closely like that of the pearl spot on the tail of *Scopelus humboldtii*. These phosphorescent organs or "Leuchtorgane" differ from the glass-bead organs in having no gelatinous refractive media. They have the pigment capsule, the blood-vessels, and the layer of polygonal elements, with metallic glance, like the glass-bead organs, and inside this layer a layer of substance which is to be regarded (Leydig, *loc. cit.*, p. 73) as a specialisation and expansion of the spindle-shaped plate of the glass-bead organs.

This inner substance ought to be homologous with the rod layer in *Ipnops*, but unfortunately its structure as described is very indefinite, probably from the imperfection of the material used. In the phosphorescent organs of *Scopelus rafinesquii* it is stated to be a grey layer of a peculiar transparent homogeneous fine granular substance. In the pearl spot organ on the back of the tail of *Scopelus humboldtii*, it is said not to be composed of cell elements, but made of very finely granular material traversed by channels through which the blood-vessels pass. Nevertheless, on side view, an appearance is seen as if it were composed of pear-shaped elements (Leydig, *loc. cit.*, pp. 53, 54). From the figure given of the microscopical structure of this layer (Leydig, *loc., cit.*, Taf. x. fig. 61), and the description of its peculiarities, it seems possible that it may eventually prove to be made up of fine rods something like those composing the rod layer in *Ipnops*. The small blood-vessels traverse the layer just as in the case of the rod layer of *Ipnops*. Leydig describes the cell elements lying next to the tapetum in the eye-like organs of some fishes as approaching in form and power of refraction the crystalline rods of Arthropoda; these must surely be identical with the rod bodies of *Ipnops* (Leydig, *loc. cit.*, p. 80).

On the whole, it seems not unlikely that the remarkable head organs of *Ipnops* are to be regarded as highly specialised and enormously enlarged representatives of the phosphorescent organs on the heads of such allied Scopelidæ as *Scopelus rafinesquii* and *Scopelus metopoclampus* (Leydig, *loc. cit.*, Taf. x. figs. 55, 56). It may be conceived that in *Ipnops* the supra-nasal and subocular phosphorescent organ of these species on either side have united and become one, with the result of the total obliteration of the eye. In *Scopelus metopoclampus* there is a notch which nearly separates the subocular organ into two parts. In the organs of *Ipnops* there is a similar notch due to an incursion inwards of their pigmented borders on either side (see Pl. LXVII.), but it lies on the outer, not on the inner margin of each organ.

The phosphorescent organs in *Ipnops* lie entirely outside the cavity of the cranium, although they sink over part of their anterior region into two cavities on either side of the median septum of the skull. Posteriorly they lie quite close to the skin surface on the top of the cranial wall. The margins of the rod layer and pigment layers are everywhere superficial. The exact extent to which the transparent roof of the organ is ossified was not made out, as no specimen was available for maceration. The organs are