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HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS

HYMENOPTERA

ICHNEUMONOIDEA

ICHNEUMONIDAE, key to subfamilies

and

ICHNEUMONINAE—I

By J. F. PERKINS

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IX. Diptera: Nematocera and Brachycera.
X. Diptera: Cyclorrhapha.

Volumes II to X will be divided into parts of convenient size, but it is not possible to specify in advance the taxonomic content of each part.

Conciseness and cheapness are main objectives in this new series, and each part will be the work of a specialist, or of a group of specialists. Although much of the work will be based on existing published keys, suitably adapted, it is expected that it will also include much new and original matter.

Parts will be issued, separately paged and priced, as they become available.

Orders for the Series or for separate parts may be placed with the Registrar at the Society's rooms now, but prices can only be quoted for those parts already in the press.

The Society is indebted to the Royal Society for a grant towards the cost of initiating this series of *Handbooks*.

A list of parts now available appears on the back cover

HYMENOPTERA

ICHNEUMONOIDEA

Ichneumonidae

Key to Subfamilies and Ichneumoninae—I

By J. F. Perkins

This part of the *Handbooks* includes a provisional key to the subfamilies of Ichneumonidae and keys to species of the Ichneumoninae, excluding the Ichneumonini which will be included in the next fascicle.

There are, at present, nearly 2000 species of Ichneumonidae recorded from the British Isles, and it is thus by far our largest family of insects. From the world, it is estimated that there are about 20,000 valid described species and, as yet, the fauna of most tropical regions has been comparatively little worked; however, it does appear that this closely knit family is particularly well represented in the north temperate region.

It is thus, perhaps, not surprising that keys to subfamilies are very imperfect, as exceptions can be found to almost all characters that have been used in defining any subfamily, even in the limited British fauna. In fact, characters of the larvae and eggs and biological characters such as the method of oviposition, in so far as these are known, seem to show greater stability than many of the adult characters that have so far been discovered. For example, in the Ichneumoninae and Cryptinae, there are some species in which the males are very difficult to place, but the larvae of the two subfamilies can be readily distinguished.

Certain suggestions that were put forward in Beirne's paper (1941, *Trans. Soc. Brit. Ent.* **7** : 123–90) on the larvae of Ichneumonidae, have not been accepted by other workers, and it seems better here, in cases where the evidence is not very strong, to adopt a general policy of agreement with the present divisions of the group. In some instances where there is little agreement about the position of certain genera I have regarded them as separate subfamilies (*e.g.* Phrudinae), for I believe that this will lead to less confusion at the present time.

There has been much changing of suprageneric names in recent years. I naturally accept the recommendations of the International Commission on Zoological Nomenclature, and this fixes the usages of such names as *Ichneumon, Pimpla* and *Ephialtes,* and thus of the names of the subfamilies and tribes to which these genera belong. I am also using those names for higher cate-

gories which were first proposed for a unit containing the genus from which the higher group name was derived. This causes little change in the names in current use in Europe. In America, names have been derived from that of the oldest genus included in the category. Recent American literature is of great importance as in it can be found much information on good diagnostic characters previously unused in separating European species.

In the key to the subfamilies I have made provision for a few genera which are both aberrant and doubtfully British (*Coleocentrus, Hypsantyx* and *Zemiophorus*).

Terms

Little need be said here concerning the terms used as in the main these have been covered in Vol. **6** (1) of the present series. However there are a few characters for which some clarification is necessary.

Face; this term is retained in the traditional sense in the Ichneumonidae for the area below the antennal sockets, between the eyes and above the clypeus.

Frons; used for the upper face (*Handbooks* **6** (1) : 4), as has already been used in the Handbook on sawflies.

Genal sulcus; a groove on the malar space, running from the eye margin to the base of the mandible ; it is often represented by a line of coriaceous sculpture.

Scutellar fovea; this term is synonymous with the scutal suture (cf. *Handbooks* **6** (1) : 22, fig. 48).

Segments of the gaster; these are referred to shortly as tergite or sternite and the number.

Central area of metanotum; used for the area previously called the postscutellum in Ichneumonidae (cf. *Handbooks* **6** (1) : 21).

Interantennal tubercle; the prominence lying just above the face, between the antennal sockets or just in front of this.

Pronotal collar; the pronotum, dorsally, usually has a raised anterior area which is called the pronotal collar; behind this is the transverse groove. The front margin of the pronotal collar may be reflexed to form an anterior carina or lamina, which may have a sulcus behind it. These characters require much further investigation in the Ichneumonidae for many useful differences are to be found in this area.

Scrobis frenalis; the term given by Thomson to the dorsolateral semicircular area lying behind the hind wings and before the basal groove of the propodeum, and in line with the area spiracularis.

Clasper; in the male genitalia, the term clasper is used for the combined basiparamere and the paramere, as it has been found impracticable to differentiate between these in particular cases.

Anterior legs; in some places it may be found that the term anterior as applied to the legs refers to the front and middle legs. This was a traditional use in the earlier authors describing in Latin, and it has been found difficult to eliminate this usage entirely from the keys.

Thyridia(ae); these terms have been used instead of the now usual *thyridium(a)* (*Handbooks* **6** (1) : 41).

Certain characters used for separating some of the subfamilies are difficult to see unless higher powers of a binocular microscope are used for the smaller species. Having, myself, found it essential to observe these characters for placing genera previously unknown to me, I consider them to be indispensable. This is particularly true of the tooth at the apex of the front tibia (*cf.* fig. 54). These difficulties seem inevitable if the males as well as the females are to be placed.

