Art. XXVII.—*Descriptions of the Larva and Pupa of* Lasiorhynchus barbicornis. By Capt. T. Broun.

[*Read before the Auckland Institute, 21st June,* 1880.]

Larva.

Colour: testaceous, more or less infuscate, head constantly castaneous, with piceous mandibles. Its *form* somewhat cylindrical, ordinarily compressed laterally, distended in front and behind. Composed of thirteen *segments*, the first forming the head, the penultimate and terminal with distinct dorsal sutures, but interrupted laterally and nearly obliterated below; all the segments with deep transverse furrows, their sides (except the anterior four and anal one) limited by a deep irregular groove, so that the rather flat inferior surface is very obviously separated from the sides. *Head:* much narrower than the second segment, sub-conical, rugulose in front, almost smooth behind, bearing several elongate fulvous bristles; *epistome* well marked, strongly transversal, its basal suture curved; *labrum* broader than long; *mandibles* robust, slightly notched at apex, uneven; *eyes* represented by small rounded elevations situated some little distance from the base of the jaws; maxillary *palpi* greatly developed, as long as the lower surface of the head, second articulation excessively short; third small, aciculate; the labial very small, connate, appearing to form the apical portion of the *mentum*; second joint small, cylindric, terminal needle-shaped; devoid of *antennæ*. The second *segment* broad, very finely rugose, with a large spiracle at each side, and a dorsal fold at its base; third broader than the preceding, broadly emarginate in front, with a large semicircular basal lobe, and a small chestnut-coloured elevation near each side; fourth equalling the former in width, obtusely rounded apically, its anterior portion separated from the basal by a deep transverse furrow; fifth to tenth with two dorsal grooves, the last-mentioned feebly impressed. The *legs* proceed from the second, third and fourth segments, are very short, and apparently only bi-articulate; they are setose. The *spiracles*, sixteen in number, are placed at the sides of the superior surface, on the second, fifth, sixth, seventh, eighth, ninth, tenth and eleventh segments. The whole surface is almost destitute of *clothing*, there being only a few scattered hair-like bristles, those on the underside shortest. The *size* is subject to considerable variation; the example before me, a small one, measures nine lines in length with both extremities incurved, and three in breadth, the middle parts, however, being much narrower.

Pupa.

Male measures nineteen lines in length, but with the rostrum projecting four lines beyond the last ventral segment. The *head* and rostrum attain a

length of twenty-three lines, are bent below the body, finely grooved superficially as far as the antennal insertion (not far from the apex), are without other distinct sculpture, though at uncertain intervals seeming slightly constricted; the *antennæ* repose at each side, extend forwards as far as the intermediate coxæ, in one specimen the external filmy covering has been removed, thus displaying the five terminal joints in perfection; the position of the *eyes*, identical with that of the imago, is clearly indicated by the lateral dilatation of the head. The *prothorax* is neither quite conical nor cylindrical but just intermediate in form, is armed at its apex with two pairs of horn-like, sometimes wrinkled, protuberances, two other but much smaller ones behind these, and two larger ones at its base; the front pair of legs attached thereto are obliquely folded below. The *mesothorax* is short, divided from the preceding by a deep frontal suture, is impressed with two longitudinal grooves; from it issue the elytra which lie obliquely along the sides, and the middle pair of legs. The *metathorax* is longer than the latter, very uneven, and bears the membranous wings and posterior legs; the tarsal claw envelopes of these latter reach the extremity of the body, and are perceptibly marked off from the covering of the tarsi. The *abdomen* consists of eight free segments, all of which, except the last, are distinctly separated from one another, the terminal ends with two large protuberances having a spine-like process at the extremity; their upper and lower surfaces are closely, finely, and irregularly wrinkled; the basal and two apical segments are more or less spiniferous above, the others are considerably raised behind, and on the summit of each elevation are placed eight short corneous, almost bi-articulate, spine-like processes forming a transverse row, whilst two or more less evident ones may be noticed on the depressed frontal portion.

The *female* differs in several respects; the *rostrum* extends but little beyond the metasternum; the *antennæ*, inserted nearer the base than the middle of the beak, are directed forwards and then sideways, thus embracing the surface just behind the basal tubercles of the prothorax; it is only half the bulk of the other sex.

Habits of the Insect.

This paper would be held to be incomplete without some account of the habits of the insect. I shall not, however, inflict on the members of the Institute an elaborate series of details, which, indeed, could not be done without long and close observation under favourable conditions, but will content myself with the mere recital of facts, from which you may draw your own conclusions.

The perfect female gnaws a hole but little broader than a pin's-head, and in the cavity deposits the eggs. If the tree or log be visited some

years afterwards, the following will be found to correspond with what usually occurs. On one occasion, when examining the forest north of Whangarei harbour, I noticed a *karaka*-tree which had been pierced by insects. I cut it down, and on opening it up found it tenanted by *Lasiorhynchus barbicornis* in all its stages. The larvæ were engaged in the formation of cylindrical drills running in different directions; the pupæ reposed in the attitude described above, *i.e.*, with the head and rostrum (the two conjointly, it will be borne in mind, longer than the body itself) bent along the lower part of the body, in a hole just broad enough to contain the insect, and without external orifice to permit its subsequent egress. I also cut out a few perfect specimens of both sexes; sometimes these had so nearly effected their exit that the extremity of the beak protruded. Of course there can be no doubt that these beetles had themselves eaten their way through, but what filled me with wonder was, how the pupa, on arriving at maturity, had managed to straighten its rostrum so that the mandibles might be employed to effect its release?

The description of the imago appears in my "Manual of the New Zealand Coleoptera."* Specimens are preserved in the Museum. I now add alcoholic examples of the larvæ and pupæ. With these before him, the student may proceed to the investigation of the question propounded, and if he can solve the problem without acknowledging the wonderful designs of the Almighty, he must be hard indeed to convince.

Art. XXVIII.—*On the Larva and Pupa of* Ceratognathus irroratus.

By Captain T. Broun.

[*Read before the Auckland Institute, 19th July*, 1880.]

Larva.

Testaceous, head reddish, mandibles black. In *form* cylindrical, medially narrowed, underside nearly plane. The head and three following segments, as well as the three ventral ones, are nearly smooth, the others studded with minute spines and numerous hair-like bristles, the legs thickly clothed with shorter rufous bristles.

Composed of thirteen *segments*; the terminal large, flabby, and uneven, appearing to possess a supplementary anal one, not, however, distinctly defined by any well-marked suture; the *head* ovate, deflexed, not so broad in its widest part as the next segment, longitudinally impressed on the

* "Manual of the New Zealand Coleoptera" (Wellington, 1880), p. 543.