

## PLATE I.

Fig. 1. Large rounded fragment of pumice (one-fourth natural size). This is a characteristic specimen belonging to the light porous and filamentous liparitic variety; only a few minerals are visible to the naked eye. The surface is but slightly altered, and the pores are filled with small *Globigerina* shells, and other materials of the deposit in which it was imbedded. Station 246; 2050 fathoms. North Pacific.

Fig. 2. Smaller rounded specimen (natural size) belonging to the same variety as the preceding, showing Brachiopods (*Discina*) and Hydroids (*Stephanoscyphus*) attached. The surface has a brownish coating of altered material, and in some places there are depositions of the hydrated peroxide of manganese. Station 246; 2050 fathoms. North Pacific.

Fig. 3. Rounded specimen of the acid variety of pumice (natural size), out of which a section has been cut to show the altered zone of argillaceous matter in all the external parts, while the central parts are but slightly altered by decomposition. Station 246; 2050 fathoms. North Pacific.

Fig. 4. Section of another specimen of the same variety as the preceding (natural size), showing a decomposed brown zone surrounding the relatively little decomposed centre. Station 246; 2050 fathoms. North Pacific.

All the above specimens floated in water a few months after they had been dredged from the bottom.

Figs. 5 and 6. Pumice stones surrounded by layers of the hydrated peroxide of manganese, so that they may be called manganese nodules (natural size). The pumice is here very much decomposed, especially in the zone nearest the layers of manganese. In fig. 5 the layer of manganese is only about 1 mm. in thickness, while in fig. 6 it is fully 1 cm.; in the former the structure of the pumice is well preserved, but in the latter it is obliterated, the pumice being for the most part soft and earthy. The pores of the pumice are often filled with reddish earthy or clayey matter. In some samples from this station the structure of the nuclei of pumice is almost wholly lost, and can with difficulty be recognised. Station 248; 2900 fathoms. North Pacific.

Fig. 7. An irregular, white, fibrous fragment of liparitic pumice, with the central portions more or less altered, the fissures being often filled with the mud of the bottom (natural size). A zone of manganese, mingled with earthy matter, is often sharply marked off from the central parts, then follow concentric zones of the peroxide of manganese, covered with the clay of the deposit. Station 241; 2300 fathoms. North Pacific.

Fig. 8. Black-brown scoriaceous fragment of basaltic pumice, with numerous circular vesicles (natural size). Crystals of plagioclase, occasionally 4 to 6 mm. in diameter, can be seen with the naked eye, and other minerals are recognised in microscopic slides. The vesicles shown in the figure are like those in the interior, which are filled with the infiltrated clay, giving the fragment an oolitic appearance. Station 241; 2300 fathoms. North Pacific.