

constant in all members of the group. But this is by no means the case. The two accessory openings are completely absent in several families, whilst in others their number is increased. A constant and very striking character, however, of all PHÆODARIA, is the peculiar structure of their tubular main-opening, which I call astropyle, with its radiate operculum and cannular proboscis. On account of this important and startling characteristic I proposed in 1881 to call this group CANNOPYLEA. The two names PHÆODARIA and CANNOPYLEA both express a very striking and quite constant character of these curious Radiolaria, whilst the two names PANSOLENIA and TRIPYLEA are applicable only to a part of the whole legion.

The history of our knowledge of the PHÆODARIA is short, but very remarkable. Although hundreds of species, many of them cosmopolitan, are distributed over all oceans and all zones, although their size is in general much greater than that of the other Radiolaria (usually 1 to 2 mm., often even 5 to 10 mm. or more), and although their form and structure are usually striking, nevertheless the PHÆODARIA remained completely unknown up to the year 1859. During that year I observed the first forms living in the Gulf of Messina, and described and figured in 1862 in my Monograph five genera and seven species, viz., (1) *Aulacantha scolymantha* (p. 263), (2) *Thalassoplancta cavispicula* (p. 261, now *Cannobelos cavispicula*), (3) *Aulosphæra trigonopa*, and *Aulosphæra elegantissima* (p. 359), (4) *Spongodictyum trigonizon* (p. 459, now *Sagoplegma trigonizon*), and (5) *Cælodendrum ramosissimum*, and *Cælodendrum gracillimum* (p. 361). I recognised the structure of the three genera enumerated as 1, 3, and 5, as so remarkable and so different from that of the other Radiolaria, that I founded three peculiar families for them, the Aulacanthida, Aulosphærida, and Cælodendrida.

The first note on the numerous remarkable PHÆODARIA discovered by the Challenger, and mainly on the large-sized inhabitants of the deep-sea, was published in 1876 by Dr. John Murray, in his Preliminary Reports on Work done on Board the Challenger (Proc. Roy. Soc., vol. xxiv., read March 16, 1876). He pointed out (*loc. cit.*, p. 535), that the tow-nets, sent down to a great depth (according to a new plan, adopted in April 1875) brought up on every occasion a great many new and peculiar Rhizopods, which had never been observed in the nets used near the surface. "The shells of all have an exceedingly beautiful tracery, a fenestrated appearance often, which a closer examination shows to be caused by pit-like depressions. Some have only one, others have several openings, through which the sarcode flows. The sarcode of all these deep-sea Rhizopods has many large black-brown pigment-cells. At times they come up with a good deal of the sarcode outside of the shell; and two specimens have been seen to throw out elongated pseudopodia" (*loc. cit.*, p. 536). Dr. John Murray distinguished at that time not less than fifty species of these interesting deep-sea Rhizopods and called them provisionally Challengerida; a term which we retain here for the largest and most characteristic family. He gave at the same time, in an accompanying plate (xxiv.), six