

to give to the sediment a more or less clayey character, and red is the prevailing colour. In the North Atlantic and some other regions the colour is brick-red from the presence of peroxide of iron intimately mixed with the clay, which often covers the minute mineral particles with a red coating. In the South Pacific over large areas and in the Indian Ocean the deposit assumes a dark chocolate colour, from the presence in great abundance of very minute round grains of peroxide of manganese.<sup>1</sup> It sometimes happens that the deposit has a bluish, rather than a red, tinge; this is the case when the specimen is from a region adjacent to a continent where large rivers throw their detrital matter into the ocean, and the colour is largely due to the presence of sulphide of iron and organic matter, as in the characteristic Blue Muds. When the carbonate of lime in the sample reaches 20 or 25 per cent. the colour becomes grey from the admixture of the white Foraminifera shells, although the residue on removal of the carbonate of lime has a distinct red colour. It was to specimens of this nature that the name "Grey Ooze" was applied by Murray and Thomson in the preliminary reports on the results of the Challenger Expedition.<sup>2</sup> The immediate upper layer when brought up in the dredge or sounding tube is thin, watery, and often has a lighter colour than the deeper layers, which are much more dense. It occasionally happened that the sounding tube penetrated nearly two feet into the deposit, and in such cases the lower end of the tube was filled with a very stiff, hard, compact clay. Sometimes there was considerable difference in colour and chemical composition between the different layers—usually depending on the greater or less percentage of carbonate of lime present. In the North Pacific the upper or surface layer was generally darker than the under layers, but this was not the case in the other regions. In some places the deposit had a mottled appearance, there being some spots where the red or chocolate colour was discharged and the clay had assumed a yellow colour. A mottled appearance is sometimes, however, due to the presence in great abundance of small manganese nodules and grains of pumice, or of altered volcanic glass and rocks.

Like clays in general, the Red Clay is soft, plastic, and greasy to the touch; it can readily be moulded into any form between the fingers after the manner of dough. It exhales when breathed on the peculiar odour of clay. Like all clays containing iron it generally becomes redder when burned; it sticks to the tongue when dry, and requires a great heat to render it perfectly free from water. When dried it cakes into a hard compact mass that can only be broken with the blow of a hammer or other hard instrument. Should the hardened fragments be placed in water they break down slowly, as is the case with other clays. A fragment placed before the blow-pipe will fuse into a black, often magnetic bead, behaving in this respect like the variety of clay known by the name of "felspathic mud;" this property may be attributed to the minute volcanic mineral particles which are always present in varying proportions. If one of these half-dried lumps be rubbed briskly with the back of the finger-nail or any hard, smooth body, the

<sup>1</sup> See Pl. XXII. fig. 1.

<sup>2</sup> *Proc. Roy. Soc.*, vol. xxiii. pp. 32-49, 1874.