

take the shape of transverse bands, which are about 3 mm. broad, and divided from each other by darker zones in which the white organs are scarce. Within the bands the phosphorescent organs are on an average 0·7 mm. apart (from centre to centre).

Towards the ventral side these organs diminish in number and stand further and further apart, until they disappear altogether below the line formed by the upper row of composite phosphorescent organs on the side.

b. Structure.

Surface views and section-series reveal the structure of these organs (Pl. LXXII. figs. 34, 35, 37). They are mostly lens-shaped, flat and extended, and sunk into the skin of the fish for about half their height (figs. 34, 35). In other cases (fig. 37) they appear nearly hemispherical, are not sunk into the skin at all, their hemispherical surface projecting beyond the surrounding surface. The lower lens-shaped forms likewise project beyond the surface, but not so much (fig. 34). They are from 0·1 to 0·2 mm. high, and generally project about 0·07 mm. The flat lens-shaped form is predominant; the high forms being rare and intermediate shapes by no means common.

The circumference is usually spherical, sometimes slightly irregular, never elliptical.

These organs do not seem to possess any special membrane, the common cuticle passing *over* them, and the capillaries of the skin appear aggregated at the base of the organ, whence bloodvessels extend up into the organ itself. These are on an average 0·02 mm. apart, and converge towards the centre of the organ at right angles to the convex base. Between them radial tubes, rounded and closed at the distal ends, are situated, and these are filled with small granular spherical cells similar to those described by Ussow¹ in the gland tubes of the simple ocellar organs of *Gonostoma denudatum*. There is no difference between these cells and the homologous ones in the simple ocellar organs with pigment coat.

The tubes in which these granular elements are contained are polygonal pyramids, with their points cut off, and consequently their narrow converging ends, which are situated near the centre, are open. The broader rounded distal ends are attached to the tissue which is situated below the organ.

The walls of the tubes are thin membranes of connective tissue into which capillaries and nerves extend. The nerves are medullated, the sheath disappearing apparently at the points where the branches of these nerves enter the mass of granular cells.

In the material at my disposal the extreme nerve ends cannot be traced. Near the centre of the organ, above the terminations of these pyramidal tubes, there is an empty space extending right across the organ; it has a shape somewhat similar to that of the

¹ M. Ussow, Ueber den Bau der sogenannten augenähnlichen Flecken einiger Knochenfische, *Bull. Soc. imp. des Nat. Moscou*, t. liv. p. 98, pl. iii. fig. 11.