

radiate within a spherical space (equally disposed in all directions), but within a quadrant or even an octant, forming a conical brush or pencil.

One very remarkable form of Actineliida is *Actinastrum*, forming the transition from these Adelaacantha to the common regular Icosacantha. In the two observed species of *Actinastrum* we find thirty-two radial spines, twenty of which are disposed after the Müllerian law, as in the Icosacantha. The other twelve are four interradial equatorial spines (lying in the two secondary meridian planes) and eight perradial tropical spines (lying in the two primary meridian planes). Therefore here in each primary meridian plane are placed ten spines (two equatorial, four tropical, and four polar spines), whereas in each secondary meridian plane are placed six spines (two equatorial and four tropical). But here also all thirty-two spines are so regularly placed that their free distal ends fall into five parallel zones, four in each polar zone, eight in each tropical zone, and eight in the equatorial zone.

*The Central Junction* of the radial spines in the ACANTHARIA becomes effected in four different ways:—(1) by simple apposition of the pyramidal central ends or bases; (2) by a basal leaf-cross, or by broad wings, four on each spine, supported one upon the other; (3) by a central concrescence of the meeting bases of all the twenty spines, growing perfectly together; and (4) by a concrescence in pairs of every two opposite spines. The most common and probably the original mode of junction is the first—by pyramidal apposition; the spines at the central base are pointed in the form of a pyramid, and the triangular faces of the neighbouring pyramids are simply placed upon one another. Often the small basal pyramids are imperfectly separated from the spines by an annular constriction. Commonly the basal pyramids of the four equatorial spines are six-sided, those of the sixteen other spines five-sided.

The second mode of junction, by a basal leaf-cross, is developed from the first and appears as a strengthening or a mechanical elaboration of it. Immediately above the basal pyramid arise from its radial edges four thin and broad triangular leaves or wings, and the meeting edges of the neighbouring wings are in apposition one with the other, so that between the bases of every three or four neighbouring spines a hollow pyramidal space remains open. The apex of such a pyramidal space is directed towards the centre of the body, but separated from it by the small basal pyramid; its open base is directed outwards. The twenty-two hollow pyramidal spaces are disposed regularly in four different groups:—(A) Four equatorial spaces, four-sided, each limited by two equatorial and two tropical spines (one canceral and one capricornal); (B) eight perizonal spaces (four northern and four southern), four-sided, each limited by one equatorial, two tropical, and one polar spine; (C) eight peripolar spaces (four northern and four southern), three-sided, each limited by one tropical and two polar spines; (D) two polar spaces (one northern and one southern), four-sided, each limited by four neighbouring polar spines.