

only small ones. The arms, however, reach an enormous development, and Quenstedt calculates the total "Krone" to contain not less than five million pieces.¹

In the recent Pentacrinidæ the arms are generally well developed in proportion to the stem. This proportion is of course least in young individuals, as shown in Pls. XXXV. and LI., while it is greatest in forms like *Pentacrinus mülleri*, *Pentacrinus maclearanus*, *Pentacrinus wyville-thomsoni*, and *Pentacrinus alternicirrus* (Pls. XIV., XVI., XIX., XXV.). These lead a semi-free existence, owing to the fracture of the stem at a node, as was probably also the case in *Extracrinus briareus* with its large "Krone."

Among the Comatulidæ the vegetative system is reduced to a minimum, as they have no stem in the adult condition. The arms, however, are often very extensively developed, far more so than in any recent Pentacrinidæ. The ultimate arms of a *Pentacrinus* or *Metacrinus* do not often exceed forty in number; and they rarely consist of more than one hundred joints, though twenty or thirty more may intervene between the last axillary and the calyx (Pls. XIV., XVI.; Pl. XVIII. fig. 1; Pl. XIX. fig. 1; Pl. XXV.; Pl. XXVIII. fig. 1; Pl. XXXI. fig. 1; Pl. XXXIV. fig. 1; Pls. XXXVIII., XL., XLII.; Pl. XLIII. fig. 4; Pl. XLIV. fig. 2; Pl. XLV. fig. 1; Pls. XLVI., XLVIII.; Pl. XLIX. fig. 1; Pl. LII. fig. 1). On the other hand, although there are quantities of ten-armed Comatulæ, very many species, especially of *Actinometra*, have from forty to sixty arms; some, like *Actinometra bennetti*, and *Actinometra schlegeli*, eighty or more; and in a few gigantic types like *Actinometra nobilis*² there may be over one hundred arms. Further, the number of arm-joints is generally from one hundred and twenty to one hundred and fifty, apart from the syzygies; while in a large *Antedon eschrichti* or *Actinometra bennetti* and in other multiradiate species of the latter genus there may be over two hundred arm-joints. Nearly all of them bear pinnules, which are often very long until quite near the arm ends. But in *Metacrinus* and also in *Pentacrinus*, though to a considerably less extent, the development of pinnules stops short some little way from the extremity of the arm; and its outermost segments bear little stumps of two or three joints only, or may even show no signs of pinnules at all (Pls. XXV., XXVIII., XXXI., XXXIV., XXXVIII., XL., XLII.; Pl. XLIII. fig. 4; Pls. XLIV., XLVI., XLVIII., XLIX., LI., LII.).

The same peculiarity is repeated on a smaller scale in the ambulacral plates of the pinnules. Those of Comatulæ (when present) are continued almost to the end of the pinnule (Pl. LIV. fig. 6). But in the Pentacrinidæ the last few pinnule joints, sometimes even four or six, are totally devoid of any ambulacral plating (Pl. XV. figs. 7-9; Pl. XVI. fig. 2; Pl. XLI. fig. 9; Pl. XLVII. fig. 10; Pl. XLIX. fig. 7; Pl. LII. fig. 5). The same is the case with the extremities of the arms. In fact, both in the persistence of the stalk and of the external basals, and also in the nature of the arms,

¹ Encriniden, p. 202.

² The specific formula of this type is— $a. 3. \frac{2}{3} . 3. 3. \frac{0}{0}$.