

clearly visible after staining. The limits of the cells, however, remain indistinct. Below this outermost layer of indistinct cells, which has a thickness of 0·026 mm., and which appears to consist of a single layer of these cells, a striated structure is met with. This fills the interval between the central cavity and the outer layer of cells. The striæ are vertical to the outer surface, and indicate that this part of the organ is composed of the same narrow slender cells described above as forming the homologous part of the simple glands without pigment coat. There is a single layer of them; they are 0·03 to 0·05 mm. long, and in the thickened centre, where the elongate nucleus is situated, 0·0015 mm. thick.

It appears from this that the only structural difference between these organs and the regular, ocellar, simple phosphorescent organs without pigment coat is the absence of the pigment coat in the one, and the presence of it in the other kind.

c. Innervation.

The nervous plexus which surrounds these organs is connected with branches of the spinal nerves in the same way as has been described above in the case of the organs without pigment coat.

d. Function.

It appears that the radial tubes in the proximal portion of the organ, which are filled with granular cells, are true gland-tubes. These glands are comparable to the milk glands in mammals, inasmuch as the secretion which is formed does not appear as a segregation of the cells, but the whole of the cell is bodily converted into the substance of the secretion. The cell is pushed from the wall of the gland-tube which is always occupied by the youngest generation of cells; and when disconnected from the capillaries in the membrane of the gland-tube the cell undergoes a change. It loses its nucleus¹ and finally also its individuality, its substance joining that of other similarly degenerated cells. In this way the secretion which occupies the centre of the organ appears to be formed.

At the expense of this secretion or fuel, the slender cells above it may produce light. The outermost layer of indistinct cells with the highly colourable nuclei I consider to be a nervous layer composed chiefly of irregular ganglion cells; the slender cells appear to be innervated from them.

The fish can probably produce light in these organs at will. They do not emit light under ordinary circumstances when not excited to phosphorescence by the fish itself.

¹Ussow (*loc. cit.*) figures nuclei in the detached cells occupying the interior of the gland-tubes. I have not seen nuclei in the detached cells in *my* sections.