

deposits corresponds with the point of insertion of a rod. They are disposed with much regularity, and at distances varying with the greatest breadth of the corresponding rods; thus, where the rods are narrow and cylindrical, the pigmentary deposits are placed close together, while they are much more widely separated where the rods are broad and club-shaped. As mentioned above, I have never found these pigment-granules definitely within a rod (as described by Greeff) nor removed far within the inner surface of this layer. I believe that the pigment is placed entirely outside the rod, and that it probably travels farther inwards during exposure to a bright light, behaving similarly in this respect to the granules in the pigment-layer of the vertebrate retina (Kühne). In this way may be explained how Greeff has found pigment quite near the end of the rod. His specimens were frequently examined fresh, consequently just after exposure. The Challenger specimens were probably collected along with a good deal of other material, and soon transferred to the preserving fluid, instead of being kept alive and examined in a good light.

Instead of being uniform in thickness, the pigment is in some places arranged in the form of large hemispherical bodies, the flat surface of each being turned inwards, and corresponding with the insertion of three or more rods. A collection of dark granules is found at the insertion of each rod here as elsewhere, but between this and the outer rounded surface of the hemispherical body there is a line showing much less pigment than elsewhere. This lighter area evidently is due to the presence here of the outer end of the rod or a prolongation inwards of the columnar layer (Pl. XXXIII A. fig. 10). This can be seen distinctly in a transverse section (Pl. XXXIII A. fig. 15; Pl. XXXIV A. fig. 4), where we get a small, round, clear spot in the same situation.

Near the periphery of the retina, and connected with the tapering rods above mentioned, the pigment-layer consists of large globular masses each formed by a collection of very dark granules. The granules are oval in shape and of considerable size, measuring one micromillimetre in length and half a micromillimetre in breadth (Pl. XXXIII A. figs. 11, 16, 17, 18). On each side of this part of the retina, reaching the extreme periphery anteriorly, and becoming continuous with the layer connected with the club-shaped rods posteriorly, the pigment is of a uniform reddish-brown colour, without dark aggregations of any kind (Pl. XXXIII A. figs. 16, 18).

I believe that this layer is of the nature of a cellular membrane, containing nuclei at intervals, but not necessarily one for every dark pigment-aggregation by any means. In support of this belief I would direct attention to Pl. XXXIII A. figs. 10, 12, 14, 15, 16, 18, 20, 21, and Pl. XXXIV A. figs. 1, 4, 6. In nearly all these figures we have an indication of such a structural condition, but the division of the pigment into cell-areas is particularly observable in Pl. XXXIII A. figs. 12, 14, 15, 16, 18, 21, and Pl. XXXIV A. fig. 6. In Pl. XXXIII A. figs. 12 and 16 the divisions are small, one apparently corresponding with the insertion of nearly every rod; while in figs. 14, 15, and 21 there