h, fragment of the fibre, lateral view; *i*, the same, transverse section (diagrams).

Fig. 2. The same, from S.W. Australia. Fragment, natural size. *a*, lobule, magnified; *b*, subdermal reticulation; *c*, dermal termination of fibre.

Fig. 3. Pigmental cells of the Ceratina. *a*, dark opaque purple; *b*, light-coloured pinkish brown.

N.B. The opaque purple pigmental cells in this illustration are made *generally* dark for contrast, or as they appear under a low magnifying-power; otherwise their elementary composition is similar to that of the light-coloured pinkish-brown ones, with the exception of the pigment.

Fig. 4. Pigmental cells of *Dysidea fragilis*=*Spongelia*.

Fig. 5. The same, elongated, ? muscular.

Fig. 6. Filaments of the trama in *Chondrilla nucula* and *sacciformis*; ? filiform cells.

Fig. 7. *Spongilla*. Sponge-cells of the parenchyma containing fragments of carmine. *a*, carmine, after Metschnikoff (Zeitschrift f. wiss. Zoologie, Bd. xxxii. Taf. xxi. fig. 4).

Fig. 8. *Stelletta aspera* and *Dercitus niger*, pigmental cells of. *a*, nucleus; *b*, granules.

Fig. 9. *Chondrilla sacciformis*. Pigmental granules, in irregular groups as they occur, viz. without cell-definition.

N.B. Figs. 3–9 inclusive are on the scale of 1-24th to 1-6000th inch.

Fig. 10. *Luffaria*. Fragment of the fibre, to show the relative size of its component elements. *a*, granular axis; *b*, horny laminæ.

Fig. 11. *Aplysina fusca*. Fragment of the fibre, to show the relative size of its component elements. *a*, granular axis, tubular, membranous; *b*, horny laminæ; *c*, transverse section; *d*, granular axis; *e*, horny laminæ; *f*, fragment of granular axis, greatly magnified; *g*, transparent sarcode; *h*, granules.

Fig. 12. *Ianthella*. Fragment of the fibre, lateral view. *a*, granular axis; *b*, horny laminæ, chiefly composed of pigmental cells.

Fig. 13. The same. Fragment of small fibre, lateral view. *a*, granular axis; *b*, first horny lamina bearing a few pigmental cells.

Fig. 14. The same. Transverse section of the fibre, showing the horny laminæ and their pigmental cells edgewise. *a*, granular axis; *b*, horny laminæ.

N.B. Figs. 10–14 inclusively are all diagrams.

Fig. 15. *Dictyocylindrus laciniatus*, Mauritius. *a*, abortive development of the spicule; *b*, cells of the parenchyma. (Scale the same as that of fig. 1, *e*, for analogical contrast.)

XIV.—*On an Organism which Penetrates and Excavates Siliceous Sponge-spicula* (Spongiophagus Carteri). By Prof. P. Martin Duncan, F.R.S., Pres. Royal Microscop. Soc., &c.

In a communication which I made to the Royal Microscopical Society on June 8, 1881, the presence of green-coloured cells on siliceous sponge-spicula, in relation to minute penetrations into their axial canals, was asserted. The occurrence of a

granular plasma of the same tint within enlargements of the axial canals was noticed; and the penetration and erosion were stated to be due to the organism. The cells which were observed within hollows on the surface of spicula, and also on perfect spicula in positions where erosion from without inwards could readily occur, were very small,—not more than $\frac{1}{7000}$ inch in length, and very much less in height. Their dimensions, however, corresponded to those of certain circular patches with hollowed-out bases, which are the first stages of the penetration through the spicule down to the axial canal. The penetration of the spicule down to the central canal is followed by the growth of the organism, which appears to erode the silica and enlarges the canal in a most remarkable manner.

After a while the spicule suffers solution of its continuity by the thinning from within, and the thinnest flakes present a granulated appearance.

Since writing that communication I have observed siliceous sponge-spicula, obtained from great depths, which are affected by an organism whose cells are much larger and whose penetrations therefore are wider and much more visible. On the head of a large spinulate spicule I found many circular pits, each containing an organic mass without definite cell-wall, and yet granular and green in colour by transmitted light. These pits are shallow and are $\frac{1}{2000}$ inch in diameter. Similar pits and of the same dimensions are seen on other spicula; but they are deep and resemble cylindrical tubes with hollowed-out bottoms. Some reach the axial canal, which has become enlarged. The penetrations contain granular organic substance; and so do the enlarged axial canals. The walls of the enlarged axial canals are frequently very irregularly eroded and look "worm-eaten;" the hollows are, moreover, green with the very visible granular matter.

Thus there are two dimensions of the penetrations. The first kind of cell found on the spicula resembles somewhat the simple zoospores of *Achlya penetrans*, nobis (Proc. Royal Soc. vol. xxv. pl. vi.); the second is larger; and in both there is a decided green tint. No ramifications of the penetrating cylindrical tube occur; and it pierces perpendicularly to the surface of the spicule, or, it may be, slightly aslant.

The presence of pits on the surface of sponge-spicula was noticed by Kölliker as a peculiar degeneration of the structure. Dr. Carter described and figured pits in the outer part of a spicule, and distinctly referred them to the action of a vegetable cell, in the Ann. & Mag. Nat. Hist. ser. 4, vol. xii. p. 457, pl. xvi. figs. 8, 9. None of the pits seen by my

friend reaches the axial canal; but some of them terminate in globular excavations.

It is evident that the assimilation of the organic substance in the sponge-spicule by the vegetable organism produces the destruction of the siliceous structure; and probably the colloid silica unites with the protoplasm of the destroyer and forms an organic compound with it.

Large cells and small nucleus-like cells operate, producing penetrations of corresponding diameters through the spicula down to the axial canal. The vegetable growth occurs there; and the amount of erosion does not appear to be in relation with the size of the primary penetration.

The organism is not an *Achlya*; and all that can be said is that it consists of cell-like bodies without very definite cell-walls, but evidently with a very delicately limiting texture surrounding a granular greenish plasma, and that there is much free and non-cellular plasma with bodies like small nuclei, the whole having a faint green tint. I have named this very lowly organic substance (which is probably a plant) *Spongiophagus Carteri*.

XV.—*Contributions towards a General History of the Marine Polyzoa.* By the Rev. Thomas Hincks, B.A., F.R.S.

[Plates I.–V.]

[Continued from p. 14.]

Family **Escharidæ** (part.), Smitt.

Lepralia, Johnston (part.).

Lepralia cleidostoma, Smitt, var. *orbicularis*.

This form differs from Smitt's species in having a rather large circular avicularium, placed on an elevation at one side of the orifice and looking towards it, instead of a pointed avicularium. The oœcium of *L. cleidostoma* is described as striated; that of the present variety is usually smooth and silvery; but I have met with one which was distinctly marked by radiating lines or slight ribs. On the whole I can see no sufficient reason for separating the two forms.

Loc. Bass's Straits, abundant in the dredgings. [Florida (*Pourtales*).]

Lepralia Poissonii, Audouin. (?=*Escharella setigera*, Smitt.)

This species was figured by Savigny in his work on Egypt,