

are so profoundly modified in *Hydrophilus piceus* that we have some difficulty in recognizing them, especially in a rapid examination. The inferior surface is undulated and the outer surface rather short; the inner surface presents a marked obliquity and bears a tuberosity which claims our more particular attention, because this arrangement, indicated in *Oligotoma Saundersii* &c., tends to become general in many other masticating insects.

The mandibles, as is well known, play the most active part in the division and mastication of food; but the maxillæ also assist in the operation to a variable extent according to the species, and the inferior projection of the inner surface from this point of view acquires particular importance. It did not escape Latreille, who sometimes mentions it under the name of *molar*. It is pretty constantly met with, but it presents frequent modifications. I confine myself to indicating the following:—

In *Carabus auratus* this prominence occupies an intermediate position between the lower and the inner surface; in *Forficula auricularia* it becomes conical and represents a lacerating rather than a grinding tooth; in *Blaps producta* it seems to be wanting, but its absence is compensated by a peculiar arrangement: the submaxillary considerably exceeding the maxillary, especially within, the inner surface of the submaxillary comes to project at the base of the maxillary, and may thus in its entirety fulfil the function generally reserved for the “molar” above indicated.

Although reduced to their essential points, the preceding descriptions suffice to show on the one hand all the interest that attaches to the morphological study of the submaxillary, and on the other the variations presented by this piece, which is too often overlooked, but the correct interpretation of which is indispensable in the comparative investigation of the appendicular organs in the Arthropoda. —*Comptes Rendus*, July 7, 1884, p. 51.

*On a new Type of the Class Hirudineæ.*

By MM. POIRIER and A. T. DE ROCHBRUNE.

As the crocodile lives in the water, says Herodotus, the interior of his mouth is covered with *Bdellas* (Lib. II. Chap. lxxviii. p. 94, ed. Müller). The translators of the Greek historian, down to Scaliger, understood the word *βδελλέων* to refer to leeches; since then several have asserted that these animals were Diptera of the genus *Culex*. The scientific researches of one of us during a pretty long sojourn in Senegambia enable us definitely to settle a still controverted question, and to prove that the *Bdellas* of Herodotus must be referred to the class Hirudineæ.

The remarkable type under consideration lives attached not only to the buccal mucous membrane of *Crocodilus vulgaris*, *cataphractus*, and *leptorhynchus*, but also to the lingual papillæ of *Gymnoplax ægyptiacus* and to the interior of the pouch of *Pelecanus crispus* and *onocrotalus*.

In its general form and the presence of branchial tufts on each



side of the body it approaches, at the first glance, the genus *Brancheion*; but by the peculiarities of its organization it differs from all known forms. We shall refer particularly to the following:—

*Digestive apparatus.*—The first part of the digestive tube presents the characters of that of the leeches with a proboscis—an exsertile proboscis, followed by an œsophagus with very thick muscular walls, of which the lumen of the canal shows a transverse lozenge-shaped section. The diameter of this organ goes on regularly increasing as far as the level of the first segment provided with branchiæ. At this point it opens into a very wide intestine with thin walls, presenting seven pairs of lobes, which ramify in the digitate branchial tufts borne by the segments of this region. The intestine is then continued into two long cæca, extending to the hinder part of the body of the animal. Between these cæca passes the very slender rectum, which bears laterally four pairs of very sinuous tubes, placed between the dorsal wall and the cæca.

As appendages of this digestive tube, which is so remarkable for its prolongations into the branchiæ, we must mention some large unicellular glands with finely granular contents placed on each side of the œsophagus, the very long excretory ducts of which penetrate into the walls of that organ, in which they ascend to a greater or less distance, and finally open into the internal cavity. These are the salivary glands.

Numerous glandular cells, probably hepatic, cover the walls of the lobate intestine.

*Generative organs.*—The male genital apparatus consists of four pairs of ovoid testes, situated in the last four segments with branchiæ. The epididymes, placed in the second branchiferous segment, form two cellular masses, in the interior of which the deferent ducts make numerous circumvolutions. These ducts, on issuing from the epididymes, unite in the median line to form a short unpaired spermatic duct, which penetrates into a large muscular sac, into which the very large penis can enter. The male aperture is situated in the eighth segment, or that which precedes the branchiferous segments.

The female apparatus is formed by two very long pyriform ovaries and two slender oviducts opening into a very small matrix; the female aperture is situated in the ninth segment.

*Circulatory apparatus.*—The circulatory, like the digestive apparatus, presents some remarkable peculiarities. The dorsal vessel furnished with sacs of the proboscis-bearing leeches does not exist. There are instead two pairs of lateral vessels, superposed, which send forth ramifications into the branchial tufts. In the digitations of these branchiæ these ramifications are placed in communication with each other by numerous transverse circular canals.

The superior lateral vessels, which we may regard as arterial, communicate with each other in each segment by an annular vessel which sends forth fine ramifications to the surface of the skin. Anteriorly these two vessels unite a little above the eyes, and emit, in front and into the thickness of the tissues, branches which unite with others, emitted by an anterior ring proceeding from the ventral vessel.

At the posterior part of the body of the animal these two lateral



canals bifurcate and unite with each other by the branches thus formed; at this point these vessels emit numerous branches, which ramify upon the inferior surface of the disk and flow into a double circular vessel which runs along the margin of this disk.

Besides these lateral vessels, the circulatory apparatus includes a median ventral vessel enveloping the nervous system. At the anterior part this vessel gives origin to a ring, the ramifications of which unite with those proceeding from the two superior lateral vessels; at the hinder part this ventral vessel passes above the canals which unite the lateral vessels, and gives origin to numerous ramifications which open into the circular vessels of the margin of the disk.

*Nervous system.*—The nervous system, which is very like that of *Clepsine*, besides the cerebrum and the posterior mass, consists of eighteen ganglia, each formed of two pairs of large lateral vesicles, and two rather smaller ventral vesicles placed one behind the other. Each ganglion emits on each side a single nerve, which shows itself further on.

The eyes, two in number, are very large, of an orange colour and cup-like shape.

The integuments, especially in the anterior part, are very rich in large glandular cells with granular contents.

The very peculiar arrangement of the circulatory and digestive apparatus, as we have just described them, appear to us to combine a set of characters sufficient to authorize the formation not only of a genus but also of a family. This family, the position of which seems to be indicated in the neighbourhood of the *Rhynehobdellidæ*, we shall designate by the name of *Lophobdellidæ*, derived from the word *Lophobdella* (from *λόφος*, a tuft, and *βδέλλα*, a leech), which we propose as the name of the genus. The species from Senegambia and the African rivers may be inscribed under the name of *Lophobdella Quatrefagesi*.—*Comptes Rendus*, June 30, 1884, p. 1597.

*On a new Type of Elastic Tissue observed in the Larva of Eristalis.*

By M. H. VIALLANES.

There are few naturalists who have not had occasion to observe the singular movements of the respiratory tube which terminates the body of the larvæ of *Eristalis*. This tube, which is composed, like a telescope, of cylinders fitted one into the other, can, at the pleasure of the animal, be greatly shortened or lengthened to seek the air at the surface of the water. The elongation of the respiratory tube is effected by means of the contractions of the body, which drive the cavitory liquid into it. Its shortening is produced by special muscles and by elastic bands lodged in its interior.

It is to the structure of these latter parts, which, at least so far as I know, have not been investigated, that I wish now to call attention. Each of these elastic bands is a single cell, but constructed in such a way as to perform the part of a thread of india-rubber. One of these elements, examined in a half-retracted state and in the blood of the animal, presents the following characters:—its cell-body is fusiform; one of its extremities is attached to the



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