discovered by Ludwig, whose observations he could not very well overlook. But he does not attempt to discuss the bearings of this fact on Ludwig's doctrine that the axial cords are the only nerves in the arm of a Crinoid. He likewise describes the regular alternating movements of the arms of a swimming *Comatula*, and the muscles by which these movements are effected; and he leaves it to be inferred that these muscles are under the control of the only nervous system of which he admits the existence, although experiments have clearly proved that this is not the case; while Ludwig has admitted that he could trace no branches proceeding to the muscles from the ambulacral nerve. As to this last point, however, Weinberg is altogether silent.

Until this present year no German morphologist, with the exception of Weinberg, had published any observations upon the Crinoids since the appearance of Ludwig's important work in 1877; and the authors of zoological text-books published in Germany have confined themselves with remarkable unanimity to reproducing Ludwig's assertions that the nervous system of a Crinoid is essentially similar to that of an Asterid, and is limited to the fibrillar bands beneath the ambulacra. Dr. Carpenter's views, if mentioned at all, which was rare, were regarded as untenable from their being altogether at variance with the established scheme of Echinoderm morphology. Claus, for example, describes the arrangement of the axial cords in the calyx in some detail, but says not a word about their functions; while their presence is not even mentioned by Gegenbaur. According to these writers, therefore, the nervous system of a complex and highly specialised type like *Pentacrinus* is exclusively represented by the subepithelial bands of the ambulacra and the oral ring which unites them beneath the peristome (Pl. LXII., *n*,*nr*). The extreme insignificance of these structures in comparison with the rest of the organism cannot fail to strike any one who examines the sections of the ambulacra represented on Pl. LVII.; and yet, according to the orthodox German morphology, they are the only nerves which a Crinoid possesses.

The theory that the axial cords are nerves has recently been restated by Dr. Carpenter,[1] with the additional support of a quantity of new facts which had been discovered since he last wrote on the subject, more than eight years ago. He concluded by saying, "those who refuse to accept them (my views) are bound, I think, either to disprove the facts, or to show that my deductions from them are unsound."

Within a very short time after the presentation of this communication to the Royal Society, two papers were published on the nervous system of the Crinoids, in which Dr. Carpenter's theory was unreservedly adopted and strengthened by a large body of additional evidence.

The second of these, by Professor A. Milnes Marshall,[2] will be best considered first. After a short historical sketch of the subject, he describes an elaborate series of experi-

[1] On the Nervous System of the Crinoidea, *Proc. Roy. Soc. Lond.*, vol. xxxvii., 1884, pp. 67–76.

[2] On the Nervous System of Antedon rosaceus, *Quart. Journ. Micr. Sci.*, vol. xxiv., N. S., 1884, pp. 507–548, pl. xxxv.