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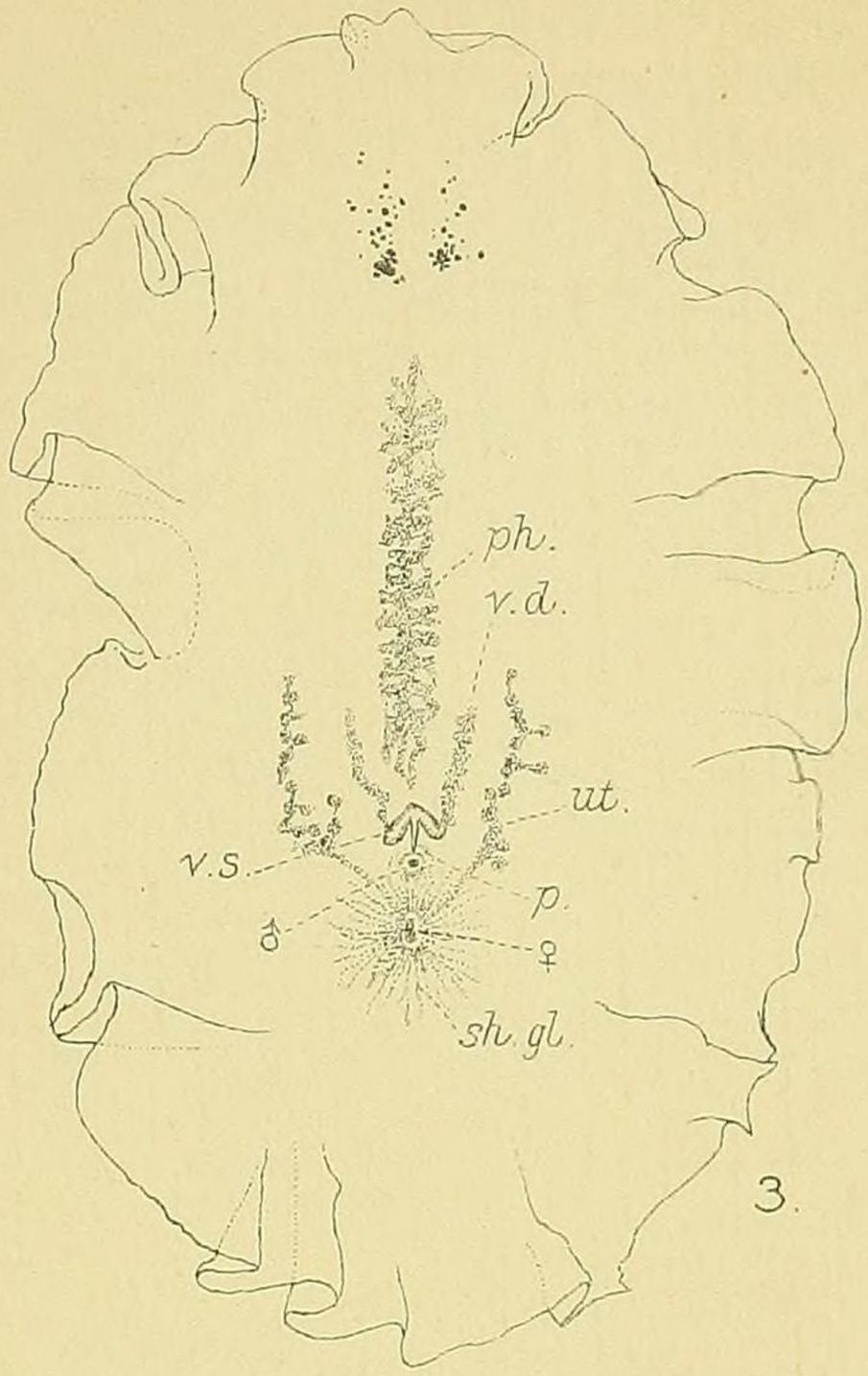

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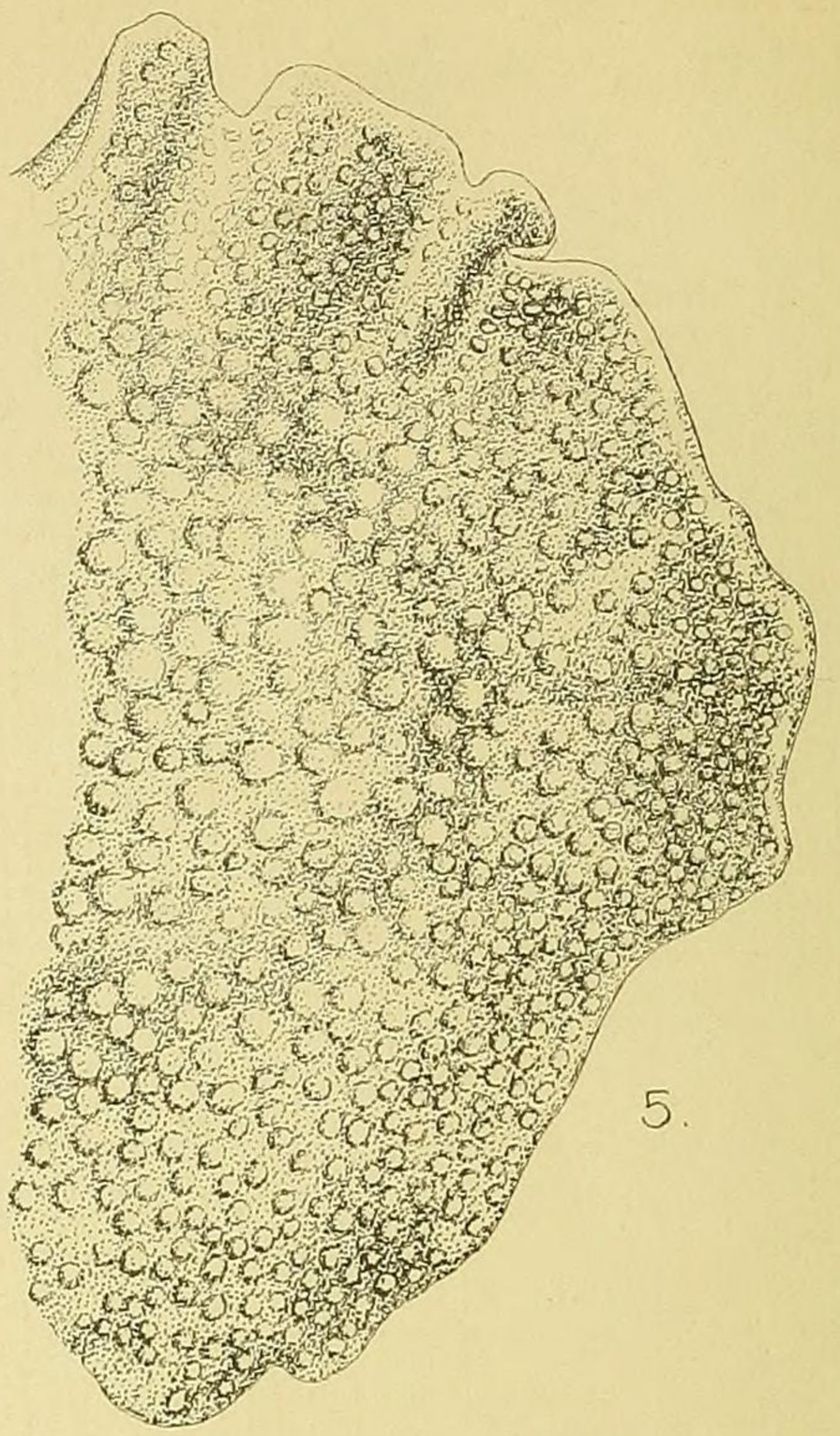

