

PLATE XX.

PHOSPHATIC CONCRETIONS.

- Fig. 1. Section of phosphatic concretion from Green Sand, Station 142 ; 150 fathoms, on the Agulhas Bank, off the Cape of Good Hope. The most abundant particles are rounded greenish grains of glauconite, associated with numerous little fragments of quartz, generally angular but sometimes rounded, distinguished in the figure by colourless sections. Towards the centre a large fragment of plagioclase is seen. All these mineral fragments are enclosed in a mass of amorphous, dirty yellowish brown, phosphate of lime (magnified 37 diameters).
- Fig. 2. Section of phosphatic concretion from Globigerina Ooze, Station 143 ; 1900 fathoms, Southern Indian Ocean. The most distinct bodies imbedded in the phosphate of lime are the shells of Globigerinidæ and Pulvinulinidæ. In the nodule represented in fig. 1 the phosphate plays simply the role of a cement for the glauconite and sandy particles ; in the nodule represented in this figure the phosphate is more abundant, penetrating into all the hollow spaces of the Foraminifera, where it is present with a clearer tint than in the fundamental enveloping mass. It may be perceived infiltrating by the foramina, but generally the pseudomorphism of the calcareous shells into phosphate is not complete, the characteristic colourless appearance of the shells being preserved in many of the sections. In some of the internal casts of the shells the phosphate is brown, owing to the presence of iron or organic matters (magnified 37 diameters).
- Fig. 3. Section of nodule from the same station presenting a more advanced phase of phosphatisation ; almost all the carbonate of lime of the Foraminifera shells is pseudomorphosed into phosphate, which has assumed a concretionary form, and in certain points gives the black cross of spherulithic aggregates (magnified 37 diameters).
- Fig. 4. Section of another nodule from Station 143. Not only is the phosphatisation here complete, but it is no longer possible to recognise the presence of the pseudomorphosed organic remains nor the internal casts of phosphate of lime. The whole field of the microscope presents a concretionary structure. The section does not extinguish uniformly between crossed nicols, but presents vague tints like concretionary minerals, and the black cross may be observed in some zones. Certain deeper coloured patches are filled with inclusions of heterogeneous particles, but on their borders a clearer zone may be observed, which follows all the contours and presents the characters of concretionary phosphate (magnified 37 diameters).