Biology

A summary of the host relationships of the family has been given in the Introduction to the Hymenoptera. I have only mentioned actual hosts of

species when these seemed to me to be of special interest in some respect. I have included general notes under tribes or genera concerning the type of host usual in the group. To give host records for each individual species would necessitate re-determination of all reared specimens, especially for all the older records; such an undertaking is quite impracticable.

Similarly, only vague terms are used for the abundance or scarcity of species in relation to the material that I have seen, but special note is made of those species which at present are known only from the north. Otherwise, the records are much more an indication of the distribution of collectors and their zeal.

I wish particularly to thank Mr. R. D. Eady and Mrs. J. A. J. Clark who have tried out parts of the key, and my wife who typed and prepared the manuscript.

I have drawn the diagrams of parts of insects using a squared eyepiece in a binocular microscope. I am indebted to Mrs. C. A. O'Brien for the figures of whole insects.

Key to Subfamilies

1 Scutellum produced into a long and slightly upwardly curved spine which reaches almost to the line of the middle of the propodeum (fig. 1); pretarsus with the arolium minute (fig. 4).

Sternites of gaster heavily sclerotized; ovipositor sheaths shortly exserted; tergites 2 and 3 and sternites 2 and 3 fused in the ♀; gaster ovate behind tergite 1 which is widest at the spiracles which are a little before the middle, and thus narrowing towards the base and apex; cell 2*Rs* rarely closed, when it is triangular (figs. 2, 3); wings with conspicuous fuscous markings. *Parasites of caddis larvae*.....Agriotypinae

(One species, *Agriotypus armatus* Curtis.)

– Scutellum with at most a short spine; pretarsus with a moderate or large arolium 2

2 (1) No pigmented veins on the hind wing except *R*, R_1 and the extreme base of *Rs*; fore wing with cell 2*Rs* eliminated by the fusion of *Rs* and *M* (fig. 5)[1].

Gaster sessile, tergites 2 and 3 with a median, transverse furrow which is more or less widened centrally (fig. 6); ovipositor exserted, with a preapical dorsal notch (fig. 7); antenna with 13 segments

Lissonotinae (Neorhacodini)

(One species, *Neorhacodes enslini* (Ruschka).)

– Hind wing with much more pigmented venation; fore wing with *Rs* and *M* not fused as above.....3

3 (2) Cell 2*Rs* pentagonal (fig. 11) (or rhomboidal in some Trogini, Platylabini and Eurylabini (fig. 8)), never petiolate, sometimes with vein 2*rm* absent but then the shape of the cell is discernible from the remaining veins (*Hemiteles* s.l., *Gelis* ♂, *Sphecophaga* and *Epitomus* (fig. 10)); gaster with tergite 1 petiolate (fig. 103) or, rarely, narrow and almost parallel-sided throughout (some Cryptinae), never with glymmae, and with the spiracles usually conspicuously beyond the middle (rarely in the middle in some Cryptinae); ovipositor of ♀ with no preapical notch; ♂ most usually with tyloidae on the flagellum; antenna with at least 16 segments; sternaulus sometimes extending to the apex of the mesopleurum; membrane of segment 1 of

[1] Of general interest is the position of the humeral vein of the hind wing (though this can only be seen under oblique lighting) which meets cell 1A far from the base of the wing.

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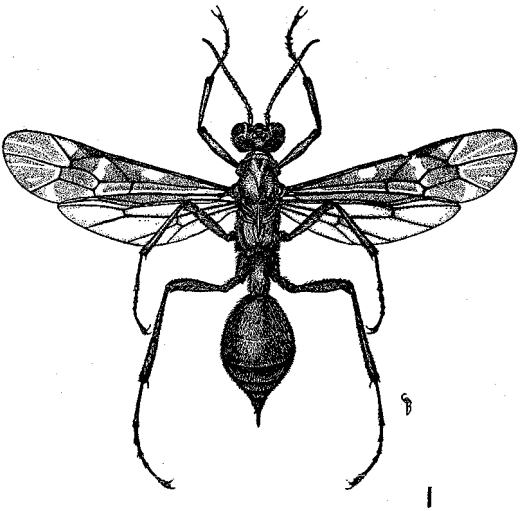

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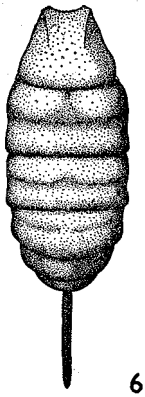

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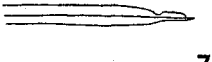

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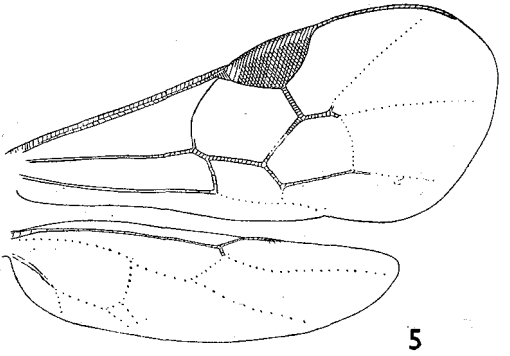

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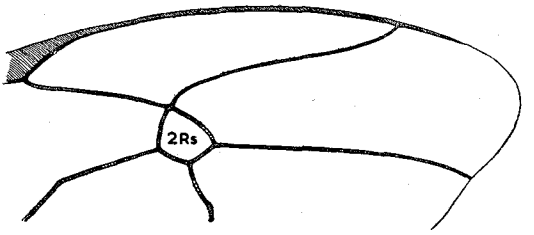
FIGS. 1–4.—*Agriotypus armatus :* 1, female ; 2, cell 2*Rs* open ; 3, aberration, 2*Rs* closed ; 4, hind pretarsus.

