always to the examination of isolated crystals or fragments of minerals such as are found in the deep-sea deposits. There are many characters which are passed over in silence, though no less important than the others, but these properties are only shown when the minerals are cut into numerous sections in various directions, and therefore but rarely seen in such isolated grains. It should also be remembered that the determination is much more difficult because these particles are of very small dimensions, are mixed with a large quantity of amorphous substances, are generally decomposed and altered by chemical or physical agencies, and in this isolated state do not present the associations which are met with in crystalline rocks. Only those mineral species that are well defined and individualised are mentioned, and their characters given in the following short descriptions. When speaking of the "fine washings" we shall indicate some of the principal characters of the amorphous matters which are present in the deposits, such as clayey matters, oxides of iron and manganese, organic substances, phosphatic grains, &c.

Amphibole.—*Hornblende.*—Although minerals of the amphibolic group are more or less frequent in the deposits it is rather difficult, except in the case of glaucophane, to distinguish the varieties owing to the minuteness of the grains and to their clastic nature. We have generally to deal with common or with basaltic hornblende. The fragments of these two varieties are generally prismatic, with a perfect cleavage of 124° parallel to the prism, high relief and interference colours, the greatest extinction angle rarely exceeding 20°. *Common hornblende*, more or less distinctly prismatic individuals, generally greenish, rarely brownish, colours of pleochroism green. Associated with quartz, epidote, felspar, and other debris of older crystalline rocks. In some cases fragments of actinolite are found as columnar or fibrous aggregates with debris of crystalline or actinolite schists. *Basaltic hornblende*, fragments of well-crystallised individuals, sometimes regularly bounded crystals coated with volcanic glass, well-marked cleavage, high lustre on the planes of cleavage, black by reflected and brown by transmitted light, strong pleochroism and absorption, small angles of extinction, vitreous inclusions, in some cases coating of magnetite and characteristic corrosion.

Glaucophane.—This mineral is somewhat rare in the deposits; it is observed in the form of small prismatic fragments and is distinguished by its highly-pronounced violet-blue colour, and by the angle of the prismatic cleavage, which is the same as for amphibole. The extinction angle on the klinopinakoid does not exceed 7°. Strong pleochroism: blue, bluish violet, yellowish grey. Occurs with land debris and fragments of mica-schists and gneissic rocks.

Apatite.—This mineral, rarely found in the deposits, is observed in the form of hexagonal columnar fragments, sometimes in elongated or rounded grains. The surface is corroded and full of small cavities, extinction parallel to the length, colourless, or but slightly coloured, in this case pleochroic, high index of refraction, considerable relief. Readily soluble in acids, tested by microchemical reaction with molybdate of ammonium and by sulphuric acid. These microchemical reactions were also used in the determination of small phosphatic concretions and of grains of the same nature. Apatite was found with fragments of older crystalline rocks (see chapter on phosphatic nodules).

Calcite.—Besides the great number of the remains of organisms or skeletons formed of calcite or of aragonite, this mineral is often observed in the deposits bounded by the cleavage planes or as radiated or fibrous aggregations. These fragments or concretions of calcite are generally characterised by the twinning parallel to $-\frac{1}{2}$ R, or by the cleavage parallel to R, colourless, sometimes coloured with limonite, bluish, yellowish, and occasionally milky or almost opaque. Small relief, between crossed nicols presents characteristic irisation, high interference colours, stronger absorption of the ordinary ray; is distinguished by the facility with which it is attacked by cold hydrochloric acid. Calcite of organic origin can almost always be distinguished by its form