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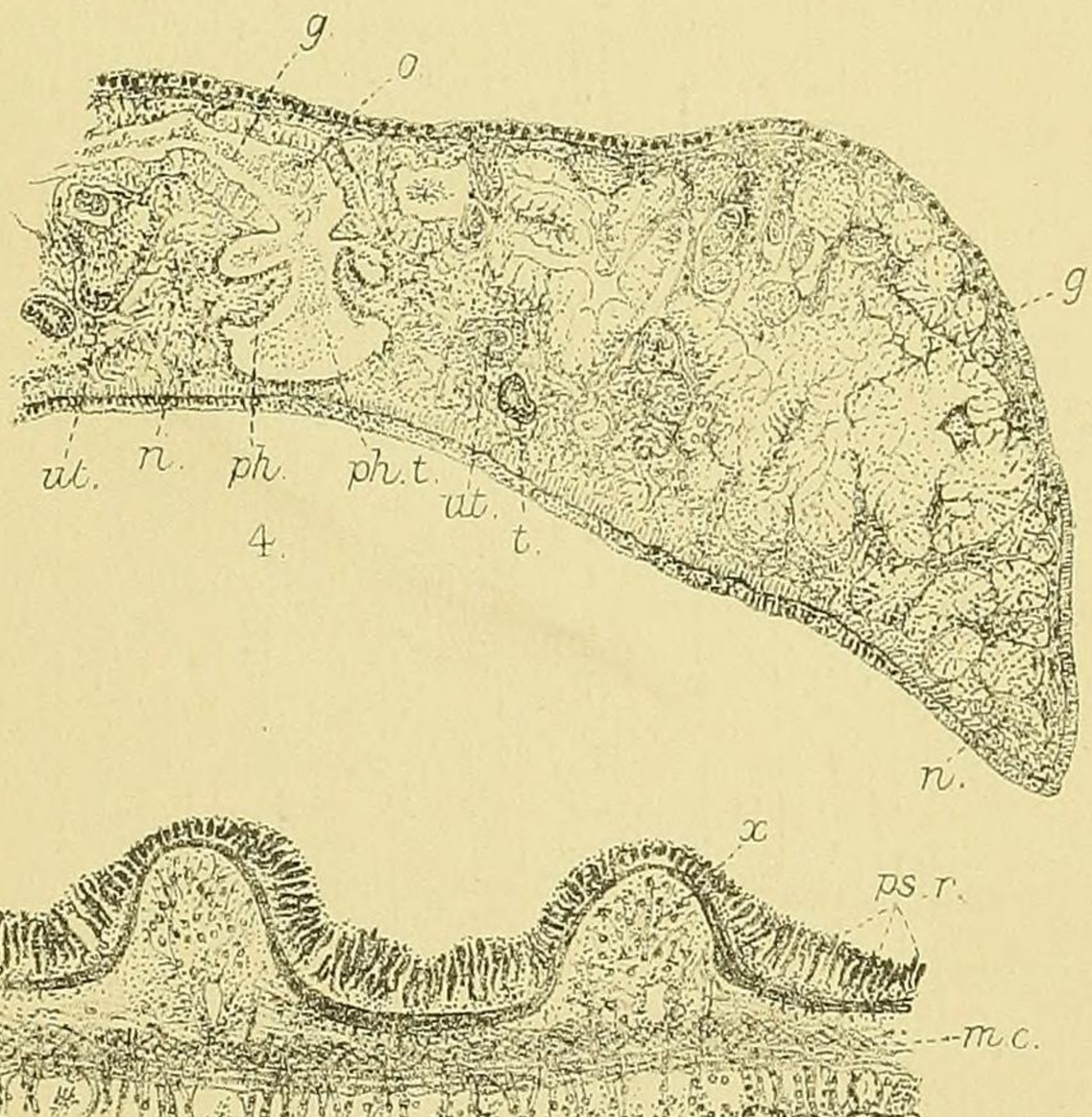

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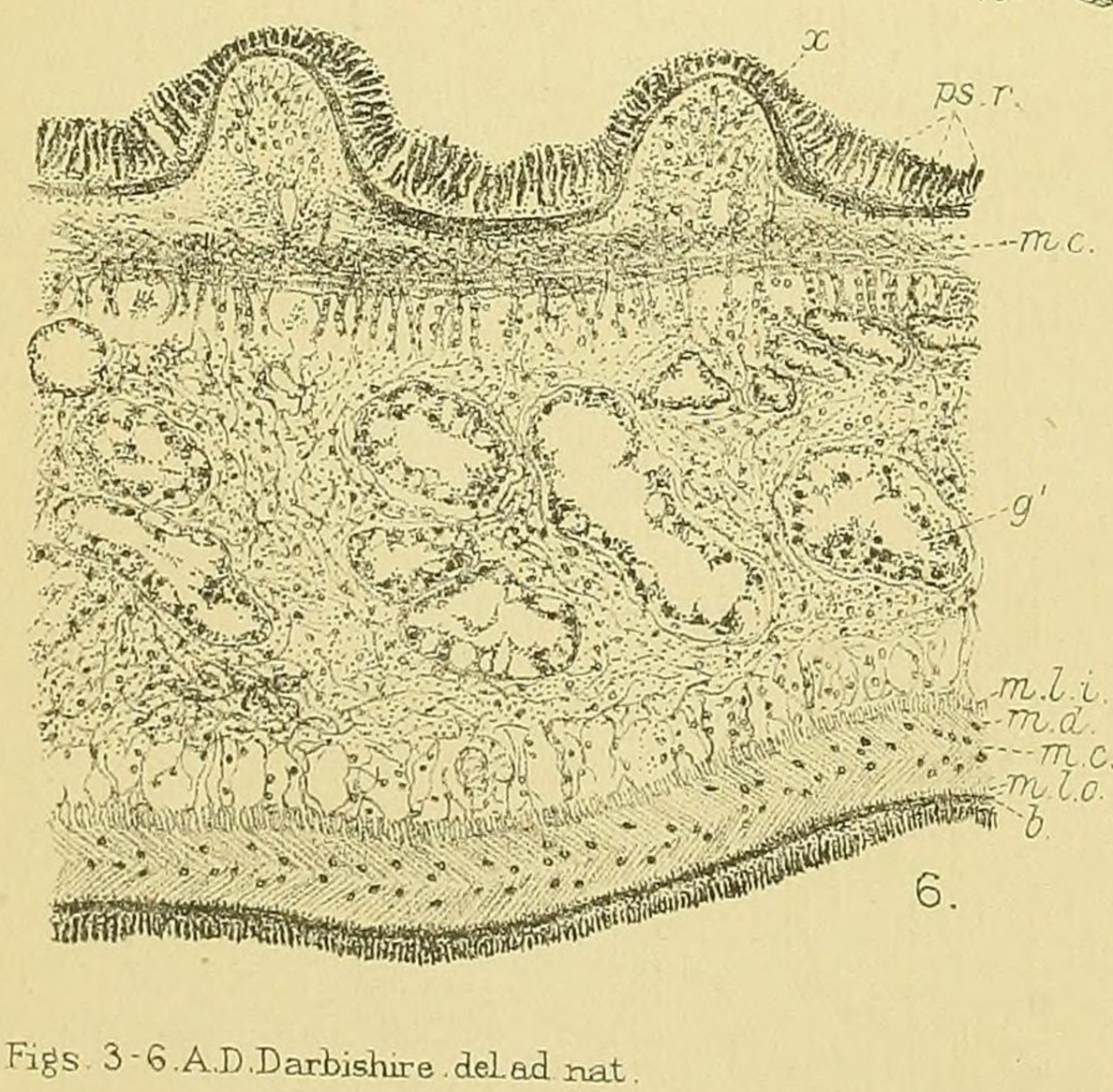

