. John Murray & Rev. A.F. Renard, Report on the Deep-Sea Deposits Collected During the Voyage of H.M.S. Challenge

nodule from the South Pacific, Station 285, 2375 fathoms. This grain is perfectly spherical, and is drawn so that the little depression is on the opposite side from the observer; it shows the aspect presented by these granules in reflected light under the microscope. The surface with metallic lustre is not perfectly smooth, but appears as if scattered with a large number of little asperities or pores. Fig. 4 represents a spherule from the same station identical in form and aspect with the preceding, but showing the cupule which is seldom absent in these magnetic globules. This cupule, it will be seen, is a circular depression attaining sometimes a diameter equal to half of that of the spherule, and appears to be characteristic of these granules; we shall presently endeavour to interpret its formation. The spherule represented in fig. 6, from the South Pacific, Station 276, 2350 fathoms, is much the same as the two others just described, but is interesting, showing, as it does, the manner in which it reposed at the bottom of the sea, being surrounded and fixed among little crystals of phillipsite, found in abundance at the bottom of the sea in certain regions. In some cases, which have not been figured, two spherules are coupled together, the one much smaller than the other, resembling two drops of molten matter soldered together in solidifying.

Turning now to their internal structure, the nature of the nucleus furnishes the principal characteristic uniting these spherules to the meteorites. The superficial crust may be easily detached, by breaking one of the spherules, and is usually found to cover a nucleus of a metallic nature, as shown in fig. 8, representing a spherule from the South Pacific, Station 285, 2375 fathoms, in which a part of the outer coating of magnetite has been removed. In this spherule, which resembles in every respect those previously referred to, the nucleus is seen with its metallic lustre, grey colour like steel, and slightly granular. Oxidation has apparently only taken place at the periphery, where magnetic oxide has been formed, while the centre, protected from further oxidation by this coating of magnetite, has remained in the state of native iron or alloy of iron. Fig. 5 shows a similar spherule from the South Pacific, Station 276, 2350 fathoms, in which the thin shell of magnetic iron has likewise been partially removed to show the metallic nucleus. This nucleus behaves like iron, being malleable and taking the impress of the pestle; treated under the microscope with an acid solution of sulphate of copper it is at once covered by a coating of copper. Fig. 9 represents a nucleus from the same station (Station 276), treated in a similar way, showing the coppery coating; it has become discoid under the pressure of the pestle and bears its impress. In some cases the nucleus, though malleable, does not present this reaction with sulphate of copper solution. Fig. 7 represents such a nucleus, from the same station (Station 276), which, though treated with the copper solution, has retained its original grey steel-like colour. This nucleus, unaffected by the copper, may be schreibersite (Ni_2Fe_4P), or an alloy of iron, cobalt, and nickel, as in certain meteorites in which the last two metals are present in considerable quantities. It is known, in fact, that certain meteoric irons are insensible to the reaction

http://19thcenturyscience.org/HMSC/HMSC-Reports/1891-DeepSeaDeposits/README.htm