

2. Simple, regular, ocellar phosphorescent organs with pigment coat, sunk in the body.

a. Distribution.

These organs have been found by me in *Opostomias micripnus* and *Pachystomias microdon*, scattered all over the body at intervals of from 1 to 3 mm. In *Echiostoma barbatum* they occur in double transverse rows on the dorsal and ventral sides of the body, while in *Malacosteus indicus* and in *Astronesthes niger* they are found on the ventral side only. In these species their extent is laterally limited by the lower row of composite phosphorescent organs.

Organs which belong to this group have been found by Ussow in *Gonostoma denudatum*,¹ *Maurolicus amethystinopunctatus*,² and *Scopelus rissoi*,³ and their position corresponds, according to Ussow, with that of the composite phosphorescent organs in other fishes. He seems to think that they replace the composite organs, without being aware that usually (except in *Sternoptyx* and *Argyropelecus*) they are present in great numbers together with the composite organs. Leydig has found such organs apparently in *Gonostoma denudatum*, according to the figure.⁴ He describes them, however, as having a reflector.

Ussow considers that these organs have a glandular nature and terms them "drüsenartige Organe." He considers them to be homologous to those which he believes to be accessory eyes. It seems rather difficult to understand how two similar and homologous organs should be so different as Ussow would make out in this case. Some of the "augenähnlichen Organe" of Leydig, those namely which are not composite, likewise belong to this group.

These authors, however, have paid much less attention to these structures than to the much more complicated and differentiated composite organs, particularly those with a reflector, and, consequently, the great and fundamental difference between the simple and composite organs has escaped their notice. Both seem to have considered the presence or absence of the reflector to be of paramount importance, and did not consider that some organs without reflectors were constructed on quite the same principle as others which possess a reflector.

b. Structure.

The structure of these organs has been described by Ussow,⁵ and his figure (pl. iii. fig. 11) gives a fair representation of the internal structure. Such differences

¹ M. Ussow, Ueber den Bau der sogenannten augenähnlichen Flecken einiger Knochenfische, *Mém. Soc. imp. des Nat. Moscou*, t. liv. pp. 97, 98, pl. iii. fig. 11.

² M. Ussow, *loc. cit.*, p. 101, pl. iii. fig. 12.

³ M. Ussow, *loc. cit.*, pp. 99-100, pl. iii. fig. 13.

⁴ F. Leydig, Die augenähnlichen Organe der Fische, p. 15, pl. i. fig. 6.

⁵ M. Ussow, *loc. cit.*