

PLATE IX.

- Fig. 1. Fourth part of a large nodule from the North Pacific (natural size); the nodule when dredged measured $31 \times 20 \times 6$ centimetres. There is a great difference between the two large faces, the one figured being the upper surface. The under surface, that which rested on the clay of the bottom, is rough and consists of numerous closely-set mammillæ, which are more numerous towards the outer edges. The upper surface is much smoother, and the reliefs of the mammillæ rounded and softened. Small pieces of pumice that have fallen on the upper surface are cemented to it by manganese depositions, and in the same way a specimen of *Nodosaria* can be seen cemented to it by layers of manganese. In addition, there were attached to the upper surface: four specimens of *Stephanoscyphus*, a Tubularian, two Actinians, a *Serpula*, two Polyzoons, and many Rhizopod tubes or rhizomes of a Hydroid. Attached to the under surface at the edge was an Annelid with a muddy tube. The white central part may be regarded as an elongated nucleus with hollow spaces filled by clayey matter; it is hard, but can be scratched with a knife. It is impossible to suggest with any certainty its original nature. The layers of manganese above the nucleus are much thicker than those below. Station 253; 3125 fathoms. North Pacific.
- Fig. 1a. End portion of the same nodule, from which the manganese has been removed by concentrated hydrochloric acid (natural size). The way in which some of the inner layers terminate at the edge suggests that this fragment may at one time have been part of a larger mass.
- Fig. 2. Under surface of nodule from the Central Pacific (natural size). It is formed on a large *Carcharodon* tooth, and takes roughly the form of that triangular body; it might be said that there are three centres of concretion, one at each corner of the triangle. The upper surface is much smoother than the under. Station 274; 2750 fathoms. Mid Pacific.
- Fig. 3. Compact nodule from the South Pacific (natural size). It is deeply mammillated, and in the hollows between the mammillæ there is a rough, irregular Rhizopod tube. The upper part of the figure shows how the nodule breaks into concentric zones. Station 289; 2550 fathoms. South Pacific.
- Fig. 4. Sections of manganese nodule from the North Pacific, one half being demanganised to show the structure (natural size). The nucleus is yellowish, and apparently was originally a piece of pumice; this is surrounded by concentric layers, some of which contain much more manganese than others. It will be noticed that, with the growth of the nodule, secondary nuclei have been embraced by the concentric layers. There is an indication of radial as well as concentric structure. Station 248; 2900 fathoms. North Pacific.
- Figs. 5 and 6. Sections of nodules from the Central Pacific (natural size). The nucleus is small and surrounded by black undulating zones or lines superposed the one upon the other. In fig. 6 the face is demanganised by concentrated hydrochloric acid to bring out the structure. Station 274; 2750 fathoms. Mid Pacific.
- Fig. 7. Section of a round nodule from the North Pacific (natural size). In this case the cut face of the nodule has been demanganised by concentrated hydrochloric acid, which leaves a clayey skeleton showing well the structure of the nodule. Three zones can be recognised: first, the nucleus; second, a zone around this without definite structure; and third, an external zone of concentric layers. Station 252; 2740 fathoms. North Pacific.
- Fig. 7a. Portion of the same, showing the external zone with concentric layers (magnified 25 diameters). Here the intimate structure is seen; the empty spaces are those that were occupied by the manganese, and the figure shows the interpenetration of earthy and clayey matters.
- Fig. 8. Section of nodule from the South Pacific, the face of which has been demanganified to show the structure (natural size). There is a hard nucleus of volcanic rock, surrounded by a zone without any alternating layers, around which are concentric layers of the usual form. Station 276; 2350 fathoms. South Pacific.
- Fig. 9. Nodule from the South Pacific (natural size). The surface has been treated with concentrated hydrochloric acid to remove the manganese; the clayey skeleton that remains is very areolar in structure. Station 297; 1775 fathoms. South Pacific.
- Fig. 10. Portion of nodule from the Central Pacific (natural size), in which tubes apparently of Rhizopods are seen between two of the layers of the clayey skeleton that remains after treatment with concentrated hydrochloric acid. Station 274; 2750 fathoms. Mid Pacific.