the phosphorescent organs situated below to be visible from the outside. The anterior perforation corresponds to the smaller anterior phosphorescent organ. This membrane extends over the phosphorescent organ for some distance (Pl. LXXI. fig. 27, *e*), the margin of the perforation being drawn out to form a kind of iris which is probably a movable sphincter membrane as in *Opostomias micripnus*. The whole organ lies pretty loose in a sac, which is divided about halfway down by a constriction into a proximal and a distal portion. Below the surface of the distal portion a pigment layer is observed, which is not continued downwards below the constriction as a continuous layer, but exists there only in the shape of scattered patches of pigment. The phosphorescent organ is situated in the sac, and consists essentially of three layers. There is firstly the innermost gland with reticulate structure (Pl. LXXI. fig. 27, *b*), forming a superficial layer of considerable thickness; it has the shape of a pouch, and is in contact with the inner surface of the proximal pouch-shaped portion of the cavity in which the phosphorescent organ is situated. The margin of this reticulate layer reaches up to the constriction. There is, secondly, a thick layer of light-reflecting spicules, perforated at regular intervals; and thirdly, the radial glandular contents of the pouch-shaped spicule-layer, which expands above to form the tangential or superficial portion of the organ (Pl. LXXI. fig. 27, *d*).

The basal reticulate structure is very peculiar, and nothing similar has been observed in any other fish. The reticulation is produced by a very regular network of pigment-threads (Pl. LXXI. fig. 30) which are associated with fibrous tissue, bloodvessels and nerves. The meshes are occupied by very irregular gland-tubes, which consist of a thin membrana limitans and one layer of ordinary gland-cells, which are about as high as broad. The lumina of these tubes were empty in the specimen examined by me. The thickness of this reticulate layer is greatest below in the fundus of the pouch, where it measures nearly 1 mm., and from this point its thickness decreases uniformly towards the margin. A stout nerve enters this structure from behind.

The spicule-layer (Pl. LXXI. fig. 29) presents a very curious appearance when seen from the surface, being perforated by oval holes of uniform shape and size, which are distributed over the surface in a perfectly regular manner. This layer is 0·1 mm. thick in the fundus of the pouch and thins out towards the margin, which coincides with the margin of the reticular layer and the constriction of the cavity in which the phosphorescent organ lies embedded. Through the perforations, which are 0·07 mm. long, 0·04 mm. broad, and 0·2 mm. apart, the secretion prepared in the reticular layer is poured into the upper portion of the organ, and also nerves and bloodvessels pass through them. The third layer, which forms the central and upper part of the organ, possesses a radial structure, particularly in its proximal part, which occupies the spicule-layer pouch (Pl. LXXI. fig. 27, *d*). The superficial portion shows vertical striations, the outermost layer appearing more granular than the rest. The state of preservation