

arm-fragments belong. But as I have pointed out above, the peculiarities of the arm-grooves upon the ventral surface of the skeleton, and their relation to the ambulacra, afford characters of considerable systematic value. The joints of *Pentacrinus naresianus*, however (Pls. XXVIII., XXIX.; Pl. XXX. figs. 1, 23), show a distinct indication of the more oblique shape which is common among the Comatulæ; while both in this species and in *Pentacrinus blakei* the peculiar nature of the syzygial union renders the arms very readily distinguishable (Pl. XXX. fig. 23; Pl. XXXa. figs. 9-12; Pl. XXXI. figs. 1, 2; Pl. XXXII. figs. 5, 7, 12, 14).

The characters of the stem of the Pentacrinidæ have already been fully discussed (*ante*, pp. 12-23). The fact that during growth it undergoes rather considerable modifications in its appearance has led to a very general belief in the impossibility of identifying species by means of stem-fragments only. This is more especially the case as regards the fossil species, which are often based upon the stem-characters alone, since calyces are but rarely met with; and I think it not improbable that two or even more types of stem from the same horizon, to which different specific names have been given, may sometimes be only different stages of growth of one and the same species. Thus, for example, four species might be made out of the joints represented in Pl. XXII. figs. 13, 14, 23, and 26, which are, however, merely different stages of growth in the stem of *Pentacrinus wyville-thomsoni*. But on the other hand, the difference between the stem-fragments figured on Pl. XIII. fig. 8 (*Pentacrinus asterius*) and Pl. XIX. fig. 4 (*Pentacrinus wyville-thomsoni*) are obviously not due to any developmental causes; and the two would be universally recognised as belonging to different species, even if nothing whatever were known about the calyces and arms belonging to them. The same remark holds good in the case of *Metacrinus*, isolated stem-fragments of *Metacrinus alternatus* (Pl. XXXIX. fig. 3), *Metacrinus cingulatus* (Pl. XLI. fig. 1), and *Metacrinus nobilis* (Pl. XLI. fig. 5), to say nothing of other species, being very readily recognisable.

What has been written above refers simply to the general appearance of the stem-fragments; but when the number of internodal joints is taken into consideration, and also the markings on their terminal faces, the characters of the stem as a whole must be regarded as of very considerable systematic value. The stem-joints of *Balanocrinus* and *Extracrinus* are very readily identified by the sculpture on their faces; but as far as the internodal joints are concerned, I am unable to find any constant difference in this respect between *Pentacrinus* and *Metacrinus*. In most (recent) species of both genera there are from three to six strongly marked ridges along the sides of each petaloid figure. The proximal ridges join their fellows in each interpetaloid space, while the outer ones reach the exterior and cause the crenulation along the line of union between every two joints, the ridges of each face alternating in position with those of the face opposite to it (Pl. XIII. figs. 10, 11; Pl. XXII. figs. 22-24; Pl. XXVI. fig. 17; Pl. XXX. figs. 25-30;