FIGS. 5–7.—*Neorhacodes enslini :* 5, wings ; 6, gaster, dorsal ; 7, apex of ovipositor, lateral.



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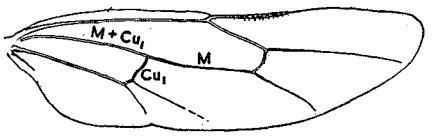

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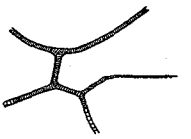

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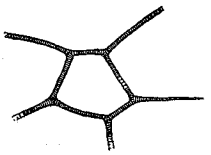

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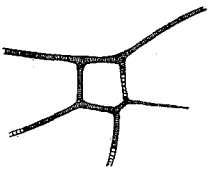

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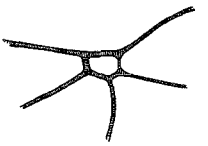

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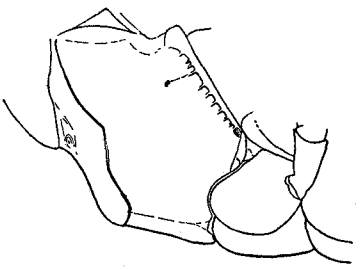

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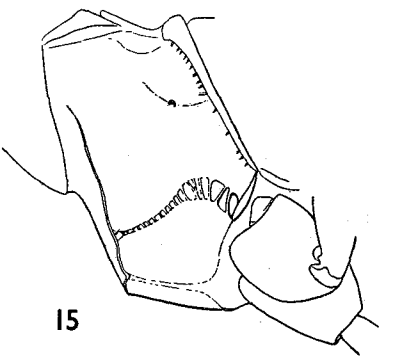

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FIG. 8.—*Trogus l. coerulator :* apex of fore wing.
FIG. 9.—*Cratichneumon :* hind wing.
FIGS. 10–13.—Cell 2*Rs* : 10, *Hemiteles ;* 11, *Ichneumon sarcitorius ;* 12, *Mesostenidea ;* 13, *Mesostenus.*
FIGS. 14–15.—Mesopleurum and mesosternum, ventrolateral : 14, *Ichneumon extensorius ;* 15, *Cryptus laborator.*

gaster not or hardly reaching in front of the line of the spiracles ; front tibia never with an apical tooth ; area coxalis of propodeum often delimited ; middle and hind tibiae with 2 spurs ; brachypterous and wingless forms occurring 4

– Cell 2*Rs* most usually triangular or petiolate or open ; if pentagonal then either the gaster is obvicusly not petiolate, or glymmae are present, or the spiracles are before the middle, or the front tibia has an apical tooth ; ♂ flagellum most usually with no tyloidae ; antenna sometimes with 14 or 15 segments (Adelognathinae) ; sternaulus never extending to the apex of the mesopleurum ; membrane of segment 1 of gaster sometimes extending well in front of the line of the spiracles ; front tibia often with an apical tooth; no brachypterous or wingless forms in Britain 6

4 (3) Central area of metanotum with no pits at the base (fig. 20) ; trochantellus of front leg not differentiated anteriorly (fig. 19) ; frons carinate between the antennae, the carinae joining the interantennal lobe.

♀ with the genae meeting broadly beneath the foramen maximum (fig. 17), in the ♂ without a narrow bridge (fig. 16) ; spiracles of segment 1 of gaster about in the middle ; ovipositor (fig. 22) ..... ALOMYINAE

– Central area of metanotum with a pair of pits at the base or with a deep basal groove (fig. 21) ; trochantellus of front leg differentiated anteriorly ; frons not carinate between the antennae 5

5 (4) Gastrocoeli and/or thyridiae normally well developed (*cf.* figs. 237–46) (weak in some *Barichneumon* and absent in *Dicaelotus*, *Colpognathus* and *Centeterus*); sternaulus often absent (fig. 14) or only weakly represented, rarely at most extending to two-thirds the length of the mesopleurum (*cf.* fig. 316) ; post-petiole with the distance between the spiracles most usually greater than the distance from the spiracle to the apex of the segment (fig. 103) (but cf. *Probolus*, some *Cratichneumon* and Eurylabini) ; gaster, most usually, conspicuously punctate ; cell 2*Rs* always well developed in size.

Posterior carina of mesosternum, when present, broadly interrupted (complete only in *Microp*e) ; ♀ with the ovipositor most usually not, or very little exserted (almost as long as the gaster in 3 species of *Cratichneumon*) ; latero tergites always narrow ; hind wing with first abscissa of $M + Cu_1$ almost straight in the apical half (before the junction with M and Cu_1) (except in some Phaeogenini) (fig. 9) ..... ICHNEUMONINAE (p. 18)

– Gastrocoeli at most very indistinctly represented at the extreme base, thyridiae absent or at least small, rarely larger and subcircular ; sternaulus present and frequently extending to the apex of the mesopleurum (fig. 15) ; post-petiole, most usually (particularly in the ♂), with the spiracles nearer to each other than to the apex of the segment ; gaster rarely punctate ; cell 2*Rs* sometimes small (*Mesostenidea*) (fig. 12).

