be transformed into argillaceous matter. Some manganese nodules have their nuclei almost entirely composed of little angular fragments of basic glass, most of which are entirely transformed into palagonite. It is barely necessary to observe that this transformation would take place much more rapidly and more completely the smaller the vitreous splinters, so that it is only in those stations where the specimens are large that the traces of the unaltered glass are preserved in consequence of their forming the nuclei of the manganese nodules; the minute splinters distributed throughout the deposit, being entirely converted into palagonite, can only be recognised by the aid of the microscope, after having followed the transitions which these specimens of different sizes undergo in the process of decomposition. These basic vitreous fragments, and the palagonitic particles resulting from their decomposition, are so frequently associated with numerous nodules of peroxide of manganese in deep-sea deposits, as to at once suggest a relation of cause and effect, which is confirmed by the analyses showing the presence of manganese in the unaltered vitreous fragments.

When these fragments of basic glass are examined in thin sections under the microscope, the vitreous part is seen to be perfectly transparent, with more or less deep colours ranging from grey-brown to brown and yellowish brown; it is perfectly isotropic and with a homogeneous structure, but is occasionally traversed by more or less irregular lines of fracture, which indicate vaguely a perlitic structure. These fractures can be seen in Pl. XVII. fig. 3, and the general aspect of the sections is shown in Pl. XVI. figs. 1–4.

The minerals observed in the vitreous base are olivine and plagioclase, often separate, rarely associated; augite is relatively rare, and so also is magnetic iron. In addition to the species distinctly recognisable, there are frequently very large numbers of crystallites, whose accumulation in certain sections of the rock masks or renders opaque the vitreous matter enclosing them. The mineral most frequently met with in these sections is olivine, which is observed in the form of very minute, very regular, and generally almost colourless, crystals. Often their proportions are so very small that, in spite of the thinness of the preparations, they are still entirely encased in the vitreous matter. The faces of these crystals are generally ∞P, $2\breve{P}\infty$, $\infty\breve{P}\infty$, $\infty\overline{P}\infty$. Frequently they have exactly the same form as fayalite. In a certain number of cases they occur as skeletons of crystals. It is possible to follow in thin slides all the transitions between these embryonic forms and the sharply-terminated crystals, the latter almost always containing a rather large number of inclusions of a brownish glass, similar to the surrounding base. Sometimes these inclusions are so large that the crystal forms around it merely a simple border. On Pl. XVI. the various peculiarities presented by olivine in these basic glasses are represented in detail.

After olivine, the mineral most frequently occurring is plagioclase-felspar; it is sometimes found in the form of lamellæ, similar to those observed in eruptive rocks of the