

Gonostyles.—The stems of the gonodendra, which bear the clustered gonophores, and which we call gonostyles, are sometimes themselves simple palpons, at other times branches of sexual palpons, or in a peculiar manner combined with sterile palpons. The ramification is in most *Physonectæ* not very rich (mainly in the males), and not to be compared with that of the *Cystonectæ*. There are, however, exceptions, as in the female gonodendra of some *Discolabidæ* (Pl. XX. figs. 11–16). The male gonostyles of the latter exhibit a peculiar appearance, since their distal part, after the detachment of the ripe androphores, is covered with tubercles (as the remaining pedicles of the latter), whilst the proximal part produces vicarious gonophores.

Gonophores.—The medusiform gonophores of the *Physonectæ* are in general of small size, especially the females. Their umbrella is sometimes well developed, with four equidistant radial canals and a marginal ring-canal, whilst at other times it is more or less reduced, and sometimes rudimentary. The manubrium is larger in the androphores, where it is usually club-shaped or cylindrical, with a central spadix; often coloured white, yellow, or red; it is often very prominent from the narrow mouth of the reduced umbrella (Pl. XII. fig. 17; Pl. XVIII. fig. 17, &c.). The manubrium of the gynophores is much smaller, ovate or subspherical, and develops constantly a single large ovum only. This is often surrounded by an irregular network of peculiar anastomosing canals (Pl. XV. fig. 15; Pl. XVIII. fig. 16). These “spadicine canals” arise by a peculiar process: the original central spadix in the axis of the young ovarium becomes excentric by the unilateral development of a single large ovum; it grows around the latter in the form of a hemispherical cup, and envelops it finally like a capsule; by the partial irregular concrescence of its two walls arises the reticulum of canals, which is called “netzformiges Canal-System” by German authors.¹

Ontogeny.—The development of the fertilised egg is hitherto known in the case of only very few *Physonectæ*. The first observations on it were made by myself in the Canary Island Lanzerote, in December 1866, and January and February 1867. I was able to observe there the embryonic development and the metamorphosis of *Physophora magnifica*, *Crystallodes rigida*, and *Athorybia ocellata* (84, Tafs. i.–xiv.). Further observations were published in 1874 by Metschnikoff, who illustrated the ontogeny of *Halistemma rubrum*, *Cupulita picta*, and *Agalmopsis sarsii* (85, Tafs. viii.–xii.). The embryology of *Agalma elegans* was afterwards described by Fewkes (89, pls. i.–iv.). Judging from these few observations, it seems that the *Physonectæ* are subject to a rather complicated metamorphosis and produce medusiform larvæ, the morphological value of which is probably very great for their phylogeny. Usually these monogastric larvæ (*Physonula*) develop the pneumatophore from their exumbrella very early, and around it a corona of provisional bracts. (Compare Family XI., Athoridæ, p. 200, and Pl. XXI. figs. 5–13.)

¹ Compare Weismann, *Die Entstehung der Sexual-Zellen bei den Hydromedusen*, 1883, p. 206.