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39. Fauna of West Australia.—III. A new Nemertean, *Geonemertes dendyi*, sp. n., being the first recorded Land Nemertean from Western Australia. By W. J. DAKIN, D.Sc., F.Z.S., Professor of Biology in the University of W. Australia.

[Received August 5, 1915 : Read November 9, 1915.]

(Text-figure 1.)

INDEX.	
SYSTEMATIC ;	Page
<i>Geonemertes dendyi</i> , sp. n.	567
STRUCTURE	569

Land nemerteans are notoriously rare animals, and it is therefore particularly interesting to record a new species from the Western State of Australia. The record is interesting too, because the other known species in Australia comes from Victoria and New South Wales, about two thousand miles distant from this western locality. The country between can scarcely be called suitable for the distribution of such an organism. The animal was discovered by the author, whilst searching for *Peripatus*, in a valley in the Darling Range not far from Perth. Land nemerteans are cryptozoic in habit and occur in the same situations as *Peripatus* and land planarians, yet no specimens have previously been discovered in West Australia, although many scientists have made collections of these latter Cryptozoa. I, myself, have looked for *Peripatus* and land planarians in the Darling Ranges, and other parts of West Australia, on very many occasions without ever meeting with a specimen of *Geonemertes*. This first record does not indicate any greater abundance, for only one isolated individual—a mature female—was found. It is probable, however, that in the keen search for *Peripatus* (when the attention is concentrated on distinguishing this animal from its background) specimens of the nemertean have been passed over as land planarians. Such, in fact, would have been the case this time, if the animal had not protruded a long proboscis on being disturbed.

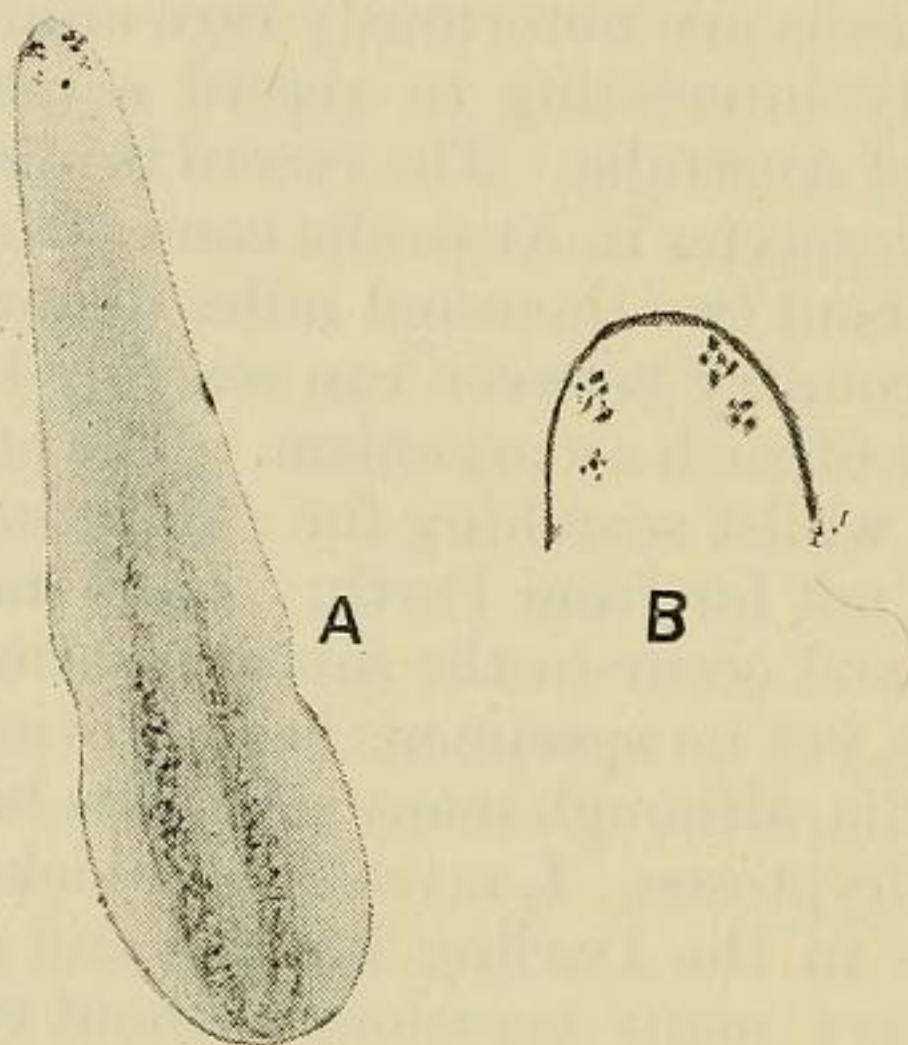
The example belongs to the genus *Geonemertes*, and I have much pleasure in naming the species after Professor Dendy, who was not only the first to discover land nemerteans in Australia and New Zealand, but who elucidated many points in the anatomy of the genus. The previously recorded species from Australia and New Zealand are *Geonemertes australiensis* Dendy, occurring in Victoria, New South Wales, and Tasmania; and *Geonemertes novæ-zealandiæ* Dendy, a very rare species occurring in South Island, New Zealand. The new form *G. dendyi* is more like *G. australiensis* than the New Zealand species.

