

female undergoes considerable changes in becoming oviferous: the segments of the body shorten; the first segment of the tail becomes more or less completely hidden beneath the seventh segment of the body; &c. These differences often deceptively simulate zoological characters.—*Comptes Rendus*, July 8, 1878, p. 52.

On Avenardia Priei, a Gigantic Nemertean of the West Coast of France. By M. A. GIARD.

The Nemertean which forms the subject of this note measures as much as 1 metre or even 1·20 metre in length when in a state of repose; when it extends itself its length may become three or four times as much. Its breadth attains 2 or 3 centims.; and the general form of the body is flattened. In the contracted state the lateral margins often appear undulated or notched, as is observed also in the *Tænia* and *Ligulæ*.

This worm is met with by hundreds at Pouliguen (Loire-Inférieure), but in a peculiar station—namely, in an old canal (*étier*) of the salt marshes, now converted into a reservoir, in which the seawater is renewed every tide. The water of this reservoir serves to set in motion the wheels of an establishment managed by M. Avenard. The workmen here have been acquainted with this enormous Nemertean for a number of years. They meet with it, at a depth of from 10 to 20 centims. in the mud, whenever they clean out a portion of the reservoir. The salters, whom I have asked about it, have not observed it any where else in the salt marshes. It is equally unknown to the fishermen of the port of Pouliguen, as also to those of Croisic.

The principal animals which inhabit the mud of the reservoir are several species of Nereids (one of which is peculiar to brackish waters), *Pholades* (*P. dactylus* and *P. candida*), *Scrobiculariæ*, flat-fishes, and eels. Oysters, which have lately been introduced into the reservoir, thrive there remarkably. The thousands of Nemerteans extracted from the mud during cleansing-operations are devoured with avidity by domestic ducks.

The Nemertean hollows out in the mud long galleries, which it lines with a mucous coating, so that no earthy particle can soil its epidermis. When put into the water it swims with the greatest facility, by performing undulatory movements, giving it an astonishing resemblance to an eel. Its colour, moreover, sufficiently resembles that of this fish: the back is of a more or less dark blackish grey, and quite black along the median line; the belly is entirely white or yellowish white.

When taken out of the water, instead of stretching softly, like *Lineus longissimus*, the animal breaks up very rapidly into a multitude of fragments, which become smaller and smaller. When the division stops, the fragments are scarcely more than 2 centims. long; and each of them has acquired a rounded form, in consequence of the contraction of the muscles, which gradually diminishes the open surface of the section, and finally causes it to disappear entirely. To obtain an entire specimen the most certain method is to throw

the worm suddenly into absolute alcohol, or to make it die slowly in the water by gradually substituting fresh water for the sea-water in which it is immersed. We frequently find individuals which have regenerated a more or less considerable portion of their body. When placed in a liquid which does not suit it, the worm pushes out its trunk and throws it off. The trunk, thus isolated, still continues to live for a long time; it invaginates and evaginates itself, and moves with a tolerably rapid creeping motion. One might suppose that we had here a case of viviparity.

The organization of our Nemertean is precisely that of the unarmed Nemerteans or Anopla; but the generic characters do not agree with those of any type previously described. The head, which is clearly distinct from the body, has the form of a heart with the point directed forward, and presents an aperture for the protrusion of the trunk. The sides of this head are occupied, throughout their whole length, by two enormous longitudinal cephalic fissures. The upper part is strongly pigmented, but there is no apparatus of vision, which may easily be explained by the subterranean existence of the animal. The mouth occupies the anterior and ventral part of the trunk; it is about 1 centim. in length, and consequently quite visible to the naked eye. The anterior part of the body, for a length of about a decimetre, is occupied by a straight œsophagus situated beneath the cavity of the trunk. Following this œsophagus the digestive tube proper commences. This point is marked by a change in the musculature. Here begins a ventral furrow, which traverses the whole body of the animal to the anus.

The cæca of the intestine are not placed opposite to each other two and two; on the contrary, there is a very marked alternation in the points of insertion of these organs to the right and left of the digestive tube. The cæca are not simple; they branch at their extremities into secondary diverticula, in such a manner that the intestine presents a true *dendrocoelism*. Such an arrangement as this had only been indicated previously in a pelagic Nemertean, the curious *Pelagonemertes Rollestoni*, two specimens of which were collected and studied by Moseley during the 'Challenger' expedition.

The lateral vessels do not appear to be so well organized as the dorsal trunk; they are rather lacunæ, comparable with those which occupy the same position in the Cestodea. Perhaps they may stand in relation to the genital organs, which alternate with the cæca of the digestive tube; I have not met with specimens young enough to decide this question.

The genital pores do not open upon the sides of the body, as is the general rule in the Nemerteans, but upon the dorsal surface and on each side of the median dorsal line. They are disseminated in an alternate and slightly irregular fashion, nearly like the pores of the ambulacral plates of certain sea-urchins. The spermatozoids are perfectly filiform, and very long. The ova are exceedingly small, and are laid separately, each surrounded by a thick mucous envelope. The nutritive vitellus is scanty. Therefore, although I have not been able to follow the development, I am convinced that the embryogeny must be dilated and that the larva must affect the *Pilidium*-form.

I give this remarkable Nemertean the name of *Avenardia Priei*, dedicating it at once to M. J. Prié, a zealous naturalist of Pouliguen, and to M. Avenard, Assistant to the mayor of Pouliguen, who furnished me with the materials of this investigation, and facilitated these sufficiently troublesome researches with a kindness for which I am glad to thank him publicly.—*Comptes Rendus*, July 8, 1878, p. 72.

Observations and Experiments on the Migrations of Filaria rhytipleurites, a Parasite of Cockroaches and Rats. By M. OSMAN GALEB.

In 1824 Deslongchamps discovered, in the fatty body of the common cockroach (*Periplaneta orientalis*), a great number of small lenticular bodies visible to the naked eye, in which he found a small Nematoid worm to which he gave the name of *Filaria rhytipleurites*. This encysted worm merely represents the asexual state of a Nematoid, the migrations of which have hitherto remained unknown.

The cyst forming the cell of this animal is composed of two membranes: the external, which is fibrous, is easily coloured by carmine; the inner one, on the contrary, which is structureless and sometimes presents a granular appearance, does not fix the colouring matter. The larva, whose movements may easily be followed through the wall of the cyst, is folded several times upon itself and surrounded by a whitish granular matter.

These Nematoids cannot quit their prison so long as the *Periplaneta*, of which they are parasites, continues alive. If by dissection we separate the cysts and then place them in a suitable liquid, the little worms soon pierce their cells; half an hour of submersion gives them all their liberty; and their vitality is such that they can remain alive for three days, or even more.

It is by chance that I have discovered the course of the migrations. The baker with whom I was lodging, knowing that I was interested in natural history, placed at my disposal all the rats caught in his traps. On opening the stomach of one of these animals (*Mus decumanus*), which I killed in order to make some histological preparations, I found a Nematoid in the sexual state, and easily established its identity with that which I had met with in the adipose tissue of the cockroach: a cutaneous fold which exists in the body of the larva at but a short distance from the anterior extremity occurs also in the adult animal at the same part; and it was this characteristic fold that suggested the name *rhytipleurites*, given by Deslongchamps to the encysted worm.

The Nematoid when set free grows rapidly; for the larva contained in the cyst does not measure more than 11–16 millims., while the adult worm often attains a length of more than 2 centims., the male being, as usual, smaller than the female.

The cuticle is thick, regularly annulated; in the larva it contains numerous porous canals. The muscular system forms a continuous



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