

(see p. 95). Specially striking were the fishes *Astronesthes* and *Idiacanthus* occurring at the surface only at night. It was also very interesting to note the remarkable coincidence between the vertical migrations of the fishes and the development of their light-organs. Fig. 490 shows the vertical occurrence of five black fishes, each mark denoting the capture of one individual; in the case of *Gonostoma rhodadenia* and *Photostomias guernei*, a black dot denotes a specimen captured at night, while a ring-shaped dot denotes a specimen taken during the day. In *Gastrostomus*, *Cyema*, and *Gonostoma grande* only slightly developed light-organs, if any, are met with. In *Gonostoma rhodadenia* and *Photostomias guernei* particularly large light-organs are present (see Fig. 494 and Plate II.). Specially interesting is a comparison of the two species of *Gonostoma*, the light-organs along the side of the body in *G. rhodadenia* having a length of 2.5 mm., while in *G. grande* they are only 0.5 mm. long. Evidently we have here a type of deep-sea fishes, living in deep water, but with the power of migrating towards the surface. These forms have retained their well-developed light-organs, which in other black fishes of the deep sea must be considered as extremely reduced, perhaps even quite rudimentary, organs. A perfect analogy is found in the decapod crustacea. The deepest living species (see table on p. 668, Nos. 8-11) have no light-organs and make no vertical migrations. Light-organs, or organs which are believed to produce light, are found only in species living between 150 and 500 metres with a maximum distribution at about 500 metres. These species have been found much higher up in the water during the night than during the day, as is brought out quite clearly by the table.

During our southern cruise we might have had a good opportunity of making an exact study of vertical migrations by the aid of precise closing-net hauls, but time did not permit, though our isolated observations are very interesting, for instance those made at Station 48. While towing our big trawl all day at this station, we were continually taking hauls with surface tow-nets, the catches during the day consisting only of the common surface forms: *Ianthina*, *Pterotrachea*, fish eggs, pteropoda, radiolaria, etc.; but between 6 and 7 P.M. the nets suddenly captured a mass of small red copepoda, which during the day had been taken at about 70 metres. At Station 53, during the day, we captured only radiolarians at the surface; at 30 metres there were a few copepoda, no young