Posterior carina of mesosternum sometimes complete ; ♀ with the ovipositor most usually conspicuously exserted (short in Stilpnini) ; latero-tergites sometimes broad (in Stilpnini, those of tergite 2 broad and not inflexed) ; hind wing often with first abscissa of $M + Cu_1$ strongly curved before the junction of M and Cu_1 (*cf.* fig. 88) ..... CRYPTINAE

6 (3) Cell 2*Rs* very small, almost quadrate (fig. 13) ; otherwise agreeing with Cryptinae (*cf.* couplet 5) ..... CRYPTINAE in part

– If cell 2*Rs* is very small, then it is triangular 7

7 (6) Head flattened dorsally, with the occipital carina nearer to the hind ocellus than the diameter of a hind ocellus (fig. 23).

Inner orbits of eyes converging towards the mouth ; posterior transverse carina of mesosternum often complete ; gaster laterally compressed, the petiole without glymmae ; in the ♀, valvula 2 of ovipositor with a preapical notch or suddenly contracted preapically and with the apex very narrow (fig. 24) ..... OPHIONINAE (THERIONINI)

– Head with the occipital carina at least as far from the posterior ocellus as the diameter of a hind ocellus or the occipital carina is absent 8

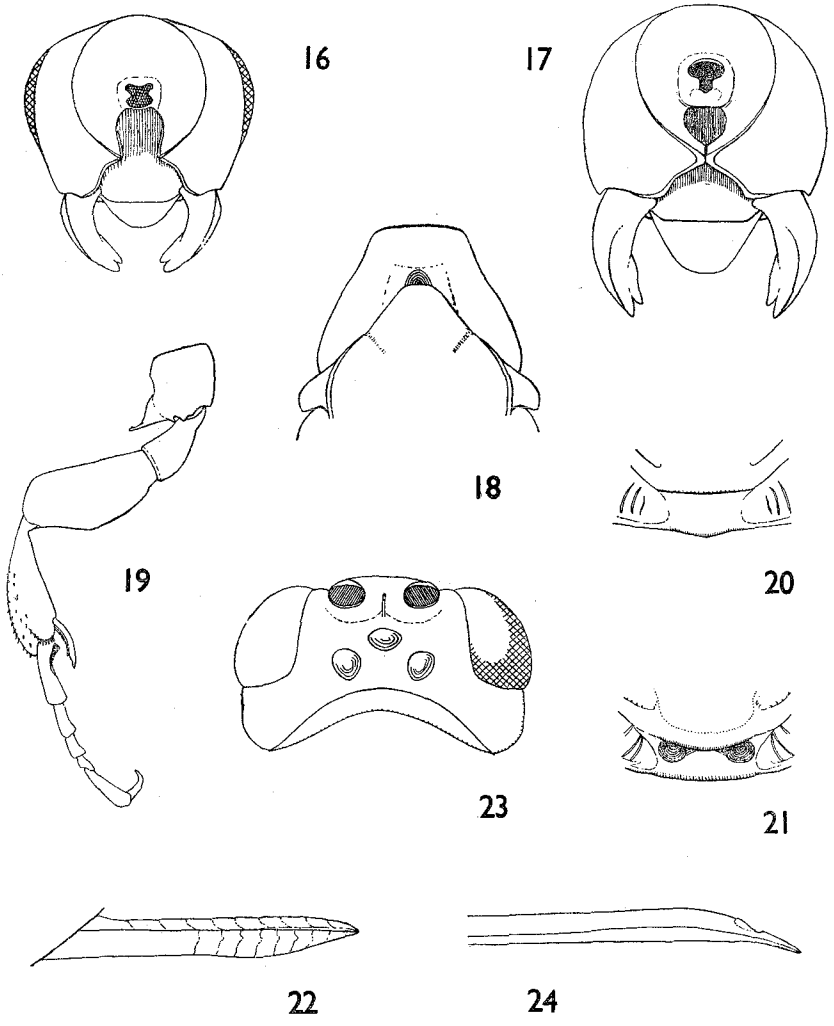
8 (7) Posterior transverse carina of mesosternum complete (fig. 25) ; gaster petiolate and compressed (usually markedly so) apically and with the spiracles of segment 1 behind the middle.

The petiole frequently with glymmae ; ♀ with valvula 2 of ovipositor

having a dorsal preapical notch (fig. 26). Note that the carina is not complete in *Phobocampe*, *Nepiera* and *Tranosema arenicola* of the Campoplegini

OPHIONINAE

– Posterior transverse carina of mesosternum incomplete, and usually otherwise disagreeing 9



FIGS. 16–20.—*Alomya debellator :* 16, head posterior, ♂ ; 17, head posterior, ♀ ; 18, pronotum, dorsal, ♀ ; 19, front leg, ♀ ; 20, central area of metanotum, ♀.

FIG. 21.—*Ichneumon extensorius*, ♀ : central area of metanotum.

FIG. 22.—*Alomya debellator :* ovipositor, lateral.

FIGS. 23–24.—*Aphanistes xanthopus :* 23, head, dorsal ; 24, ovipositor, lateral.

