

**AUSTRALIAN MUSEUM.  
CATALOGUE OF  
THE AUSTRALIAN  
HYDROID ZOOPHYTES**

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**W. M. BALE**

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*Hydrozoa, for the ...*

*Baird*

AUSTRALIAN MUSEUM.

V. 2548

CATALOGUE

OF THE

AUSTRALIAN HYDROID ZOOPHYTES,

By W. M. BALE.

PRINTED BY ORDER OF THE TRUSTEES,  
E. P. RAMSAY, F.L.S., CURATOR.

*C.*  
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1884.

## PREFACE.

LIKE the "Catalogue of the Crustacea," the "Catalogue of the Hydroid Zoophytes" is issued by the Trustees with a view not only to affording a guide to the collections of the Museum, but also to providing students of natural history in Australia with a compact account of all that has been done hitherto in the description and illustration of the Australian representatives of this group. Prefixed to the systematic portion of the Catalogue is a general Introduction on the morphology of the Hydroida. The Catalogue itself contains also a large amount of new matter, which, with the numerous plates, illustrating a large proportion of the species, will, it is believed, render it a work of permanent value.

The letters A.M., after the description of a species, indicate that it is represented in the collection of the Australian Museum.

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## INTRODUCTION:

THOUGH it would be impracticable, within the limits of the present work, to give a complete account of the organization of the Hydroid Zoophytes, a brief sketch of the more important features of their structure and life-history can scarcely fail to be of interest, at least to those students who have but limited opportunities of access to the fuller literature of the subject, and is indeed essential to a proper comprehension of the terminology.\*

For the substance of the *résumé* here presented I am mainly indebted to Mr. Hincks' History of the British Hydroid Zoophytes, with some aid from other European authors; for of the anatomy and development of the Australian Hydroïda next to nothing has been recorded, the species in almost every case being known solely from their chitinous exo-skeletons. As regards the Calyptoblastea—the sub-order in which these structures attain their highest development, and to which nearly all the known Australian species belong—this is not of great relative importance, as the animals are formed on the same general plan throughout the group; but in the other principal section—the Gymnoblastea—there exists very great diversity of form and armature; it is therefore the more to be regretted that so little is known of the Australian representatives of this sub-order.†

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\* The terminology used in describing the Hydroïda is rather complicated, the more so that our two principal English authorities—Professor Allman and the Rev. Thos. Hincks—have adopted different designations for many portions of the Hydroid structure. I have not thought it necessary to give a table of the terms in use, as they are explained in the text and can readily be found by reference to the index.

† I can find no account hitherto of any Australian Gymnoblastea, except three or four polyparies, the animals of which are unknown.



The type of the order Hydroids is the *Hydra*, a little animal common enough in pools which contain water for the whole or the greater part of the year. If some of the weeds be collected from such pools and placed with water in a glass vessel, the *Hydra*, when present, may be found after the lapse of an hour or two clinging to the glass or the weeds. The body is light brownish, cylindrical and very slender when fully extended, but often changing to a globular or any intermediate form. Its greatest length may be about half an inch, but is usually rather less. The upper or distal extremity, in which is situated the mouth, is surrounded by a circle of slender thread-like arms or tentacles; and the basal or proximal portion forms an adhesive disc, by which the *Hydra* attaches itself to weeds or other substances, and by the aid of which it can move slowly from place to place, exactly as a sea-anemone glides along the glass wall of an aquarium.\* Indeed, except in the relatively longer body and fewness of the tentacles, the *Hydra* is externally a miniature sea-anemone, and comports itself in the same fashion, seizing with its tentacles and devouring any small animal that may come in contact with it. The body of the *Hydra*, which, like the tentacles, is exceedingly extensible and contractile, is occupied by a cavity which extends from the base to the apex, and is without internal organs of any kind; being, in fact, a simple digestive tube, or food-sac, with a single aperture—the mouth—by which the food is received and the undigested residue expelled.† The body-wall is composed of two layers, which also extend throughout the tentacles; of these the outer is known as the *ectoderm*, and the inner as the *endoderm*. "Each consists of numerous nuclear bodies, or 'endoplasts,' embedded in a granular 'intercellular substance' or 'periplast'; and each may be rendered

\* In its locomotive habit the *Hydra* stands alone among the animals of which it is in most respects the type.

