murrayi, *Metacrinus costatus*, *Metacrinus nodosus*, and *Metacrinus wyvillii* the distichal pinnules are flattened as well as their successors, and all have wide basal joints, as shown in Pl. XLVIII.

The lower pinnules of *Pentacrinus* do not present anything like the characters of those of *Metacrinus*, the only approach to this type being the relatively large size of their lower joints in *Pentacrinus asterius* (Pl. XIII. fig. 1) and in some forms of *Pentacrinus mülleri* (Pl. XV. fig. 3); while the distichal pinnules never receive their ambulacra direct from the peristome or from one of the five primary ambulacra of the disk, as do the radial and lower distichal pinnules of *Metacrinus* (Pl. XXXIX. fig. 2; Pl. XLIII. fig. 3; Pl. L. fig. 3). This character is at once sufficient to separate the disks of the two genera; but it does not produce any important effect upon their external appearance in the same way as do the large number of radials and the great size of the pinnules borne by them. There are other very striking features, however, which considerably affect the general facies of the species of *Metacrinus*. There is always a much greater length of the terminal portions of the arms which have undeveloped pinnules than in any species of *Pentacrinus;* and this gives a curious rat-tailed appearance to the general plume of arms. Compare *Pentacrinus* (Pls. XI., XV., XVIII., XIX., XXV., XXVIII., XXXI., XXXIV.), *Metacrinus* (Pls. XXXVIII., XL., XLII.–XLIV., XLVIII., XLIX., LI., LII.).

An examination of these Plates will also bring out the more striking differences in the characters of the stems of the two types. The cirri of *Pentacrinus* vary considerably in length and in appearance, being long and stout in *Pentacrinus asterius* and *Pentacrinus mülleri* (Pls. XI., XIV.); shorter in *Pentacrinus wyville-thomsoni*, though still stout (Pl. XIX.); and slender in *Pentacrinus naresianus*, *Pentacrinus decorus*, and *Pentacrinus blakei* (Pls. XXVIII., XXXI., and XXXIV.), the number of joints varying from twenty to fifty. In *Metacrinus*, however, the mature cirri nearly always have over forty joints, which are generally moderately stout; though of course they are not absolutely so large in the less robust types like *Metacrinus costatus* (Pl. XLIX.) and *Metacrinus nodosus* (Pl. L.), as in *Metacrinus angulatus* (Pl. XXXVIII.), *Metacrinus cingulatus* (Pl. XL.), and *Metacrinus murrayi* (Pl. XLII.). In the three types last mentioned, and also in *Metacrinus interruptus* (Pl. LII.), the cirri about the tenth or twelfth node are larger than those below them; but in other species this difference is not so manifest. All the species of the genus, however, have the older cirri more or less directed upwards, as is especially well shown in *Metacrinus angulatus* (Pl. XXXVIII.), *Metacrinus wyvillii* (Pl. XLVIII.), *Metacrinus interruptus* (Pl. LII.), and *Metacrinus tuberosus* (Pl. LIII.); though it is less marked in *Metacrinus varians* (Pl. XLIV.). This character occurs in no *Pentacrinus* excepting *Pentacrinus wyville-thomsoni* (Pl. XIX. fig. 1), and is by no means constant in that type. But the result of it is that the supra-nodal joint takes a considerable share in the formation of the cirrus-socket, being more or less deeply incised