

## PLATE XVI.

Fig. 1. Section of fragment of sideromelan, or unaltered basic volcanic glass, forming the nucleus of a manganese nodule from Station 276 ; 2350 fathoms, South Pacific. In this preparation there is seen a skeleton crystal of olivine, and single and elongated grains of metallic oxides. At the upper part of the figure the commencement of alteration into palagonite can be observed (magnified 37 diameters).<sup>1</sup>

Fig. 2. Section of nucleus of nodule from Station 160 ; 2600 fathoms, Southern Indian Ocean. It is an unaltered fragment of sideromelan filled with little crystals of olivine, some of which contain inclusions of glass similar to that forming the mass of the rock. There are also skeletons of crystals forked at the two extremities. All the olivine crystals are surrounded by trichites (magnified 37 diameters).

Fig. 3. Section of nucleus of nodule from Station 285 ; 2375 fathoms, South Pacific. It is formed of a greenish grey sideromelan represented in the lower part of the figure, and of brownish yellow palagonite represented in the upper part of the figure. This section shows that the palagonite must be produced by the decomposition of the sideromelan, as it encloses crystals of olivine similar to those observed in the unaltered glass in the lower part of the figure (magnified 37 diameters).

Fig. 4. Section of nucleus of manganese nodule from Station 302 ; 1450 fathoms, South Pacific. This nucleus of sideromelan has been partly transformed into red palagonite along the borders of fissures. The glass contains colourless crystals of olivine, some of which are of considerable size, but the great majority appear as microliths scattered throughout the mass (magnified 37 diameters).

<sup>1</sup> The following coloured figures of minerals and rocks were drawn by M. E. de Munck, viz. :—Pl. XVI. fig. 1 ; Pl. XVII. figs. 1, 2 ; Pl. XVIII. figs. 1, 3 ; Pl. XIX. figs. 1, 3, 4 ; Pl. XXI. fig. 1 ; Pl. XXII. figs. 1, 2, 3 ; Pl. XXVIII. fig. 3 ; Pl. XXIX. figs. 1, 2, 3. Several figures on Pl. XXIII. were drawn by M. W. Priuz.