

mesembryanthemum. The researches of these last observers have shown that in *Tubularia mesembryanthemum* the sexual cells are derived from that part of the ectoderm which forms the deeper portion of the endocodon in the very young gonophore. It is this portion which ultimately becomes the ectodermal covering of the spadix, and the place of origin of the sexual cells thus coincides with their place of development, so that they do not here require as in other instances to wander from one to the other. Weismann and Ciamician agree in believing that the great majority of the egg-cells serve merely as food-cells, and after attaining a certain size become broken down and dissolved, thus affording nutriment for those egg-cells which are destined for development.—a view which, as we shall presently see, is supported by the phenomena observed in *Myriothele*.

In the very young gonophore—whether male or female—the sexual cells, as may be seen in *Tubularia larynx*,¹ already surround the spadix, and soon quite fill the cavity which is included between the spadix and its now widely separated ectodermal coat, and thus serves in the female as a brood chamber for the developing embryo. In the egg-cells which at this stage fill the brood chamber in *Tubularia larynx* may be seen a large nucleus with nucleolus (germinal vesicle and germinal spot).

With the growth of the gonophore the mass of sexual cells which it contains becomes more and more voluminous, and we soon find that the place of these egg-cells is taken by a plasma-like mass which envelops the spadix, and which still continues to increase in volume with the continued growth of the gonophore. We next see that a portion of the mass has become detached from the rest in order to undergo a special development within the cavity of the gonophore. Whether this detached mass can be regarded as a true ovum may be doubted, but at all events it takes the part of an ovum in passing through various stages of development. It is destitute of external membrane, and it is probable that it is at this stage that the influence of the male element is exerted on it, and that the process of segmentation takes place. This process, however, is here very obscure, and observations have failed in obtaining satisfactory results as to the mode in which it is carried on.

According to Ciamician the segmentation of the ovum in *Tubularia mesembryanthemum* is an irregular one, the embryo being formed by an epibolic extension of some of the segmentation spheres over the remainder, the former giving rise to the ectoderm, and the latter to the endoderm.

This form of segmentation, by which some of the segmentation spheres rapidly multiply and surround the others, closely resembles that of the Ctenophora, and is very different from what takes place in the formation of a planula. I have never seen anything of the kind in the species of *Tubularia* whose development I have studied, and neither Balfour² nor Kleinenberg have been able to confirm the conclusions of Ciamician.

¹ *Gymnoblasic Hydroids*, p. 91, pl. xxiii. figs. 19–24.

² *Balfour's Works*, Memorial Edition, vol. ii. p. 154.