

notions of morphology. I freely admit the functional analogy of the under-basals of *Encrinus*, *Erisocrinus*, &c., with the central plate of *Cupressocrinus* or *Stemmatocrinus*; but until the apparently simple nature of the latter shall have been proved to be really due to the disappearance of sutures, as in the basal ring of *Bathycrinus*, *Rhizocrinus*, and *Agassizocrinus*, I think that we must regard it as a top stem-joint, corresponding to what de Loriol calls the "article basal" in *Apiocrinus* and *Millericrinus*.

*Encrinus* is remarkable as being the only Neocrinoid with ten (or twenty) arms of biserial joints, which increases its resemblance to *Stemmatocrinus*. There are, however, some species (*Encrinus gracilis*) with ten uniserial arms, as in the other Neocrinoids and in *Erisocrinus* so far as yet known. This is also the case in de Koninck's genus *Philocrinus* from the Carboniferous strata of the Punjaub.<sup>1</sup> But the basals seem to be much higher and the cup generally deeper than in either *Erisocrinus* or *Stemmatocrinus*. The structure of the lower part of the cup was unfortunately obscured in de Koninck's specimen, so that the presence of under-basals is still doubtful.

Wachsmuth and Springer point out that the absence of any anal plates in *Erisocrinus* and *Stemmatocrinus*, and the want of any knowledge of their ventral side render it doubtful "whether they belong to the Cyathocrinidæ, or even to the Palæocrinoidea; and if it had not been for their marked resemblance to *Eupachycrinus*, in which a ventral tube has been observed, and that both were representatives of the same geological age, living under the very same conditions, we should have felt strongly disposed to place the whole genus with *Encrinus*, with which it has, indeed, both in body and arms, the closest affinities."<sup>2</sup> They think the number of radials to be not of material, or, at most, "only of generic importance; but in *Encrinus* the aboral side of the body, or the plates which in all Cyathocrinidæ constitute the calyx, form almost a flat disk—at least do not extend beyond the basal plane—and this is the only distinction which can be discovered between the two forms in the fossil state. This, however, may involve important structural modification in the internal anatomy of the animal, and probably shut out *Encrinus* entirely from the Palæocrinoidea."

Our knowledge of the anatomy of recent Crinoids, however, does not favour this supposition. There is very much less difference between the calices of *Encrinus* and *Erisocrinus* than between that of *Antedon eschrichti* with high radials and a narrow but deep central funnel, and the low flattened calyx of any *Actinometra*. But the only difference exhibited by the ventral sides of these two types is that the mouth is central in the *Antedon* and excentric in *Actinometra*. I can therefore see no reason for supposing that *Erisocrinus* had a solid inflexible vault built up of the so-called oral plates, like that of the Cyathocrinidæ, with which family it, as well as *Stemmatocrinus*, is placed

<sup>1</sup> Description of some Fossils from India, discovered by Dr. A. Fleming of Edinburgh, *Quart. Journ. Geol. Soc.*, vol. xix. p. 4, pl. ii. fig. 5.

<sup>2</sup> Revision, part i. p. 142.