of manganese, and to the outer surfaces were attached Ascidians, Brachiopods, Hydroids, and Rhizopods. The appearance of these fragments of pumice is represented in Pl. I. figs. 1–4. Fig. 1 shows (one-fourth natural size) a characteristic specimen of the light, porous, filamentous variety of liparitic pumice; the form is rounded or egg-shaped, many of the pores and areolar spaces are filled with the deposit, and the whole surface of the fragment has undergone a slight alteration into a clayey or earthy substance. A few crystals are visible to the naked eye projecting from the surface, and large portions of the surface are discoloured by the peroxide of manganese. Fig. 2 represents a rounded specimen (natural size) of the same variety as the preceding, to which several deep-sea organisms are attached. The surface is coloured brownish or black by the hydrated oxides of manganese and iron. Fig. 3 exhibits a similar specimen, with a segment removed to show the discoloured altered zone towards the periphery, and the light-coloured, less altered, internal parts. Fig. 4 represents a similar and smaller specimen cut in section to show the discoloured altered zone towards the periphery.

Station 248, 2900 fathoms.—The trawl contained a large number of manganese nodules and many pumice stones, together with a *Lamna* tooth, 2 cm. in length, and many other sharks' teeth of smaller size. Some of the pumice stones had but a slight coating of manganese, while others were surrounded by concentric layers of this substance over 9 cm. in thickness. Some of the manganese nodules were 2 to 3 inches in diameter, composed almost entirely of dense, black, concentric layers of manganese, surrounding one or more small nuclei. Pl. II. fig. 1 represents one of the most characteristic, as well as one of the most abundant, forms of nodule at this station, about thirty nodules more or less resembling this one in shape and in size being procured. The general form is round; the mammillæ are not prominent, but run the one into the other without forming marked reliefs. Two surfaces of these nodules present a marked difference of aspect; the inferior surface, which we believe to have rested in or on the clay, is represented in the figure, and is seen to be covered with an immense number of little rugositics, or rounded points, about 1 to 2 mm. in diameter, and the same in height; these asperities, being scattered over the whole of the surface, render the nodule rough to the touch and somewhat like shagreen in appearance. On the other, or superior, surface of the nodule, which appears to have projected above the surface of the clay, the asperities are not nearly so numerous, and the mammillæ are smoother, larger, and less pronounced than on the surface here represented. Pl. IX. fig. 4 shows the internal structure of these large round nodules, the left half of the figure giving the appearance of a nodule when cut in section and polished, the right half showing a similar surface after the manganese has been removed by steeping it for some time in strong hydrochloric acid. In both these nodules the nuclei may be referred to fragments of pumice which have undergone profound alteration. Around these nuclei undulate fine alternating zones of manganese peroxide, separated by other lighter coloured zones in which this material is less abundant. These