

misleading; therefore it is manifestly better to abandon an initial subdivision based solely on the condition of the investment with respect to perforation.

The adoption of three Sub-orders, instead of two, depending on shell-texture rather than on mere perforation, as latterly proposed by Reuss, meets the difficulty in part, but is still open to objection. On the one hand, there is a considerable group of true *Miliolæ*, our knowledge of which is much extended by the Challenger collections, that have rough arenaceous tests; and on the other, the large and important family TEXTULARIDÆ is practically unprovided for, inasmuch as it is sometimes truly arenaceous, sometimes hyaline and perforate, and sometimes externally sandy but with an inner perforate shell. The author endeavours to meet this difficulty by dividing certain genera and placing the two halves in different Sub-orders; thus *Textularia* appears as *Textularia* amongst the hyaline forms and as *Plecanium* amongst the arenaceous, and *Bulimina* in the same way as *Bulimina* and *Ataxophragmium*; but this is cutting the knot rather than untying it, and even were so summary a method practically convenient, the proposal to split a natural group like that comprising the Textularian and Bulimine types in order to meet the exigencies of an artificial distinction, is not one to be lightly adopted.

Passing from Sub-orders to Families, even greater anomalies are apparent, especially amongst the hyaline forms. For example, *Spirillina* is found at almost the opposite end of the scale to the Rotaline genera; *Nodosaria*, *Cristellaria* and *Polymorphina* are placed in three different Families, whereas, in point of fact, they are connected by intermediate and dimorphous modifications, so as to form an absolutely continuous series; and *Textularia*, *Bulimina* and *Cassidulina* are similarly separated. These appear to me fatal objections to the details of the classification, viewed as a natural arrangement.

What has been already urged against the employment of the terms *Perforata* and *Imperforata* in Reuss's scheme, applies with equal force to that of Dr. Carpenter and his colleagues. There is, however, in the English arrangement but little infringement of natural relationship in the constitution of the Families, except, perhaps, the association of *Textularia* and its immediate allies with *Globigerina* and the Rotaline genera. Apart from this, its chief drawback is that the divisions are too large to be zoologically convenient, a defect more and more felt as the number of known genera is augmented.

Rupert Jones, in his outline, entirely omits the forms having chitinous tests (*Gromida*), and, following Reuss's example, divides the Foraminifera into three Sub-orders, namely, PORCELLANA, ARENACEA, and HYALINA. He employs the term *Imperforata* as a synonym for *Porcellana*, that is to say, for a section exactly coextensive with Carpenter's family *Miliolida*; whilst *Perforata* is given as an alternative for *Hyalina*. In other respects the general plan differs from that of the "Introduction," chiefly in the redivision of the Sub-orders into a larger number of Families.

Turning now to the synopsis in Professor Zittel's Handbook of Palæontology, we