9 (8) Vein 2*rm* absent, front wing with a distinct vein running from the vannal notch to the tornus, and well separated from the hind margin of the wing (fig. 30); spiracles of segment 1 of gaster behind the middle; claws pectinate; ovipositor with a dorsal, preapical notch
OPHIONINAE (OPHIONINI in part)

– Cell 2*Rs* complete or with the vein 3*rm* absent, front wing with at most a darkened area running along the margin of the wing from the vannal notch, and never with a distinct vein as in the Ophionini; vein 2*rm* absent in *Arotes* which disagrees with all the other characters 10

10 (9) Mesepimeron usually with a mesopleural furrow (as found in Braconidae) (fig. 31); if this is absent then $M + Cu_1$ of the hind wing is in greater part erased; front wing with the first free abscissa of Cu_1 strongly thickened; stigma most usually very broad (fig. 32) 11

— Mesepimeron never with a furrow; $M + Cu_1$ of the hind wing only erased at the extreme base; front wing with the first free abscissa of Cu_1 rarely somewhat thickened; stigma often very narrow 13

11 (10) Segment 2 of gaster with very narrow laterotergites (fig. 33); hind wing with $M + Cu_1$ almost complete; hind wing with the humeral vein meeting the first abscissa of A_1 at most about one-fourth of the length from the base; fore wing with vein 2*mcu* with two widely spaced fenestrae (fig. 28).
Tergite 1, which is parallel-sided has the spiracles conspicuously before the middle (fig. 36); mesepisternal furrow conspicuously developed; in ♀ valvula 2 of ovipositor with no dorsal notch; claws simple
ORTHOPELMATINAE

— Segment 2 of gaster with very broad laterotergites (in Phrudinae, weakly inflexed in ♀ and sometimes strongly so in ♂) (figs. 34–5, 37); hind wing with $M + Cu_1$ always erased; hind wing with the humeral vein meeting A_1 almost at the base; fore wing with vein 2*mcu* with only one fenestra (fig. 32) 12

12 (11) Mesepisternum never with a furrow; claws most usually strongly pectinate, if simple then either tergite 2 of gaster is conspicuously shorter than tergite 3 (fig. 35) or the third antennal segment is conspicuously shorter than the fourth; cell 2*Rs* irregular pentagonal (fig. 27); vein 2*rm* sometimes absent; spurs of hind tibia straight; ♀ ovipositor narrow apically, with no dorsal notch in valvula 2 ..... PHRUDINAE

— Mesepisternum usually with a furrow (*cf.* fig. 31); claws never pectinate; tergite 2 of gaster at least as long as tergite 3; third antennal segment at least subequal to the fourth; cell 2*Rs* small, vein 3*rm* absent but other veins surrounding it are thickened (fig. 32); spurs of hind tibia sometimes curved; ♀ ovipositor having a preapical dorsal notch in valvula 2, which is obscure or absent in those species which have either a conspicuously thickened ovipositor or the ovipositor sinuate apically
OPHIONINAE (TERSILOCHINI)

13 (10) Face strongly, upwardly produced between the base of the antennae (figs. 39, 40); clypeus not or only very weakly differentiated from the face which is more or less protuberant or with a " shield "; front and middle trochantelli frequently not divided from the femora (fig. 38) ..... METOPIINAE

— Face not upwardly produced between the base of the antennae except in the Xoridini (fig. 41) and Lycorininae; clypeus most usually well differentiated from the face which is rarely protuberant; at least the middle (and hind) trochantellus divided from the femur 14

14 (13) Front leg with no trochantellus (fig. 19); pronotum with a pit centrally on the hind margin (fig. 18); gaster with the spiracles of tergite 1 about in the middle of the segment.
Medium sized Ichneumonids, at least 10 mm. long ..... ALOMYINAE

— Front leg with the trochantellus differentiated from the femur; pronotum never with a pit on the hind margin 15

15 (14) Cell 2*Rs* large and rhomboidal, rarely very shortly petiolate, and always complete; vein Cu_1a received at or above the middle of cell Cu_1b (fig. 45); gaster polished beyond the first segment; ♂ with the genital claspers long and spine-like (fig. 48); ♀ ovipositor exserted, but never as long as the abdomen, and with the hypopygium long and reaching at least to the line of the apical dorsal segment, and most usually beyond this (fig. 46); ovipositor

