to the original one which the muciferous system fulfils in the ordinary type of surface fishes. Considering that the majority of the localised and more highly specialised luminous organs are situated within the area of, and stand in relation to, the muciferous system, we may be justified in assuming that one of those additional functions is to surround the fish with luminosity, the more so as the mucus has been actually observed to have phosphorescent properties in newly caught specimens.

The so-called phosphorescent organs or luminous bodies have been noticed ever since the first species of *Scopelus* and other pelagic genera were described; but they were regarded as peculiar pigment spots or modified portions of the scales. Many species of *Scopelus* possess, beside the round mother-of-pearl-coloured spots, a pair of whitish gland-like bodies on the upper side of the snout; and it seems that Cocco was the first to assert that these bodies have phosphorescent properties. He mentions[1] these organs as "apparecchio lucido," and one of the species possessing them he named "*Nychtophus metopoclampus*." Bonaparte copied Cocco's accounts, and Valenciennes[2] adopted his views as to the function of these organs. In 1864, when engaged in the systematic arrangement of the fishes of the families Sternoptychidæ, Scopelidæ, and Stomiatidæ, I. ascribed phosphorescent properties to all these organs, whilst from their histological examinations Leuckart[3] and Ussow[4] declared them, or at least part of them, to be accessory eyes. Leydig[5] holds the opinion that they are "pseudo-electric" organs, which sometimes may have the function of emitting light; Emery[6] adopts the view of their phosphorescent nature in *Scopelus*. As these organs occur, not only in deep-sea fishes, but also in nocturnal pelagic forms, their function might have been expected to be readily ascertained by actual observation; however, so far as I am aware, this has been done twice only, viz., by myself, when I happened to notice distinct flashes of light to issue from a dying specimen of *Scopelus* floating on the surface in the British Channel; and by Dr. Guppy,[7] who examined some freshly caught specimens of the same genus.

During my examination of the Challenger fishes I found the luminous organs widely distributed over the various organs of the body, and discovered especially their presence, in a unique modification, in a genus of Alepocephalid fishes (*Xenodermichthys*), as well as in the Halosauridæ, in which their relation to the muciferous system is undeniable. Finally, Lütken[8] suggested that the white terminations of the dorsal tentacle of *Himantolophus reinhardti* may be phosphorescent during life, which undoubtedly they are.

Luminous organs are not equally distributed among the various families of deep-sea

[1] *Nuovi Ann. d. Sci. Nat.*, 1838, tom. ii. p. 184.
[2] Cuv. Val., vol. xxii. pp. 443, 444, 445.
[3] Ueber muthmassliche Nebenaugen bei einem Fische, *Bericht ü. d. Versamml. deutsch. Naturf.*, 1864.
[4] *Bull. Soc. imp. des Nat. Moscou*, 1879, vol. liv. p. 79.
[5] Die augenähnlichen Organe der Fische, 1881, 8°, Bonn.
[6] *Mittheil. Zool. Stat. Neapel*, vol. v., 1884, p. 471.
[7] *Ann. and Mag. Nat. Hist.*, vol. ix., 1882, p. 202.
[8] *Vidensk. Selsk. Skriv.*, vol. xi., 1878, p. 341.