

Introduction to the Study of the Foraminifera;<sup>1</sup> and more briefly, but in the same sense, by Parker and Jones in their memoir on Foraminifera from the North Atlantic and Arctic Ocean, as follows:—"The shell of *Globigerina* is composed of a series of hyaline and perforated chambers, of a spheroidal form, arranged in a spiral manner, and each opening by a large aperture around the umbilicus, in such a manner that the apertures of all the chambers are apparent on that aspect of the shell, and form a large 'umbilical vestibule.'"<sup>2</sup> This umbilical vestibule, into which "each segment opens by a large crescentic orifice, the several chambers having no direct communication with each other," is a feature of some prominence in Carpenter's description.

Parker and Jones, in their paper above quoted, record the occurrence of only two species of *Globigerina*, namely, the typical *Globigerina bulloides* and *Globigerina inflata*; and in their supplementary tables recognise but two others, *Globigerina helicina* and *Globigerina hirsuta*. The allusions in Dr. Carpenter's work are confined to the same forms. This paucity of illustration must be attributed to the fact that the researches of the authors referred to were based chiefly upon the northern representatives of the type; and the limited view which they adopt as to the generic characters of the group results more or less from the same circumstance.

Owing to the wide area embraced by the dredging operations and the diverse conditions under which the tow-net was employed, the Challenger collections have opened a new field for the investigation of the genus; and its morphological characters have been found to present a far wider range of variability than seems to have been previously suspected.

With rare exceptions, which need not at present be taken into account, the test of *Globigerina* is always distinctly spiral. In the typical *Globigerina bulloides* and its immediate allies it is constructed on the Rotaline plan, that is to say, the whole of the segments are visible on the superior face of the shell, those of the last convolution only on the inferior; but in certain forms, of which *Globigerina æquilateralis* is the most important, the arrangement is planospiral, and the segments are seen equally on both faces of the test. The general external contour of the shell is either conical, trochoid, turbinoid, subglobular, nautiloid, plano-convex, compressed and carinate, or complanate.

The number of segments of which the adult shell is composed, varies in different species from three to about twenty, and they are arranged so as to form from one to three convolutions. The individual chambers are typically spherical, and they are separated externally by deep depressions; but in the compact varieties of the genus they are not more convex externally than those of other Rotaliform Foraminifera. In certain cases part of the segments of the outer convolution are elongated radially and have pointed extremities, whilst in others the chambers are compressed and their sutures occasionally limbate.

<sup>1</sup> Introd. Foram., p. 181.

<sup>2</sup> *Phil. Trans.*, 1865, vol. clv. p. 365.