Habitat.—The specimen was found under a small log in a rather damp situation, about two yards from a small stream, in

one of the valleys near Armadale. Under the same log were two specimens of *Peripatus gilesii*, a slug, and some of the usual small cryptozoic arthropoda. *Scutigera* was also common in the neighbourhood.

External characters.—*Geonemertes dendyi* is apparently much smaller than the East Australian species, for its total length when living and uncontracted was only 15 mm. (proboscis retracted). The greatest breadth occurred at a point about one third of the length from the posterior end. Just in front of this was a slight constriction, as if the animal had been nipped. It is probable that this feature is only some temporary or individual character of the specimen captured, but as no others are to hand for purposes of comparison, it is worth mentioning.

Text-figure 1.



Geonemertes dendyi.

A. Dorsal view. B. Anterior end considerably enlarged.

The colour of the living animal is brown-pink, but the shade is not uniform over the entire surface. The lateral parts of the body are more of a light flesh-colour and signs of the large ova were visible, showing through the skin. The under surface is pale. On the dorsal surface, and most prominent on the posterior third of the animal, are two dark stripes of chocolate-brown. They are not sharply defined, and the dissecting-microscope indicated that they are collections of little brown spots. There is just a faint indication of the continuance of the stripes forward over the anterior part of the dorsal surface.

Close to the anterior end of the body, and on the dorsal surface, are the eye-spots. According to Dendy, *Geonemertes australiensis* differs from other known species of *Geonemertes* in the possession of a large number of eyes. The New Zealand species has only four eyes, and four or six are the usual numbers. In Dendy's specimens from the eastern states the eyes numbered as many as thirty or forty, and they were arranged in two groups. It is

interesting to note that the author describes each group (containing about 20 eyes of various sizes) as sometimes showing indications of a division into an anterior and a posterior group, and he says that "it suggests that the numerous eyes of *G. australiensis* may have been derived by subdivision of four eyes, two large anterior and two small posterior, such as we find in *G. chalicophora*."

In *Geonemertes dendyi* there are four quite distinct groups of eyes—two anterior groups of large eyes, and two posterior groups of smaller eye-spots. There are five or six spots in each of the anterior groups and three in each of the posterior, making a total of sixteen.

ANATOMY.

The anatomy of the animal as made out from serial sections does not differ in any points of importance from that of *G. australiensis*. Unfortunately, the animal was fixed in an acid fixative and consequently it is impossible to see anything of the calcareous stylets.

The epidermis and basement-membrane are both of the usual type. There are no rod-like bodies, and calcareous bodies like those described by Dendy in *G. australiensis* are not to be seen. This, however, is no proof of their absence, for Dendy was never able to find them in his sections although no acid fixative was employed.

