suggested that the great development and calcification of this lamella would bring the ambulacral nerve into a position corresponding to that of the radial nerve-cords of Ophiurids and Echinids. Marshall[1] has recently put forward a somewhat similar hypothesis, viz., that this lamella "probably represents the earliest stage in the process by which the nerve becomes detached from the epidermis and shifted inwards." We know far too little, however, about the ontogeny of the Echinoderm nervous system to do more than speculate on this subject. According to Selenka and Ludwig the nervous system of Asterids and Holothurids is of ectodermic origin; while Götte's observations lead to the conclusion that the ambulacral nerves of Crinoids are derived from the endoderm. Should this really be the case, there can be no difficulty in taking the same view respecting the axial cords.[2] But even then we get no clue to the morphology of the central capsule, as Marshall has conveniently called the fibrillar envelope of the chambered organ in which the axial cords originate.

He remarks[3] that "Dr Carpenter's observations lead to the belief that, at any rate in its present form, it is connected with the change from the pedunculate to the free-swimming condition; and it is worthy of notice that the two actions with which it has been found to be specially concerned physiologically, *i.e.*, the movements of swimming and of righting, are ones that the pedunculate form, from the very nature of things, can never exercise."

I cannot quite share Marshall's belief in the relation between the central capsule and the change from the attached to the free mode of life. The only difference between the chambered organ of a *Comatula* and that of a Stalked Crinoid is the absence of any cirrus-vessels in connection with the latter; for these come off from the peripheral vessels of the stem (Pl. XXIV. fig. 4; Pl. LXII.—*cv*), which are the downward extensions of the cavities of the chambered organ. But the central capsule or fibrillar envelope of these cavities, which in *Comatula* "is specially connected with the complex co-ordinated movements of swimming and of righting when inverted," is equally present in all the Stalked Crinoids (Pl. VIIb. fig. 2; Pl. XXIV. figs. 6, 7; Pl. LVIII. figs. 1, 3; Pl. LXII.); and there can be no doubt that it controls the movements of flexion and extension of the arms. The latter of these is essential to the proper nutrition of the animal; and I can quite believe that the arms may also be used for swimming by those Pentacrinidæ, such as *Pentacrinus maclearanus*, *Pentacrinus alternicirrus*, and *Pentacrinus wyville-thomsoni*, which have short stems terminating below at a nodal joint (Pl. XVI. fig. 1; Pl. XIX. fig. 1). In all the Stalked Crinoids the central capsule is continued downwards into the stem as a sheath around the central vascular axis (Pl. VIIa. figs. 1, 2; Pl. XXIV. figs. 1–6; Pl. LXII.—*ca*), and it gives off branches which spread out towards the surface of the stem,

[1] *Loc. cit.*, p. 546.

[2] Whatever be the origin of these cords, they are essentially mesodermic in their distribution; and it is in this sense that I have spoken of them in the text as constituting a mesodermic nervous system (p. 114).

[3] *Loc. cit.*, p. 547.