Some species have as many as two hundred arms, each consisting of from one hundred and twenty to two hundred joints; while I have counted three hundred joints in the arms of a large *Antedon eschrichti*. The regular and graceful mode in which a ten-armed Crinoid swims is well known. The simultaneous flexions of the five right and of the five left arms alternately involve the co-ordinated contraction of several hundred pairs of well defined muscular bundles, and yet these are performed in entire independence of the ambulacral nervous system, with which the muscles are in no direct connection. In fact the eviscerated skeleton which has lost its disk and oral nerve-ring will swim as well as the entire animal. Whence does it get this power?

According to R. Hertwig[1] "Zunächst ist für mich die schon oben vertheidigte Grundanschauung maasgebend dass die Lebenserscheinungen der Ctenophoren nicht gut ohne die Annahme eines mesodermalen Nervensystems verständlich sein möchten. Seitdem durch die neueren Untersuchungen mit sicherheit Nerven bei den Medusen und Actinien nachgewiesen worden sind, ist kein Fall im Thierreich bekannt, in welchem complicirtere und raschere Muskelbewegungen ohne gleichzeitige Anwesenheit von Nerven zu Stände kämen. Sollten die Ctenophoren in dieser Hinsicht eine Ausnahme machen?"

Substitute for "Ctenophoren" the name "Crinoideen" in the above quotation, and the question arises, Where is the co-ordinating centre of the muscular movements of a Crinoid?

A centre of this kind, if it exists in such a highly organised type as a Crinoid, cannot but be regarded as belonging to a nervous system; whereas a denial of its existence brings us face to face with a physiological problem of much complexity. As a matter of fact, however, there is both physiological and anatomical evidence for the existence of such a centre, though the morphological difficulties which its presence involves are of the most perplexing character.

The well-known experiments of Dr. Carpenter[2] have shown conclusively that the fibrillar envelope of the chambered organ is the governing centre on which all the muscular movements of the animal depend, and that the movements of each individual arm depend upon the integrity of the axial cord of that arm. For they stop directly it is injured, just in the same way as injury to the chambered organ causes all the arms to be rigidly stretched out by the action of the dorsal elastic ligaments. The fibrillar envelope of the chambered organ, therefore, is the centre of a nervous system, the peripheral portion of which consists of the axial cords of the rays, arms, and pinnules, and of the numerous branches proceeding from these cords.

The occurrence of this fibrillar tissue in the stem and cirri (Pl. XXIV. figs. 1–5, *ca.*), and also in the ventral perisome, whether bare or plated (Pl. LIX. figs. 2–4, 6, 7;

[1] Ueber den Bau der Ctenophoren, *Jenaische Zeitschr.*, Bd. xiv. p. 437.

[2] *Proc. Roy. Soc. Lond.*, 1876, p. 453.