Pyrosoma colony (Fig. 2). The Ascidiozooids all have their dorsal surfaces turned the same way, but the direction is different in different species. Huxley in his first memoir[1] described the Ascidiozooids of *Pyrosoma atlanticum* as having their dorsal surfaces[2] directed towards the open end of the colony; and in his second memoir[3] he describes the same condition in the case of *Pyrosoma giganteum*. In *Pyrosoma elegans*, however, Keferstein and Ehlers[4] found that the dorsal surfaces of the Ascidiozooids were turned towards the closed end of the colony. The Ascidiozooids are not arranged in systems or groups, and as their atrial apertures all open into a single common cloaca which has only one opening to the exterior, the whole colony may be regarded, as Savigny pointed out, as forming a single large system. The Ascidiozooids placed near the open end of the colony are provided with tubular prolongations of their dorsal body-wall, containing muscle fibres, and probably acting as dilatators of the opening.

The test is remarkably clear and transparent. In its histological characters it agrees with the test of many of the Ascidians. It contains test cells which are mostly stellate, and have branched processes (Pl. I. fig. 6). There are no bladder cells, no pigment cells, and no spicules.

Each Ascidiozooid is elongated antero-posteriorly (Figs. 2 and 4) and consists of two parts, the large thorax and the small abdomen, but these regions are not separated by any external constrictions. The branchial and atrial apertures are merely rounded openings with no lobes. The atrial is not prominent, and there is no atrial siphon (Pl. I. fig. 3).

The branchial aperture is raised on a projection as described above, and leads into a short branchial siphon, which is continued backwards by a large tubular or infundibular cavity, widening slowly or rapidly, according to its length, until it joins the branchial sac. Round the walls of this large cavity, which evidently corresponds to the zona præbranchialis of Simple Ascidians, are found two circular muscle bands, and other very delicate muscle fibres may be found encircling the body farther back. In *Pyrosoma spinosum*, n. sp., the muscle bands around the large branchial region of the body are numerous. There is always a strong atrial muscle in the wall of the peribranchial cavity, and an atrial sphincter. These are the only muscle fibres in the mantle, which is otherwise a clear membrane forming the body wall, and clothed externally by the ectoderm, a layer of squamous epithelium, and on the inner surface by another layer of squamous epithelium, the parietal layer of the atrial membrane (or third tunic).

At the anterior end of the præbranchial zone, and just inside the branchial aperture, is placed the circle of simple unbranched tentacles. They are about twelve in number,

[1] *Phil. Trans.* 1851, part ii. p. 581.

[2] It must be remembered that Huxley called the neural surface ventral and the endostyle dorsal, the reverse of the nomenclature of regions now generally accepted.

[3] *Trans. Linn. Soc. Lond.* 1862, p. 201.

[4] Zool. Beiträge, p. 72.