

The total number of PHÆODARIA, hitherto described and illustrated by figures, amounts therefore to seventeen species, viz., the seven species first described by myself (in 1862); the six new species figured by Dr. John Murray (in 1876); the three new species discovered by Hertwig (in 1879) and the single species last-mentioned described by Bütschli (in 1882). The rich collection of the Challenger has added to this small number such an astonishing wealth of new and remarkable forms, that I can describe in the following system of PHÆODARIA not less than eighty-four genera and four hundred and sixty-five species. These belong to fifteen different families and four different orders. But this great number is probably only a small part of the numerous interesting PHÆODARIA, which are abundantly distributed over all the oceans; those (*e.g.*) of the Indian and of the Arctic Oceans are almost unknown.

The great majority of these wonderful PHÆODARIA are inhabitants of the deep-sea, mainly of the southern hemisphere, and are so common in many stations explored by the Challenger, that its collection contains many thousands (or rather hundreds of thousands) of well-preserved specimens. A smaller part of the legion is found on the surface, widely distributed over all oceans; some of these are very common (as, *e.g.*, *Aulacantha*, *Aulosphæra*, *Sagosphæra*, *Calodendrum*, *Castanella*, &c.) and it is difficult to explain how they could entirely escape the eyes of all former observers.

The three general characters which distinguish the PHÆODARIA easily and constantly from all the other Radiolaria are the following:—(1) the double membrane, a thick outer and a thin inner envelope, of the big central capsule; (2) its typical main-opening or astropyle, placed on the oral pole of the main axis, and distinguished by a peculiar radiate operculum, with tubular proboscis; (3) the phæodium, or the peculiar voluminous pigment-body, which constantly lies in the oral half of the calymma, surrounds the oral part of the central capsule, and is composed of numerous phæodella, or singular pigment-granules of green, olive, brown or black colour.

Besides these three general and never failing marks of the PHÆODARIA, the majority of this legion (but by no means all) possess the three following peculiarities; (1) two parapylæ or accessory openings of the central capsule, placed laterally (at the right and left) on the aboral pole of the main axis (wanting in the Challengerida, Medusettida, Castanellida, and perhaps in some other families); (2) a characteristic skeleton which is always extracapsular, wanting only in the Phæodinida, incomplete in the Cannorrhaphida and Aulacanthida, but perfectly developed and of very various shapes in the twelve other families; usually this silicated skeleton is composed of hollow tubules, which are filled up by jelly (PANSOLENIA); but in some families it is composed of ordinary solid network, not different from that of the other Radiolaria, *e.g.*, especially in the Castanellida and Sagosphærida; (3) an extraordinary size of the body, as well of the central capsule and its nucleus, as of the extracapsular skeleton; the majority of PHÆODARIA have a diameter of 1 to 2 mm., and are therefore from ten to twenty times as large as the