

## PLATE XXIII.

- Fig. 1. Magnetic spherule of cosmic origin from Station 285; 2375 fathoms, South Pacific. This spherule was extracted from a manganese nodule, and has a coating of black magnetic iron, with a brilliant and shagreened surface (magnified 90 diameters).
- Fig. 2. Magnetic spherule from Station 276; 2350 fathoms, South Pacific. It is regular in form, but has not a central nucleus. The figure shows a broken surface, which is blue-black, with a dull aspect. The structure presents many somewhat regular cleavages. Although presenting some of the characters of chondres of bronzite, somewhat like that shown in fig. 11, the origin of this spherule must be regarded as doubtful (magnified 90 diameters).
- Fig. 3. Spherule composed of crystals of phillipsite from Station 276; 2350 fathoms, South Pacific. The spherules are terminated by the faces of domes or pyramids. This shows the external aspect of the spherules seen in section in Plate XXII. figs. 2 and 3 (magnified 90 diameters).
- Fig. 4. Cosmic magnetic spherule from Station 285; 2375 fathoms, South Pacific. The external aspect of this spherule is similar to that shown in fig. 1, but the figure exhibits the characteristic cupule present in nearly all these cosmic spherules (magnified 90 diameters).
- Fig. 5. Cosmic magnetic spherule from interior of nodule from Station 276; 2350 fathoms, South Pacific. A part of the external layer has been removed to show the grey metallic nucleus of native iron (magnified 90 diameters).
- Fig. 6. Cosmic magnetic spherule from Station 276; 2350 fathoms, South Pacific, embedded in a mass of little crystals of zeolites (magnified 90 diameters).
- Fig. 7. Metallic nucleus of a cosmic spherule from the same station. This nucleus has a grey metallic lustre; it has taken a discoidal form under pressure in an agate mortar. When placed in an acid solution of sulphate of copper, no copper was precipitated, and it is probably an alloy of iron, nickel, and cobalt (magnified 90 diameters).
- Fig. 8. Cosmic spherule from Station 285; 2375 fathoms, South Pacific, a portion of the crust having been removed to show the metallic nucleus (magnified 90 diameters).
- Fig. 9. Metallic nucleus of cosmic spherule from Station 276; 2350 fathoms, South Pacific. The black coating has been removed, and the particle has assumed a discoidal appearance under pressure in an agate mortar. When placed in an acid solution of sulphate of copper, the copper was at once precipitated over the whole surface, which indicates that the nucleus was composed of native iron (magnified 90 diameters).
- Fig. 10. (See fig. 13.)
- Fig. 11. Chondre from Globigerina Ooze, Station 338; 1990 fathoms, South Atlantic. This chondre is about 1 mm. in diameter. In reflected light under the microscope it has a bronze metalloïd reflection. It is formed by the juxtaposition of a great number of lamellæ, which start from an excentric point, where there is a depression in the form of a cupule. The characters are quite analogous to those of chondres of meteorites (magnified 37 diameters).
- Figs. 13 and 10. Microstructure of one of the lamellæ of the chondre represented in fig. 11. These are formed of an accumulation of little colourless prisms, about 0.05 mm. in diameter. The prisms follow two directions, cutting each other at an angle of 70°. The lamellæ have many dark-coloured inclusions in the form of crystallites, which are probably magnetite, arranged regularly following the direction of the little prisms (magnified 390 diameters).
- Fig. 12. Appearance of the magnetic particles extracted from Radiolarian Ooze, Station 274; 2750 fathoms, Mid Pacific, after being broken down in an agate mortar, and treated with an acid solution of sulphate of copper. The black particles are fragments of magnetite and coatings of the cosmic spherules, while those on which copper has been deposited are malleable particles of native iron (magnified 37 diameters).