There can be no doubt that these structures in the species examined by me are in no way similar to those described by Ussow; I find, however, a difference between them and the gland-tubes of the internal spherical part, which has not been noticed by Leydig.

At first sight it appears that the radial lines in the part occupying the cup are much closer together than in the interior of the sperical portion of the phosphorescent organs. Spherical cells, as in the latter part, cannot be distinguished so readily in the cup, and the substance also seems to be more transparent and less granular. The radial stripes are much closer together in *Echiostoma* than in *Astronesthes*.

The structure of this part of the organ is the following :—

From the disc of large granular cells, situated at the constriction, fibres originate, which extend upwards in a vertical direction towards and nearly to the outer surface, terminating 0·04 mm. below it.

They extend below to a trumpet-shaped, thickened base, and become more and more slender distally. They are in direct connection with the substance of the basal disc, and interspersed with granular spindle-shaped cells which appear more abundant in the basal than in the distal part of the fibres. These spindle-shaped cells have spherical nuclei identical with the nuclei in the cells of the disc. The bulk of the fibres seem to be composed of nerves; bloodvessels have not been observed in them.

The fibres are on an average 0·025 mm. apart. Their structure is very transparent and they appear closer than they really are in longitudinal sections, because one generally sees several layers of them, but transverse sections show their true distance.

Attached to each of these fibres are cells, generally long and slender but sometimes also stout and spindle-shaped, in such a way that one layer of them encloses each fibre. These cells appear to be attached to the fibres by one of their ends and they project from the fibres like the hairs on the tail of a squirrel. Sometimes, particularly when the cells are very slender, they extend nearly parallel to the fibres and produce the closely striated appearance of this structure which is observed in some cases (Pl. LXXI. fig. 33). Sometimes, particularly where the cells are stout, they radiate from the fibres in an oblique direction, never exceeding an angle of 45°, and they invariably point outwards.

These cells are very tender and transparent, their nuclei easily escape observation in specimens not specially preserved, and their contours can only be distinguished by means of very fine sections and good lenses. Under ordinary circumstances this whole mass appears structureless and granular.

If we now compare this description with the statements of Ussow and Leydig, mentioned above, we find that although the differences are great, still the observations are not altogether incompatible.

Ussow's observation of the organ in the fresh state in *Chauliodus* shows us that there is a transparent substance with radial lines in this part of it.