

chemical difference, an important morphological character of the skeleton also separates the ACANTHARIA from all other Radiolaria: in the latter the skeleton is never centrogenous or arising from the centre of the capsule; in strict opposition to this general fact the skeleton of all ACANTHARIA is centrogenous, composed of radial spines, which arise from the central point of the capsule and pierce its membrane. These characteristic "radial spines of acanthin," arising from the centre, are never hollow (as formerly was supposed), but constantly solid. Their form is extremely variable, and most important for the distinction of genera and species; but more interesting from a general point of view is their peculiar arrangement or disposition.

The regular disposition of twenty radial spines has general value almost for all ACANTHARIA, with the exception only of the small group of Actineliida. In this latter group the number of radial spines is either more or less than twenty, and their disposition is either quite irregular or follows a peculiar rule. The number of individuals of these Actineliida, compared with that of the other ACANTHARIA, may be scarcely 1 per cent., whilst the latter have more than 99 per cent.; the number of observed species is in the former about 5 per cent., in the latter about 95 per cent. Nevertheless the small group of Actineliida is very important, being probably the ancestral group from which all other ACANTHARIA have been phylogenetically derived. These other ACANTHARIA, with twenty regularly disposed radial spines, represent the two large groups of Acanthonida and Acanthophracta. For short and clear distinction of these two groups of ACANTHARIA, we will call the Actineliida (with irregular number and disposition of radial spines) Adelacantha, in opposition to the Icosacantha (Acanthonida and Acanthophracta), which all possess twenty regularly disposed radial spines.

Johannes Müller, the great zoologist, to whom we are indebted for the first detection and accurate knowledge of the Acanthometra, already recognised the regularity in the peculiar disposition of their twenty radial spines (Abhandl. d. k. Akad. d. Wiss. Berlin, 1858, pp. 12, 37). In honour of my great master I have called this regular disposition the "Müllerian law of spine disposition," and have given a full explanation of it in my Monograph (1862, pp. 40-45, 371, 372). With regard to its general value for all Icosacantha (Acanthonida and Acanthophracta), we might also call this morphological Müllerian law "the Icosacanthan law."

In 1862 I had already given the following precise definition of this "Icosacanthan law" (*loc. cit.*, p. 40):—"Between two poles of a spineless axis are regularly disposed five parallel zones, each with four radial spines; the four spines of each zone are equidistant one from another, and also equidistant from each pole; and the four spines of each zone are so alternating with those of each neighbouring zone, that all twenty spines together lie in four meridian planes, which intersect one another at an angle of 45°." For the clear conception of this remarkable Müllerian law, and for the complete understanding of its high value for the complicated