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4. A new species of Semper's larva from the Galapagos Islands.

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(With 1 [4] Figs.)

eingeg. 1. März 1906.

In 1867 Semper[1] described a peculiar type of pelagic larva captured in tropical waters by Prof. Behn in Kiel and subsequently by Semper himself in the neighborhood of the Cape of Good Hope, the Mozambique Channel and off the coast of Java. Upwards of a quarter of a century later van Beneden[2] described a second species taken in the Altantic close to the Cape Verde Islands. Recently this same author[3] has proposed the generic name *Zoanthella* to include these organisms commonly known as Semper's larvae, designating the one described by Semper *Z. semperi* and the other *Z. henseni*. The characters of the genus are thus described (free translation): »Pelagic larvae attaining a length of 13 mm. Body elongated, provided in one species with a flagellate plate and in the other with a vibratile fringe, extending in both parallel to the axis of the body along the anterior median line. Twelve septa, of which six are macrosepta and six microsepta, disposed as in the Zoanthariae (microtype of Erdmann). Aboral pore present or absent.«

Recently another species of this proposed genus, which I have called *Zoanthella galapagoensis*, came to light in a vial of pelagic copepods taken by Messrs. Snodgrass and Heller in the neighborhood of the Galapagos Ids. There was but a single specimen, 6 mm in length, and where an external delicate coat, apparently a mucous secretion had been removed, the epithelium appeared light chocolate brown in color obscurely flecked with small, lighter almost grayish patches. It is possible however that this effect may be the result of age or some reagent.

The body is spindle shaped with the mouth at the extremity of the more slender half. In common with other members of the genus no sign of tentacles exists; and a heavy ciliated fringe extends from the mouth along the anterior median line to a point about 1,75 mm from the aboral pole. As Semper clearly shows in *Z. semperi* this band pursues a slightly spiral course, scarcely evident in fact with the present species. The anterior surface is distinctly flattened and in the neighborhood of the mouth is slightly grooved, the cilia springing from the bottom of the

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[1] Über einige tropische Larvenformen. Zeischr. f. wiss. Zool. Bd. XVII. S. 407—420.

[2] Les Anthozaires pélagiques recueillis par le professeur Hensen, dans son expédition du Plankton- I. Une larve voisine de la larva de Semper. Bull. de l'Acad. roy. de Belg. 3. Ser. T. 3. p. 55—99. Same article in Arch. de Biol. T. 10. p. 485—521.

[3] Les Anthozaires de la »Plankton-Expedition«. Res. de la Plankton-Exp. d. Humboldt-Stiftung. Vol. II. 1898.

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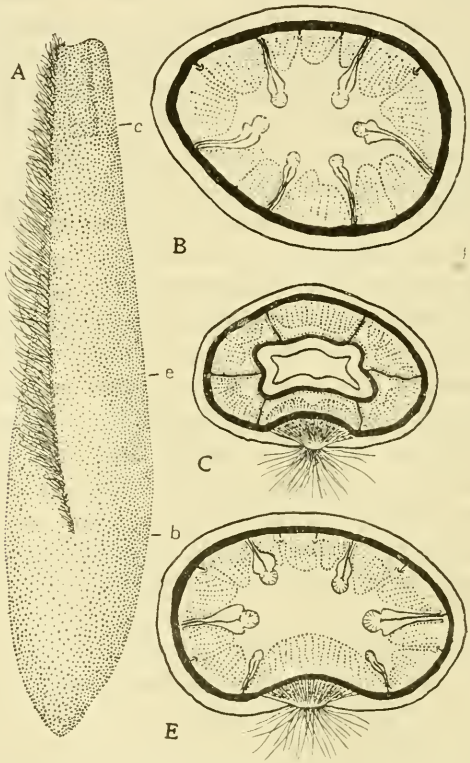
depression. There is no trace whatever of an aboral pore such as Semper describes and were it not for the fact that he carefully studied living material such a structure might justly be considered an artefact.

The ectoderm throughout is in contact with the mesogloea and is of nearly uniform character and thickness with the exception of the ciliated plate. This last named structure, as the figures show, is a modified portion of the outer layer along the ventral surface and consists of innumerable exceedingly slender cells with a height in a fully developed



Zoanthella galapagoensis. *A*, entire animal; *a*, *b*, *c*, regions where correspondingly lettered sections were taken.

condition at least twice that of the ordinary ectoderm. At its posterior extremity the plate arises as a small aggregation of cells forming in sections two groups, one on each side of the mid line but internally separating, thus forming a distinct cleft into which the mesogloea penetrates. This condition soon ceases anteriorly where the locomotor cells rapidly increase in numbers and form a layer continuous across the mid line, a state of affairs persisting to the oral opening. From the figures

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it will be seen that the exposed, cilia bearing portion is of much smaller extent than the side in contact with the mesogloea and is therefore specifically different from *Z. henseni* where the ciliated cells in cross section form a very broad, almost rectangular plate.

As van Beneden states for *Z. henseni* each cell is exceedingly slender with the usually elliptical, deeply staining, compact nucleus placed at a varying distance from the basal end. The distal fourth of the cell is finely granular, almost homogeneous, and is bounded externally by a delicate perfectly distinct cuticular border (Cuticularsaum) surmounted by a tremendous cilium. In *Z. semperi* the cilia are fused into a vibratile plate which persists even in preserved material. With *Z. galapagoensis*, whatever may have been the case in life, there is no sign in preserved material of a fusion to form an undulating membrane and the same appears to be true of *Z. henseni*. This last named species is also peculiar in having the ciliated plate formed "d'une seule et même espèce de cellules" while in the present species members of pigment cells are present in the deeper portions and often extend their delicate processes for varying distances toward the outer surface of the body.

