Chalk

MR. WALLACE'S theory that chalk was deposited in comparatively shallow water requires careful examination before it is accepted by geologists. I do not think he has given sufficient evidence to bear out his views which are necessary to his theory of continents.

Mr. Wallace cites the resemblance between chalk and Globigerina-ooze, namely—

The similarity of the minute organisms found to compose a considerable portion of both deposits; several species of Globigerina appearing to be identical in the chalk and the modern Atlantic mud; the presence of Coccoliths and Discoliths in both formations; the abundance of Sponges in both; the presence of *Porifera vitrea*, the nearest representative of the Ventriculites of the white chalk; the resemblance of the forms of Echinoderms; and without attempting to reconcile these with a shallow sea-deposit, he proceeds to state the case on the other side. This consists of the difference in analysis between chalk and Globigerina-ooze, the former containing more carbonate of lime and less alumina, the presence of silica in the Globigerina-ooze being perhaps counterbalanced by the flints in the chalk. The greater proportion of alumina certainly points to different conditions, which Mr. Wallace considers to be that chalk is the very fine mud produced by the disintegration of coral-reefs, and mentions a deposit resembling chalk at Oahu in the Sandwich Islands and the deposit in several growing reefs, without however attempting to show that there is any probability that the remains found in these would bear any resemblance to the Sponges and Echinoderms of the chalk, or why we find no remains of these Cretaceous coral-reefs.

Mr. Wallace does not state in what the greater resemblance between chalk and Globigerina-ooze of shallow over deep water consists, but he looks on it as "weighty evidence."

Mr. Gwyn Jeffries, he says, finds all the Mollusca of the chalk to be shallow-water forms, many living at forty to fifty fathoms, some confined to still shallower waters, while deep-sea forms are absent. The late Dr. S. P. Woodward considered that Ammonites probably lived in water not over thirty fathoms; and these facts are as difficult to reconcile with Mr. Wallace's views that chalk was deposited in a sea of not over a few thousand feet as in a deeper sea.

The rareness of corals and absence of coralline beds of the age of the Lower or Upper Chalk is an important objection to the theory that chalk was deposited similarly to the Oahu chalk, the beds of Maestricht and Faxoe being above the chalk, and the former are not even conformable with it.

The point I think is still an open one, whether we shall accept Mr. Wallace's views that chalk was deposited in a comparatively shallow sea and not very far from land, or in a deep sea, the immense break between the chalk and Eocene beds giving ample time for very considerable alteration to have taken place in the disposition of land in the interval. I send this letter in the hope that a discussion on the point may elicit new facts bearing on the subject.

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[1] "Specimen photographicum." Verona, 1859. Plate xxi.

[2] Actually described as Araucarites, a useless modification in this instance.