

possessing two abductors and a very strong, thick and long adductor, the inner branch having simple and very weak muscles.

Notes are given (pp. 465-6) on the nerve-system as displayed in *Goplana polonica* and the varieties of *Gammarus pulex*. The "auditory hairs" on the upper antennæ of *Callisoma branickii* are minutely described, and from their likeness in structure and nerve-apparatus to the auditory hairs and auditory nerves of the Decapods, as described by Hensen, it is argued that a like function may be reasonably attributed to these organs in the Amphipods, notwithstanding Leydig's doubts on the subject. The plumose hairs of the last uropods are not considered to have anything in common with the function of hearing. A detailed account is given of the antennary nerves in *Callisoma branickii*.

In describing the so-called "calceoli," the author refers to the work of Dybowsky as showing in agreement with his own observations that these organs are to be found sometimes on the upper as well as the lower antennæ, and in the female as well as the male sex. He thinks it clear that the "trumpet-mouthed auditory cilia" on the upper antennæ of *Gossea microdeutopa*, Sp. Bate, and the oval "auditory cilia" on the upper antennæ of *Bathyporeia robertsoni* of the same author, are really "calceoli."

In *Callisoma branickii* the calceolus presents a thin-walled, flattened, pedunculate vesicle, nearly of the same form as figured for *Gammarus pulex* and *Gammarus neglectus* by de la Valette, G. O. Sars and Leydig. A large circular ganglion-cell lies close to the base of the calceolus, but the entrance of the nerve into it could not be made out. In the peculiar lanceolate calceoli of *Goplana polonica*, nerve-fibrillæ were traced right to the sharpened rims of these organs, with a fan-like distribution. The calceoli are here regarded as apparatus for smelling in agreement with the view of G. O. Sars. [This view had earlier been advocated by de la Valette and by Bate and Westwood, Brit. Sess. Crust., vol. i. p. 87, 1863; H. Blanc would refer them to the sense of hearing.]

In *Hyale jelskii*, the author found on the front rim, both of the outer and of the inner lobe, of the second maxillæ three rows of bristles, each row consisting of differently formed bristles. In the uppermost row no connection was found with the nerves, but in the lowest and middle rows this connection was made out, and the suggestion is offered that the lowest row are perhaps organs of touch and the middle row organs of taste.

Numerous observations are given (p. 511 f.) on the intestinal canal and its appendages. The whole length of this organ appears to be sheathed in a layer of the adipose tissue (Leydig's *serosa*). The muscular covering of the mid-gut consists chiefly of transverse threads, that of the hind-gut of an outer layer of transverse, and of inner, thick, separate, longitudinal muscles. The membrana propria of the mid-gut is very thin, that of the hind-gut thick, consisting of a transparent, homogeneous matrix, including groups of spindle-shaped cells which run out into thin, long processes at both ends. In the central part of the mid-gut he believes that no cuticula or intima exists. [In the Caprellidæ Mayer (p. 147) finds, apparently throughout, a fine, not chitinous, intima.] Between the mid- and hind-gut is an outer projection and an inner, ring-shaped flap or valve, with its free edge directed backwards, so that what is passing through the body can easily go from the mid- into the hind-gut, but not easily on the reverse route. In *Pallasea cancellus* the hind-gut has six rows of dilators (not to be confounded with sphincters).

The appendages of the intestine are next discussed. The cæcal diverticulum behind the stomach is designated neck-gland (Nackendrüse.) To this expression Mayer takes exception as not very appropriate. Mayer also remarks that in the Caprellidæ there are at this part of the intestine not one diverticulum only, but a pair. The muscles, cells and vesicles of the liver-tubes are minutely described. The cylindrical glands, opening, according to the author, at the beginning of the hind-gut, close behind the above-mentioned valve, are called rectal-glands (rectaldrüsen.) The view of G. O. Sars that these cylindrical glands are homologous