

are founded upon bottom-specimens, which differ in important respects from those taken at the surface of the ocean.

The outer or visible test consists of a single spherical chamber, the exterior of which, in surface-specimens, is almost always more or less beset with spines. The spines are sometimes so short and minute as to be scarcely perceptible, but more frequently they take the form of slender needle-like spicula of considerable length (Pl. LXXVIII.; Pl. LXXXI. figs. 12-14, 24, &c.). In the interior of the chamber of surface-specimens, there is usually, if not invariably, a polythalamous *Globigerina*-like shell, which is more or less apparent through the hyaline walls of the outer test. The internal shell is also beset with spines, and its segments are partially or entirely filled with coloured sarcode, as shown in the two figures Pl. LXXXI. figs. 18, 19, drawn from specimens from which the outer test has been removed. The external test of pelagic specimens is a calcareous film of extreme tenuity. I have been unable hitherto to obtain any satisfactory measurement of its thickness. The dimensions of the test vary a good deal; large examples sometimes attain a diameter of $\frac{1}{30}$ th inch (0.84 mm.). The walls are in all cases distinctly perforated, but they have nothing resembling a general aperture.

Bottom-specimens differ from those taken at the surface much more in the thickness of the walls than in the external dimensions of the test. The shell is seldom much more than $\frac{1}{30}$ th inch (0.84 mm.) in diameter, but the walls of average full-sized examples are from $\frac{1}{500}$ th to $\frac{1}{400}$ th inch (0.028 to 0.063 mm.) in thickness. The outer surface is never spinous, but is either smooth (Pl. LXXXI. fig. 25) or granular (figs. 9, 11), or even slightly tuberculate (fig. 23). The minute specimens which are found in comparatively shallow water (fig. 10) are commonly of a brown colour, and more or less areolated externally.

The perforations are usually very distinct, and they are commonly of two sorts, differing in point of size (Pl. LXXXI. figs. 8, 22, &c.). Thus in one example, from which measurements have been taken, the larger pores show a tolerably uniform diameter of about $\frac{1}{1200}$ th inch (0.021 mm.), the smaller series of about $\frac{1}{3000}$ th inch (0.005 mm.); whilst in another the diameters are $\frac{1}{1900}$ th inch (0.013 mm.) and $\frac{1}{4000}$ th inch (0.0063 mm.) respectively. But no general rule can be laid down, inasmuch as in a certain proportion of specimens the pores are practically all alike, presenting an intermediate diameter of about $\frac{1}{3300}$ th inch (0.0077 mm.).

D'Orbigny describes and figures the aperture of *Orbulina universa* as a rounded orifice, but states that he had only been able to find it in about one-sixth of the specimens he had collected. After the careful examination of thousands of bottom specimens I have not succeeded in obtaining one with an orifice that can be affirmed with any certainty to be the natural aperture. Openings approximately circular are occasionally met with, sometimes more than one in a shell, but the edges are invariably rough and abrupt, as though the result of fracture (Pl. LXXXI. fig. 20), and they lack the smooth neatly-finished aspect which is a common feature of the mouth of a Foraminifer. Under