to correspond with different depths, and that the light-organs are not peculiar to the deepest and darkest water-layers. Previously this belief was generally adopted because the light-organs were looked upon as a means of illuminating the dark abyssal region. Brauer indicates that of the six species of *Cyclothone* five are black and live in deep water, while one species (*C. signata*) is grey, lives in much shallower water, and has by far the largest light-organs (see Fig. 493, showing the small light-organs of the dark forms and the large ones of *C. signata*). Of the Scopelidæ, the surface forms of the genus *Myctophum* (s.s.) possess the largest light-organs, while the sub-genus *Lampanyctus*, taken in closing-net hauls by the "Valdivia" between 800 and 600 metres, has very small light-organs.

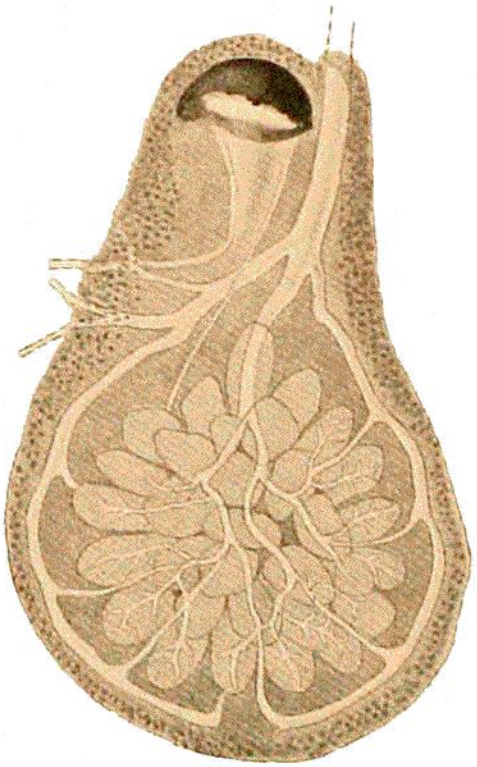

FIG. 494.
*Gonostoma rhodadenia*, Gilb. Photophore from upper lateral series ($\frac{8}{1}$).

If now we consider the captures of the "Michael Sars," and the vertical distribution of the fishes previously described, we see that our experience confirms Brauer's views. *Cyclothone microdon* with small light-organs was found much deeper than *C. signata* (see Plate I., showing these two forms, the difference between their light-organs being easily observed). Of special interest is Fig. 490, showing the vertical distribution of five black fish-species, two of which (*Gastrostomus bairdii*[1] and *Cyema atrum*) have no light-organs; *Gonostoma grande* has very small light-organs, while those of *Gonostoma rhodadenia* and *Photostomias guernei* are large (see Plate II., showing the two species of *Gonostoma*, Fig. 67, *a*, p. 86, representing *Photostomias guernei*, and Fig. 494, showing a light-organ of *Gonostoma rhodadenia* magnified). Besides these we found in our deepest hauls many forms without light-organs, for instance, species belonging to the genera *Aceratias*, *Melamphaës*, *Cetomimus*.

Light-organs are, therefore, specially characteristic of fishes belonging to the upper 500 metres in warm oceanic waters.

[1] On the tip of the tail this species is provided with an organ, the function of which is unknown; it has been regarded as a light-organ, but this does not alter our view.