

of the snout. The barbel is inserted in front of the extremity of the hyoid bone; it is much longer than the head and terminates in a luminous organ, from which a short terminal filament arises.

Gills four, well developed, the laminæ on the posterior part of the horizontal branch of the outer branchial arch being shorter than the others. Gill-rakers in the shape of short spiny tubercles.

The distance of the vent from the root of the caudal is twice the length of the head. The anal fin commences immediately behind it, and terminates so close to the caudal that the extremities of some of its posterior rays touch it. The dorsal is coterminous with the anal in front, but does not extend quite so far backwards; both fins are about equal in height and lower than the tail between them. Caudal fin short, cleft, the lower lobe being the stronger. The upper pectoral ray is separated from the remainder of the fin by a short interspace; it is about as long as the head and has the terminal portion covered with a white luminous substance. The pectoral fin proper is extremely narrow, short, and in fact rudimentary. Ventrals much more developed, as long as the head; their root is nearer to the extremity of the snout than to the root of the caudal, but rather nearer to the vent than to the gill-opening.

The skin is naked, with conspicuous mucous openings on the top of the head, and a great number of luminous organs¹ which are arranged as follows:—

a. A series of small eye-like organs, which commences on the isthmus and runs along each side of the abdomen to the root of the caudal fin. It consists of five very small organs on the isthmus, thirty between the pectoral region and the ventral fin, twenty-two between the ventral fin and the vent, and about sixteen between the vent and the root of the caudal. Of these latter posterior organs some may be occasionally missing, all being very small.

b. The upper lateral series consists of eye-like organs, which in size and position generally correspond to those of the former series, but there is now and then a break in the series by one or more of the organs being absent. This series disappears altogether opposite to the anal fin.

c. A series of similar organs along the base of the branchiostegals.

d. An eye-like organ, isolated and somewhat larger than those described, between the operculum and suboperculum.

e. A still larger organ, between the upper jaw and the eye, so closely simulating an eye, that, from its external appearance, a cornea, iris, and pupil might be distinguished.

f. A great number of minute organs, some with a lighter centre, others being merely raised pigment-spots, scattered over the whole body and head.

g. It has been already mentioned that the terminal portions of the barbel and pectoral filaments are covered and slightly thickened by a layer of white luminous

² The histology of these organs is described in Appendix B.