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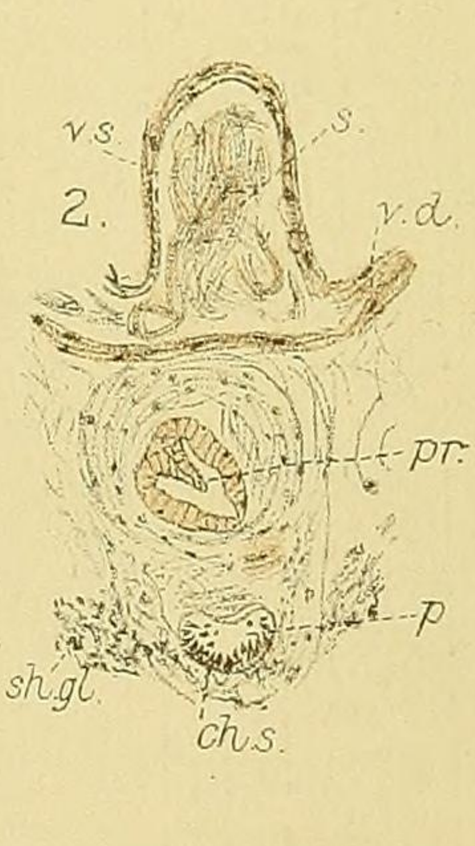

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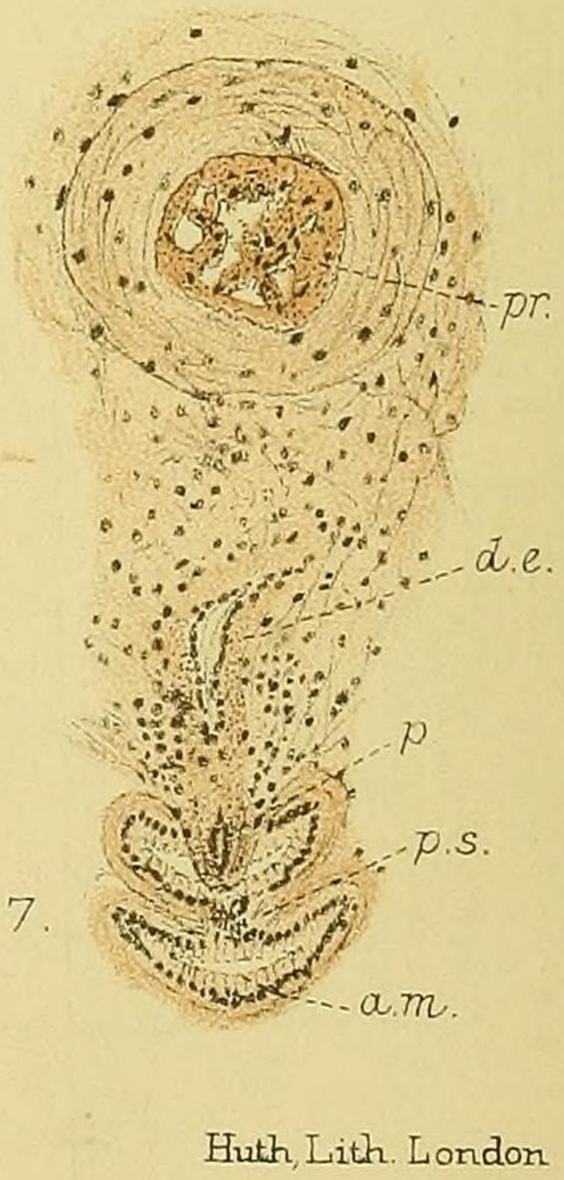

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Figs. 3-6. A.D. Darbishire. del. ad nat.

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PLANARIANS FROM ZANZIBAR.

16. Davenport, C. B. "Review of von Guaita's Experiments in breeding Mice." Biol. Bull. 1900, ii. p. 121. [Interesting as a careful attempt to discuss the facts before the Mendelian principles were rediscovered.]
17. Day, J. R. Monthly Homœop. Rev. Lond., 1897, xli. p. 148. [Case of albinos from parents who were first cousins.]
18. 'Fancy Mice.' *Anonymous*. London (Upcott Gill), pp. 4, 5. [Contains also Carter Blake's notes, pp. 14–23.]
19. von Guaita. "Versuche mit Kreuzungen von verschiedenen Rassen der Hausmaus." Ber. naturf. Ges. Freiburg-i.-B. 1898, x. p. 317.
20. —— —— *Ibid.* 1900, xi. p. 131.
21. Haacke, W. "Ueber Wesen, Ursachen, und Vererbung von Albinismus, &c." Biol. Centralblatt, 1895, xv. p. 45.
22. Pickering, J. W. "Coagulation in Albinos." Jour. Phys. 1896, xx. p. 310. [Full references.]
23. Seligmann, C. G. "A Note on Albinism." Lancet, 1901, lxxx. p. 803.
24. Weldon, W. F. R. "Mendel's Laws of Alternative Inheritance in Peas." Biometrika, 1902, i. p. 244. [Refers to Johann von Fischer's testimony.]
25. —— 'Nature,' 1903, lxvii. pp. 512, 610; lxviii. p. 34.
26. Zoth, O. "Ein Beitrag zu der Beobachtungen und Versuchen an japanischen Tauzmäusen." Arch. ges. Physiol. 1901, lxxxvi. p. 147. [Full references to Cyon, Rawitz, &c.]
27. Cuénot, L. "L'Hérédité de la Pigmentation chez les Souris." Arch. Zool. exp. (4) 1903, vol. i. no. 3.
28. Darbishire, A. D. "Third Report, &c." Biometrika, 1903, ii. pt. iii.
29. Weldon, W. F. R. "Mr. Bateson's Revisions of Mendel's Theory of Heredity." Biometrika, 1903, ii. pt. iii.

4. On the Marine Fauna of Zanzibar and British East Africa, from Collections made by Cyril Crossland in the Years 1901 and 1902.—Turbellaria Polycladida. Part I. *The Acotylea*.

By F. F. Laidlaw, B.A. Cantab., Assistant Demonstrator and Lecturer in Biology in the Owens College *.

[Received May 25, 1903.]

(Plate IX.† & Text-figures 3–7.)

Mr. Crossland's collection contains, so far as the Acotylea are concerned, specimens of four new genera and eight new species out of a total of nine species in all. This high percentage of novelties is not surprising when one remembers that but little is known of

* Communicated by the Secretary.
† For explanation of the Plate, see p. 113.

the Polyclad fauna of the Indian Ocean, and especially of the African coasts.

As a matter of fact, I believe that no shore-haunting species have hitherto been recorded from the East Coast of Africa, save from the Red Sea and from the neighbourhood of the Cape of Good Hope.

Of the four new genera described in the present communication, *Phylloplana* is closely related to *Leptoplana*, whilst the other three are of unusual interest.

In order to keep the paper within reasonable limits I have done little more than give an account sufficient, I hope, in each case, to render the future identification of the species a matter of certainty. I have not attempted to enter into any detailed account of the anatomy of the various species, or to deal with many of the interesting questions which have been suggested to me by their structure. I have given a list of species of one or two of the genera, with their distribution and some of their more obvious characters, as I believe such lists may have some use.

My thanks are due to Mr. Crossland, who has permitted me to examine and describe this collection, and has furnished me with useful notes and coloured sketches of some of the species.

I am also indebted to Mr. A. D. Darbishire for drawings reproduced on Plate IX.

Family Planoceridæ.

Planocera crosslandi, sp. nov.

"White, leaf-like form. Dredged off the mainland coast in 10 fathoms." Slightly damaged.

Length	22 mm.
Breadth.....	16 ,,
"Mouth"* from anterior end...	12·5 ,,
♂ aperture from "mouth." ...	4 ,,
♀ ,, ,, male	1·5 ,,
Tentacles from anterior end ...	6 ,,

Only a single specimen collected. This species is most closely allied to *Pl. armata* mihi [**5**].

The eye-spots have an arrangement very similar to that found in the latter species. There is a dense cluster at the base of each tentacle; the paired group of brain-eyes lying in front of the brain is more extensive than that behind it. The epidermis unfortunately has entirely disappeared from the surface of the specimen. The muscles of the body-wall are very similar to those found in *Pl. armata*. The brain is well defined and of moderate size. The gut has the character typical of the genus, viz. some seven pairs of large branches from the main gut, each of which gives off numerous smaller ramifications which do not form any anastomoses. The gut is without the peculiar diverticula found in *Pl. armata*.

