SIR,—In his valuable communication "On some Crustacea . . . from the Upper Cretaceous of Faxe" (GEOL. MAG., Nov. 1901, p. 487) Dr. Henry Woodward has copied from Dr. K. O. Segerberg's paper "De Anomura och Brachyura Dekapoderna inom Skandnaviens Yngre Krita" (Geol. Fören. Stockholm Förhandl., xxii) certain statements concerning the geology of the Baltic Uppermost Chalk (Yngre Kritan). Since these might mislead English readers, I ask leave to correct them.

Since 'Faxekalk' is identical with 'Corallkalk,' it is incorrect to say that "The lower layer of the Faxe Chalk is . . . largely composed of corals, hence called coral-chalk." Even if the term 'Faxekalk' be applied to the whole of the Uppermost Chalk, the expression is misleading, since the bottom bed of the Uppermost Chalk does not consist of the Corallian Limestone (Faxekalk *sens. str.*), but this latter itself rests on a bed of coccolith-limestone (Saltholmskalk).

The hardness of the coccolith-limestone depends on a secondary cementing through calcite-crystals or flinty matter, a process in no way restricted to any definite horizon; looser varieties of this limestone are found just as much in its lower levels as "in the upper layer."

The coccolith-limestone forms the main facies; here and there on the coccolith-ooze there sprang up coral banks or groves of bryozoa; but the shower of coccoliths proceeded unchecked, so that

¹ "Om de Senglaciale og Postglaciale Nivaforandringer i Kristianiafeltet," pp. 682-3.