

phylogenetic conclusions which he drew from it, he arrived at an improved systematic arrangement in which he distinguished six orders:—(1) *Thalassicollea*, (2) *Sphærozoea*, (3) *Peripylea*, (4) *Acanthometrea*, (5) *Monopylea*, (6) *Tripylea*. The numerous isolated discoveries with which Hertwig enriched the morphology of the Radiolaria, have been already alluded to in the appropriate paragraphs in the anatomical portion of this Introduction (see L. N. 42, pp. 340, 341).

The new and interesting group, which was thus erected into an order under the name *TRIPYLEA*, I had already a year previously separated from the other Radiolaria as "*Pansolenia*" in my *Protistenreich* (L. N. 32, p. 102). Since, however, neither the three capsular openings of the *TRIPYLEA* nor the skeletal tubes of the *Pansolenia* are present in all the families of this extensive order, I substituted in 1879 the more suitable name *PHÆODARIA*, which is applicable to all members of the group (L. N. 34). In the preliminary memoir then published regarding the *Phæodaria*, a New Group of Siliceous Marine Rhizopods, I distinguished four orders, ten families, and thirty-eight genera. The great majority of these new forms (among which were no less than 465 different species) were first discovered by the deep-sea investigations of the *Challenger*. John Murray was the first who called attention to the great abundance in the deep sea of these remarkable Rhizopods, and to the constant presence of their peculiar, dark, extracapsular pigment body (*phæodium*); even in 1876 he described a portion of them as *Challengerida* (L. N. 27, p. 536; L. N. 53, p. 226). The earliest observations on the *PHÆODARIA* were made at Messina in 1859, where I examined five genera of this remarkable group alive (compare p. 1522 and L. N. 16).

By the discovery that the *PHÆODARIA*, although differing in important respects from the other Radiolaria, still conform to the definition of the class, a new and extensive series of forms was added to this latter, and by their closer investigation a fresh source of interesting morphological problems was disclosed. In other groups, however, morphology was advanced by comparative anatomical studies. In addition to the smaller contributions of various authors, mentioned in the foregoing bibliography, I may specially refer to the valuable *Beiträge zur Kenntniss der Radiolarien-Skelete*, insbesondere der *Cyrtida* by O. Bütschli (L. N. 40, 1882). On the basis of careful comparative anatomical studies, investigations into the skeletal structure of a number of fossil *Cyrtoidæa* and critical application of the recently published researches of Ehrenberg into the *Polycystina* of Barbados (L. N. 25), Bütschli attempted to derive the complicated relations of the *Monopylean* skeletons phylogenetically from a simple primitive form,—the primary sagittal ring. Even if this attempt did not actually solve the very difficult morphological problem in question, still the critical and synthetic mode in which it was carried out deserves full recognition, and furnishes the proof that the comparative anatomy of the skeleton in the Radiolaria not less than in the *Vertebrata*, is a most interesting and fruitful field of phylogenetic investigation. A