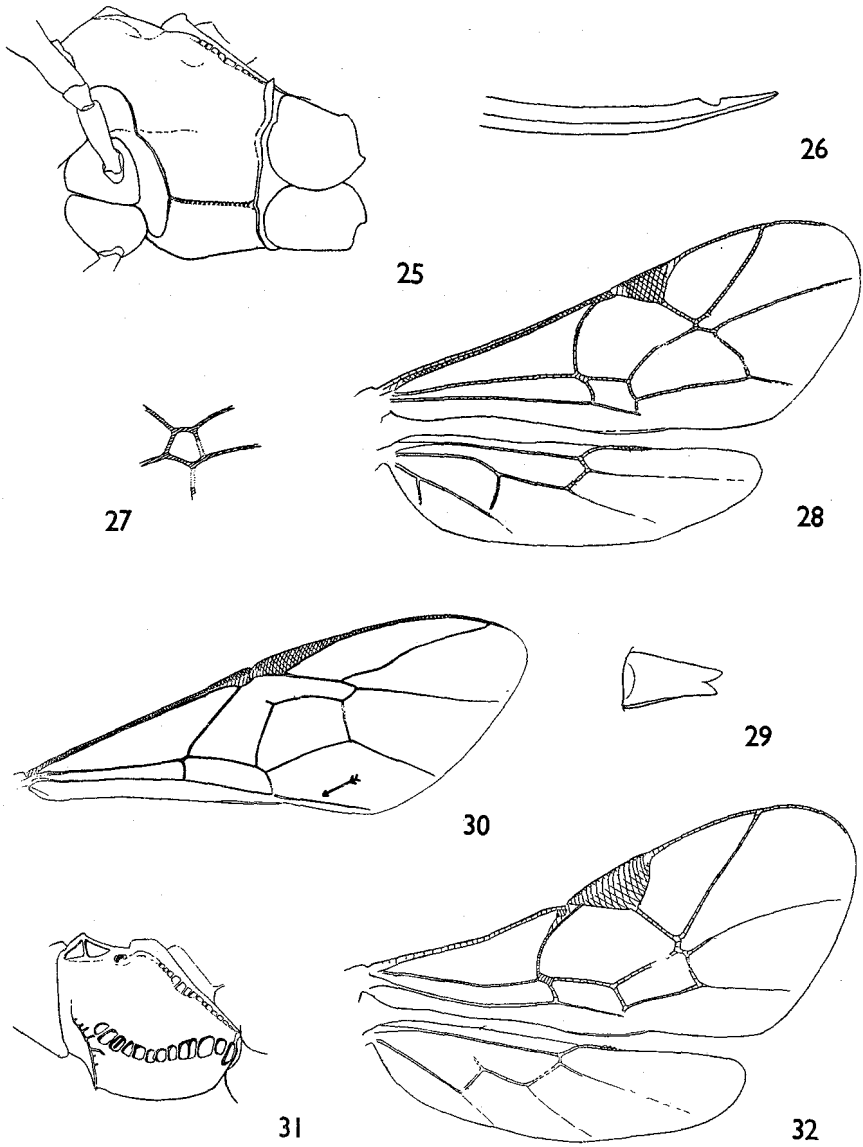


FIG. 25.—*Dusona foersteri* (syn. *Campoplex pugillator* auctt.) : mesopleurum and mesosternum, ventro-lateral to show complete posterior carina.
FIG. 26.—*Horogenes armillata :* ovipositor, lateral.
FIG. 27.—*Phrudus monilicornis :* cell 2*Rs*.
FIG. 28.—*Orthopelma mediator :* wings.
FIG. 29.—*Nepiera collector :* mandible.
FIG. 30.—*Ophion obscuratus :* wing.
FIGS. 31–32.—*Leptopygus harpurus :* 31, mesopleurum to show furrow ; 32, wings.

with valvula 2 having no subapical notch.

Face with little or no modelling and not divided from the clypeus (fig. 47) except weakly in *Dolichochorus* ; tergite 1 petiolate or subpetiolate, with conspicuous glymmae (fig. 46) MESOCHORINAE

— If rarely the cell 2*Rs* is large and somewhat rhomboidal, then otherwise disagreeing with the above combination of characters ; ♂ never with the claspers long and spine-like 16

16 (15) Upper tooth of mandible broad and excised apically so that there are 3 apical teeth (fig. 44).

Ovipositor with valvula 2 having a deep, subapical excision, and not exserted ; epicnemial carina often incomplete and sometimes entirely absent 17

— Upper tooth of mandible sometimes much larger than the lower, but then more or less pointed and never excised 19

17 (16) Scutellum with a subapical spine or tubercle (fig. 49) ; cell 2*Rs* large and rhomboidal, hind wing with the first abscissa of Cu_1 much shorter than *cua* (fig. 42) ; claws wide when viewed from beneath, with the strong pecten arising from the inner margin (fig. 43).

Submetapleural carina strongly raised anteriorly ; epicnemial carina absent (fig. 49) ; abdomen apically, laterally compressed ; ♀ ovipositor sheaths broad (fig. 50) ..... LISSONOTINAE (BANCHINI)

— Scutellum with no tubercle or spine ; cell 2*Rs* moderate, sometimes open, hind wing with the first abscissa of Cu_1 much longer than *cua* ; claws not widened and if pectinate, the pecten not obviously arising from the inner margin 18

18 (17) Spiracle of tergite 1 much before the middle, glymmae present at the extreme base, the segment usually strongly and sharply narrowed in front of the spiracles and more or less parallel-sided behind these ; submesopleural carina often strongly raised ..... DIPLAZONINAE

— Spiracle of tergite 1 about in the middle of the segment, glymmae absent, the segment sometimes subpetiolate and evenly narrowing from the spiracles to the base and somewhat expanded behind the spiracles ; submesopleural carina rather narrow ..... CTENOPELMATINAE

(*Zemiophorus* and *Hypsantyx* of Euryproctini : doubtfully British)

19 (16) Face protuberant, the clypeus not divided from the face (fig. 58) ; occipital carina absent.

Scape long and cylindrical (fig. 59) ; gaster sessile, often laterally compressed apically in the ♀ ; cell 2*Rs* pentagonal, often open apically (fig. 52) ORTHOCENTRINAE

— If, very rarely, the face is protuberant and the clypeus not divided from the face, then the occipital carina is complete 20

20 (19) Antenna with 14, or rarely 15, segments.

