rocks. These two micas are very characteristic of terrestrial rocks and mineral particles. *Olivine*, distinction difficult, but sometimes irregularly-bounded fragments, decomposing into serpentine, and with fragments of older eruptive rocks. PYROXENE (*a*) *Rhombic*, *Bronzite*, lamellar aggregates, generally large fragments found with older eruptive rock debris, with peridotite fragments. (*b*) *Monoclinic*, *Augite*, fragments irregularly bounded or bounded by cleavage planes, transforming into uralite or chlorite, rarely vitreous inclusions, associated with fragments of diabase. *Diallage*, grains bounded by cleavage planes, associated with mineral particles and fragments of older eruptive rocks. *Quartz*, grains generally without crystallographic outlines, rounded or angular, sometimes covered with oxide of iron, liquid inclusions, some with carbonic acid or small cubic crystals, needles of rutile, tourmaline, scales of chlorite, hematite, &c. Occurs always with granitic, porphyritic, schisto-crystalline rocks, or with fragments of continental sedimentary rocks; the minerals and rocks associated with the quartz grains give a clue as to the matrix rock. In some cases grains quite rounded, and all of about the same dimensions, with thin coating of limonite, found far from coasts in pelagic deposits, are to be considered as wind-borne.[1] *Rutile*, small grains, or microscopic prismatic crystals imbedded in schistose rock particles, always associated with continental debris. *Serpentine*, compact or fibrous grains, associated with fragments of older crystalline rocks, principally with peridotic rocks. *Tourmaline*, often in small prismatic fragments of crystals, almost always of continental origin and associated with debris of crystalline schists, granitic rocks, &c.[2] *Zircon*, small quadratic crystals, more or less rounded, as in the case of tourmaline, almost always of continental origin, and found with debris of crystalline schists and of older eruptive rocks; associated frequently with quartz grains, and other minerals derived from the disintegration of sedimentary rocks.[3]

The above are the principal mineral particles in the marine sediments to which we attribute a continental origin. The mineral characters of many of them are not, however, of a nature to give certain and satisfactory indications; especially is this the case for the particles of apatite, chlorite, chromite, epidote, garnet, hematite, magnetite, olivine, and pyrites. It is only the geographical position, along with the mineralogical associations, that permits a satisfactory determination in any particular case. On the other hand, for several of the species a continental origin seems to be indicated beyond all doubt; this is the case with glaucophane, white mica, sericite, tourmaline, zircon, microcline, and for the great majority of the grains of quartz.

[1] See Plate XXVI. fig. 3; these rounded grains of quartz are here associated with particles of felspar, green hornblende, glassy volcanic fragments, grains of manganese, very rarely fragments or particles of vein quartz, milky, and of irregular form, found with continental land debris.

[2] See Plate XXVII. fig. 6; black fragments of prismatic crystals of tourmaline, with rounded grains of quartz glauconite, and zircon.

[3] See Plate XXVII. fig. 4; small bipyramidal crystals, one in the centre, the other a little higher in the figure.