* The term "mouth" is used to mean the opening of the pharyngeal pouch to the exterior.

Genital Organs.

The *male apparatus* consists of a short, muscular, somewhat barrel-shaped penis, which tapers a little towards its free posterior end, where it carries three large chitinous hook-like structures, identical in character with those found in *Pl. armata*. In front of these its entire lumen is lined with the small, very numerous chitinous spines so characteristic of this and allied genera. The penis-muscles are longitudinal and diagonal. The prostate gland is large, and, with the penis, is enclosed in an outer muscular sheath, the walls of which are made up of an inner circular and an outer longitudinal layer of muscle-fibres. At the distal end of the penis the prostatic muscles come into close contact with the muscles of that organ, but at the upper end of the penis a wide space intervenes between it and the sheath. Here the muscles of the penis are collected into bundles of retractor fibres, and traverse the surrounding sheath-cavity to join the muscles of the sheath.

The prostate is closely enfolded by the inner muscle-layer of the sheath; it gives off a short duct which enters the base of the penis after receiving the ductus ejaculatorius from the vesicula seminalis. As in *Pl. pellucida* and *Pl. armata*, this duct runs for a short distance right inside the prostatic duct.

The vesicula seminalis lies outside the sheath.

The vasa deferentia are much dilated.

The antrum masculinum, into which the free end of the penis projects, is lined with a ciliated non-secretory epithelium.

Cf. von Graff's figures of the genital apparatus of *Pl. pellucida* and *Pl. simrothi* [**3**]; also my figure of *Pl. armata* [**5**].

Female apparatus.—The bursa copulatrix is large, and has thick walls composed of an outer layer of circular and an inner layer of diagonal radial fibres. Its walls are much folded. Beyond the bursa, the vagina, which is lined with ciliated epithelium, runs forwards and upwards through the large shell-glands, and then turns sharply back, receiving as it does so the common duct from the uteri. Beyond this it is continued back as the thread-like accessory vesicle, which ends blindly. The walls of the bursa show no trace of secretory activity.

The following is a list of species which can be referred at present with tolerable certainty to the genus *Planocera*:—

A. Species in which the penis is armed with large chitinous hooks as well as with spines.

a. Six hooks present.

Pl. armata Laidlaw [**5**]. Maldives.

b. Three hooks present.

Pl. crosslandi, sp. nov. Zanzibar.

B. Species in which the penis is armed with spines only.

a. Pelagic forms.

† Nervous system much decentralised.

Pl. simrothi v. Graff [**3**].

†† Nervous system normal.

Pl. pellucida (Martens) [**3**].
? *Pl. pelagica* (Moseley) [**1**].

β. Non-pelagic.

Pl. graffii Lang [**1**].	Mediterranean.
Pl. folium Œrsted [**1**].	Mediterranean, North Sea.
Pl. reticulata Diesing [**1**], *nec* Stimpson.	Sandwich Is.

Planocera nebulosa Verrill [**2**] is probably not a member of the genus *Planocera* s. str.

PARAPLANOCERA AURORA, sp. nov. (Plate IX. fig. 1.)

Body almost circular, margin crenellate. Shore form.

Length	15 mm.
Breadth.....	12·5 ,,
"Mouth" from anterior end	7·5 ,,
Tentacles ,, ,, ...	5·0 ,,
♂ aperture from "mouth"	2·5 ,,
♀ ,, ,, male	·5 ,,
Length of receptaculum seminis.....	3·0 ,,
Tentacles apart.....	1·0 ,,

The coloration of this beautiful species is shown in Pl. IX. fig. 1. In general it is of a rich rose-pink, becoming more intense towards the margin, and mottled with lines and spots of yellowish white. The tentacles are pink, and the mid-dorsal region white.

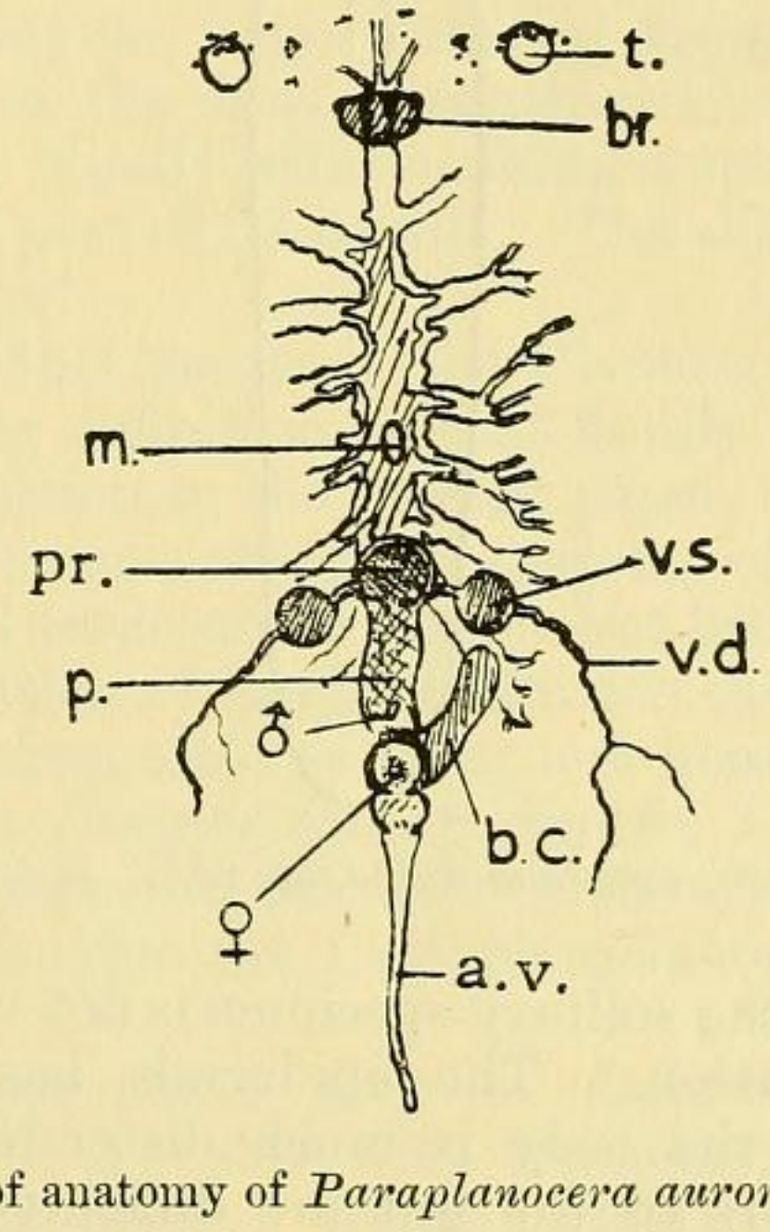
The gut-branches are six in number. The arrangement of eye-spots and appearance of the genital apparatus are shown in the accompanying figure (text-figure 3, p. 103).

The genital organs have an arrangement in general precisely similar to that found in the other species of the genus [**6**]. The antrum masculinum is small, lined with ciliated epithelium. The penis is a coiled muscular tube (*p.*), its walls consisting of circular and radial muscle-fibres. Its lumen is lined with chitinous spines of two different kinds, those near the distal end of the penis being large and irregular, whilst further forward (*i. e.* away from the antrum) the spines become small and thorn-shaped. These two kinds of spines merge rather gradually into each other.

Some way in front of the antrum a thin outer layer of circular fibres detaches itself from the wall of the penis, to form an outer sheath which remains attached to the ventral side of the penis for some distance, so that it is only at its proximal, anterior, end that the penis is completely free from the sheath. The space

between them is occupied by a loose spongy reticulum of protoplasm with few nuclei. At its proximal end the penis receives the very short duct which opens into it from the prostate (*pr.*), which with its duct is ensheathed in a continuation of the muscle-wall of the penis, which at this level again fuses with the muscles of the outer sheath.

