

between the ash and Red Clay, the left of the figure representing the ash and the right the Red Clay. In the volcanic ash all the minerals are clastic, irregularly disposed, with almost no interposition of clay. This accumulation has a greenish tint due to the presence of a large number of fragments of augite, hornblende, delessite or chloritic substance. The outlines of almost all the crystals are blunted as if broken. Hornblende is represented by fragments of a brownish or dark greenish colour, with the characteristic cleavages, strongly pleochroic. The crystals of augite are greenish or brown-violet; very often augite is present in the form of aggregated microliths surrounded by delessite. There is also a large number of sections of felspar belonging to plagioclase or sanidine; they are colourless, more or less irregular, and generally transformed into zeolitic matter. Moreover, there are in this ash rather small lapilli, principally formed of an aggregation of green microliths of augite and small fragments of basalts, or of highly-altered basic glass. Finally, there are numerous grains of magnetite, of manganese, and of olivine transformed into hematite. All these mineral particles are cemented by colourless zeolitic substances.

The general appearance of these particles under the microscope is further represented in some of the lithographic plates at the end of the volume. Plate XXVI. fig. 2 shows numerous minute vitreous splinters transformed into palagonite and coloured by manganese and iron, along with augite, plagioclase, magnetite, from a Red Clay, Station 282, 2450 fathoms, South Pacific. Fig. 3 of the same plate represents the mineral particles of a Red Clay from the South Pacific, off the coast of Australia, Station 165A, 2600 fathoms. There are numerous angular fragments of volcanic glass with elongated pores and ragged outlines among the particles of felspar, hornblende, grains of manganese, and minute rounded particles of quartz. The rounded fragments of quartz coloured with limonite, represented in this figure, are evidently wind-borne particles from the continent of Australia. Pl. XXVII. fig. 2 represents the mineral fragments and fine washings in a Red Clay from the South Pacific, Station 178, 2650 fathoms. Besides the crystals of felspar and augite there are numerous vitreous, colourless, volcanic particles with elongated pores, and in addition to these a very large number of extremely minute particles of the same nature, which make up the principal part of what we denominate in this work "fine washings." These smaller microscopic particles are more or less angular, forming an impalpable powder, and it will be seen that they cover the field of the figure between the larger mineral particles. Pl. XXVII. fig. 3 shows again abundance of vitreous particles of pumice, along with volcanic minerals, from a Red Clay in the North Pacific, Station 240, 2900 fathoms. As in all the preceding residues, the mineral particles are angular; the vitreous particles are sharply characterised by their ragged outlines and their structure, and among them are some vitreous grains transformed into palagonite. Pl. XXVII. fig. 4 presents once more an abundance of volcanic particles from a Red Clay, South Pacific, Station 294, 2270 fathoms. The vitreous