

somewhat larger oval form, were surrounded by a perfectly continuous skin, and exhibited no trace of a connecting stalk. The chamber layer in the former case was still simply a closed sphere, while in the second a rupture had taken place towards the pointed pole of the oval body, at the point apparently where the osculum would be developed. A beautiful post-embryonal series, with certain modifications of form, was observed by Wyville Thomson<sup>1</sup> in *Pheronema (Holtenia) carpenteri*.

Generally speaking, however, no important modification in the form seems to occur during the development. In those Lyssacina in which the spicules are never soldered together, the growth may apparently continue until the death of the animal; so that giant forms of 50 cm. in diameter and more may arise, as *Poliopogon gigas*, *Malacosaccus vastus*, &c. In many Lyssacina, however, which, as they grow, typically exhibit a soldering of the principal needles, there appears to be a definite limit of growth (e.g. in *Euplectella aspergillum*). It is readily intelligible that when the soldering of the needles has progressed from the median portion of the tube to the basal tuft on the one hand, and to the firm terminal sieve-plate on the other, any further extension of the sponge-body is really impossible. It is different with the Dictyonina, in which the principal needles (Dictyonalia) are immediately after their formation united with one another into a connected framework. Here, however, both on the free margin of the cup- or tube-like body, and on the whole dermal and gastral surface, there is a persistent continuance of growth through the laying down of fresh portions of the framework and simultaneous displacement of the loose dermal and gastral skeleton. It is only when the dermal skeleton becomes itself rigid, through the union of its spicules in a reticulate framework, or by a continuous siliceous membrane, that an absolute check is placed upon any further lateral growth. This seems also to occur in individual cases, e.g., in *Fieldingia*, and with apparent regularity in several fossil forms.

In many species the whole body dies and falls to pieces at once, while in others dissolution is more gradual and begins at the base. Thus many specimens, especially of Dictyonina, and also many Lyssacina, are dead in their basal portion, which consists simply of a perfectly macerated skeleton, representing either the loose fibrous tuft, as in *Poliopogon amadou*, or a dead portion of the dictyonal skeleton. The latter case is illustrated in Pl. CII. fig. 1, in reference to *Euryplegma auricularis*, where the lower boundary of the persistent, somewhat darker soft body is sharply marked off. On a large beautifully developed specimen (40 cm. in height) of *Aphrocallistes vastus*, which Dr. Gotsche brought from Japan, the whole basal portion for about a hand's length has been killed. The siliceous elements rooted in the mud are not, however, always wholly dead. The long tuft needles of the Hyalonematidæ and the anchor needles of the Euplectellidæ undoubtedly retain their life, being probably nourished through the strand of their axial canals.

In all skeletal elements which have been exposed, for a lengthened period after

<sup>1</sup> *Phil. Trans.*, vol. clix. p. 70.