Text-fig. 3.



Sketch of anatomy of *Paraplanocera aurora*, sp. nov.

a.v., accessory vesicle; *br.*, brain; *b.c.*, bursa copulatrix; *m.*, mouth; *p.*, penis; *pr.*, prostate; *v.d.*, vas deferens; *v.s.*, vesicula seminalis; *t.*, tentacle.

The prostate is large. There is a pair of thin-walled vesiculæ seminales (*v.s.*) outside the sheath. From each of these a short duct runs, piercing the sheath, and uniting with its fellow to enter the commencement of the prostatic duct.

The terminal parts of the female apparatus are exactly similar to those of *P. langi*, structurally and histologically. However, in the present species I cannot find any indications of the shell-glands.

DISPAROPLANA DUBIA, gen. et sp. nov. (Plate IX. fig. 2.)

A single specimen.

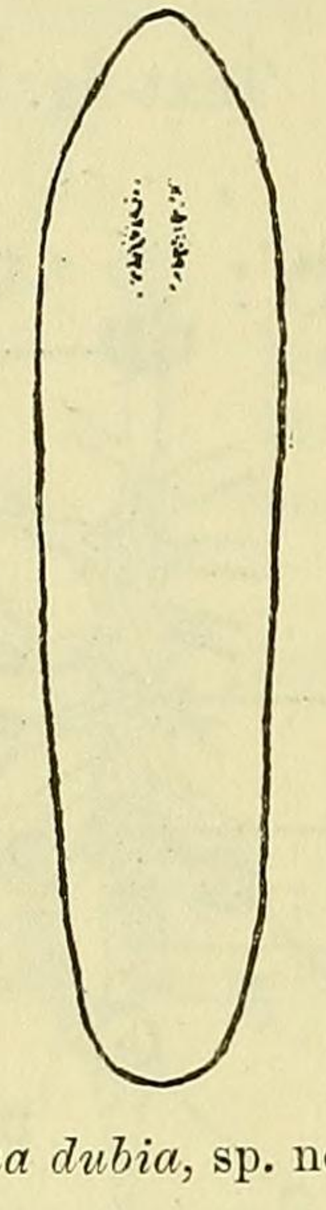
Length	12·5 mm.
Breadth	3·0 „
"Mouth" from anterior end	4·0 „
♂ aperture from "mouth"	1·5 „
♀ „ „ male	·4 „

The external characters of this species are shown in text-fig. 4 (p. 104).

There are no tentacles The eye-spots are arranged in two

rows extending forward from over the brain. They are mostly of small size, but immediately over the brain there are on either side some half-a-dozen eyes of a much greater size than the rest.

Text-fig. 4.



Disparoplana dubia, sp. nov. × 4 circ.

Unfortunately the solitary specimen is not in a very satisfactory state of preservation. The epidermis has almost completely disappeared, and the body is much distended with ripe eggs, so that the characters of the gut are difficult to determine. The pharynx is folded and of the usual Acotylean type. The brain is protected by a sheath of unusual toughness.

Genital Organs.

Male apparatus.—The terminal parts consist of a cylindrical penis lined with short chitinous spines, of a small prostate gland, and of a muscular vesicula seminalis (Pl. IX. fig. 2). The resemblance to the corresponding organs in *Planocera* or *Paraplanocera* is very close. The male aperture is very small and opens into a narrow tube which runs forwards and a little upwards. The cells lining it give off a granular secretion. After a course of about 1 mm. this passage widens out to become the lumen of the penis. This organ is proportionately longer than in *Planocera* and a little coiled; but shorter than in *Paraplanocera*. Its walls are not very stout, and the muscle-fibres which form them are continuous with those that surround the prostate. The spines lining the lumen bear a close resemblance to those of *Planocera*; but the diameter of the penis is relatively less. The prostate is small, but similar to that of *Planocera*. Its duct is joined by the ductus ejaculatorius running to the penis from the relatively large vesicula seminalis which lies in front of the prostate and receives

the two vasa deferentia at its hinder end. Its walls are thin and consist of circular muscle-fibres.

The resemblance existing between these organs of *Disparoplana* and those of *Planocera* and *Paraplanocera* is so great, that we are compelled to assume a close relationship between these genera. In the shape of the penis *Disparoplana* approaches rather the latter genus, whilst in possessing a single vesicula seminalis it approximates rather to the former.

Female apparatus.—The antrum femininum is large and rather elongated. The vagina, after running forward to receive the separate openings of the uteri, is continued back as the accessory vesicle which ends blindly after making a second turn forwards, ventral to the first part of its course. The shell-glands open into the accessory vesicle.

The inclusion of this species in the Planoceridæ will necessitate an alteration of the definition of that family. I do not attempt to offer a new definition in the present paper, since it is necessary to have information concerning the anatomy of a large number of species the internal structure of which but little is known, before any useful modification of Lang's definition can be suggested.

However, it is permissible to point out here that the discovery of such a form as *Disparoplana* indicates, I think forcibly, not only that in the future our definition of the Planoceridæ will have to be altered, but also that the Leptoplanidæ may be a polyphyletic family.

The genus *Disparoplana* may be defined as follows:—An elongated form, not provided with tentacles; the eyes arranged in two lines over the brain. Mouth a little in front of the middle of the body. Penis cylindrical, armed with chitinous spines resembling those of *Planocera*; a well-developed prostate and single large vesicula seminalis present. Female ducts simple, a small accessory vesicle present.

Stylochus zanzibaricus, sp. nov.

Labelled "s.s. Juba."

A small, rather elongate form.

Length	.....	10 mm.
Breadth	.....	4 ,,
Tentacles from anterior end	.....	2·5 ,,
"Mouth" ,, ,,	.....	7 ,,
Genital openings from hinder end	...	·5 ,,

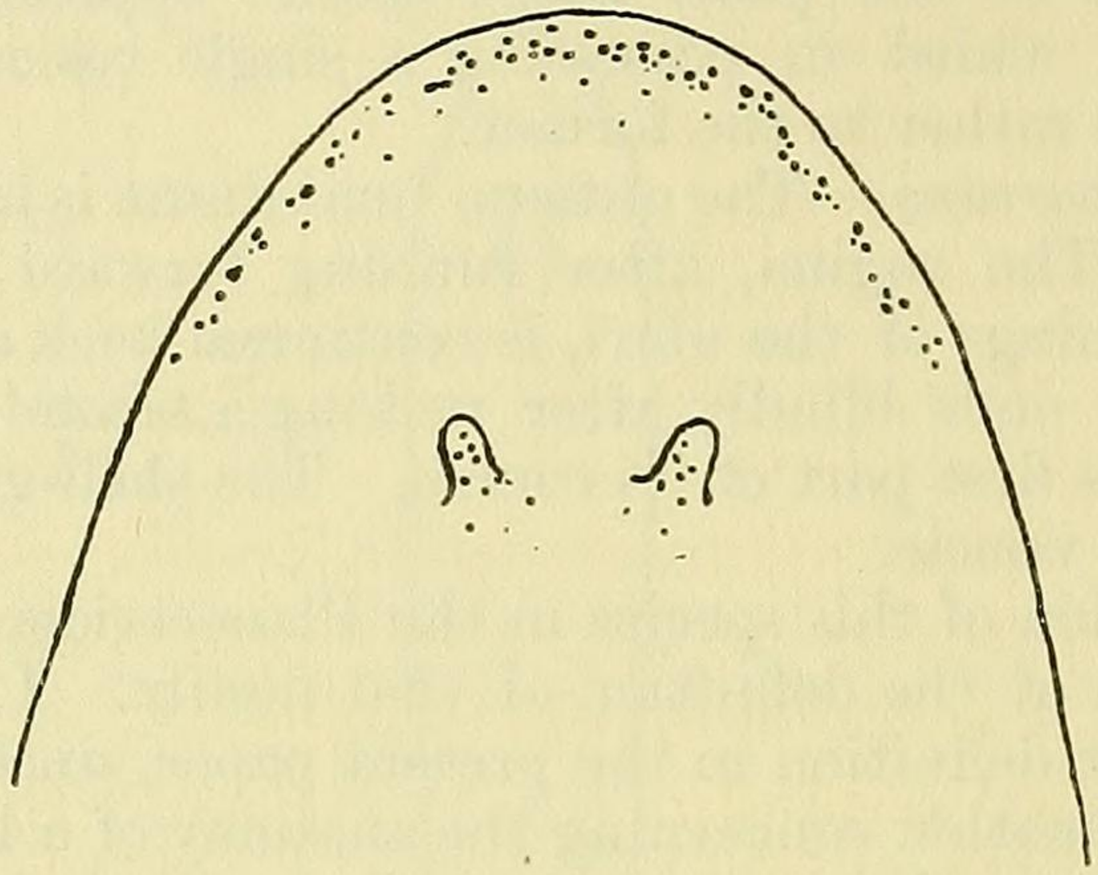
No note as to colour, but to judge from the single spirit-specimen, this is mottled reddish-brown and yellow on the dorsal surface; the ventral surface is uniform greyish yellow.

