

lattice-shell, whilst the others (Aphracta) are without it. The RADIOLARIA APHRACTA, then, or Radiolaria without a complete skeleton, are the Colloclaria (p. 9), the Acanthometra (p. 725), the Plectellaria (p. 895), and the Phæocystina (p. 1543). On the other hand, the RADIOLARIA CATAPHRACTA, or Radiolaria with a complete skeleton, are the Sphærellaria (p. 49), the Acanthophracta (p. 791), the Cyrtellaria (p. 1015), and the Phæocoscina (p. 1590).

Upon this basis the first subdivision of the Radiolaria was made by Johannes Müller, who recognised three groups:—"I. *Thalassicolla*, without receptacle, naked or with spicules; II. *Polycystina*, with a siliceous receptacle; III. *Acanthometra*, without receptacle, but with siliceous radial spines" (L. N. 12, p. 16).

106. *The Ectolithia and Entolithia (Extracapsular and Intracapsular Skeletons).*—The relation of the skeleton to the central capsule in the Radiolaria is very various in many respects; in the first instance two great groups, *Ectolithia* and *Entolithia* (see note A), may be distinguished topographically by mere external observation; in the former the skeleton lies entirely outside the central capsule; in the latter, partially at all events, within it. The *Ectolithia*, with a completely extracapsular skeleton, include all NASSELLARIA and PHÆODARIA, as well as a great part of the SPUMELLARIA (all Colloclaria and the most archaic forms of Sphærellaria); the *Entolithia*, on the other hand, in which the skeleton lies partly within, partly without the central capsule, include all ACANTHARIA and the majority of the SPUMELLARIA (most Sphærellaria, see note B).

A. The difference between *Ectolithia* and *Entolithia* was applied in my Monograph in 1862 (p. 222) to separate the Monocyttaria into two main groups. The arrangement was, however, quite artificial, being contrary to the natural relations of the larger groups, as was shown seventeen years later by the discovery of the different structural relations of the central capsule.

B. Among the ACANTHARIA, which all possess primitively an intracapsular and centrogenous skeleton, the remarkable *Cenocapsa* (Pl. 133, fig. 11), seems to furnish the single exception; in it the skeleton consists of a simple spherical shell which encloses the concentric central capsule. The exception is, however, only apparent; the twenty perispinal pores of the shell show that they were originally in connection with twenty centrogenous acanthin spines, and that these have disappeared by retrograde metamorphosis.

107. *Perigenous and Centrogenous Skeletons.*—Much more important than the topographical relation of the skeleton to the central capsule, according to which the *Ectolithia* and *Entolithia* are separated from each other (§ 106), is the original development of the skeleton within or without the central capsule, which gives rise to the distinction between perigenous and centrogenous skeletons. *Centrogenous skeletons* are found only in the ACANTHARIA, which are further distinguished from all other Radiolaria by their skeleton being formed of acanthin; in all ACANTHARIA the formation of the skeleton begins in the middle of the central capsule, from which twenty (the number is inconstant only in the