

larvæ of workers (which are barren females) and converting them into queens by feeding them with peculiar food, used only for such as are destined for sovereignty, and as the working ants are also *barren* females,—is it probable that the ants have the power by selecting one of their number to convert her into a *fertile* female by the means of some peculiar treatment which may cause the more full development of those organs essential for impregnation? I am aware in the case of the bees this is accomplished in infancy; still, as the *matured* workers have the *female* organs *perfect*, though in a comparatively *low* state of development, is it irrational to suppose, that when circumstances make it necessary, even at a *later* period of life, these same all-important parts may be stimulated and rendered fit for the accomplishment of so desirable an object as reproduction? I am also aware that working ants, like working bees and wasps, do occasionally lay eggs; but when this does take place, they invariably produce males, which I suspected could not be the case with those alluded to, from the great disparity of size observable in the larvæ and cocoons, and which I should have been able to ascertain with certainty had not the before-mentioned accident befallen them.

I remain, dear Sir, yours respectfully,

To Richard Taylor, Esq.

HENRY DENNY, A.L.S.

On the Digestive Apparatus of the Gnat, Culex pipiens, Linn.

By F. POUCHET.

The digestive apparatus of the Gnat is highly complicated: the mouth is composed of two mandibles furnished with a row of stiff fixed hairs, and of two maxillæ bearing moveable cilia like the blades of a fan and destined to collect the alimentary granules.

The intestinal tube is remarkable from the presence of eight isolated vesiculiform stomachs which are ovoid, thin, arranged symmetrically around the intestine, and each communicating with it by means of a short canal situated at the union of the anterior third with the two posterior thirds of its internal region. These eight cavities represent so many stomachs, and cannot be compared with the respiratory vesicles described by Treviranus, Ramdohr, Carus, Meckel, Owen, Newport and Lacordaire, in several insects belonging to the order Diptera or Lepidoptera. At first sight these gastric cavities are observed to be more or less filled with nutritious matter similar to that perceptible in the remainder of the intestinal tube. These vesicles in fact are seen to contract from time to time and successively, in order to allow the alimentary substance to pass into the intestines. The contractions are repeated at intervals of from twenty-five to thirty seconds; moreover on immersing these insects in liquids coloured with carmine or indigo, the eight stomachs are observed in the course of half an hour or sometimes less to be perfectly filled with these substances; the nature of these organs is consequently beyond doubt.

Although certain observers, as Swammerdam and Leon Dufour, have asserted that several insects ruminate, it cannot be admitted

that in the larva under consideration there is any act which altogether is comparable to what happens among the true ruminant quadrupeds. From their structure however, their physiological action and their development, these multiple stomachs of the gnat call to mind, but on a small scale, what is observed on the 'rumen' and 'reticulum' of the ruminants. In fact their inner membrane is finely alveolated like that of the paunch in these large animals, and the nutriment does not pass by these vesicles as if it were a simple canal, which is generally the case, but it is conveyed into them by a particular passage; it sojourns there for a longer or shorter period, experiences a certain elaboration, and is then expelled by the same passage and re-enters the intestinal tube. The nutriment does not return, it is true, to the mouth, but it undergoes a certain alteration in the stomachs, for the particles partially digested which are perceived in the intestine are considerably thinner than those in the gastric vesicles. In the first periods of life the ruminants feed solely upon milk, there is as yet no rumination in them, and the two first stomachs are then proportionately very small; this is likewise the case in the very young larvæ of the gnat, as they immediately after their issue from the egg absorb a very thin and almost entirely fluid nutriment; these organs are at this period simply rudimentary and perfectly impermeable. The thorax itself which contains them is proportionately much smaller than in larvæ of a greater age.

Thus, if the comparison between the digestive function of the vesicular stomachs of the gnat and the physiological action of the two first digestive cavities of the ruminants is not perfect, however distant these animals are in the zoological scale, yet it cannot be denied that in a local physiological point of view there is rigorous analogy. It is moreover highly worthy of attention that these stomachs are absolutely analogous by their form, their position, and the manner in which they act, to the stomachs of the polygastric Infusoria described by Ehrenberg. This fact adds a fresh proof, although observed upon other animals, of the truth of the investigations of that scientific naturalist.—*Comptes Rendus*, Oct. 25, 1847.

Description and Anatomy of a new and curious subgenus of Planaria.

By JOSEPH LEIDY, M.D.

In October 1840, Prof. S. S. Haldeman published a description of an animal under the name of *Planaria gracilis**. Upon examination I detected such a remarkable peculiarity in the digestive apparatus as led me to investigate its anatomy in detail, and to form for it a separate subgenus, characterized as follows:—

Phagocata, oblonga, plano-convexa, nuda, contractilis, mucosa, antica auricularia. Aperturæ duæ, ventrales, ad os et generationem pertinentes. Proboscides multæ.

* Supplement to No. 1 of "A Monograph of the Limniades, or Fresh-water Univalve Shells of North America, containing descriptions of apparently new animals in different classes," &c. By S. S. Haldeman. Philadelphia, 1840.



Pouchet, F. 1848. "On the digestive apparatus of the gnat, *Culex pipiens*, Linn." *The Annals and magazine of natural history; zoology, botany, and geology* 1, 241–242. <https://doi.org/10.1080/03745485809496105>.

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