

spherules, also from this station. The external aspect of one of these spherules of phillipsite is shown in Pl. XXIII. fig. 3, while figs. 2, 5, 6, 7, and 9, on the same plate, represent cosmic spherules extracted by means of a magnet from the nodules or the clay in which they were imbedded.

There were about 300 sharks' teeth and fragments of sharks' teeth, either with a slight coating of manganese or forming the nuclei of nodules, some of which are represented in Pl. V. fig. 12 and Pl. VI. figs. 1 and 19, and about twenty petrous bones and tympanic bullæ and other smaller fragments of bones of Cetaceans. Two of the tympano-periotic bones are shown in Pl. VII. figs. 6 and 7, and were attached when brought up. Among the nodules were also four large otoliths of fish, about the size of those of the Tunny, as well as two of the tabulated teeth of *Tetrodon*. For many reasons it seems probable that this station is not far removed from the seat of some old submarine eruption.

Station 280, 1940 fathoms.—There were two or three hardened pieces of the deposit, perforated in all directions by worm-tubes, and coated with deposits of peroxide of manganese. One piece was 2 inches in length and very irregular in outline; two smaller pieces were flat, and to one of them an *Esperia* was attached.

Station 281, 2385 fathoms.—In the bag of the trawl there were some dark chocolate-coloured clay, many manganese nodules, large slabs of volcanic tufa covered with manganese, many sharks' teeth, and a few earbones and fragments of other bones of Cetaceans. There were between two and three bushels<sup>1</sup> of manganese nodules. Among these were several large slabs, from 1 to 2 inches in thickness; one of them measured 18 × 12 inches. A portion of one of these slabs is shown in Pl. IV. fig. 3. About the middle of the section will be noticed a dark line; beneath this line there is a Red Clay that would seem to have been at one time the upper surface of an old sea-bottom. Here manganese nodules were in process of formation, some of them nearly imbedded in the Red Clay forming the lower part of the figure, while others projected partly above the surface. A fall of volcanic ashes appears to have taken place upon this old sea-bed, and to have covered the floor of the ocean, in some places at least, to the depth of an inch, as represented in the figure above the dark line. The minerals making up the ashes lying immediately upon the Red Clay are coarser than those above. The appearance of these volcanic minerals at the junction with the Red Clay is represented in Pl. XXI. fig. 2, the right-hand side of the figure representing the Red Clay deposit, and the left the volcanic ash. In most cases the slabs are coated with layers of peroxide of manganese only on the upper surface and along the edges, the under surface being composed of red or chocolate-coloured clay. The nodules imbedded at the junction between the shower of ashes and the Red Clay have a concentric arrangement, and sometimes have sharks' teeth as nuclei. In some of the slabs, as has been stated, the layer of ashes is fully an inch in thickness, in others it is less than half an inch. Pl. IV. fig. 4 shows a nodule, on

<sup>1</sup> About 80 litres.