

Blainville, in his *Actinologie* (24, pp. 125–140), and Lesson, in his *Acalephes* (3, pp. 425–465), collected the scattered descriptions and figures of the older observers, and distinguished a greater number of genera, but without any clear anatomical understanding and without critical judgement.

The excellent naturalists, who, in the sixth decade of our century (1853 to 1859), did so much for the anatomical knowledge of Siphonophoræ, gave also the first accurate description of the typical Diphyidæ, mainly *Diphyes* and *Abyla* (4–10). Kölliker (4, Tab. ix.–xi.) gave an excellent description of three Mediterranean types—*Praya diphyes*, *Diphyes sieboldii*, and *Abyla pentagona*. Vogt (6, Tab. xvi.–xxi.) gave beautiful drawings of the same forms, and also of *Galeolaria aurantiaca*. But the greatest progress in the knowledge of Diphyidæ, mainly regarding their development and connection with Eudoxidæ, was made by Gegenbaur (7 and 10) and by Leuckart (5 and 8). The former described, too, a greater number of new species (of *Praya*, *Diphyes*, and *Abyla*, 10).

The most complete anatomical and systematic description of the polygastric Diphyidæ, and of their offspring, the monogastric Eudoxidæ, as also the best and fullest account of the whole family up to our days, was given in 1859 by Huxley (9, pp. 30–66, pls. i.–v.). He restricted the family Diphyidæ to the genera *Diphyes* and *Abyla* in the sense of Eschscholtz, and separated them from *Praya*, as the type of another family, Prayidæ (Kölliker, 4, p. 33). He gave, further, the first accurate description of numerous Diphyozoids (or Eudoxidæ), of seven different genera, and indicated probable ontogenetic connection with different forms of *Diphyes* and *Abyla*.

During my residence in the Canary Islands, from December 1866 to February 1867, I had the opportunity of examining typical representatives of all the eight genera of true polygastric Diphyidæ which are described in the sequel, and there I drew from nature the figures, which will be seen in Pls. XXXI. to XLII. of this Report. The greater number of the Diphyidæ, there observed by me, were afterwards found again in the collection of the Challenger, mainly in bottles containing surface animals, which were taken in the Tropical and Subtropical Atlantic (Stations 334 to 354; March 14 to May 7, 1876). In Lanzerote I observed directly the metagenesis of *Diphyes* (with *Cucullus*), *Diphyopsis* (with *Ersæa*), *Abyla* (with *Amphiroa*), *Bassia* (with *Sphenoides*), and *Calpe* (with *Aglaisma*).

*Nectophores*.—The two nectocalyces, which, in all Diphyidæ, are placed at the top of the stem, appear in three different stages of phylogenetic development, and these determine the division of the family into three divergent subfamilies. The first subfamily, Prayidæ, has two nectophores of nearly equal size and similar form, opposed to one another; sometimes the first is somewhat smaller than the second; their surface is rounded, the jelly-substance very soft. Their shape is either mitriform or reniform (*Praya*, Pl. XXXI.), or more hemispherical (*Lilyopsis*).