† The absence of a distinct alimentary canal, divided off from the general cavity of the body, distinguishes the sub-kingdom Coelenterata, to which the Hydrozoa belong, from all the higher groups; while in the one lower sub-kingdom—the Protozoa—there is no permanent body-cavity at all, and the food mixes freely with the soft protoplasmic material which occupies the interior.

more or less complex by vacuolation or fibrillation." Between these two layers the reproductive elements are developed, the male organs consisting of small conical receptacles, situated somewhat below the tentacles, while the globular ova are produced lower down on the body in a simple sac, and are ultimately set free by the rupture of the ectoderm.

The body of the *Hydra* possesses a wonderful reparative power, which enables it to recover without difficulty from the effects of injuries. Thus if it be cut open for its entire length, it will under favourable conditions speedily unite again, while the division of the body into several distinct portions merely results in the development of a complete *Hydra* from each fragment. These and many other experiments of a similar nature, which were first made by Abraham Trembley, and described in his celebrated work on the *Hydra*,\* have often been repeated with the same results; not so, however, another and still more remarkable experiment, in which, he says, he succeeded, namely, turning the animal inside out, and keeping it alive in this condition, the external and internal surfaces of the body changing their functions as well as their position. Trembley's statement has been unhesitatingly accepted by later authors, but does not appear to have ever been confirmed; and Professor Engelmann, who has repeated the experiment in a great number of cases and under various conditions, has invariably found either that the *Hydra* died, or that the body, when it did not regain its proper position, separated below the tentacles and became disintegrated, a new body being sometimes budded off from the remaining distal portion.†

The most common mode of increase in *Hydra*, as in all the members of the order, is by gemmation. The young *Hydra* first appears as a slight protuberance on the body of the parent; it increases rapidly in size, often showing the rudiments of the tentacles on the second day, and on the third or fourth day it is

\* Mémoires pour servir à l'histoire d'un genre de Polypes d'eau douce, à bras en forme de cornes. Leyden, 1744.

† Zoologischer Anzeiger, Vol. I. Bösel had also failed in this experiment.

sufficiently developed to seize and devour its prey, though it usually remains attached to the parent for a few days longer. Sometimes the vegetative activity is so great that a third, and even a fourth generation may be developed before the separation of the first bud from the parent stock, forming, for the time being, a composite plant-like structure. Occasionally the *Hydra* multiplies by fission, which may be either transverse or longitudinal.

#### THE HYDROID COMMUNITY.

We have seen that in *Hydra* the process of gemmation sometimes gives rise to a compound structure, consisting of several *Hydræ*, or *polypites*, which ultimately become detached, and enter upon a separate existence, the normal habit of the zoophyte being solitary. This habit is shared by only one or two other genera; throughout the rest of the order the polypites which are produced by gemmation remain organically connected, forming a permanent colony. The whole organism, whether simple, as in *Hydra*, or complex, as in the Hydroida generally, is called the *hydrosoma*, the plant-like structure of the composite forms being also known as the *hydrophyton*. In some instances it consists merely of a few polypites springing from a thread-like fleshy stolon, which is attached to some foreign substance; in other cases it forms an erect, plant-like, ramified structure, varying in height from a fraction of an inch to several feet; and in the larger species bearing many thousands of polypites, all the result of growth and gemmation from a single ovum. The forms assumed by these organisms are varied and beautiful; some resemble miniature trees with their stems, branches, and twigs; others produce graceful pinnate shoots like delicate fernfronds; and in the large family of the Plumulariidae the prevailing form is elegantly plumous or feather-like. In the latter family the polypites are borne in a single series along each of the ultimate ramules,\* in the Sertulariidae each ramule usually bears two series. The hydrosoma consists essentially of the

\* Called by Kirichenpauer "hydrocladia."