

rows, on the head, &c., are slightly larger and more conspicuous than the others. The average measurements are :—

Radius of spherical portion,	0·15 mm.
Radius of stricture,	0·08 „
Depth of cup,	0·4 „
Radius of orifice of cup,	0·25 „
Focal length of the paraboloid reflector,	0·08 „

They are accordingly larger than the simple organs, yet much smaller than the much more highly differentiated composite phosphorescent organs, with reflectors, found in *Argyropelecus*, *Scopelus* and *Sternoptyx*. They are intermediate between these two kinds in size and differentiation of structure. The whole organ is covered, with the exception of the exposed outer surface, by a dense layer of pigment very similar to that described above as forming the sacs which enclose the simple phosphorescent organs. This layer is about 0·02 mm. thick, and it is most dense at the stricture; round the lower spherical part its thickness is greater than in the wall of the cup. Towards the margin (Pl. LXIX. fig. 3) it becomes very much thinner. This pigment is the same as that in other parts of the skin. There is a layer of pigment just below the outer surface and there are thin layers of it parallel to the *outer* surface further down which join the pigment coat of the phosphorescent organ. The nerves and bloodvessels penetrate the pigment coat. A thin but very distinct membrane (Pl. LXIX. fig. 3, *m*) is found within it, which clothes the whole of the inner surface of this coat. It is very thin, being only 0·0015 mm. in thickness, but it is conspicuous in sections in consequence of its high refractive power; it replaces functionally the complicated reflectors observed in the more highly differentiated phosphorescent organs.

The outer surface is closed by a continuation of the ordinary cuticle, which is convex (Pl. LXIX. fig. 3, *b*) and appears as an immovable cornea. Below this, *two* other thin membranes are found, the outer one of which is structureless like the cuticle, whilst the inner one consists of cells (Pl. LXIX. fig. 3). In the specimens at my disposal, these membranes were generally folded and appear collapsed, but it seemed to me that in the living state the space between the innermost and intermediate membrane (Pl. LXIX. fig. 3, *d*) is probably filled with a kind of corpus vitreum, traces of which have been observed by me in some of the sections. In that case this structure would be a *lens*. Its development, however, seems subject to specific variations. Ussow¹ in his figure of the organ in *Stomias anguilliformis* indicates a structure corresponding to that observed by me particularly in *Astronesthes niger*. I am not prepared to say to what extent the differences between these structures in different species may be due to differences in the state of preservation of the various specimens.

¹ M. Ussow, *loc. cit.*, pl. ii. fig. 10B.