

It appears highly probable that the whole structure is very transparent in the fresh state, and that the delicate cells, which appear granular in spirit specimens, are then difficult to distinguish. Perhaps Ussow has failed to see their contours and nuclei. The radial fibres described by him entirely correspond to the fibres observed by me.

Leydig represents this structure in his figures as consisting of radial tubes, which he considers as glandular.

Between the squirrel-tail-like columns of cells with the central fibre, very slender membranes, likewise containing nerves as well as capillaries, are found. These membranes coalesce with the watch-glass-shaped external portion of the membrane and are thickened near their base. They divide the fibres with their cell columns completely, as may be observed in longitudinal, but much better in transverse sections which are properly stained.

These polygonal tubes are identical with the tubes observed by Leydig and are not so distinct as the gland-tubes of the spherical part, but similar to them.

Ussow has not observed them, whilst Leydig and myself have found them without exception. According to Leydig, however, they are filled with spherical granular cells, similar to those in the proximal spherical portion of the phosphorescent organ. Leydig's material was not very good and this statement must therefore be accepted with caution.

c. *Innervation.*

Leydig¹ has discovered the mode of innervation of these organs. According to him, a thick nerve enters it by penetrating the pigment coat and intima, *near the central constriction*, which divides the spherical from the cup-shaped portion. It then spreads out and joins the granular mass in the centre.

To these observations, which I can corroborate, I have to add that the nerve is a branch of a spinal nerve, and where there are two composite organs on each side of each segment, the nerves supplying them join a little way above the upper organ of the two. They are the thickest branches of the spinal nerves, and all other branches originate from them in such a way as clearly to indicate that they form the stem of the distal two-thirds of the spinal nerve. The two composite phosphorescent organs appear to be situated at the terminations of the two main branches into which the spinal nerve divides.

I have mentioned above that Leydig's "central granular mass" is identical with the granular secretion in the centre of the spherical glandular portion, *together with* the disc of large granular cells situated in the constriction. The nerves of course terminate *in the disc*, and not in the secretion. Here they become non-medullated. Other, but very much smaller and quite insignificant nerve-fibres are also found attached to the spherical

¹ F. Leydig, Die augenähnlichen Organe der Fische.