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I. Wissenschaftliche Mittheilungen.

1. Pigment Migration in the Eyes of Palaemonetes.

A preliminary notice [1].

By G. H. Parker, Instructor in Zoölogy, Harvard College, Cambridge, Mass., U. S. A.

eingeg. 23. April 1896.

The following results were obtained from experiments made upon *Palaemonetes vulgaris* Stimp. with the intention of determining the character of the changes induced in the pigment of the retina by the presence or absence of light and of ascertaining whether these changes were dependent upon the action of the central nervous system.

In the compound eye of *Palaemonetes*, each ommatidium consists of the following parts: two corneal hypodermal cells (Fig. 1, *crn.*) closely applied to the proximal surface of the corneal facet (*cta.*); a cone (*con.*), formed from four cells and occupying an axial position in the distal part of the ommatidium; two distal retinular cells (*cl.dst.*), containing black pigment and partly covering the sides of the group of four cone cells; a rhabdome (*rhb.*), occupying an axial position in the proximal part of the ommatidium and surrounded by seven proximal retinular cells (*cl.px.*), each of which contains black pigment and, after passing through the basement membrane (*mb.ba.*), extends as a retinal nerve

[1] Contributions from the Zoölogical Laboratory of the Museum of Comparative Zoölogy at Harvard College, E. L. Mark, Director, No. LXII.

fibre (*fbr.r.*) to the first optic ganglion (*gn.opt.*), where it terminates; and finally a few accessory cells (*cl.su.*) containing a whitish pigment and extending from the proximal part of the retina through the basement-membrane toward, but not into, the first optic ganglion.

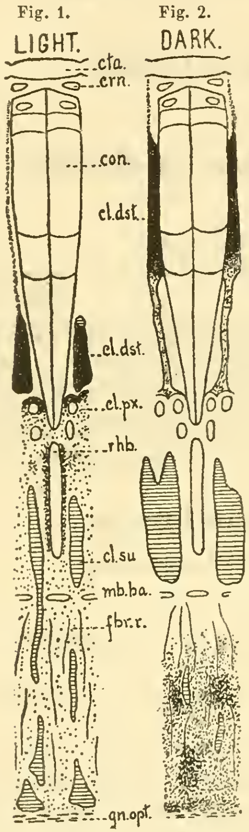

Fig. 1. Ommatidium from a retina subjected to the action of light for some-what more than two hours.

Fig. 2. Ommatidium from a retina kept in the dark for about the same length of time.

Abbreviations: *cl.dst.* distal retinular cell; *cl.px.* proximal retinular cell; *cl.su.* accessory cell; *con.* cone; *crn.* corneal hypodermal cell; *cta.* corneal facet; *fbr.r.* retinal nerve fibre; *gn.opt.* first optic ganglion; *mb. ba.* basement membrane; *rhb.* rhabdome.

In eyes which had been subjected to the light for somewhat over two hours, the pigment in the accessory cells (Fig. 1, *cl.su.*) showed two regions of concentration. one in the proximal part of the retina, the other near the distal surface of the first opticganglion. These were about equally conspicuous and usually connected by numerous pigmented strands. In an eye kept some two hours in the dark (Fig. 2), the concentration near the optic ganglion had largely disappeared, and the great bulk of the pigment was located in the proximal part of the retina. The movement of this pigment from the retina proximally to the position near the first optic ganglion, as induced by light, was accomplished in from forty-five minutes to an hour, and the reverse movement, which took place in the dark, was completed in from one and three-quarters to two hours.

In an eye exposed to light, the pigment in the proximal retinular cells (Fig. 1, *cl.px.*) was distributed almost uniformly through the retinal fibres and the bodies of the cells; there were, however, two slight concentrations, one at the distal ends of the cells and another around the rhabdome. In an eye kept in the dark (Fig. 2), the pigment was located entirely in the retinal fibres proximal to the basement membrane. The movement of the pigment from its proximal position to its distal one under the influence of light was accomplished in from thirty to forty-five minutes; the reverse movement, in the dark, required from forty-five minutes to an hour.

In the accessory cells and the proximal retinular cells, the migration of the pigment is not the result of a change in the position of these cells, but is due, I believe, to protoplasmic movements within the cells themselves redistributing the pigment. In the distal retinular cells, which are entirely filled with pigment, the changes involve an alteration in both the form and position of these cells.

