

XII.—*On the Nutritive and Excretory Processes of Porifera.*

By ARTHUR T. MASTERMAN, B.A., Assistant-Professor of Natural History, University of St. Andrews.

SINCE the publication in the June number of this Magazine of my short paper upon the above I have, through the courtesy of Mr. G. Bidder, of the Naples Zoological Station, been put in possession of a paper of his upon the same subject (Proc. Roy. Soc. vol. li.). Before arriving at my own results I had inadvertently overlooked this important work; and my conclusions in several points bear out those stated by him.

Firstly, he finds that "In *Heterocœla* the collars of the collar-cells are at first mere fringes, which help to retain the food and filter the water as it passes from the base of the cell to the moving tip of the flagellum. When the cell is satiated the flagellum ceases to move and degenerates; the collar unites with the neighbouring collars to prevent the water that is already filtered and already foul from returning past the inactive area to pollute the afferent water-supply. When the food has been digested the cells elongate and become closely pressed together; the separation of their basal parts takes place in the manner already described ('In *Leucandra aspera* and *Sycon raphanus* the collar-cell, after it has accumulated a certain quantity of spherules in its base, splits off this base by a transverse fission as a non-nucleated mass of protoplasm, which we may term a "plinth"—p. 477), and the distal parts start on a new cycle with hungry protoplasm, active flagella, and separated collars."

This conclusion only differs from that at which I arrived in the fact that I have reason to believe that in the case I examined the *whole* collar-cell degenerates to the amœboid condition. The process here described by Bidder is obviously a stage in the differentiation of the endoderm cells into locomotory permanently collared cells, and permanently amœboid (so-called "mesodermic") digestive cells which I suggested as being probable in the higher sponges (p. 495), just as the separation of any organ performing any two main functions into two distinct organs, each performing one of these functions, will be preceded by steps in which the primary organ will be divided into two parts more or less distinct, each performing mainly one function, the separation of the two functions taking place by degrees in time and space (*cf.* urogenital organs and differentiation of sexes).

The above author also describes and figures "Metschnikoff

cells," which result from the amoeboid degeneration of the collared cells. These he traces to the ectoderm, and he suggests that they are excretory in function.

Secondly, he finds that the ectodermal gland-cells (for which he claims a general occurrence in sponges) are excretory in function, and conduct a process of intracellular excretion. I can find, however, no evidence in his paper of the occurrence of diapedic nephrocytes, which are so clear a feature in the form I studied, unless, indeed, his Metschnikoff cells be shown later to leave the colony through the ectoderm.

The course of the metabolic circuit through the tissues, including the identification of the endodermal choanocytes and the so-called "mesoderm," both morphologically and physiologically, and the part played by each in ingestion and digestion, are all points in which Mr. Bidder's conclusions, arrived at independently and prior to my own, agree with the latter, and confirm the doubts which I expressed with regard to Lendenfeld's deductions.

The importance of the collar-cell metamorphosis from a phylogenetic point of view may be expressed in the statement that further proof than at present exists must be forthcoming before the presence of a true mesoderm or middle germinal layer in the sponges can be accepted as an established fact.

XIII.—*A Visit to Damma Island, East Indian Archipelago.*

By JAMES WALKER.—*With Notes on the Fauna*, by R. B. SHARPE, G. A. BOULENGER, E. A. SMITH, R. I. POCKOCK, C. O. WATERHOUSE, C. G. GAHAN, W. F. KIRBY, and F. A. HERON.

THE volcanic island of Damma, one of the northernmost outliers of the Serwatty Group, is situated almost exactly halfway between the large islands of Timor and Timor-Laut, and about 350 miles from the nearest point of the coast of Australia. It is less than ten miles in length by about five miles wide, and thus ranks among the smaller members of the great Eastern Archipelago, while it is certainly one of the most remote and least known of them all. Though the island has been for some time in the possession of the Dutch, nothing was known of its natural history previous to the visit of H.M. surveying-ship 'Penguin,' so far as I can ascertain, except that a Dutch collector had landed there for a short time and had procured a few birds. It was the cause of no little satisfaction, both to myself and to my energetic fellow-worker, Dr. P. W. Bassett-Smith, that orders were received



Masterman, Arthur T. 1894. "XII.—On the nutritive and excretory processes of Porifera." *The Annals and magazine of natural history; zoology, botany, and geology* 14, 48–49. <https://doi.org/10.1080/00222939408677766>.

View This Item Online: <https://www.biodiversitylibrary.org/item/78508>

DOI: <https://doi.org/10.1080/00222939408677766>

Permalink: <https://www.biodiversitylibrary.org/partpdf/62208>

Holding Institution

University of Toronto - Gerstein Science Information Centre

Sponsored by

University of Toronto

Copyright & Reuse

Copyright Status: NOT_IN_COPYRIGHT

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.