

XI.—*The Lice of Petrels.*—Part II.* *The elongate Forms.* By GORDON B. THOMPSON.

[Continued from vol. ii, p. 493.]

THE elongate forms of Mallophaga from petrels constitute a compact group of parasites having a characteristic facies. As a group, however, they show a number of marked differences among themselves, which make it rather impossible for one to give a single description covering all of them. Since the ten genera which contain all the species in question are separated from one another mainly on the head markings (as seen in cleared specimens), I have considered it the best plan to describe the head structures of the genus *Halipeurus* as a type, and to point out the modifications occurring in the remaining genera.

In the genus *Halipeurus* the head is almost twice as long as broad, tapering gradually anteriorly, with rounded clypeal front and evenly concave occiput. The dorsal surface of the head is composed of a number of fairly sharply defined sclerites and is divisible into three fairly distinct regions: (1) a posterior epicranial region, extending from the occiput to a line joining the bases of the antennæ; (2) a frontal region, extending from the antennæ to the clypeal suture; and (3) the clypeal region in front of this suture.

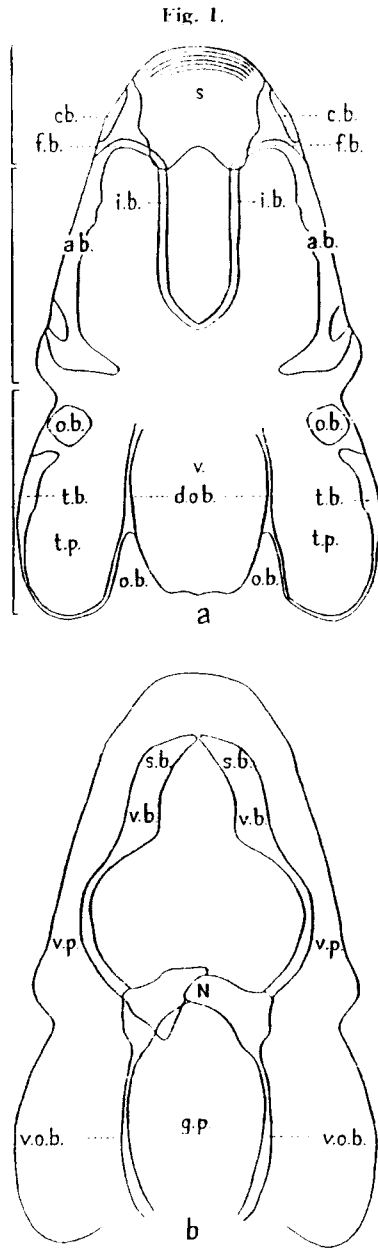
* Part I. appeared in *Ann. & Mag. Nat. Hist.* ser. 11, vol. ii, 1938, pp. 481-493.

The epicranial region is composed of two lateral temporal plates (fig. 1, *tp.*), each of which covers rather more than a third of the surface, and which are limited internally by the ill-defined dorsal occipital bands (fig. 1, *d.o.b.*), the latter having between them the uncoloured vertex (fig. 1, *v.*). The temporal plates are continued round the sides of the head on to the ventral surface, where they are similarly limited by the ventral occipital bands (fig. 1, *v.o.b.*), between which lies the strongly coloured gular plate (fig. 1, *g.p.*). Chitinous thickenings laterally and posteriorly, seen in optical section, give rise to the temporal bands (fig. 1, *t.b.*) and occipital blotches (fig. 1, *o.b.*). The eye, perforating the temporal band close to its anterior end, cuts off a rounded ocular blotch (fig. 1, *o.b.*) in front.

The frontal region also exhibits a median lightly coloured area, lying between two more heavily chitinised lateral areas. The latter are limited externally by the antennal bands (fig. 1, *a.b.*), anteriorly by the frontal bands (fig. 1, *f.b.*), and internally by the internal bands (fig. 1, *i.b.*). The ventral surfaces of frons and clypeus are not separated, and will be dealt with after description of the latter.

The clypeus is composed dorsally of the signature (fig. 1, *s.*), a chitinous plate broader in front and narrowing posteriorly, which is flanked by short clypeal bands (fig. 1, *c.b.*). The clypeal suture lies between the clypeal bands and the posterior border of the signature and the frontal bands. The signature is variable in form in the different genera, and is of considerable diagnostic value. In *Halipeurus* it has a series of crescentric lines upon the anterior border, and is usually of the shape shown in the figure (fig. 1, *s.*).

From the anterior portion of the clypeal bands a pair of ventral bands (fig. 1, *v.b.*) run downwards, inwards, and backwards for a short distance, then turn sharply and diverge as the internal borders of a pair of narrow ventral plates (fig. 1, *v.p.*), which run back to the mandibles and offer a condyle for the anterior facet. Lying between them, just in front of the mandibles, is a hinged flap, the labrum, which is supported by chitinous bars laterally and anteriorly. There is a small uncoloured immovable trabecula in front of the antennæ, which latter is simple



Semi-diagrammatic drawings of: *a*, dorsal aspect,
b, ventral aspect of head of *Halipeurus* sp.

in the female, and has the third segment obliquely produced into an appendage, and the two terminal segments inserted dorsally in the male.

I am leaving out of account the rather complex chitinous structure, which offers a facet for the posterior articulation of the mandible. No tentorium is present. The hypopharynx is well developed in its typical form.

