

spicules, which give to most of the Didemnidæ their characteristic appearance. Their presence renders the test hard, brittle, and opaque, and gives it in most cases a gleaming white appearance. Both by sight and by touch, a specimen of the Didemnidæ with calcareous spicules in the test may be readily diagnosed without further examination, while a lens or low power objective places the matter beyond all doubt by showing the numerous white stellate bodies imbedded in the test. In some few species, however, of the family (e.g., *Didemnum tortuosum*, von Drasche), no spicules have been found. Whether this is permanently the case in these species, or is only at a certain time or in a certain condition of the colony, is not yet known. It is quite an exceptional circumstance amongst Didemnidæ.

Another very important characteristic of the family is found in the condition of the reproductive organs. The male system consists of a single very large testis of ovoid form placed on the right side of the intestinal loop, and having a long conspicuous vas deferens, the lower part of which commences its course by coiling spirally around the upper part of the testis for a number of turns. It then runs forward in the usual manner to join the rectum, along which it courses to the peribranchial cavity. The ovary consists merely of a few ova which are placed alongside the vas deferens. The mature ova are of very large size, and they frequently make their way into the common test surrounded by a covering of ectoderm, which they push out before them from the body-wall of the parent Ascidiozoid. How their escape from the common test to the exterior of the colony is effected is not yet known.

The alimentary canal is comparatively simple, and is of much the same relative size in all members of the family. The stomach is large, and is usually of more or less globular or ovate form. Its wall is almost invariably smooth, with no folds, ridges, or other thickenings. In a few cases, however (e.g., *Leptoclinum speciosum*), slight ridges, formed of thickened epithelium, project into the interior, but they are not visible on the outside. In some cases the intestine may be divided into regions of different calibre (*Eucelium hospitolum*, Savigny), and sometimes the margin of the anus is provided with a pair of curiously curled horns or projections (see von Drasche, *Die Synascidien*, &c., p. 30, and Taf. xi. fig. 34).

The process of gemmation in the Didemnidæ is very remarkable. Each new Ascidiozoid in the colony arises as two buds which form respectively its thoracic and abdominal regions. The first of these develops from the region of the parent where the thorax and the abdomen join, while the second is formed a little farther back, on the abdomen. The two buds eventually join to form the body of the new Ascidiozoid. This method of budding was termed pyloric by Giard.¹ It has since been more fully investigated by Della Valle.² Embryonic budding, or blastogenesis, is not seen so

¹ Recherches sur les Synascidies, *Archives de Zool. expér.*, &c., t. i. p. 576, 1872.

² Nuove Contribuzioni, &c., p. 48, 1881.