Cell 2*Rs* pentagonal, vein 3*rm* sometimes absent ; tergite 1 subpetiolate or petiolate, the spiracles a little behind the middle (fig. 60) ; ♀ usually with the ovipositor shortly exserted, valvula 2 with no preapical notch ADELOGNATHINAE

— Antenna with at least 16 segments 21

21 (20) Mesoscutum, posteriorly, with no lateral carinae (fig. 61) (in the Rhyssini of which some have weak lateral carinae, the mesoscutum is coarsely, transversely striate ; a weak trace of carina occurs in some *Tromatobia* and *Ephialtes* (*Iseropus*) *stercorator*).

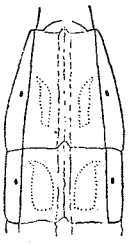
Gaster often with a broad basal articulation ; ovipositor conspicuously exserted (except *Hyperacmus*) ; gaster often with a pair of conspicuous tubercles on tergites 2/3–5 ; claws of ♀ often with a basal lobe or a sub-basal tooth, and never pectinate either in the ♀ or ♂ 22

— Mesoscutum, posteriorly, with conspicuous lateral carinae which join with those enclosing the scutellar fovea laterally ; mesoscutum never trans-striate (fig. 62) 23

22 (21) Vertex posteriorly, strongly sloping to the occiput and forming a very obtuse angle with this ..... PIMPLINAE

(Xoridini, Neoxoridini and Rhyssini, Ephialtini in part, Polysphinctini in part, *Hyperacmus* and *Miomeris* of Plectiscinae)

— Vertex dorsally flattened and meeting the occiput at a sharp angle COLLYRIINAE



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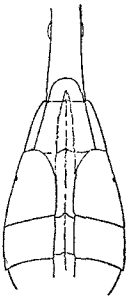

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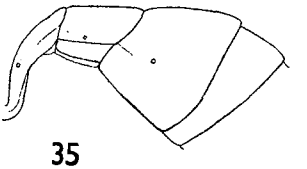

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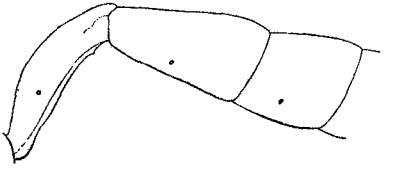

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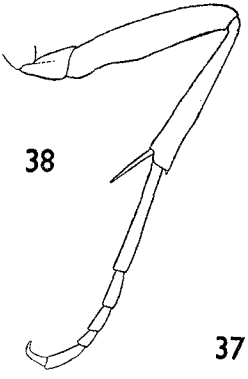

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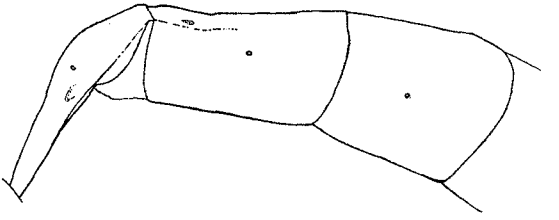

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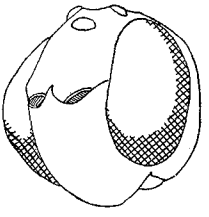

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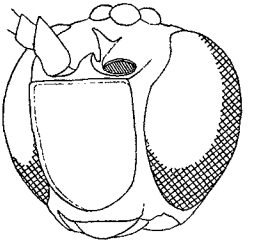

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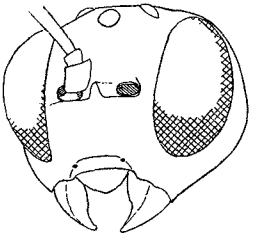

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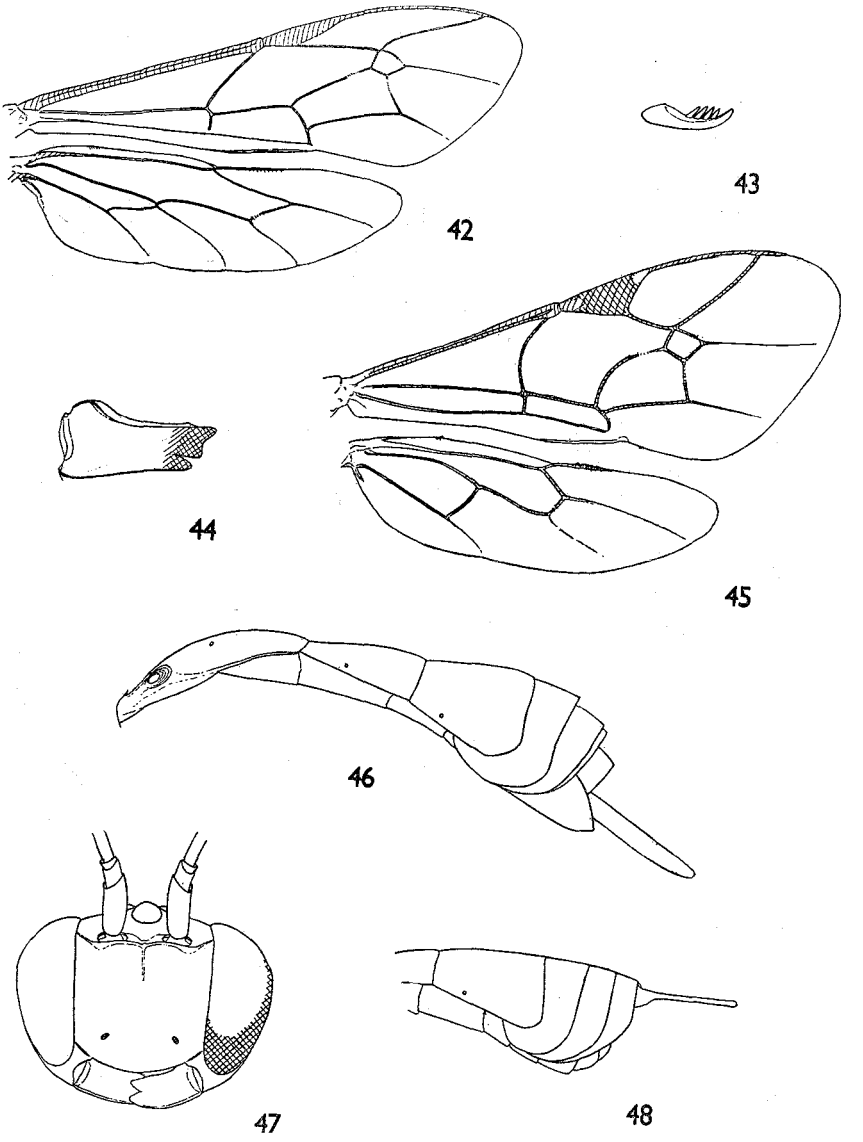
FIGS. 33–34.—Sub-basal segments of gaster, from beneath : 33, *Orthopelma mediator*, ♂ ; 34, *Phrudus monilicornis*, ♂.

