

not present siphonal necks, but each segment of the siphuncle is joined to the subsequent one (that which is formed after it) by a sort of "cogwheel," more or less regular, which is found at the aboral extremity of the former, spreading a little over the concave surface of the septa (Pl. II. figs. 4 and 6), and thus preventing the penultimate chamber from communicating with the siphonal cavity.<sup>1</sup> The apical extremity of the siphuncle is a cæcum making a small prominence in the interior of the initial chamber (Pl. II. fig. 7, *psph.*); from this cæcum a sort of ligament, situated in the median sagittal plane, runs, while enlarging, to the wall of the initial chamber (prosiphonal ligament or "prosiphuncle," Pl. II. fig. 7, *c.*). We can only make conjectures as to the nature and function of this "ligament." But it evidently cannot have had the function of siphuncle in the embryo;<sup>2</sup> the embryo with a single chamber cannot have had any kind of siphuncle, and from the formation of the second chamber the true siphuncle was constituted.

The fact that in our *Spirula reticulata* the last chamber is so shallow renders it probable that the increase of the shell-siphon is intermittent, and that each segment of the siphuncle does not originate much before the septum which is topographically anterior to it.

*d. Pallial Cavity.*—The pallial cavity is widely open, the margin of the mantle not being at any point united to the cephalopodal mass. But it is considerably less deep than in the other Dibranchiates; the presence of the shell prevents its extension on the median line (Pl. I. fig. 6; Pls. III. and IV.), and even on the sides it does not extend very much further (Pl. IV. figs. 1 and 3, *a.*). In *Nautilus* likewise the pallial cavity does not extend so far backwards as in the other Cephalopods. Upon the "visceral" face of the pallial cavity, at the very posterior extremity, are found (in the female) the nidamental glands (Pl. I. fig. 6, *n.g.*, &c.). In front, and partially concealed by the anterior extremity of these glands, are glandular prominences (Pl. I. fig. 7, *x*; Fig. C in the text, *iii*), apparently accessory nidamental glands (see further on, Reproductive System); the left one partly hides the extremity of the oviduct (Fig. C, *ix*). In *Spirula peronii* and *Spirula australis* (Pl. I. fig. 7; Pl. II. fig. 1) the anus opens between these two prominences on the level of their anterior margins, whilst in *Spirula reticulata* it, as well as the two neighbouring sessile renal openings (Fig. R), is hidden on the median line behind these two prominences, which are almost in contact; between the two prominences there is seen, beneath the integuments, the ink bag (Figs. C and R, *iii*). The glandular extremity of the oviduct projects between the left gill and the glandular prominence, behind which it sinks and opens obliquely (Fig. R, *vii*).

The *gills* are situated quite laterally (Pl. IV. fig. 3, *br'*), less ventrally than in other Cephalopods. They are relatively small, and present about twenty-five pairs of leaflets.

<sup>1</sup> The remarkable radiating structure of the siphuncle of certain palæozoic Cephalopods is perhaps comparable to it.

<sup>2</sup> Munier-Chalmas, Sur le développement du phragmostracum des Céphalopodes et sur les rapports zoologiques des Ammonites avec les Spirules (*Comptes rendus*, t. lxxvii., 1873, p. 1559).