

internal longitudinal bars in the branchial sac. No calcareous spicules like those of *Culeolus* are present in the vessels of *Pharyngodictyon*, but a few rather large muscle fibres are found traversing them. The walls of the vessels are covered with squamous epithelium except on the internal edges of the longitudinal bars, where the cells become columnar and have tapering pointed free ends (Pl. XXI. fig. 13).

The endostyle is large and conspicuous. In side view (Pl. XXI. fig. 5) its course is nearly straight, but when seen in front view (Pl. XXI. fig. 16) the edges are found to be very much undulated. The very considerable breadth of the organ is also seen in this view.

The tentacles are large and fairly numerous. They are wide at their bases and recall by their appearance (Pl. XXI. fig. 14) the tentacles of some species of *Styela* amongst the Simple Ascidians. The upper surface of the tentacle is covered by a broad band of cubical epithelium (Pl. XXI. figs. 14, 15), while the sides and lower surface are formed of squamous cells. The usual septum of connective tissue is present in the interior (Pl. XXI. fig. 15).

The alimentary canal forms a large mass (Pl. XXI. fig. 5), including the widest portion of the body; it is very opaque. The stomach is a large ovate, thick-walled organ on the dorsal edge. It has ridges projecting into the interior. The intestine extends posteriorly for a short distance and then turns sharply to the ventral side and anteriorly. It is a large tube irregularly swollen with fæces at intervals. It forms the ventral edge of the visceral mass, and then crosses the œsophagus to reach the dorsal side of the branchial sac (Pl. XXI. fig. 5). In sections the stomach and intestine are found to contain great masses of a soft greyish colour composed mainly of Diatoms.<sup>1</sup>

The mature Ascidiozooids are hermaphrodite. The large genital organs lie completely posterior to the alimentary canal in a long diverticulum of the mantle, which is the post-abdomen. The anterior portion of the post-abdomen (Pl. XXI. fig. 5) is narrow and contains the genital ducts. Further back it swells into a fusiform body, in which the ova and the spermatic vesicles lie, and behind this it is continued into a long narrow tail which usually terminates in a slightly swollen extremity (Pl. XXI. fig. 5). One or two large yellow ova usually occupy the centre of the fusiform genital mass, while in front and behind are placed the small ovate or globular spermatic vesicles. The latter are usually about twelve or fifteen in number, and they stain a very deep red with picrocarmine. Each has a fine duct which runs upwards to join the vas deferens (Pl. XXI. fig. 17). This tube is large and conspicuous. It is formed at the upper end of the genital mass by the junction of the ducts from the spermatic vesicles (Pl. XXI. fig. 5), and runs forwards over the alimentary viscera to reach the rectum, up which it courses to its termination in the dorsal part of the peribranchial cavity. The upper part of the vas deferens is usually a little wider than the rest. The ova are of very

<sup>1</sup> The deposit on the bottom at Station 147, where this species was obtained, is Diatom ooze.