Zoology Part LXXVII: Report on the SIPHONOPHORÆ. By Professor Ernst Haeckel. Bound in Volume 28,1888.

or subglobular (in the Porpalidæ), sometimes more flatly expanded or discoidal (in the Porpitellidæ). Its vertical main axis is in the first case little shorter or nearly as long as the horizontal or equatorial axis; whereas in the second case it is much shorter, only one-half or one-third as long, or even less. The free prominent margin, or the glandiferous *limbus umbrellæ*, marks the boundary between the exumbrella (upper or pneumatophorous half) and the subumbrella (lower or siphonophorous half).

Exumbrella.—The upper, apical or proximal, part of the discoidal trunk, which corresponds to the exumbrella of the Medusæ, and physiologically represents the nectosome, is in all Porpitidæ circular and composed of the pneumatocyst, filled with gas, and the surrounding pneumatophore. This latter is composed of two parallel membranes, separated by a network of anastomosing radial canals—the outer thicker membrane armed with thread-cells and pierced by the stigmata, is the pneumatocodon; the inner thinner membrane, immediately including the pneumatocyst, is the pneumatosaccus or the invaginated exoderm. Both membranes are connected by numerous branched radial septa, and the cavities between these, radiating from the centre of the disc, are the radial canals of the exumbrella (pallial vessels); they open at the margin of the disc into the large circular canal of the limb.

The surface of the exumbrella is in many Porpitidæ smooth, in others more or less papillate, owing to conical protuberances of the pneumatocyst. Often an elegant multiradiate pigment-star is visible, produced by a dark pigment in the wall of the pallial vessels. The central part of the exumbrella in all Porpitidæ is pierced by a central stigma, and a surrounding corona of eight stigmata placed in the walls of the eight surrounding radial chambers. The other stigmata of the exumbrella, in larger species several hundreds, in smaller only few, are sometimes disposed in regular radial rows, at other times more irregularly scattered.

Pneumatocyst.—The chitinous polythalamous float filled with gas, which is called pneumatocyst (formerly "inner shell"), is in the Porpitidæ always regularly circular, corresponding to the surrounding pneumatosaccus (or the invaginated exumbrella) from which it is secreted. Consequently its general form in the subfamily Porpalidæ is highly vaulted, campanulate or cap-shaped (*Porpalia*, *Porpema*, Pls. XLVII., XLVIII.), whereas in the flatly expanded Porpitellidæ it is discoidal, even or slightly vaulted (*Porpitella* and *Porpita*, Pls. XLV. and XLVI.). The pneumatocyst is always composed of two little distant and nearly parallel lamellæ of structureless chitin, which are connected by numerous concentric annular septa. The latter divide the float into numerous concentric ring-chambers, and these open on the upper or proximal face by stigmata, on the lower or distal face by tracheæ.

The *central disc of the pneumatocyst* has in the Porpitidæ the same structure as in the Discalidæ; it is composed of a spherical or subglobular central chamber (with a central stigma above) and of eight equal triangular radial chambers, each of which bears

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