Within the basement-membrane are two layers of muscle-fibres, but judging from the figures the thickness of the layers is not so great as in *G. australiensis*. The outer sheath is of circular fibres, the inner of longitudinal muscle-fibres. If a layer of diagonally disposed muscle-fibres exists between these two sheaths, it is not evident in the transverse sections. The muscular diaphragm, described by Dendy as a development in the cephalic region, is well seen in the present species.

The alimentary canal exhibits no new points. In the specimen sectioned the lumen of the canal is almost obliterated by masses of protoplasm such as have been described by von Graff as occurring under certain conditions in *G. chalicophora*. The mouth opens into the rhynchodæum as in *G. australiensis* and the New Zealand species. The position of the opening is in front of the cerebral ganglia.

The Lateral Organs.—Two distinct cephalic or ciliated pits are to be found on the ventral surface near the anterior end of the body. The ducts pass almost vertically upwards toward the cerebral ganglia and then turn rather abruptly and run toward the sides of the body. Cilia can be traced in these ducts for a considerable distance—they are to be seen where the ducts are quite close to the ganglia. There is little to add further in connection with these, except that the ducts come into rather intimate connection with a curious mass of tissue lying ventrally and slightly posteriorly to the ventral lobes of the brain. This is probably what Dendy calls the "œsophageal organ." The tissue

is most certainly non-nervous. It stains an intense blue with hæmatoxylin and has all the characters of glandular tissue.

Cephalic Gland.—One of the most curious differences between *G. dendyi* and *G. australiensis* is the apparent lack of a well-developed cephalic gland. I must confess that I cannot recognise any structures in my sections which seem to fit in with the description given by Dendy. The sections were stained with hæmatoxylin, and glandular structures are well brought out. The dorsal glands are well developed, and agree in position with those described as occurring in *G. australiensis*, but there are no other distinctly "large, irregular, glandular masses, closely packed together—staining deeply with hæmatoxylin" overlying the dorsal lobes of the cephalic ganglia. The only well-developed glandular structures in this position are the anterior glandular masses of the dorsal glands.

Reproductive Organs.—The single specimen so far known is a mature female, and there is no trace whatever of male organs. The sexes are also separate in *G. australiensis*. In the classification offered in Benham's treatise (Treatise on Zoology, Ed. by E. R. Lankester, Part iv.) the genus *Geonemertes* is placed in the family Prosorhocmidæ: "With four eyes, cerebral organs are rudimentary. Cephalic gland large. Mouth and rhynchocœl coincident. Usually hermaphrodite." If *G. dendyi* is considered as one member of this family, the diagnosis of the latter requires to be made a little more general.

In *G. dendyi* the ova are found throughout almost the entire length of the body—the most anterior ones occurring just posterior to the brain-masses. They are present in different stages of growth, but most of them are very large and apparently mature. Curiously enough, I cannot detect the genital ducts which are figured so distinctly by Dendy. In one or two places there are signs that might be interpreted as remains of these ducts. If one did not know, however, that such structures *did* exist in the genus, they would never be suspected from my sections.

SUMMARY

The characteristic features of *Geonemertes dendyi*, sp. n., are as follows. The length of the mature female is about 15 mm. when crawling. The colour is brown-pink, with two dorsal and somewhat posterior darker longitudinal bands of chocolate-brown. The eyes are arranged in four groups—two anterior, each of five or six larger spots, and two posterior groups, each of three smaller eyes, making about sixteen or seventeen altogether. Lateral organs are well developed, opening by characteristic ciliated cephalic pits on the ventral surface at the anterior end. The mouth opens into the rhynchodæum. The sexes are distinct. Cephalic gland apparently not well developed. Other structures agreeing well with the description of similar parts in *G. australiensis*. The specimen was found under a small log, together with *Peripatus gilesii*, in the Darling Hills, Western Australia, not far from Perth.

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[Begin Page: Page 567]

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568 • PROF. W. J. DAKIN ON

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570 ON A KEW NEMERTEAX.

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