In an eye subjected to light, the distal retinular cells (Fig. 1, *cl. dst.*) surround the axis of the ommatidium immediately in front of the proximal retinular cells. In this condition the body of each cell has a length of about 30 μ, and from it a single process, containing more or less pigment, reaches distally to the corneal hypodermis. In an eye kept in the dark (Fig. 2), the distal retinular cells occupy a position some 70 μ further distal and the body of each cell has a length of about 70 μ. In this condition the cell possesses, in addition to its distal process, a proximal one which reaches the distal ends of the proximal retinular cells. The proximal movement and the contraction of these cells under the influence of light, is completed in from one and a half to one and three-quarters hours. The reverse movement and the expansion of these cells, both of which changes occur in the dark, require from one and three-quarters to two hours.

When in a given animal one eye is exposed to light at the same time that the other is kept in the dark, the pigment of each eye adjusts itself to its appropriate condition, thus demonstrating the independence of the two eyes in this respect.

The results of pigment migrations can be observed in retinas of optic stalks which have been cut from the animals. Hence the brain is not essential to these changes. Similar conditions can likewise be observed in retinas cut from the optic stalks. The essential mechanism of these changes must, therefore, be located entirely in the retina, and is not only independent of the brain, but also of the ganglia in the optic stalk.

The preceding statements require one qualification. In many of the experiments on excised optic stalks and excised retinas, the pigment-changes, though noticeable, were only partial. This is due, I believe, not to the withdrawal of any influence from the central nervous organs, but to certain unavoidable conditions in the experiments — stoppage of the circulation, etc., accompanied with a gradual death of the tissues, which overtakes the retina before the pigment cells have completed their changes. That the central nervous influences are not at all necessary to the migration of the pigment, is shown by the fact that in several of the excised optic stalks and retinas these migrations were completely accomplished.

April 9, 1896.

2. La glande susoesophagienne de la Haementeria officinalis.

(Communication préliminaire.)

Par H. Bolsius, S. J., Oudenbosch (Pays-bas).

eingeg. 12. Mai 1896.

La *Haementeria officinalis* est une Hirudinée du Mexique, appartenant aux Rhynchobdellides. Bien des détails de son anatomie la rap-

Fig. 1.

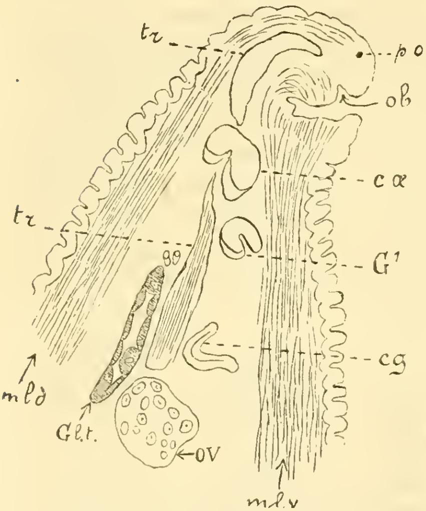

Fig. 2.

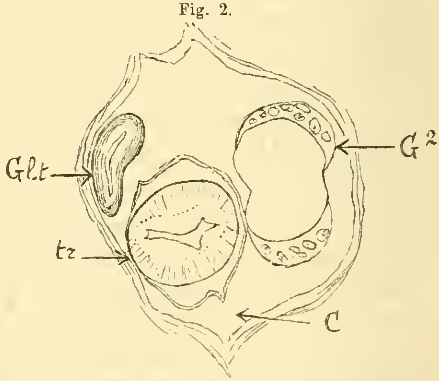

Fig. 1. Coupe longitudinale de la partie antérieure de la *Haementeria officinalis*, contenant à peu près 23 anneaux extérieurs. La coupe passe un peu à côté de l'axe du corps. *po.* Pigment oculair. *ob.* Orifice buccal. *tr.* Trompe, coupe tangentielle, interrompue par *C. oe.* Collier oesophagien. G^1. Premier ganglion. *cg.* Cordon ganglionnaire. *mlv.* Muscles longitudinaux ventraux. *mld.* Muscles longitudinaux dorsaux. *OV.* Ovaire. *Gl.t.* Glande tubulaire, impaire, susoesophagienne. Grossissement a* >< oc. ord. 2 Zeiss = ± 20 fois lin.

Fig. 2. Coupe transversale au niveau du 2me ganglion G^2. Elle représente uniquement le contour de la cavité *C* qui loge la chaîne ganglionnaire, la trompe *tr*, et la glande tubulaire *Gl.t.* Grossissement A >< oc. ord. 2 Zeiss = ± 50 fois lin.

proche des Glossiphonides, entre autres la position du canal efférent des testicules du côté dorsal, contrairement à ce que présentent les Hirudinides, les Herpobdellides, les Piscicolides, etc. (voyez Zool. Anz. No. 454. 1894.)

Une formation toute spéciale de la *Haementeria*, et que nous n'avons rencontrée jusqu'ici dans aucune autre Hirudinée, est celle que