The eye-spots are found on and about the base of the tentacles and on the anterior margin, where they are of moderate size (see text-fig. 5, p. 106).

I have not found any definite group of brain-eyes.

The anatomy of the genital organs is practically identical with that of *S. neapolitanus* [1]. As in that species, the mature ovaries have passed to a ventral position.

Text-fig. 5.



Anterior end of *Stylochus zanzibaricus*, sp. nov., showing the arrangement of the eye-spots.

STYLOCHUS SUESENSIS Ehrenb. ?

Stylochus suesensis Lang.

A single large specimen from Ras Oswemba, 10 fathoms.

Length	40 mm.
Breadth.....	25 ,,

The specimen is much damaged and the dorsal surface badly broken.

The marginal eye-spots extend completely round the body. This character is not stated to occur in Ehrenberg's type, but may well have been overlooked. In other respects, size and colour, so far as the latter can be determined, viz. dull yellow mottled with small brown spots on the dorsal side, it agrees. The ovaries are immature and lie *among* the gut diverticula. Doubtless, when ripe, they would shift ventralwards. The penis is squared at its free end. The prostate is very large and has thick muscular walls.

The genus *Stylochus* includes at present a few rather closely related species, most of which have a very similar style of coloration, viz. a ground-colour ranging from dirty white to dull yellow or greyish brown; irregularly mottled with darker spots or streaks of brown. The tentacles lie far forward and carry eye-spots. Marginal eye-spots may extend completely round the body.

A satisfactory grouping of the species is not at present possible, since one of the most remarkable features, known to occur in several species, viz. the ventral position of the ovaries, has

been studied only in a few cases. Consequently it cannot, unfortunately, be employed as one of the principal characters in sub-dividing the genus.

I give below a tentative table of the species of the genus hitherto described, with their distribution:—

A. Species with eyes on the anterior part of the margin only.

α. Ovaries dorsal.

S. pilidium (Götte) [1]. [Mediterranean. Valparaiso (v. Plehn) [4].

β. Ovaries ventral.

Marginal eyes extremely small.

S. neapolitanus (Delle Chiaje) [1]. Mediterranean.

Marginal eyes moderate, brain-eyes absent?

S. zanzibaricus, sp. nov. Zanzibar.

γ. Position of ovaries doubtful.

S. frontalis Verrill [2]. New England.
S. limosus Diesing [1]. Japan.
S. conglomeratus Diesing [1]. Japan.

B. Species with eyes completely surrounding the margin.

a. Ovaries dorsal.

Small brightly coloured species.

S. plessisii Lang [1]. Mediterranean.

b. Ovaries ventral.

S. suesensis Ehrenb. ? [1]. Zanzibar.

c. Position of ovaries doubtful.

S. suesensis Ehrenb. [1]. Red Sea.
S. argus Czerniowsky [1]. Black Sea.
S. ? zebra Verrill [2]. New England.

Since the publication of Lang's Monograph, the following species have been removed from the genus:—

1. *Stylochus littoralis* (Verrill) = *Planocera elliptica* Girard.

This species is now referred by Verrill to a new genus, *Eustylochus*, characterised by the presence of a median female anterior accessory vesicle, apparently similar to that found in *Paraplanocera*.

2. *Stylochus ? sargassicola* (Mertens) is referred by von Graff to the genus *Stylochoplana* [3].

Verrill's species *Stylochus crassus* [2] is, I think, evidently not a member of this genus.

Family Leptoplanidæ.

Phylloplana lactea, gen. et sp. nov. (Plate IX. fig. 3.)

Shore form. "White, with minute grey dots scattered sparsely over dorsal surface." Collected 19.2.01; several specimens.

The dimensions of an adult specimen are as follows:—

Length	30 mm.
Breadth.....	17 ,,
"Mouth," from anterior end ...	14 ,,
♂ aperture from "mouth" ...	4 ,,
♀ ,, ,, male	1 ,,

This species externally bears a close resemblance to a typical *Leptoplana*, being perhaps a trifle broader and more leaf-like. Further, its internal anatomy shows it to be distinctly related to the members of that genus, but the presence of two vesiculæ seminales with thick muscular walls is sufficient to distinguish it from that somewhat crowded genus. The arrangement of the eye-spots is shown in fig. 3, Pl. IX. The pharynx is very large, and extends for a distance of over 8 mm. The gut-branches are numerous and without anastomosis.

Genital Apparatus.

Male organs.—The two vasa deferentia each open into the hinder end of the elongated and somewhat convoluted vesiculæ seminales (Pl. IX. fig. 3, *v.s.*). These have thick muscular walls consisting of circular fibres, amongst which are found a small number of oval nuclei. The lumen is narrow, and lined with a flattened epithelium. After running forwards for a total distance of about ·75 mm., the two vesiculæ unite, and their lumen is continued backwards into a median ductus ejaculatorius, which has a length of about ·5 mm. For the first part of its course it has thick walls, and its diameter is about equal to that of either of the vesiculæ, whilst the epithelium lining its lumen is apparently of a prostatic character. For the last third of its course or thereabouts it becomes much narrower, and has much thinner walls and the epithelium loses its secretory character. Finally, this narrower part of the median ductus, which lies through nearly its whole length at a level dorsal to the vesiculæ, opens on to the base of a small penis, which is armed with a downwardly-curved, backwardly directed stylet. The penis lies at the upper end of a fairly long antrum masculinum.

Female apparatus.—The female aperture opens into a wide convoluted vagina, which at first has a course in general in a forward direction, and is provided with rather thick walls, but after a time its walls become thinner and the lumen wider. It then turns backwards, lying dorsal to the first part of its course, and becomes rather narrow, whilst the cells lining it, up to this point ciliated, lose their cilia, and have rather the appearance of secretory cells. When this backwardly-directed part reaches the level of the female aperture, it receives the two uterine ducts through a common opening on its ventral side, and is continued beyond this to end in a small, slightly muscular accessory vesicle. The shell-glands lie close about the aperture.

