

## RED CLAY.

This deposit is spread over the greater depths of the ocean remote from land; it is the most widely distributed and probably the most characteristic of all the Deep-Sea Deposits. The nature and origin of this Red Clay has been the subject of much discussion and speculation ever since the deposit was first discovered in the Atlantic by the Challenger naturalists in depths exceeding 2400 fathoms, on the voyage between Tenerife and the West Indian Islands. It was at first believed to be the most minutely divided material, the ultimate sediment, so to speak, produced by the disintegration of the land, which, held in suspension in sea-water, was distributed to great distances by ocean currents. In 1874 Wyville Thomson expressed the opinion that the Red Clay was primarily of organic origin, being "essentially the insoluble residue, the *ash*, as it were, of the calcareous organisms which form the *Globigerina* ooze, after the calcareous matter has been by some means removed." He further suggested "that clay, which we have hitherto looked upon as essentially the product of the disintegration of older rocks, under certain circumstances, may be an organic formation like chalk," and that the fine smooth homogeneous clays and schists familiar to the student of palæozoic geology had an origin similar to that of the Red Clay.<sup>1</sup> These views were subsequently supported by Professor Huxley and other writers.<sup>2</sup> In 1877 John Murray published his reasons for believing that the clayey matter in Marine Deposits far from land is principally derived from the decomposition of aluminous silicates and rocks spread over the oceanic basins by subaerial and submarine eruptions,<sup>3</sup> and this view will be the one adopted in the present work, although M. Renard is inclined to attribute a more important role to submarine eruptions than is admitted by Murray. Colloid clayey matter coming in suspension from the land may, it is admitted, play some part in the formation of this deposit.

In the Tables of Chapter II. there are 70 of the samples procured by the Expedition described under the head of Red Clay. In depth these range from 2225 fathoms at Station 259 to 3950 fathoms at Station 238, the average depth being 2730 fathoms.

The name Red Clay is retained not only on account of its historical interest, but because it appears sufficiently expressive of the nature and appearance of the deposits included under the appellation. The amount of clayey matter and the colour vary greatly in different samples, but the hydrated silicate of alumina is always present, so as

<sup>1</sup> *Proc. Roy. Soc.*, vol. xxiii. p. 47.

<sup>2</sup> Huxley, *Manual of the Anatomy of the Invertebrated Animals*, London, 1887; see also *Nature*, vol. xi. pp. 95, 116; vol. xii. p. 174.

<sup>3</sup> "On the Distribution of Volcanic Debris over the Floor of the Ocean," &c., *Proc. Roy. Soc. Edin.*, vol. ix. pp. 247-261. Wyville Thomson (*Voyage of the Challenger*, "Atlantic," vol. ii. p. 299) allows that these volcanic materials form an important element in the Red Clay, but he still holds that the source he originally suggested has contributed no inconsiderable share towards the formation of this deposit. [Subsequently, however, he abandoned the view that calcareous shells contained silicate of alumina.—J. M.]