

ontogenetic development of Vertebrates. I will not circumstantially refute this argument, but will only remark that in *Polygordius* and other Chætopods, which are representatives of a group of animals in which segmentation reaches such a very high degree of perfection, the longitudinal muscular layer of the body-wall is as yet continuous in the adult, and not divided into metameric sections, as it is in certain Arthropods and in Vertebrates. Now let us consider contractions of the inner muscular layer *a* of the Nemertea, the only layer that is common to all of them, from *Carinella* to *Cerebratulus* and from *Cephalothrix* to *Pelagonemertes*. This layer also corresponds with the longitudinal muscular layer just alluded to of other lower worms, such as *Polygordius*, and, as was noticed in our paragraph on the muscular system (*cf.* p. 72), its contraction is sometimes very distinct in favourable sections.

We then see the contraction marked out as so many successive blocks of contracted, thickened fibres, separated by intervening parts of non-contracted fibrous tissue (Pl. XV. figs. 9, 10). The sections demonstrate that the phenomenon persists throughout the whole breadth of the animal, *i.e.*, that successive rings of contractile tissue alternate with intervening rings in which no contraction is observed. This phenomenon is thus in a certain degree comparable to an arrangement in distinct myomeres.

It is not unimportant that it was especially noticed in the fundamental muscular layer, and it may at the same time be remarked that it appears, from what I have as yet been able to observe myself, that the number of these rings in a given length of the animal, is the same, or a multiple of the number of intestinal cæca and transverse nerve-tracts in the plexus; in other words, that the incipient metamery of the internal organs is in a definite relation to these phenomena—which might also deserve the name of incipient metamery—in the muscular layers.

For the present the fact is, however, not yet definitely demonstrated that these successive blocks are indeed present as such in the living animal. The possibility is still open that they may be waves of contraction which have been fixed at the moment of the immersion of the animal in the preserving fluid. For this reason I will not lay any undue weight on this observation.

The ideas concerning the origin of metamery here expressed, and advocated for several years in my university lectures, differ from those of Lang (XVIII) and Sedgwick,<sup>1</sup> in so far as they do not recognise the primary importance of the so-called cœlomic sacs—the paired archenteric diverticula of *Amphioxus*—for the solution of this question.

The question of the Vertebrate cœlome, so full of obscurities and difficulties, is purposely left out of consideration here, where the relation to archicœlous ancestral forms is discussed, and where an attempt is made to show that it is indeed probable that the impulse towards the establishment of metamery is due to forces for which the

<sup>1</sup> A. Sedgwick, On the Origin of Metameric Segmentation, *Quart. Journ. Micr. Sci.*, vol. xxiv. p. 43, 1884.