SOME BERMUDA OLIGOCHÆTA, WITH A DESCRIPTION OF A NEW SPECIES.

BY J. PERCY MOORE.

During two visits to the Bermuda Islands in the summers of 1898 and 1901, Prof. A. E. Verrill, while devoting most of his attention to marine zoology, was able to gather a collection of Oligochæta which adds materially to our knowledge of the fauna of these islands. The character of the collection and the circumstances under which it was gathered indicate the probable occurrence of additional forms. Of the six species hitherto recorded from the Bermudas in several of Beddard's papers, all but one, and that the very common and widely distributed *Perichæta bermudensis* Bedd. (*Pheretima hawayana* (Rosa) Mich.), are represented in Prof. Verrill's collection. In addition the material includes two species of *Pheretima* not previously known from the Bermudas, a new species of *Enchytræus* and an immature *Helodrilus* having a combination of characters not known in any hitherto described species, but which is not now characterized because of the lack of suitable material.

Enchytræus marinus sp. nov.

The alcoholic specimens measure exactly 10 mm. in length and about .7 mm. in greatest diameter. There are 73 somites in the type specimen and 71 in the other, which is crushed at about the middle into two pieces. The prostomium is broadly rounded. Toward the anterior end the length of the somites is about two-thirds their diameter, while the posterior ones become very short, about one-quarter their diameter. The terminal three or four of the latter taper abruptly to the anus.

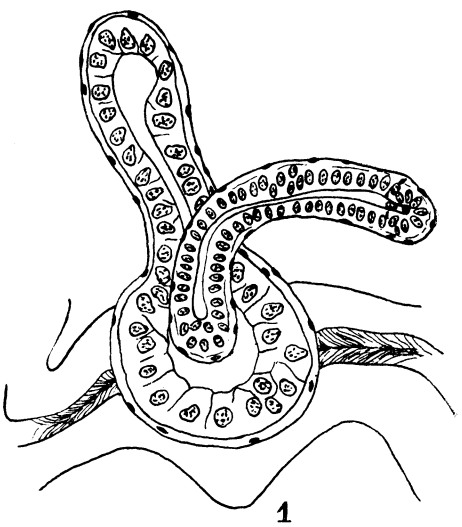
With the exception of somites III and IV, in which there are three, the ventral setæ are two per bundle throughout the entire length of the body; but they are absent entirely from I and XII. From II to X, inclusive, the dorsal bundles contain 3, on all other somites 2 setæ. All setæ are nearly straight externally and strongly hooked within the body wall. They are stout, somewhat thickened at the middle, and taper to the ends. Those composing each bundle are of equal length and thickness. In the

ventral bundles the setæ increase in size to somite IV, where they are about one and one-half times as long as on II, and distinctly larger than the dorsal setæ of the same somite. This relative size of dorsal and ventral setæ continues to at least somite X.

A small cephalic pore exists between the prostomium and peristomium, but other dorsal pores are wanting. The genital pores are, as usual in the family, the male on XII, the female $\frac{XII}{XIII}$, and the latter slightly the more mesiad. The clitellum is undeveloped. No pigment is apparent anywhere and the blood shows no trace of color in the alcoholic specimens. Prof. Verrill's label describes the living worms as "white."

Pepto-nephridia are certainly absent from the example sectioned, and none could be detected in the type specimen when cleared in glycerine. Conspicuous septal glands are developed on $\frac{V}{VI}$, $\frac{VI}{VII}$ and $\frac{VII}{VIII}$, and open in the usual way on the pharyngeal pad. As a result of great development of muscular tissue all of the dissepiments between the last septal gland and the testes somite—that is $\frac{VII}{VIII}$, $\frac{VIII}{IX}$, $\frac{IX}{X}$ and $\frac{X}{XI}$—are much thickened.

The spermathecæ (fig. 1) occupy somite VI, and open to the exterior in the furrow $\frac{V}{VI}$ on a level nearly midway between the dorsal and ventral setæ-bundles. The duct is a simple thick-walled tube having a length about equal to the flask-shaped ampulla, into the bulbous base of which it opens on the latero-dorsal aspect, from which a striking asymetry of the entire organ results. Unicellular glands, which are such a conspicuous feature of the spermathecal duct of *E. albidus*, are altogether absent from the examples here described. The ampulla is regularly flask-shaped, with



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a nearly spherical base and a cylindrical neck slightly dilated at its free dorsal extremity. The two parts are of about equal length, the base being about three times, and the neck one and one-half times the diameter of the duct. The ampulla stands vertically by the side of the œsophagus, above which the neck rises. The bulbous base is in contact with the side of the œsophagus and the contiguous tissues of the two are continuous, but whether an actual communication between the cavities of the two organs exists could not be demonstrated beyond question. A few spermatozoa are present in the cavities of both ampulla and duct of the specimen sectioned. A lateral view of the right spermatheca is shown in fig. 1, which sufficiently exhibits the general cellular constitution of its walls, and its topographical relation to the œsophagus, which is shown in outline.