In *Philoceanus* the posterior half of the head differs from the type only in having a sinuous occiput, the occipital blotches embracing two projections with a concavity between them. The anterior part differs radically. There is no clypeal suture, the antennal and clypeal bands being continuous. The frontal bands are only slightly chitinous and require careful tracing to their junction with the antennal bands. They bend round internally to form short inconspicuous internal bands. The ventral bands can be traced under a high power, but are not specially chitinised. The signature has a strong band along its anterior border; concave sides supported by pear-shaped incrassations, which have their broader ends directly posterior, and which exhibit a concentric grooving similar to that occurring on the points of the mandibles; and a broad triangular hinder end, with the apex directed backwards. It bears on its surface a pear-shaped depression, the gutta, flanked by two lateral grooves, into which fit the heads of the signature bars. The labral expansions, upon which Kellogg originally founded the genus, vary in extent.

Pelmatocerandra has the head shorter and broader, the occipital blotches being wider apart and the occiput flatly convex between them. The occipital bands are much more definite, reminding one of the condition in *Gibelia*. The ocular blotch is large, the temporal bands very narrow. The anterior half of the head is very distinct in character. The signature is very similar in shape to that of *Philoceanus*, but the anterior border bears a number of crescentic lines, the gutta, lateral grooves, and marginal incrassations are absent. A clypeal suture is present. The antennal bands, which are narrow posteriorly, widen at the suture, so that the frontal bands are broad and directed obliquely forwards, fading completely away at their anterior limit, from which point the internal bands run backwards as short broad

blotches. From a narrow base in front of the antenna an elongated triangular blotch runs forward parallel to the antennal and frontal bands. This last is absolutely characteristic of the genus, though an analagous structure occurs in *Giebelia*, which lends support to its inclusion with these groups and not to the Philopteridæ.

The head of *Synnautes* closely resembles that of *Hali-peurus*, but is more slender and has a more concave occiput. The clypeal bands and, in particular, the ventral bands, are better developed. The signature has a broad crescentric ringed border, and no gutta nor lateral grooves. The signature bars are not developed. A clypeal suture is present. The internal bands are short.

The genus *Naubates* * has a very distinct head, more heavily chitinised than any of the other genera, and with very remarkably developed signature bars (these structures are modifications of the borders of the ventral plate) and with a sinuous occiput. The anterior border of the clypeus bears crescentric rings. A clypeal suture is present, and in some species of the genus the antennal bands are broken by a frontal suture at their junction with the frontal bands. The dorsal occipital bands are scarcely demonstrable, but ventral occipital bands are well developed.

In the genus *Pseudonirmus* the whole general appearance of the head is modified by the fact that the frontal bands fuse to form a continuous line bounding the frons anteriorly, a small chitinous bar running backwards from this in the mid-line representing the fused internal bands. A clypeal suture is present in two of the species but not in *P. charcoti* (Neumann). In the three species known to date, it will be noticed that the clypeus gradually tends to disappear. Dorsal occipital bands are well developed.

In *Episbates* the clypeus, with its suture, bands, and signature are entirely absent. The antennal and frontal bands form a continuous line round the anterior margin of the head.

Included in the genus *Perineus* are three fairly distinct types of head. The general characters which distinguish

* The subgenus *Micronaubates* of Pessôa and Guimarães (1935) will be discussed later.

the members of this genus are the greater development of ocular and occipital blotches, the absence of occipital bands, and of a distinct clypeal suture, though the latter is usually indicated, and the slight development of the usual clypeal sutures. The signature itself is not conspicuous. Most species have a slight crescentric ringed border.

Harrisoniella differs from *Perineus* in having the signature bars, which are by no means conspicuous.

In the genus *Bedfordiella*, as already pointed out by me in the original description, the clypeus and clypeal suture are distinct; the clypeus is similar to that of *Philoceanus*, but without gutta or lateral grooves; the anterior bands are thick, narrowing towards the mid-line, which they do not reach; there are no internal bands; the ventral bands are indicated anteriorly; the occipital and ocular blotches and the bases of the antennal bands are large, as in *Pseudonirmus*.

The thorax, abdomen, etc., of these elongate forms will be dealt with in the detailed descriptions of the genera and species in future contributions.

Key to the Genera.

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|---|--------------------------|
| 1. Small forms from small petrels | 2. |
| Larger forms | 3. |
| 2. Slender forms with narrow head: no clypeal suture | <i>Philoceanus</i> . |
| Stouter forms with broad head: clypeal suture distinct | <i>Pelmatoceraudra</i> . |
| 3. Antennal, anterior and internal bands well developed | 4. |
| Antennal, anterior and internal bands not well developed | 6. |
| 4. Pleura straight, cuticle scaly, ♀ abdomen sharply two-pointed | <i>Synnautes</i> . |
| Pleura crose, ♀ abdomen bluntly two-pointed | 5. |
| 5. Ventral bands hardly developed | <i>Hali-peurus</i> . |
| Ventral bands strongly developed | <i>Naubates</i> . |
| 6. Anterior bands uniting in the middle line.... | 7. |
| Anterior bands not uniting in the middle line.... | 8. |
| 7. With clypeal region in front of anterior bands. Without clypeal region | <i>Pseudonirmus</i> . |
| 8. Clypeus clearly marked off | <i>Episbates</i> . |
| Clypeus not clearly marked off | <i>Bedfordiella</i> . |
| 9. Signature bars present | 9. |
| Signature bars absent | <i>Harrisoniella</i> . |
| | <i>Perineus</i> . |