

any case was very small compared with the larger indications in the clays at other stations where the deposit is of a dark chocolate colour. The surfaces of many of the nodules were covered with Rhizopod tubes and the stolons of Hydroids.

Station 253, 3125 fathoms.—The small dredge, as well as the tow-nets attached to it, contained clay and manganese nodules. One of the nodules was of large size, and flat or slab-like in form. It measured  $31 \times 20 \times 6$  cm.; a fourth part of this nodule is shown in Pl. IX. fig. 1. There was a great difference in appearance between the upper and lower surfaces; the lower surface, that which rested on the deposit, or was immersed in it, is very rough and uneven, consisting of numerous closely-set mammillæ; these mammillæ are more numerous near the outer edges of the block, and the whole under surface has a scoriaceous aspect. The upper surface, on the other hand, has relatively few mammillæ, and these are smooth, rounded, and softened, when compared with those of the under surface. Small pieces of pumice appear to have fallen on the upper surface of this block, and to have been cemented to the upper surface of the nodule by subsequent depositions of peroxide of manganese. In the same way a Nodosarian Foraminifer and worm-tubes, that lived attached to the upper surface, have become imbedded by the successive additions of manganese. Attached at different parts of the surface of this nodule were four living specimens of a Hydroid (*Stephanoscyphus*), a Tubularian, two small Actinians, a Serpularian, two Polyzoons, and the whole surface had a reticulated appearance from the presence of Rhizopod tubes or the stolons of the Hydroids. An Annelid with a muddy tube was attached to the under surface. Fig. 1a shows a portion of a section of this nodule, from which the manganese has been removed to show its structure. The whitish coloured irregular nucleus is surmounted by successive layers of manganese 3 to 4 cm. in thickness, while beneath this nucleus the layers are only about 1 cm. in thickness. It will be observed that many of the layers above the nucleus terminate rather abruptly towards the periphery, which structure seems to suggest that this nodule was once a part of a larger mass that had subsequently been fractured and surrounded by the external layers. The nucleus is irregular and of an elongated form, and in its centre are hollow spaces filled with clay; it is very hard and compact, but can be scratched with a knife. When examined in thin slices this nucleus is yellowish and finely granular, the grains being about 0.001 mm. in diameter. The whole mass is streaked with colourless lines, resembling in some respects certain microliths; it is isotropic, some colourless fragments being birefrangent; it did not present cleavages nor crystallographic contours. Two or three fragments of felspar and some elongated fragments, which appear to be mica, were observed, as well as some prismatic sections of zeolites. The nucleus is penetrated by dendrites of manganese in many directions. In all probability this nodule projected about an inch above the general level of the deposit when at the bottom of the ocean.

In addition to this large nodule was another with a diameter of 8 to 9 cm., resembling in many respects the nodules dredged at Station 252. The mammillæ are,