

the other species of *Niphargus*, and, indeed, from *N. puteanus*, as in its shorter antennæ, the differently formed hand of the last pair of limbs, etc.; so that, perhaps, our species may be regarded as the representative of a new genus between *Niphargus* and *Gammarus*." This, however, he does not establish, but remarks that "*Niphargus caspius* is very probably the 'extinct Gammarid' (see Leydig, Ueber Amphipoden und Isopoden, Zeitschr. f. wiss. Zool. xxx. p. 249) which the other species of *Niphargus* have as their ancestor."

Defective eyes, Grimm explains, are compensated for by other sense-organs; for example, in the male of *Niphargus caspius* the five-jointed main flagellum of the upper antennæ has on its first four joints very large olfactory cylinders, with an aperture at the free extremity of each, "from which, perhaps, as Leydig states, thin hairs may actually be exerted; and from within a nervous branchlet penetrates into each cylinder, and forms a cellular inflation (in the cylinder itself) only to disappear immediately afterwards, as I have observed still better in living examples of another species, namely *Gammarus priscus*, mihi, at Krasnovodsk." The species of *Onesimus* being mud-burrowers "have no sense-organs on the antennæ and other external parts of the body, as in *Niphargus*," but, on close examination, "we find very highly developed, although concealed, sense-organs on the outer lamellæ of the maxillipedes, which have already been described or figured by different authors. These are short thick stumps with rounded ends, which stand in corresponding cylindrical depressions of the lamella, from which they usually have only the rounded portion projecting. Some of them, however, appear much longer, inasmuch as they project more and also have the extremities more acute; these are the two cylinders standing at the apex of the lamella, which present a transition towards the ordinary setæ, and thus also prove that we have to do with chitinous setæ metamorphosed for a particular purpose." These he proposes to call "taste cylinders."

1880. GROBBEN, CARL.

Die Antennendrüse der Crustaceen. Separat-Abdruck aus den Arbeiten des zoolog. Instituts zu Wien, Tom. III. Heft 1. 18 pp. m. 1 Taf. 1880.

The antennary gland, originally discovered by Leydig, *Naturgeschichte der Daphniden*, 1860, is described as consisting of two histologically distinct parts, a terminal pocket, *Endsäckchen*, and a convoluted tube, *Harnkanälchen*, which, for the Amphipoda, opens in the well-known generally cone-shaped process of the compound basal joint of the lower antennæ. In *Gammarus marinus*, Grobben says, the terminal pocket lies in the dilated basal-joint of the lower antennæ, quite close to the integument, connected with it by trabeculæ. Its shape is reniform; at the hinder end, comparable to the hilus of the kidney, rises the renal tube, which at first runs a short space back, then bends forward, at the same time inclining towards the middle, presently turns upward, again turns back downward, and now in a great arc winding close to the terminal pocket, after a short geniculation runs into the antennary cone, in the apex of which the gland has its outlet. The terminal pocket is lined by an epithelium, the cells of which are arched forwards into the interior of the pocket. The protoplasm is coarsely granular. The exterior is sheathed in a delicate supporting membrane. The protoplasm of the cells lining the renal tube shows a finely fibrous structure, as already noticed by Weismann. The nuclei are oval; towards the cavity the cells were covered by a noticeable cuticula. The terminal section of the tube is formed by cells which completely agree with the matrix-cells of the skin, and which also develop a chitinous cuticula, which passes direct into the cuticula of the skin. This terminal section, which in structure does not agree with the renal tube, but shows the