

cortical shells) are prolonged on the outside into prominent free radial spines. But other spines may also arise from the surface. Very remarkable is the presence of twenty symmetrically disposed radial spines in some forms of Amphitholida (*Amphitholus acanthometra* and *Amphitholonium acanthonium*, &c.). It recalls the twenty radial spines of the Acanthonida, though the laws of distribution in the two similar cases are quite different.

The cortical shell of the Tholonida remains either simple, or it becomes doubled by formation of an outer veil or envelope. This outer cortical shell or "veil" may either repeat completely the typical form of the inner with its cupolas, or it may form an ellipsoidal envelope without dome-shaped partitions. Its network is either like that of the inner, or it is very delicate and irregular, spider-web like. The connection between the two cortical shells is effected by a variable number of radial beams, often prolonged on the outside into radial spines.

The growth of the Tholonida by apposition of new chambers is very characteristic, constantly pairs of chambers originating at both opposite poles of the three dimensive axes, firstly on the transverse axis, secondly on the principal axis, thirdly on the sagittal axis. It is possible that by repeated apposition of new chambers the Tholonida are transformed into Discoidea, but commonly the number of domes is restricted, two in the Amphitholida, four in the Staurotholida, six in the Coccotholida. If new chambers in an irregular manner or in a spiral order be opposed to those first formed pairs of chambers, the Tholonida may be transformed into Soreumida, Streblemida, or Lithelida. The phylogenetic connection between these families is probably very complex and very worthy of further research.

The network of the shell in the Tholonida is sometimes regular, with circular (often hexagonally framed) pores of equal size, sometimes irregular, with roundish pores of unequal size. Commonly the shell is thick and compact; in those genera in which the cortical shell is doubled, the inner is commonly compact, the outer a very delicate veil.

The central capsule of the Tholonida is originally always enclosed by the central chamber, and like this of lentelliptical form, a triaxial ellipsoid. With the apposition of cupolas the growing central capsule may form dome-shaped protuberances which enter into the former. So we may find in the Amphitholida a central capsule with three joints (separated by two annular parallel constrictions), in the Staurotholida a cross-shaped capsule (with four caps around the central lentellipsis), in the Cubotholida a clustered capsule with six caps, surrounding six sides of the cubical central mass. In the Coccotholida (with medullary shell in the central chamber) the latter encloses in the centre the nucleus of the cell. The calymma, or the jelly-veil between the central capsule and the enveloping shell, probably always exhibits annular constrictions, corresponding to those which separate the cupolas of the shell. All these anatomical peculiarities in the Tholonida require a further accurate study.