

first axillary (inclusive) is particularly advisable in the case of the Neocrinoids. For among all the members of this sub-class which have ten or more arms,<sup>1</sup> *Metacrinus* is the only genus besides *Plicatocrinus* in which the second joint beyond the primary radials is not an axillary, a character which has elsewhere been pointed out as distinguishing the Neocrinoids from the Palæocrinoids.<sup>2</sup> In the various types of Comatulæ and in some species of *Pentacrinus* there is a similar constancy in the number of joints which intervene between the successive axillaries of the dividing arms. I have therefore found it convenient<sup>3</sup> to give special names to the joints composing the primary and secondary arms respectively, and to restrict the term "brachials" to the joints composing those portions of the arms which undergo no further division.

The joints of the primary arms may be called "distichals," a term no longer used with the precise meaning which Müller attributed to it;<sup>4</sup> while the joints of the secondary arms (if there be any) may be termed "palmars." These names are of much use in descriptions of Comatulæ; for in this family the number and character of the segments between the successive divisions of the arms exhibit variations which are, to a great extent, constant in different species, and thus give us the means of classifying them into larger or smaller groups.<sup>5</sup>

The Pentacrinidæ, however, exhibit a much greater irregularity in this respect; and they also present more exceptions to the following rule, which holds good in almost all the Neocrinoids. The first two joints beyond every axillary of the dividing rays are united to one another in the same manner, either syzygy or bifascial articulation, as the second and third radials are. Thus, for example, there is a syzygy between the two outer radials of *Encrinus*, and another between the two lowest brachials. In *Apiocrinus* and *Millericrinus* the corresponding joints are respectively united by bifascial articulations.

This rule holds good in all the ten-armed Comatulæ, whether the joints are articulated (*Antedon rosacea*) or united by syzygies (*Actinometra solaris*); and it is equally true in all the many-armed species with the exception of two groups of Actinometræ, together with a few unusually aberrant types. In one group, which is represented by *Actinometra multiradiata*, the two outer radials and also the first two of the three distichals are articulated by ligaments only; but in all the subsequent arm divisions there is a muscular joint between the first two segments after each axillary, and the second one is traversed by a syzygy, whether it be itself an axillary or a free brachial, while the first bears a pinnule. Another variation occurs in *Actinometra typica*, *Actinometra novæ-guinææ*, and their allies. These forms have three distichals in the primary arms, the first two of which are articulated, while the axillary is a syzygy; but the two outer

<sup>1</sup> This passage does not refer to *Promachocrinus*, in which genus there are ten primary rays.

<sup>2</sup> On *Allagecrinus*, &c., *Ann. and Mag. Nat. Hist.*, ser. 5, vol. vii., 1881, p. 296.

<sup>3</sup> *Actinometra*, *Trans. Linn. Soc. Lond.*, (Zool.), ser. 2, vol. ii. p. 24.

<sup>4</sup> *Bau des Pentacrinus*, p. 31.

<sup>5</sup> Classification of Comatulæ, *Proc. Zool. Soc. Lond.*, December 1882, pp. 746, 747.