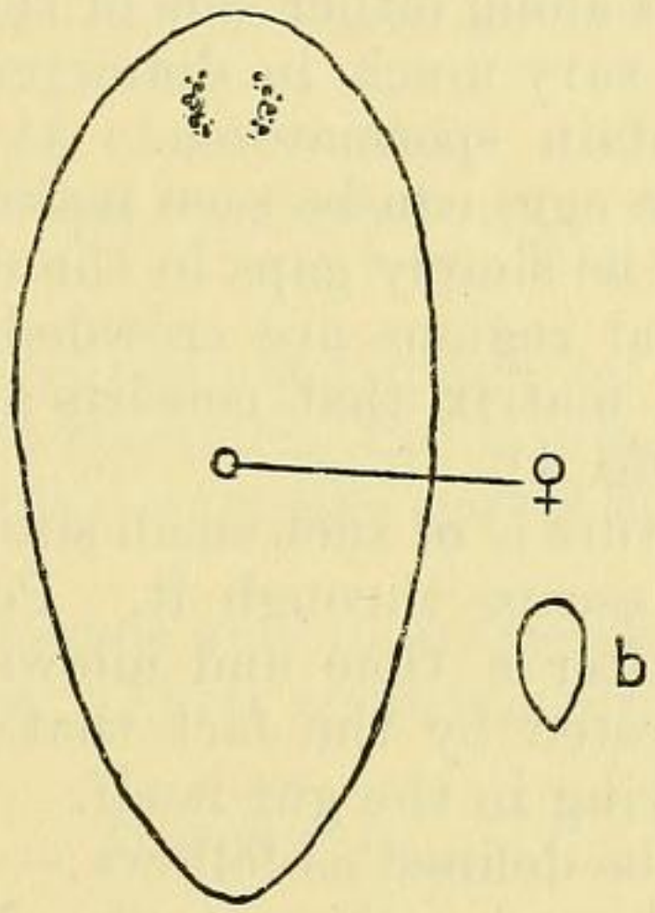
The genus may be defined very briefly as follows:—Leptoplanoid with flattened leaf-like body. A pair of long muscular vesiculæ seminales, which lie parallel to the median ductus ejaculatorius and penis and receive the vasa deferentia of either side respectively at their hinder ends.

HAPLOPLANA ELIOTI, gen. et sp. nov. (Plate IX. fig. 4.)

Two specimens dated 25.3.01. One of them is immature; the other, from which I prepared sections, is in a late stage of sexual activity, and the centre of the body is crowded with eggs. The body is oblong, about 6 mm. in length, 3 in breadth, with rounded ends. In places it is as much as 1 mm. in thickness.

The eye-spots are arranged in two irregular lines lying over the brain on either side of the middle line. They are not numerous (text-fig. 6).

Text-fig. 6.



Haploplana elioti, sp. nov., magnified and (*b*) natural size.

On the dorsal side the epithelium contains a number of pseudorhabdites. On the ventral surface close to the margin there are numerous small rhabdites on either side, but these do not occur elsewhere. The basement-membrane is thin, and the muscles of the body-wall are very feebly developed. On the dorsal side these consist of a narrow longitudinal layer followed by a few circular fibres. On the ventral side there is an additional inner longitudinal layer. The dorso-ventral musculature is well-developed. The ovaries are dorsal, the testes ventral.

The pharynx is of a very simple type; it consists of a fold projecting from the middle of the wall of the oval pharyngeal pouch, the longer axis of the pouch coinciding with the main axis of the body. The opening into the gut lies rather in front of the opening to the exterior, which is about at the middle of the pouch (see Pl. IX. fig. 4, *ph.t.*).

The gut-branches are numerous and appear to undergo anas-

tomoses, but it is difficult to determine this owing to the great accumulation of eggs in the lateral parts of the body.

The "mouth" is about 1·5 mm. behind the anterior margin.

The opening of the antrum masculinum is about 1 mm. behind that of the "mouth." It is very minute. The small vasa deferentia are full of spermatozoa; at the level of the antrum masculinum they become much contorted, and finally both open into a very small median vesicle, which latter appears to open directly by a minute pore into the antrum. Thus there would appear to be no intromittent organ, though it is quite possible that the vesicle may be to some extent everted. The vesicle is provided with a very thin wall of circular muscle-fibres.

The antrum femininum opens some ·25 mm. behind the male aperture; it is small and surrounded by a number of shell-glands. Dorsally it passes upwards and then backwards, receiving as it turns back the common opening of the two uteri. Beyond these it is prolonged into the very small accessory vesicle.

The uteri extend along either side of the body not far from the middle line; they vary much in diameter in different localities, and in places contain spermatozoa. At intervals, where they become dilated, the eggs can be seen making their way into them by what appear to be simply gaps in the uterine walls.

The whole lateral regions are crowded with large eggs, which lie embedded in a matrix that consists apparently of a yolk-like material (Pl. IX. fig. 4).

The female aperture is of such small size that it seems impossible that the eggs can escape through it. Possibly the body of the parent ruptures after a time and allows the eggs to pass out. This view is suggested by the fact that in some of the sections eggs can be seen lying in the gut itself.

The genus may be defined as follows:—

Body small, oval, and rather stout. No tentacles or sucker. Body-wall muscles feeble. The pharynx of a simple type, opening at the end of the first fourth of the body. Male genital apparatus of small size, copulatory organ much reduced. Female apparatus simple, with a small accessory vesicle. Eyes in two rows over the brain.

The position of this curious form amongst the Leptoplanidæ depends on negative rather than on positive characters. Its exact affinities are doubtful, and it is probably a degenerate organism.

Family Cestoplanidæ.

Cestoplana filiformis, sp. nov.

"15.2.01. Ribbon-shaped, about 1 in. × $\frac{1}{8}$ in. Creamy white with bright yellow border, and a median stripe of the same colour" (cf. *C. rubrocincta* for colour).

The "mouth" lies within 1·5 mm. of the hinder extremity.

Evidently closely allied to the Mediterranean *C. rubrocincta*,

but, I think, sufficiently distinguished by its much smaller size and yellow instead of red stripes. I have accordingly ventured to describe it as a new species, partly on account of the above-mentioned differences and partly on account of its different habitat. The genital organs, which are those of a typical *Cestoplana*, are not fully mature, but are at the same time sufficiently advanced to lead one to suppose that the specimen will not increase very largely in size.

Unfortunately the head of the only specimen has been damaged, so that it is not possible to determine the arrangement of the eye-spots.

Ommatoplana tuberculata, gen. et sp. nov. (Plate IX. figs. 5–7.)

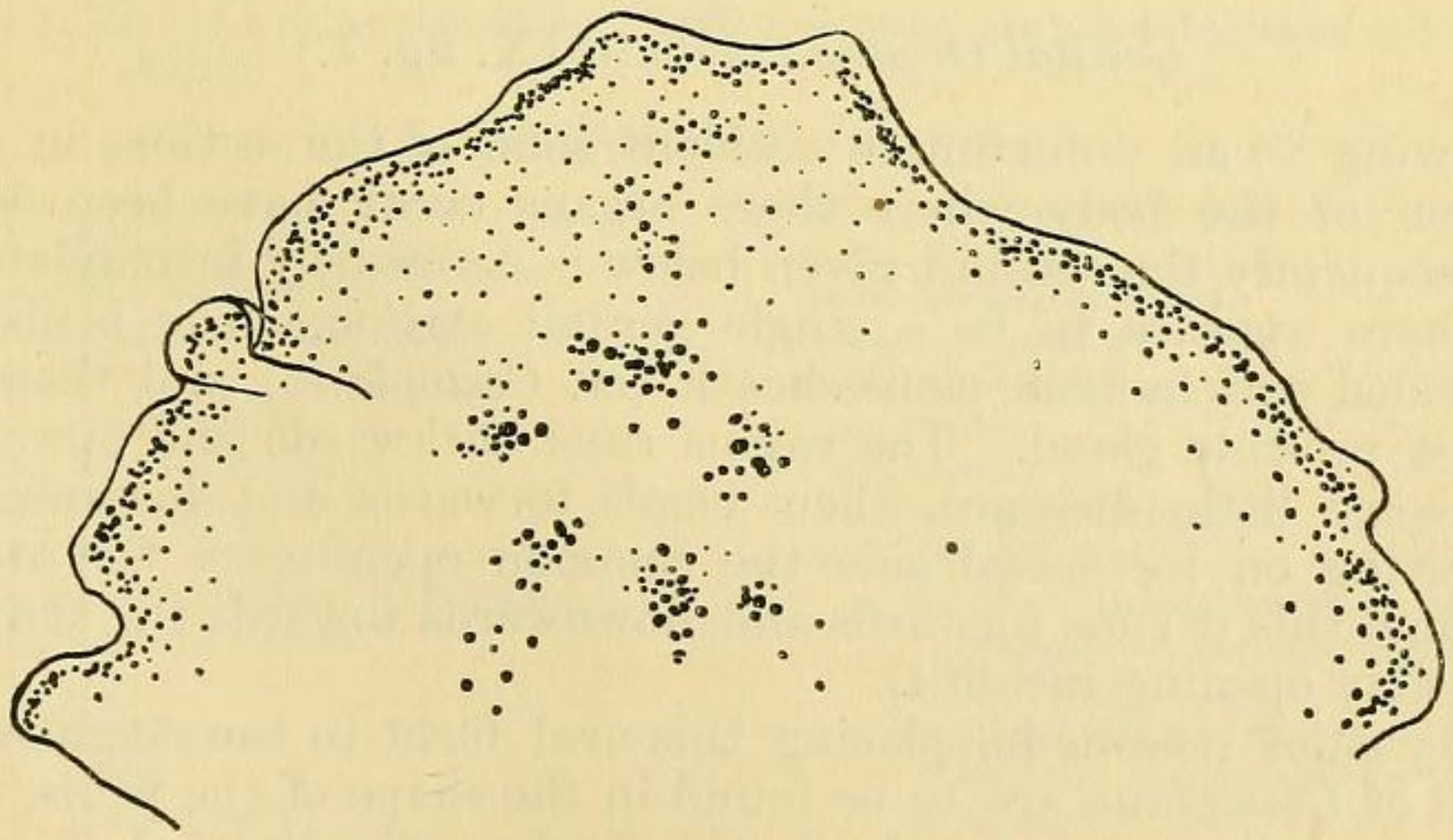
One specimen, immature. "Prison Island, 4.6.01. White, about 1 in. long, stiff and almost harsh to the touch when alive."

