

fishes; and it is a remarkable fact that they are almost entirely absent in those which have the muciferous system most developed; thus, neither the Macruridæ nor the Ophidiidæ possess specialised luminous organs, probably because the mucus, which is so abundantly secreted, supplies a sufficient amount of luminosity. In the Berycidæ and Gadidæ we find only isolated instances, which remind us of the præocular or rostral organ of certain *Scopeli*. On the other hand, the Halosauri possess a wide lateral-line system with well differentiated luminous organs superimposed on it. In each of the families of Carangidæ and Alepocephalidæ one species only is provided with them. In the Pediculati luminous organs are of common occurrence and serve as lures to attract other fishes; they are most common in the Sternoptychidæ, Scopelidæ, and Stomiidæ, in which they have principally the function of enabling these fishes to illuminate their surroundings, more rarely of alluring other fishes. In the Murænidæ no luminous organs have been found; but in some of them the muciferous system is enlarged.

The luminous organs present many modifications as regards their seat, appearance and structure.

1. In their most primitive condition they appear as innumerable minute tubercles more or less raised above the surface of the skin, and covering the sides of the body; they are crowded together in transverse bands corresponding to the segments of the muscular system. This form occurs in *Echiostoma*, *Opostomias*, *Pachystomias*, *Photonectes*, *Malacosteus*. I suppose that the pores scattered over the skin of some species of *Ceratias* (*Ceratias uranoscopus*, *Ceratias carunculatus*) are apertures of follicles in which luminous mucus is secreted.

2. Larger in size, less numerous and more projecting beyond the surface, are the small nodules in the skin of *Xenodermichthys*; they are distributed over the head as well as the body, and follow, on the former, the muciferous ducts, whilst they are arranged in a quincuncial fashion on the body, and are wanting along the tract of the lateral line.

3. More differentiated are the eye-like spots, of a white colour in preserved specimens, and red or green during life, which are arranged at regular intervals in two series on the lower side of the body of the fish, and which occur also on the head, at the base of the branchiostegals and on the gill-cover. Their arrangement is constant within the limits of a species, and to judge from their external appearance they gradually pass into the next form. They occur in numerous genera:—*Gonostoma* (some species), *Chauliodus*, *Astronesthes*, *Stomias*, *Echiostoma*, *Opostomias*, *Pachystomias*, *Photonectes*, and *Idiacanthus*.

4. Still more differentiated are large round flat organs of a peculiar mother-of-pearl brightness, arranged like the former in rows on the lower side of the body and head, with isolated ones on the sides and on the opercles, and frequently with the addition of a short dorsal and ventral series on the peduncle of the tail. They are found in the