

less distinct, of the same octoradial composition of the centre of the float, which is immediately evident in all Porpitidæ and Discalidæ.

The pneumatocyst of *Rataria* consists only of a horizontal, slightly campanulate or flatly conical disc of elliptical outline, whilst that of *Velella* and of *Armenista* bears a solid vertical triangular crest, placed in a diagonal axis of the disc.

The pneumatocyst of *Rataria* is of the highest interest, since it offers all desirable intermediate forms between the bilateral crested float of the other Velellidæ and the circular crestless float of the Porpitidæ. This is the more important, as the young Ratarula-larvæ of *Velella* and *Armenista* exhibit the same structure of the pneumatocyst (during a longer or shorter time) which is permanent in the autonomous genus *Rataria*. A central chamber, placed in the centre of the exumbrella, is here always surrounded by eight radial chambers, just as in the Porpitidæ and Discalidæ. But whilst in these two families each radial chamber (as well as the central chamber) possesses a stigma, or a free opening on its upper surface, there are in the similar pneumatocyst of *Rataria* three such openings only, one in the upper face of the central chamber and one on each side of it, in the two chambers, which are directed towards the two sagittal poles, or the poles of the major axis of the ellipse. The stigmata of the six other chambers seem to be lost by phylogenetic reduction (Pl. XLIV. fig. 8). Each of the eight radial chambers usually possesses a trachea or a bunch of descending air-tubules on its lower face (fig. 9).

The octoradial structure of the pneumatocyst, which is obvious in *Rataria*, is also recognisable in the similar Ratarula-larvæ of *Velella* and *Armenista*. But it is not equally distinct and well preserved in all species of these two genera. The peripheral wall of the central chamber, which separates it from the eight surrounding radial chambers, is pierced by eight openings, connecting the former with the latter. These openings of communication afterwards often become so enlarged that the eight chambers appear only as radial lobes of the central chamber, and sometimes the eight radial septa between the former are so reduced that the eight lobes nearly disappear. This fact explains the striking contradictions of the former observers, some of whom interpret the Ratarula-larvæ as young forms of Velellidæ (Huxley, Bedot, &c.), some as larvæ of Porpitidæ (Agassiz, Burmeister, &c.).¹ Indeed all these larvæ belong to the Velellidæ, since the larvæ of the Porpitidæ never develop a vertical sail. But the octoradial structure of the central part of the pneumatocyst, which is always very distinct in the latter, is of very variable distinctness in the former; sometimes it is well preserved, at other times not, and sometimes the cenogenetic modification is so strong that it becomes quite lost.

The *concentric ring-chambers of the pneumatocyst*, which surround its octoradial central part, are not circular in the Velellidæ (as in the Porpitidæ and Discalidæ), but more or less elliptical, with prolonged sagittal axis, and shortened transverse or frontal

¹ Compare Pagenstecher, 55.