Length	26	mm.
Breadth	14	,,
"Mouth" from anterior end...	13·5	,,
♂ aperture from "mouth" ...	·75	,,
♀ aperture	?	?

The stiff texture of the specimen noted by Mr. Crossland is very obvious in the spirit specimen, and is due to the presence of large numbers of muscular wart-like projections on the dorsal surface.

The eye-spots are numerous and lie scattered over the anterior part of the dorsal surface. Their arrangement is shown in text-figure 7.

Text-fig. 7.



Anterior end of *Ommatoplana tuberculata*, sp. nov., to show the arrangement of the eye-spots.

The epithelium on both dorsal and ventral surfaces contains very numerous pseudorhabdites which stain deeply. Below the

epithelium lies a thick basal membrane which shows no trace of nuclei.

On the ventral side the muscles of the body-wall consist first of a very narrow outer layer of longitudinal fibres lying against the basal membrane. These are succeeded by an outer diagonal layer, which in turn is followed by a few circular fibres, and these by an inner diagonal layer, the fibres in this latter running at right angles to those of the outer diagonal layer. Lastly comes the thick inner longitudinal layer.

On the dorsal surface there are first a fine outer longitudinal layer, next a diagonal layer, and lastly a thick circular layer. Hence the dorsal muscles are somewhat similar to those of *Cestoplana*, the ventral are more highly developed (see Lang [**1**], t. 16. fig. 1).

The dorsal tubercles are more muscular and broader in proportion to their height than those of *Cycloporus*. They are covered with an epithelium, which about their base is similar to that of the rest of the surface of the body, but which towards their apices becomes flattened and loses its pseudorhabdites. Under the basement-membrane, which becomes somewhat attenuated on the tubercles, is a special layer of circular muscle-fibres. In the centre of each tubercle is a small quantity of tissue richly supplied with nuclei, and connected with the parenchyma of the body by a strand of tissue which pierces the muscles of the body-wall. This tissue is perhaps nervous in character (Pl. IX. fig. 6, x, y).

The pharynx is large and much folded. The "mouth" lies behind its posterior end, and communicates with the elongated pharyngeal pouch by a narrow channel. The gut-branches are numerous and lie at different levels (Pl. IX. fig. 6, g').

Genital Organs. (Plate IX. fig. 7.)

Owing to an unfortunate accident some of the sections in the region of the body where these organs occur have been lost. Consequently the account given below is necessarily incomplete.

There appears to be a single genital atrium. The penis is provided with a true penis-sheath (cf. *Cestoplana*), and there is also a prostate gland. The vagina runs backwards and upwards for some little distance, then bends forwards and downwards, receiving on its dorsal side the common opening of the uteri. Beyond this it runs forwards and downwards towards the atrium (possibly opening into it ?).

My chief reasons for placing this oval form in the neighbourhood of *Cestoplana* are to be found in the shape of the penis, the presence of a prostate gland, the backwardly-directed mouth-opening, and the disposition of the eye-spots. The thickness of the basement-membrane and the arrangement of the gut-branches and muscles of the body-wall are, I believe, indications which point in the same direction.

The genus *Ommatoplana* may be defined as follows:—

Body oval, covered on the dorsal side with numerous wart-like tubercles. Eye-spots scattered over the anterior third of the body dorsally. "Mouth" behind the pharynx. A single genital atrium. Penis provided with a true penis-sheath, without a stylet; prostate gland present, with thick muscular walls. Vagina provided with an accessory vesicle.

Literature.

1. Lang.—Naples Monogr. xi. 1884.
2. Verrill.—Trans. Connect. Acad. viii. pp. 459–520, pls. xl.–xliv.
3. Graff, von.—Zeitschr. wiss. Zool. lv. 1893, pp. 189–219, tt. vii.–x.
4. Plehn, von.—Jena. Zeitschr. xxx. pp. 137–176, tt. viii.–xiii.
5. Laidlaw.—Fauna and Geogr. of the Maldive and Laccadive Archipelagoes, vol. i. pt. 3, pp. 282–312, pls. xiv., xv. (1902).
6. Laidlaw.—Manchester Memoirs, vol. xlvii. pt. 2, no. v. (1903).

EXPLANATION OF PLATE IX.

Fig. 1. *Paraplanocera aurora*, sp. nov. (p. 102). × 1½.

Fig. 2. Section through the region of the male apparatus of *Disparoplana dubia*, sp. nov. (p. 103). The section is oblique, and hence it is possible to see the vesicula seminalis in the same section with the anterior end of the penis, which actually lies some distance behind it. The plane of the section is very nearly longitudinal.

Fig. 3. General anatomy of *Phylloplana lactea*, sp. nov. (p. 107). × 1½.

Fig. 4. Transverse section across the body of *Haploplana elioti*, sp. nov. (p. 109), in the neighbourhood of the pharynx.

Fig. 5. Anterior end of *Ommatoplana tuberculata*, sp. nov. (p. 111). × 5.

Fig. 6. Part of a transverse section across the body of *Ommatoplana tuberculata* passing through two of the tubercles.

Fig. 7. Part of a transverse section of ditto, showing the prostate, penis, and penis-sheath.

Explanation of Lettering.

a.m., antrum masculinum.
b., basement membrane.
ch.s., chitinous spines.
d.e., ductus ejaculatorius.
g., gut.
g'., gut-branches.
m.c., circular muscles.
m.d., diagonal muscles.
m.l.i., inner longitudinal muscles.
m.l.o., outer longitudinal muscles.
n., nervous tissue.
o., egg.
ov., ovary.
p., penis.
p.s., penis-sheath.
ph., pharynx.
ph.t., pharyngeal pouch.
pr., prostate.
ps.r., pseudorhabdites.
s., spermatozoa.
sh.gl., shell-glands.
te., testis.
ut., uterus.
v.s., vesicula seminalis.
v.d., vas deferens.
x, tissue of tubercle-process of *Ommatoplana*, perhaps nervous in character.
y, gap in muscles of the dorsal body-wall of *Ommatoplana tuberculata*.