

particles present the same characters as in the preceding figures, associated with crystals or splinters of felspar, plagioclase, augite, and magnetite. Among the particles may be observed bipyramidal crystals of quartz, which may have come from the disintegration of a liparitic rock. In Pl. XXVII. fig. 5 the aspect of the minutest particles of the fine washings of a Radiolarian Ooze is represented, from Station 225, 4475 fathoms, West Pacific. In addition to the debris of organisms, there may be observed little fragments of volcanic minerals, or splinters of colourless glass with a porous appearance. Pl. XXVI. fig. 1 represents the mineral particles from the residue of a Globigerina Ooze, in the South Pacific, Station 300, 1375 fathoms; these are observed to have the same characters as in the case of the Red Clays, consisting of vitreous particles associated with splinters of felspar, plagioclase, magnetite, augite, and minute grains of manganese peroxide.

If now we pass to the mineral particles in terrigenous deposits, we may still in some instances recognise an abundance of vitreous particles, as, for instance, in the deposit called a Blue Mud, in the South Pacific, Station 303, 1325 fathoms, represented in Pl. XXVI. fig. 4. Here the mineral particles are almost exclusively formed of splinters of a brownish glass, more or less vesicular, the pores being generally rounded, but associated with these are colourless particles with a filamentous structure, which are probably derived from acid glasses. The predominance of vitreous particles and volcanic minerals in a Blue Mud is also represented in Pl. XI. fig. 2, showing the mineral particles from Station 237, 1875 fathoms, North Pacific. Here there are seen besides the fragments of plagioclase, sanidine, augite, hornblende, and magnetic grains, many splinters of vitreous matter which are present under three different aspects—some transparent, slightly violet, or almost colourless, fibrous with cylindrical pores, as may be seen in the lower part of the figure and near the upper left hand side; other vitreous splinters are deep brown, almost opaque, with large, more or less circular, pores; and again these vitreous particles are transformed into a reddish brown resinoid substance, resembling palagonite, as may be seen on the right hand side of the figure. In Pl. XXVII. fig. 1, which represents the mineral particles in a Volcanic Mud, off the Sandwich Islands in the North Pacific, Station 262, 2875 fathoms, we have a most typical example of these vitreous fragments. The whole field of the microscope is occupied by vitreous particles, slightly brownish in colour, with relatively few pores, but presenting the characteristic fracture and outlines of these glassy fragments.

All the figures to which we have referred represent these particles in an isolated condition in the deposit. In the compact tufas which were dredged from the bottom of the sea they present a slightly different aspect.

In the Tables of Chapter II. vitreous particles are recorded in 45 specimens of Red Clay, 6 of Radiolarian Ooze, 4 of Diatom Ooze, 63 of Globigerina Ooze, 6 of Pteropod Ooze, 20 of Blue Mud, 3 of Red Mud, 10 of Green Mud, 20 of Volcanic Mud, 3 of