

both before and after being treated with spirit or glycerin. It appears to occupy no definite position in the chambers, being sometimes found in the larger and sometimes in the smaller ones. Cells about 0.05 mm. in diameter, having in the interior minute vibrating particles, were frequently observed, but whether these were connected with the reproduction of the animal or not it is impossible to say.

Pelagic Foraminifera swarm in the surface and subsurface waters of the tropics, where the greatest number of species and largest and thickest shelled specimens are found; in the colder waters north and south, the specimens become smaller, till in the Arctic and Antarctic only dwarfed specimens of *Globigerina bulloides* are met with. The distribution of the dead shells on the bottom of the ocean corresponds with the distribution of the living ones on the surface, and is governed by surface temperature; on the other hand those species of Foraminifera which live on the bottom attached to Zoophytes and other animals or substances have a distribution quite independent of surface temperature. Independently of the evidence afforded by the distribution of the shells above referred to, it is most unlikely that the same animals should live on the bright sunny surface waters at a temperature of from 60° to 80° and also at the bottom at a temperature of from 32° to 40°, where there is a pressure of two or three miles of water and an absence of sunlight, and no living specimen of these pelagic species was taken on the bottom.

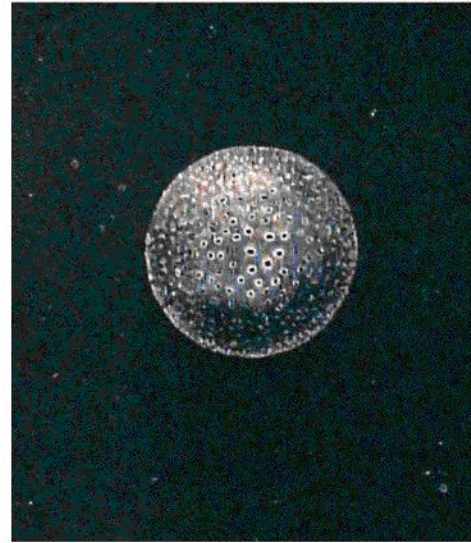


FIG. 310.—*Orbulina universa* (d'Orbigny), from the deposits.

These Foraminifera appear to be truly pelagic animals, and to flourish in the open sea far from land. It is a remarkable fact that they generally disappeared from the tow-net gatherings as land was approached and where river water entered the sea. They were very rarely taken in any of the bays or estuaries. About the British coasts, or even in the North Sea, they are very rarely observed, yet they are taken in great numbers on the surface 100 miles west of the Outer Hebrides.

The same species inhabit the tropical waters of the Atlantic, Pacific, and Indian Oceans, but some species are relatively more abundant in one ocean than in another. For instance, *Pullenia obliquiloculata* is much more abundant in the Pacific than in the Atlantic, while *Pulvinulina menardii* and *Sphæroidina dehiscens* predominate in the latter ocean.

The sarcode of the bottom-living Foraminifera was frequently examined; that in the