

Station 157, 1950 fathoms.—Among the stones dredged at this station were numerous glaciated fragments, the largest weighing over 20 kilogrammes. Some of them were only partially imbedded in the Diatom Ooze, the depth to which they were imbedded being marked by a sharp line. The portions above the surface of the deposit had a slight coating of the black oxide of manganese, and this substance was most abundant just at the line marking the separation between the deposit and the superincumbent water. In the same deposit some fragments of Hexactinellid spicules had a rather thick coating of manganese peroxide.¹

Station 160, 2600 fathoms.—The trawl at this station contained about 16 litres of manganese nodules, pumice stones, earbones of Cetaceans, and sharks' teeth. With respect to their form the nodules may be arranged into three groups: first, more or less pyramidal or irregularly grape-shaped; second, spheroidal or ellipsoidal; third, flattened, mammillated, and irregular in form. A typical example of the first group is represented, natural size, in Pl. II. fig. 3. It measures about 5 cm. in longest diameter; its fundamental form may be compared to a triangular wedge, with a curved surface at the superior part. The surface is entirely mammillated, but the rounded rugosities are not very pronounced, being much softened down, and but slightly projecting, with a diameter of 5 to 6 mm. Upon one face the mammillæ are much more abundant than on the other. Animals are usually attached to the smoother face, and we are inclined to believe that this face projected above the surface of the deposit, while the rougher one was imbedded in the clay. The figure represents the smoother face of this nodule, and shows more or less pronounced reliefs in two directions, following which the fracture usually takes place with the greatest facility. The first is parallel to the lateral edges of the wedge along the radii; the second is more or less parallel to the superior surface of the figure, and follows a curved direction, answering to the disposition of the layers in the interior as represented in fig. 3*a*, showing a section of a nodule similar to that of fig. 3. The first direction answers to the fracture running from the periphery to the inferior point of the wedge. This form may indeed be compared to a fragment of a more or less regular spherical body, where the fractures had taken place along the radii, thus leaving a triangular solid terminated in one aspect by the primitive peripheral face. Fig. 3*a* shows the internal structure of this type of nodule, and it will be observed that parallel to the curved superior surface there are alternating zones, sometimes yellowish white, sometimes black-brown, the last having the character of earthy manganese. These internal curved bands follow very regularly the external curved surface, and have a thickness of about 2 mm. Notwithstanding their homogeneous appearance, microscopic examination shows that the light-coloured bands are traversed by fine arborescences or dendrites of manganese. The existence of these dendrites is also shown by attacking the nodule with hydrochloric acid, and examining the skeleton with a lens; a portion of a nodule so

¹ Murray, *Scot. Geogr. Mag.*, vol. v. p. 427, 1889.