

In my Monograph (1862, p. 412) I founded a separate subfamily, Dorataspida, for the "*Acanthometræ cataphractæ*," which I considered as the first subfamily of the "Ommatida." That subfamily contained at that time only two genera, *Dorataspis* (with seven species) and *Haliommatidium* (with five species). A third genus, *Aspidomma* (with two species), was united by me with the Haliommatida (because of its double shell). For a fourth genus (*Diploconus*) with a single species I founded the peculiar family of Diploconida. Therefore the whole number of Acanthophracta described in my Monograph amounted only to four genera and fifteen species. Now the rich collections of the Challenger have added such a great number of new forms, that we may distinguish here thirty-eight genera and two hundred and twelve species.

Richard Hertwig in his excellent work (*Der Organismus der Radiolarien*, 1879, p. 25) separated his "Acanthophractida" perfectly from the "Ommatida" (or the siliceous Sphæroidea), and united them with the "Acanthometrida" in his order "Acanthometrea." But he separated them also from the nearly allied Diploconida, following my former arrangement. He distinctly noted that the skeleton in all these Acanthophractida (as well as in the Acanthometrida) consists not of siliceous but of the organic substance "acanthin."

The astonishing number of new and interesting forms of Acanthophracta which I have found in the rich collection of the Challenger enables me to distinguish now in this suborder six different families, two of which are perfectly new (the Sphærocapsida and the Hexalaspida). But the four other families also are so much enlarged that their interesting morphology appears in quite a new and clear light. Far the largest and most important of these six families is that of the true Dorataspida, which embraces seventeen genera and one hundred and eight species (more than the other five families together). From this largest and oldest ancestral family four other families have afterwards arisen, whilst a single family, the Sphærocapsida, seems to possess no direct phylogenetic connection with the five other families.

The peculiar and quite new family of Sphærocapsida (Pl. 133, figs. 7-11; Pl. 135, figs. 6-10) differs from all other Acanthophracta in the singular structure of the spherical acanthinic shell, composed of innumerable small plates or aglets, each of which is pierced by a very small porule. This peculiar paved shell (enclosing the central capsule and separated from it by the jelly-like calymma) seems to be produced on the surface of the spherical calymma, immediately by secretion of the pseudopodia, and independently from the twenty radial spines, united in the centre of the sphere. On the twenty points, where the spines perforate the shell, there are originally eighty larger pores (four around each piercing spine); but there is no certain indication that the shell is produced by the meeting apophyses of the twenty spines, as is the case in the five other families of Acanthophracta. Therefore perhaps it is