time, but in 1903 the mating α was repeated in the experiment γ, in which the *identical birds* used in α were again mated together. In this experiment a uniform generation was obtained. A pair of birds bred in this F. 1 generation were mated together and the result is recorded in exp. δ.

The total results of the mating of Barb and Nun are:—

(Exp. α, γ) F. 1: shell present 2; shell absent 10.
(Exp. β, δ) F. 2: shell present 3; shell absent 11.

I can also mention here that two birds which were crosses, in the F. 1 generation, between a Nun and a Fantail, kindly sent to me by Miss Thiselton-Dyer, showed no trace of "shell." These birds were not bred from.

The experiments here recorded form part of a larger investigation into heredity in Pigeons still in progress, which has been subsidised by the Government Grant Committee of the Royal Society.

I am indebted to Mr. J. Lewis Bonhote for raising and recording birds bred in Exp. 14, also to Mr. R. J. Elwell for raising birds in Exps. 9 and 12.

I have also to thank Mr. Bateson, who has most kindly supervised all the experiments.

8. On a new Species of Worm of the Genus *Pontodrilus* from the Shores of the Red Sea. By FRANK E. BEDDARD, M.A., F.R.S., Prosector to the Society.

[Received October 5, 1905.]

(Text-figures 78 & 79.)

The specimens of *Pontodrilus* upon which the following description is based were kindly placed in my hands by Mr. Cyril Crossland, F.Z.S. They were collected by that gentleman "in clean shell and coral sand on the shores of an islet in Khor Dongola, on the Soudan coast." Mr. Crossland further informed me that the worms "live about the highest level at which the sand is kept wet by the sea. As there is practically no rainfall the water in which they live is undiluted by rain almost always. A species of *Nereis* and some Crustacea share this habitat." There is thus no doubt about the purely marine surroundings of this *Pontodrilus*, which so far agrees with the majority of the species of the genus.

The general aspect of the worms was like that of the other species of *Pontodrilus* with which I am acquainted.

The length of the largest and fully mature example was 102 mm., the size being thus about the average size of the species of this genus.

The *prostomium* was frequently difficult to define accurately, owing, of course, to a protrusion of the buccal cavity. In three specimens, where its characters were very plain, I observed two conditions. In two individuals the prostomium was continued over the first segment of the body by grooves extending over about half that segment; in the other there was no such extension backwards of the prostomium. As both of these specimens were immature, I have no positive reason for asserting that they are not different species. But existing knowledge of this genus does not favour the supposition that two species live in common in one limited area. I should prefer, therefore, in the meantime to regard the character of the prostomium as variable in this particular. The prevalent arrangement in the genus is an epilobic or (as I prefer to call it) epicheilous prostomium. But one species, *P. insularis*, is reported to have no process of the prostomium, and also a variety of the type form *P. matsushimensis* * described by Dr. Michaelsen. But in this case the variety does not occur in the same locality as the type.

The *setæ*, as is usual or universal (?) in the genus, are paired, and the two setæ of the ventral pair close together than those of the lateral pair. On the xviiith segment, which bears, as in other species, the male pores, the most ventral seta of each ventral couple is present, but I did not detect the more dorsal seta of the couple.

The *clitellum* in this genus usually embraces segments xiii–xvii. In the present species it very distinctly extends over the xviiith and to the very end of that segment. This is the first external feature which has led me to distinguish the present species as new and undescribed.

The *genital papillæ* confirm by their arrangement this point of view. It is true that I have examined only one fully mature worm and that the papillæ are known to vary † among mature specimens. I find, however, that in no species already known is there a close approximation to the conditions which obtain in the species of *Pontondrilus* which forms the subject of the present communication For in the present species the genital papillæ are very distinctly paired structures, and not single and median. Moreover, they lie in front of the male pores, and there are no papillæ following the male pores which are so prevalent in the genus *Pontodrilus*. The paired papillæ lie between segments xiii/xiv and xiv/xv. They correspond in position to the ventral setæ. The anterior pair are decidedly larger than the posterior pair. These papillæ are very flat and hardly, if at all, project beyond the adjacent surface of the body. The appearance when seen through a hand-lens is shown in the figure (text-fig. 78, p. 560). The centre of each papilla is opaque, white, and either somewhat kidney-shaped (anterior papillæ) or more rounded (posterior papillæ). This is surrounded

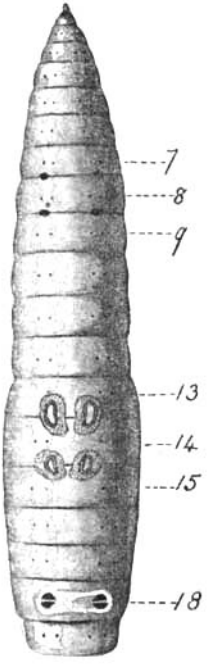
* Michaelsen, Zool. Jahrb. Syst. Abth. xii. p. 220.

