

In November and December 1840, and consequently only a few months later than Müller and Troschel's preliminary paper above referred to, Gray¹ published a synopsis of the genera and species of starfish. He divided the Asteroidea into two unnamed sections, one characterised by having four rows of ambulacral tube-feet, the other having two rows. The first section contained one family, named "Asteriadæ;" the second section three families, named *Astropectinidæ*, *Pentacerotidæ*, and *Asterinidæ*. These four families comprised forty-five genera and nine subgenera, which were briefly defined by structural characters. This classification was republished as a separate work² in 1866, with a few alterations and eight additional genera which had been described in the interim.

In 1869 Perrier³ published a valuable memoir on the pedicellariæ of Asterids and Echinids.

In 1875 Perrier⁴ pointed out that the characters upon which the sectional divisions or families made by Müller and Troschel and by Gray were based were insufficient and unsatisfactory. He insisted upon the importance of the pedicellariæ as a classificatory factor, and he divided the group into two unnamed divisions by means of the character of the pedicellariæ and of the disposition of the ambulacral tube-feet. The first division was characterised by the presence of pedunculate forcipiform or forcipiform pedicellariæ, and a usually quadriserial arrangement of the ambulacral tube-feet; the second division by sessile, pincer-formed, or valvate pedicellariæ, and a usually biserial arrangement of the ambulacral tube-feet. The first division contained only one family, the "Asteriadæ;" the second division six families, the *Echinasteridæ*, the "Linckiadæ," the *Goniasteridæ*, the *Asterinidæ*, the *Astropectinidæ*, and the *Pterasteridæ*. These seven families embraced forty-five genera (forty-two recognised in the text), a number of Gray's genera being absorbed or altered. Both families and genera were characterised by the structure of the skeleton. This work contains a careful revision of the species contained in the *Museum d'Histoire Naturelle* of Paris, and supplemented by those in the British Museum.

In 1878 Viguière⁵ published an elaborate investigation on the Asterid skeleton, and propounded his discovery that in the mouth-ring of some starfishes the ambulacral plates were predominant, whereas in others the adambulacral plates were predominant. He also showed that a great range of variation occurred in the form of a plate which he called the "odontophore" (the basal interbrachial plate), as well as in the character of the mouth-plates, which he called teeth.

¹ A Synopsis of the Genera and Species of the Class Hypostomia (*Asterias*, Linnæus), *Ann. and Mag. Nat. Hist.*, 1840, vol. vi. p. 175.

² Synopsis of the Species of Starfish in the British Museum, London, 1866.

³ Recherches sur les Pédicellaires et les Ambulacres des Astéries et des Oursins, *Ann. Sci. Nat.*, 5e Série, t. xii. 1869, p. 197.

⁴ Révision de la Collection de Stellérides du Muséum d'Histoire Naturelle de Paris (*Archives de Zool. expér.*, t. iv. 1875, pp. 265-450; t. v. 1876, pp. 1-104, 209-304).

⁵ Anatomie comparée du Squelette des Stellérides (*Archives de Zool. expér.*, t. vii. 1878, pp. 33-250, pla. v.-xvi.)