

c. Innervation.

The innervation is similar to that of the suborbital organs with reflectors to be described below. A stout nerve enters the inverted lobe of the organ (Pl. LXXII. fig. 40, *d*), and ramifies within it, its branches extending between the gland-tubes. From the fibrous layer, which separates the glandular from the epithelial portion of the tangential lobe, nerves extend into the epithelial layer and are joined to the ganglion cells at its base, which are in direct connection with the typical clavate cells.

d. Function.

The discovery of the clavate cells removes all doubt as to the phosphorescent nature of these organs. The gray sphincter membrane, which is non-transparent and movable, plays the part of a lamp shade, and acts like the iris of an eye. The fish can shoot forth a ray of light, modify its brilliancy, and illuminate such objects as are in the line of vision, but this ray may be immediately intercepted when the fish finds it advantageous to pursue its way in darkness. The phosphorescent organ has the same position as the eye, the optical axis of the two being parallel.

The organs of *Astronesthes*, on the other hand, are not nearly so highly developed, being only glandular; yet their appearance would lead one to suppose that here also the secretion of the gland-tubes is either constantly luminous or may be incited to phosphorescence at the will of the fish.

e. Development.

The position, and to a certain extent the glandular nature, of these organs render it probable that they have been developed from that portion of the slime-canal system which is situated in the suborbital region.

12. Suborbital organs with reflector.

The phosphorescent organs belonging to this category are the largest and most highly developed known.

a. Distribution.

As the name implies, they are found in the suborbital region, a larger and a smaller one generally occurring on each side. They have been found by me in