

of the body, they are often connected by a pavement of minute irregular plates, which may commence as low down as the level of the second radials, and are thought by Wachsmuth and Springer to indicate the presence of a flexible perisome. This is especially the case in some species of *Taxocrinus*, the rays of which must have been at least as free as those of many Pentacrinidæ and Comatulæ, and much more so than those of *Apiocrinus* and *Guettardicrinus*. In these two genera, as in *Uintacrinus*, the calyx interradials are not only present but well developed, so as to increase the size and complexity of the cup. In fact the rays of *Guettardicrinus* are immovably united as far as the second brachial, either directly, or by the intervention of interradial plates; while some species of *Apiocrinus* (*Apiocrinus parkinsoni*) have the second and third radials in close lateral contact with their fellows. Other species, however, with the arms free from the radial axillaries, have a well defined pavement of interradial plates, the lowest of which are large and regular and rest on the upper angles of the first radials, as in *Apiocrinus roissyanus*;¹ while the upper ones are smaller and more irregular, and pass gradually upwards into those of the ventral side. The same is the case in *Marsupites*.

Many Pentacrinidæ and Comatulæ have wide rays which are in close lateral contact just as in *Apiocrinus parkinsoni* (Pl. XV. fig. 2; Pls. XVIII., XIX.; Pl. XXV.; Pls. XXVIII.–XXX.), while others have the rays more separated from one another, but united by flexible perisome in which the joints of the lower pinnules and numerous small irregular plates are imbedded (Pl. XIII. fig. 1; Pl. XXXI.; Pl. XXXVII. fig. 1; Pl. XXXIX. fig. 1; Pl. XLIX. figs. 1, 2; Pl. L. fig. 1). These may cease at the level of the third axillaries, or pass up into the plating of the ventral side as in *Apiocrinus roissyanus*, *Marsupites*, and the Liassic species of *Extracrinus*. But they are never so large as in these fossils, and more nearly resemble the small irregular plating of the Ichthyocrinidæ.

Thus then there are many Neocrinoids with no interradial plates in the calyx; and when these plates are present and well defined, as in *Apiocrinus*, *Guettardicrinus*, and *Marsupites*, or *Uintacrinus*, they are not limited to any special side of the calyx, but are equally distributed all round it; so that there is no distinction of the anal side, *Thaumatoocrinus* of course excepted.

In the Palæocrinoids, however, the pentamerous symmetry of the calyx is almost always disturbed by a greater or less modification of the plates on the anal side. The difference may be very slight, as in *Phimocrinus* and *Cupressocrinus*, which have the anal opening separating the muscle-plates of two adjacent radials. But even this character appears to be absent in the remarkable genus *Erisocrinus* from the Upper Carboniferous of America, which has a calyx unusually like that of *Encrinus*; and also in *Stemmatocrinus* from the Russian Carboniferous, which is still more like *Encrinus* in the structure of the arms.

Some forms have a special anal plate between two of the primary radials. This is the

¹ See woodcut, fig. 9 on p. 183.