

XXX. *On the Anatomical Characters of an Australian species of Perophora.* By JOHN DENIS MACDONALD, F.R.S., Assistant-Surgeon of H.M.S. 'Herald,' commanded by Captain H. M. DENHAM, R.N., F.R.S. Communicated by GEORGE BUSK, Esq., F.R.S., F.L.S.

Read February 17th, 1859.

DURING our stay at King George's Sound, the dredge obtained several specimens of a very interesting compound Tunicary, belonging to the "social" division so called, and which I believe to be a new species of the genus *Perophora*. The points in which it differs from the known species appear to me to be too trifling to warrant the fabrication of a new genus for its reception. I shall therefore name it *Perophora Hutchisoni*, after its first discoverer, Lieut. John Hutchison, R.N.

The zooids are about one-fifth of an inch in length, pyriform in shape, and supported on alternate tubular foot-stalks of a corneous texture, with one or more transverse articulations. These pedicels are continuous at their base with a tubular axis, from which they appear to be derived by simple extension of its walls without articulation.

The principal trunk in the specimen before me is firmly fixed upon a sprig of *Amphibolis antarctica*, over which its rather irregularly-divided branches extend themselves, occasionally drooping freely, like the tender sprays of a climbing plant.

No articulations are anywhere to be found except in the pedicels of the zooids, whose test commences at a definite line, where the corneous tissue of the pedicels terminates.

The test is finely coated over with a minute siliceous grit interspersed with Foraminifera and calcareous atoms.

When all these adhering particles are removed by cautious immersion in dilute nitric acid, which destroys all the carbonate of lime and loosens the attachment of the siliceous elements, their impressions are left on the surface of the test, and here and there on that of the axis, which thence presents a deeply pitted appearance.

The internal surface of the tubular axis is lined throughout with a very distinct epithelial membrane, obviously connected with its nutrition; and in the little buds, which spring, botanically speaking, in the indefinite mode, from the growing branches, the cæcal dilatation of the rudimentary test is lined with an extension of the same membrane. This lining, however, is not to be confounded with the true pallio-vascular system which is contained within it, and consists of a simple branched tube exactly corresponding with the trunks and ramifications of the corneous axis, while the coats of the tubules which enter the pedicels of the zooids are continuous with the mantle. Thence results a sort of "cænosarc," exhibiting a remarkable analogy to that of the *Sertularians*, an analogy which is still further sustained by the nature of the sclerous axis just described. This, however, may be regarded as perfectly homologous with the repent tubes and free pedicels of *Laguncula*, *Pedicellina*, and other Polyzoa.

The branchial and cloacal openings present little or no external prominence, and are

still further concealed by the gritty coating. The former is situated on the upper surface near the free extremity, holding a subterminal position, so that in the mutual relationship of these openings, *Perophora*, and indeed also other pedunculate forms, may be said to exhibit an approach to *Boltenia*.

The surface of the mantle is beautifully marked with yellow branched and reticulated lines, similar, no doubt, to those which have been noticed in *Clavelina*, indicating the distribution of vessels.

The endostyle occupies a portion of the dorsal surface extending from near the branchial opening to the inner extremity of the sac, where it presents a slight curvature towards the oral orifice.

The transverse bars of the respiratory network are about five in number, and join the endostyle in a direction nearly parallel with a line drawn through the branchial and cloacal openings, while the much smaller and more numerous longitudinal nervures lie parallel with the endostyle. The beautiful network so formed is invested with a stout epithelium, and its meshes are fringed with vibratile cilia.

The mouth is situated at the anterior and inferior part of the respiratory cavity, and opens into a short cylindrical oesophagus which passes downwards and backwards to join a comparatively small and subglobular stomach. The intestine arises from the dorsal surface of the latter organ, and after having performed a graceful flexure by turning forwards and outwards, terminates in a very ample atrium or open space between the exterior of the branchial network and the muscular coat. The lining of this space is very obviously continuous through the branchial slits with that of the respiratory chamber.

The generative organs, as in most compound Tunicata, are included within the intestinal loop, and, on account of the close proximity of the cloaca, the ducts are necessarily very short.

Two distinct canals, alternately interchanging the office of artery and vein, are circumstantially described as occupying the pedicels of the British species of *Perophora*, but I cannot say that I have found such to be the case in the Australian one. There is, however, much difficulty in determining the question, on account of the obstacles which the superficial gritty particles and the pigmentary matter of the mantle and tubules oppose to the observation of the vital phenomena of the animals. I think I may safely affirm that no such arrangement is traceable in *Didemnum*, *Botryllus*, and numerous other Tunicata, both simple and compound, that might be adduced; and if it be actually present in the British *Perophora*, I cannot help regarding the fact as something quite exceptional in the group.

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