† E.g. *P. laccadivensis*, see Beddard in 'Fauna of Maldive and Laccadive Arch.' vol. i. pt. 4.

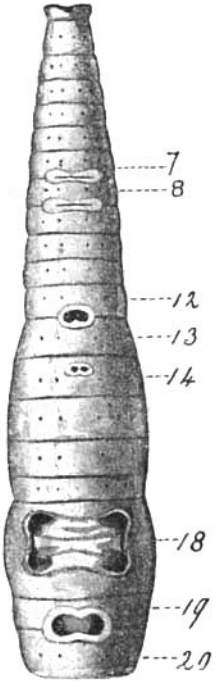
by a clear ring, and this again by a broader and opaque, white, halo.

The *male pores* are very conspicuous upon the xviiith segment, and, as in other species of *Pontodrilus*, the area upon which they open is depressed in a sucker-like fashion. Each depression is divided into two by a transverse raised fold. The actual pore seems to correspond in position to the outer of the ventral seta couple. Although the external characters are sufficient to define the present as a new species of *Pontodrilus*, in the existing state of knowledge of that genus it may be useful to give particulars of certain internal organs which are known to vary from species to species.

Text-fig. 78.



Text-fig. 79.



Text-fig. 78.—Ventral view of *Pontodrilus crosslandi*, sp. n. Some of the segments are numbered 7, 8, 9, &c.

Text-fig. 79.—Ventral view of *Pontodrilus laccadivensis* F. E. B. Some of the segments are numbered 7, 8, &c.

The *gizzard* is not at all prominent.

The anterior intersegmental *septa* are as usual much thickened. The last of these thickened septa divides segments xiii./xiv.; but

this septum is not quite so strongly developed as those which lie in front. The last *hearts* lie in segment xiii. The *nephridia* are obvious in segment xv.

The *spermathecæ*, which open in line with the male pores, *i. e.* with seta *b* of Michaelsen's scheme *, have a single diverticulum of about half the length of the pouch itself. Their pores are situated between segments vii./viii. and viii./ix.

The *spermiducal glands*, like those of some, but not every, species of the genus, possess a distinct duct separable from the glandular and also tubular region by a constriction and by its nacreous appearance due to the strong muscular coat. The glandular part is fully six times as long as the muscular duct. The duct in the fully mature is curved into a horseshoe-shape. It is of uniform thickness thoughout, and does not increase in diameter towards the external pore.

For the purposes of an easier comparison with other species I append a definition of this new *Pontodrilus*, which I propose to name after Mr. Crossland.

Pontodrilus crosslandi, sp. n. (Text-fig. 78.)

Length about 100 *mm. Prostomium epicheilous* ($\frac{1}{3}$–$\frac{1}{2}$). *Setæ paired rather distant; distance* a–b *less than* c–d. *Clitellum xiii.–xviii. Male pores* (*on xviii.*) *and spermathecal pores* (*vii./viii., viii./ix.*) *in line with seta* b. *Papillæ paired on intersegmental areas xiii./xiv., xiv./xv. Last thickened intersegmental septum xiii./xiv. Last hearts in xiii. Spermathecæ with single diverticulum half the length of the pouch. Spermiducal glands with distinct muscular duct.—Hab.* Shores of Khor Dongola, Red Sea.

In view of the cutting of the Suez Canal and the alleged and consequent migration of the Mediterranean fauna eastwards and of eastern additions to the same †, it is important to note that the species *Pontodrilus crosslandi* is by no means a variant of, or most nearly related to, the Mediterranean *P. littoralis*. It comes nearest, as I am inclined to think, to *P. laccadivensis* and *P. matsushimensis* var. *chathamiana* by reason of its anteclitellian papillæ, unknown in other species. It lacks the papillæ following the male pores, which are so general in *Pontodrilus*.

To emphasise the likenesses and also the differences between *P. crosslandi* and *P. laccadivensis* I add a figure of the latter (text-fig. 79, p. 560) for purposes of comparison. This species has not yet been figured, though its essential characters have been described ‡.

* Oligochæta, in 'Das Thierreich,' 10 Lief. (Berlin, 1900).

† E. A. Smith in P. Z. S. 1891, p. 396.

‡ Beddard in 'The Fauna and Geography of the Maldive and Laccadive Archipelagoes,' vol. iv. pt. iv. p. 374.