The general ectoderm consists of (*a*) the usual slender elements together with occasional more spindle shaped bodies having much the appearance of sensory cells, (*b*) gland cells, (*c*) nematocysts and (*d*) pigment cells. The last named occupy the deeper portions of the layer and are apparently stellate in form, the slender processes often extending in various directions for considerable distances. The nematocysts, as van Beneden has noted in *Z. henseni*, are of two distinct types, one relativly small and slender and very abundant form with one end level with the surface of the body; and another rarer, larger and of more elliptical shape similarly located or irregularly placed in the vicinity of the mesogloea where they undergo all but the last stages of their development. The gland cells appear to belong to one class. Rarely one meets with comparativly large cells filled with a homogeneous darkly staining secretion, but in some cases, at least, they appear to be degenerate nematocysts, or compound structures due to the union of typical glandular elements. These latter are usually very slender and vase-like, often spindle shaped, with an intensely staining secretion in the distal half, while the nucleus holds a position between this and the delicate stem.

As in other species belonging to the genus there are no tentacles about the mouth, but owing to the presence of numerous particles of organic debris entangled among the cilia it is possible that the ciliated plate, in addition to acting as a locomotor organ, may also serve to drive microscopic organisms or organic particles into the mouth. On the other

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hand it is suggestive that the nematocysts become more numerous about the mouth. There is no trace of siphonoglyphes.

The pharynx extends inward for a distance equal to one seventh the length of the body, and its walls throughout are developed into prominent folds, which in a general way correspond to the septa and so are disposed symmetrically. In the neighborhood of the mouth the pharyngeal cavity presents an irregular quadrilateral form, but more inwardly and especially near its junction with the gastrovascular cavity it assumes more the appearance of a transverse slit. While its walls are of varying thickness, especially in the lateral folds the cells are of essentially the same character. The more abundant are comparativly long and slender with the nucleus holding a position about the middle of the cell, whose basal half is much vacuolated. These cells bear a moderately heavy coat of cilia. But slightly less numerous are gland cells, of a very slender vase shape, the glandular secretion staining activly with haematoxylin. Gland cells belonging to another distinct class and more infrequent, especially in the neighborhood of the oral opening, also occur in the pharyngeal lining. They are of a more decided vase shape and the secretion is coursely granular, and in color closely resembles the pigment of the ectoderm. Finally nematocysts, of about the same size and shape as the larger type occurring in the ectoderm, are present in the deeper portions of the pharyngeal epithelium. They are relativly infrequent, not more than one or two appearing in the same section.

The mesogloea is relativly thick, almost totally unaffected by Delafields haematoxylin and appears to be homogeneous or slightly fibrous under high magnification. In *Z. henseni*, acccording to van Beneden it contains numbers of cells of two distinct classes, but in *Z. galapagoensis* all are of essentially the same character. Here and there are elements somewhat larger than usual but it is probable that they are the result of the contraction of the ordinary cells, which are usually spindle shaped, rarely stellate and at many points extend across the mesogloea. Cells of this same general shape are also closely applied to the ectoderm or endoderm where they may form a fairly distinct though probably temporary layer.

The coelenteron, septa and endoderm have been accurately described in the case of *Z. henseni*, and the description answers so closely for the present species that a detailed account is unnecessary. In both species twelve septa are present, six macrosepta and six microsepta alternating with each other, and arranged symmetrically with reference to the dorso-ventral plane. The macrosepta alone unite with the pharynx and extend nearly to the aboral pole of the animal. The free border of each terminates in a mesenterial filiment, which at this stage shows no ten-

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dency to form convolutions, but is peculiar in being attached basally to a pyriform enlargement absent in *Z. henseni* judging from van Beneden's figures. The appearance suggests the trefoil development into the cnido-glandular tract (Nesseldrüsenstreif), and ciliated tracts (Flimmerstreifen) of adult Zoantharian zooids, but these divisions although more sharply defined about the middle of the coelenteron are present from the neighborhood of the pharynx to the aboral pole.

The cells composing the terminal rounded section of the macrosepta are, as in *Z. henseni*, slender, frequently vacuolated, but usually stain activly. Nematocysts, often of comparativly large size, occur in this same region. The pyriform portion is composed of cells essentially the same as those of the intraseptal endoderm save that they are not so high. The basal section consists of low, cubical or rectangular cells like those covering the microsepta. These last named structures are all small, and extend from a point near the aboral pole to the inner end of the pharynx. Judging from their size, both species of septa arise in precisely the order assumed by van Beneden for *Z. henseni*.

Concerning the relationships of these organisms I have nothing to offer. The specimens thus far secured are far from a fully developed, sexually mature condition and are adapted for a pelagic existence, and furthermore the transformations necessary for the assumption of the adult form are totally unknown. In view of the peculiar character of the ciliated plate and the presence of an aboral pore *Z. semperi* differs widely from *Z. henseni* and the present species, and it may well be that the adult forms are widely separated systematically.

5. Note on the Supposed Type Specimen of Peripatus leuckarti Saenger, and on the Nomenclature of the Australian Onychophora.

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eingeg. 2. März 1906.

In my memoir on the Oviparous Species of *Onychophora*, published in the Quarterly Journal of Microscopical Science[1], I pointed out the necessity for a re-examination of the original type of *Peripatus leuckarti* Saenger, in order to finally settle the vexed question of the nomenclature of the various Australian species of the group. Within a few months of the publication of this memoir I was able, thanks to the kindness of the Curator of the zoological Museum at Leipzig, which I visited in 1902, to make the following notes on a specimen which there is little doubt is the identical one described by Saenger and formerly in the

[1] February 1902.

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