

volcanic glass, surrounded by different coloured bands altering into palagonitic material. One of these is represented in Pl. XIX. fig. 3; another nucleus, in which the vitreous base is transformed into palagonite, is shown in Pl. XVII. fig. 2.

Station 294, 2270 fathoms.—In the lower six inches of the sounding tube there was a dark-coloured deposit, containing a large quantity of manganese, together with palagonitic fragments, sharks' teeth, and zeolitic crystals.

Station 296, 1825 fathoms.—The mud in the lower half of the sounding tube was of a dark brown colour from the presence of manganese grains, and in the trawl were several small manganese nodules, about the size of peas, together with numerous splinters of basic volcanic glass and palagonite.

Station 297, 1775 fathoms.—The deposit here was a Globigerina Ooze containing 71 per cent. of carbonate of lime. The trawl contained about 4 litres of manganese nodules, while about 3 litres were obtained in the tow-net attached to the trawl, along with a quantity of the yellow-coloured Globigerina Ooze. The weights, 300 fathoms in front of the trawl, were scored with black streaks, as if they had been dragged over lumps of manganese. The nodules rarely exceeded 4 cm. in diameter, were round in form, and not so massive as nodules of a similar size dredged from a Red Clay. The great majority had large, whitish, yellowish, or greenish nuclei, evidently originally composed of aggregations of the deposit, for very many casts of Foraminifera were observed in a yellowish or whitish substance, which is unaffected by dilute acids. In general these nuclei are soft, but at other times they are harder, and the casts of Foraminifera are very perfect. One of these nuclei contained iron, alumina, and magnesia, with small quantities of soluble silica, manganese dioxide, and soda. The portion insoluble in hydrochloric acid, amounting to 53 per cent., consisted mainly of free silica. The general appearance of these nodules is represented in Pl. III. fig. 8, while in fig. 9 of the same plate one of the nodules is broken to show the nucleus. In some cases the nucleus consists of a fragment of basic volcanic glass surrounded by altered palagonitic zones; in other cases the central unaltered portion has entirely disappeared, the whole nucleus being converted into palagonite. Occasionally the nucleus is composed of a large number of angular fragments of palagonite with hollow spaces in the centre (see Pl. XVIII. fig. 1). When the manganese is removed from these nodules by concentrated hydrochloric acid the skeleton that remains has a very areolar structure, as represented in Pl. IX. fig. 9.

This station is instructive as being one of the few instances in which manganese nodules were found in a Globigerina Ooze. It may be pointed out that the manganese nodules are here associated with a considerable quantity of basic volcanic glass, fine areolar volcanic ash, and palagonitic grains; indeed, this association of altered basic volcanic material and manganese is very constant in deep-sea deposits. While there were perfect casts of Foraminifera observed in the nuclei of many of the nodules, no casts of these organisms were found in the deposit itself. The accumulation of free silica in