

shows a pale, fine structure, but no opening. They may be seen on the flagellum of the lower antennæ of *Gammarus puteanus*.

4. Riechzapfen. These olfactory tubes are on the flagellum of the upper antennæ. They have a narrower dark-rimmed stem and a paler, broader body, in which there is a slight indentation at about midway. A cloud of fine granular substance may sometimes be seen issuing from the terminal aperture.
5. Schuhartige Anhängsel. Calceoli. These shoe- or slipper-like stalked appendages are supposed to belong only to the lower antennæ of the male, but it is now known that they occur on both pairs of antennæ and in both sexes.

In the ordinary bristles, called by de Rougemont tactile bristles, Leydig could not find a nerve, though inclined to regard both the bristle and still more the fine offshoot near the tip as the sheathing of a nerve-end. That Claus should have seen the nerve in other Crustacea [the Argulidæ] he thinks open to doubt. This doubt Claus criticizes in "der Org. d. Phron. p. 10-11, n. The plumose bristles Leydig had always regarded as tactile bristles, having in other subjects shown how they were placed upon indubitable ganglia. If the view of recent observers, that these are auditory hairs, be justified, the sense of sound, Leydig infers, must be distributed over a considerable portion of the surface of the body, a conclusion not of necessity to be rejected.

He defends his attribution of an olfactory function to the "Riechzapfen" against the objections of Graber in 1877. In the lower animals he considers that the different senses are not necessarily very sharply distinguished, so that one and the same nerve-end-apparatus may serve for the sense of touch, taste and smell, may even not be quite inaccessible to light and sound. He illustrates his meaning by the popular use of the German word "Wittern" (compare English "savour") employed sometimes of taste and sometimes of smell.

In *Gammarus fluvialilis* and *Gammarus pulex* he thinks the eyes are pretty much alike in shape. In both the cornea is smooth and without facets. The crystal cone, he says, consists of four pieces, which can scarcely be correct; see Note on Grenacher, 1879. In view of the very varying statements of authors on the eye of *Gammarus puteanus*, he made investigations from which he determines that the optic ganglion is present, but not the eye, though pigment-spots mimicking the eye have led some observers to believe that an eye existed in fact.

Under the heading, "Ueber die Schalendrüse," Leydig reminds us that in his Naturgesch. d. Daphniden, 1860, pp. 28, 29, he had described his discovery in *Gammarus* of the homologue of the "green gland" in *Astacus*, but when he says that O. Sars seven years later only knew of the presence on the lower antennæ of "un procès conique dirigé en bas et appelé l'épine olfactoire," he is very much in error as to the state of Sars' knowledge. See Note on Sars, 1867. Claus, in 1879, objects that the name "Schalendrüse" has no sense when applied as by Leydig to the gland in the base of the antennæ, "sondern passt lediglich für das in die Schale gerückte Drüsenpaar der Phyllopoden, welches der Kieferregion gehört." The pair of glands corresponding to the shell-gland is entirely wanting, he adds, in all developed Malacostraca, and has hitherto been made out only during the larval life in *Sergestes* and *Euphausia*, while on the other hand in the *Phyllopoda* and many other Entomostraca the antennary gland corresponding to the green gland of *Astacus* only exists in the larval stage, but afterwards becomes completely degraded (Der Org. d. Phron., p. 13).

On the digestive system, Leydig recalls the investigations he had described in 1855 in regard to the stomach, histological structure of the intestine, liver and adipose body. He here remarks that the fat-drops are always colourless, and that in the fatty body of the body cavity, round the intestine, there are besides the fat-drops also layers of those concretions