Although its distortion prevents an accurate measurement, the sperm funnel appears to be only two and one-half times as long as wide; highly glandular. The vas deferens is coiled and reaches to the posterior end of XV before returning to the male pore; it has a total estimated length of from six to eight times the funnel. Its two limbs have an equal diameter, which is about one-tenth to one-twelfth of the body at the same point.

The brain is anteriorly slightly concave, posteriorly nearly straight, with a slight median concavity and feebly prominent postero-lateral lobes.

Some of the characters used to distinguish *E. marinus* from the widely distributed *E. albidus* Henle, 1837 (= *Halodrillus littoralis* Verrill, 1874), are doubtless due to the immaturity of the specimens, but this cannot be true of the absence of the pepto-nephridia, the form of the spermatheca, and the peculiarities of the setæ. I have repeatedly studied *E. albidus* at Wood's Hole (where it abounds) and elsewhere, and have found no connecting variations.

Prof. Verrill writes that the species was common in the upper littoral zone, below the tide mark of ordinary tides, at Coney Island, but was not noticed elsewhere. The collection contains two specimens labeled "No. 940, High-water mark, Bermuda, 1898."

Pontodrilus arenæ Mich.

This species appears to be of common and very general occurrence at and below high-tide mark. In almost all cases the intes-

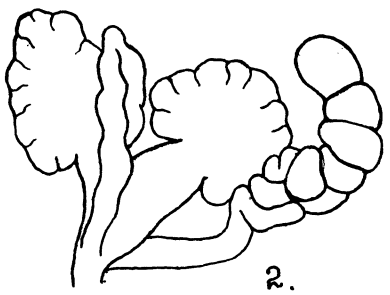
tine is filled with coarse coral and shell sand, the grains of which are frequently upward of .5 mm. in diameter. The ornamentation on the setæ is extremely faint. No. 939, 1898; No. 965, Hungry Bay, April 13, 1901; No. 966, Elbow Bay, March, 1901.

Pheretima schmardæ (Horst) Mich.

Prof. Verrill remarks upon the great activity (so characteristic of the genus) of this and the next species. When captured they writhe like active lizards, as a result of which most of the specimens are broken in two. They occurred under stones only in the neighborhood of a house said to be 250 years old. The intestines were filled with a very fine reddish earth. *P. schmardæ* has not previously been reported from the Bermudas, and in the West Indian region is known only from the Barbadoes. No. 964, Walsingham, May 5, 1901; No. 962, 1901.

Pheretima rodericensis (Grube) Mich.

This widely distributed species, described by Beddard (under the name of *Perichæta dycri*) from Jamaica, Trinidad, etc., is represented in the collection by a single example from the Bermudas, to which islands it is new. A peculiarity of the gizzard of this species appears to have escaped notice. The organ in question occupies somite X and a small part of XI. From near its posterior end on each side a stout tapering band or column of muscle arises and passes obliquely caudad to the body wall at the setæ line of somite XI. These form powerful retractors and dilators of the gizzard, and may be the remains of the septum $\frac{X}{XI}$, as Beddard has suggested in the case of a somewhat similar structure described by him in *P. taprobanæ*, and especially *P. bermudensis*. A delicate membrane runs from the muscles mesiad and dorsad to the dorsal blood vessel and appears to be continuous with the peritoneal sheaths of both of these organs.



The diverticula of the spermatheca show considerable variation. The folded portion becomes successively longer from before backward and at the same

time changes from a spirally coiled condition to a tortuous folding in one plane. An abnormality of the second spermatheca of the left side is shown in fig. 2, as viewed from behind. The ampulla is divided into two portions, each of which has the form, but little more than one-half of the diameter of the normal. Each has a short duct which unites with its fellow into a common one much enlarged at the point of union. One perfectly normal diverticulum springs as usual from the cephalic face of the ampullar duct, but it is diverted to a mesial instead of the usual lateral position. A second much smaller diverticulum arises from the caudal face of the common duct and for about one-third of its blind end is reflected on itself. No. 961, 1901.

Eudrilus euginæ (Kinberg) Mich.

Three large examples. No. 936, 1898.

Onychochæta windlei Bedd.

One small specimen. No. 962, 1901.

Eisenia fœtida (Sav.) Mich.

One specimen of this now cosmopolitan species. No. 938, 1898.

Helodrilus (Allolobophora) chloroticus (Sav.) Mich.

Common. No. 937, 1898; No. 962, 1901; No. 965, Hungry Bay, April 13, 1901, just below high tide. This last record of the label, if correct, is of interest as indicating the occurrence of this species on the littoral zone. Many of the posterior setæ of these specimens are missing, the bundles being reduced in such cases to single seta.

Helodrilus sp.

A very small *Helodrilus*, No. 963, 1901, could not be determined at all; a larger example, No. 961, 1901, while exhibiting characters of an undescribed species, is too immature for satisfactory description.