FIGS. 35–37.—Basal segments of gaster, lateral : 35, *Phrudus monilicornis*, ♀ ; 36, *Orthopelma mediator*, ♀ ; 37, *Leptopygus harpurus*, ♀.

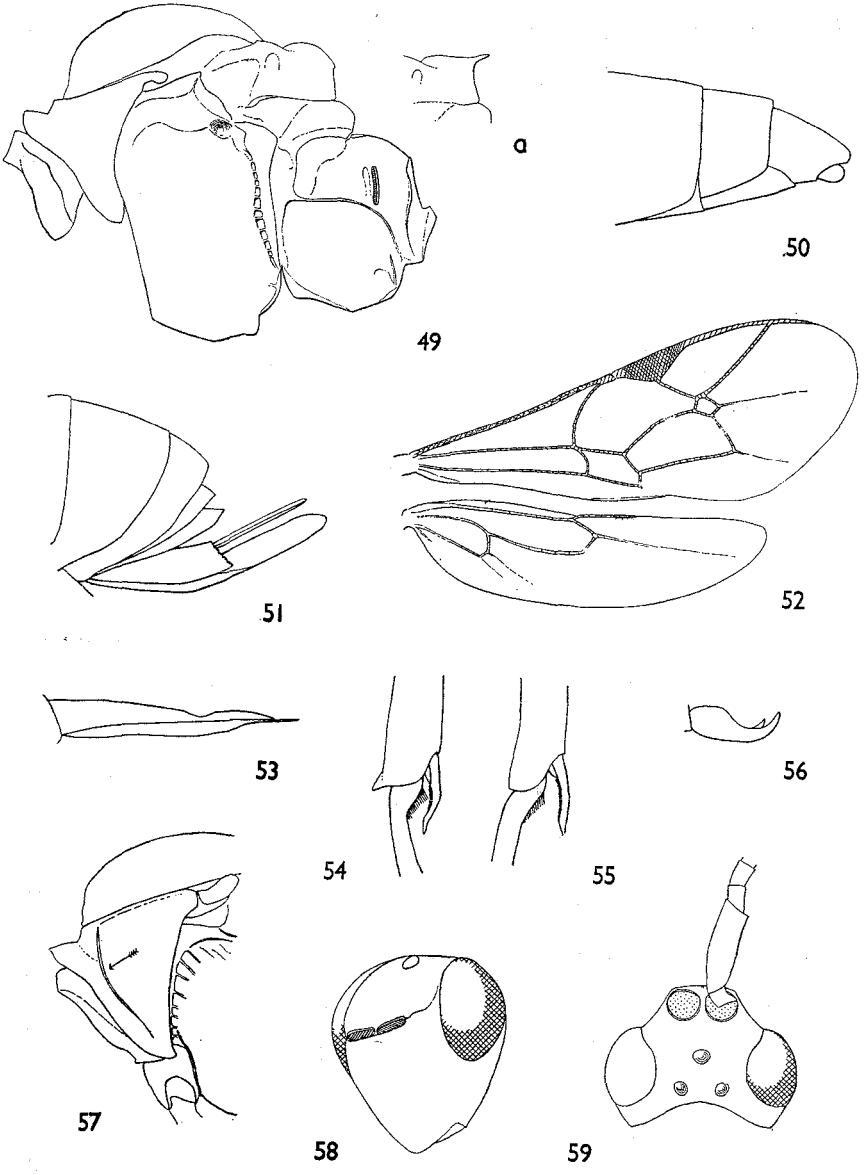
FIG. 38.—*Metopius dissectorius* : middle leg.

FIGS. 39–41.—Head, anterolateral : 39, *Exochus prosopius*, ♀ ; 40, *Metopius dissectorius*, ♀ ; 41, *Xorides fuligator*, ♀.



FIGS. 42–44.—*Banchus falcatorius*, ♀: 42, wings; 43, claw; 44, mandible.
FIGS. 45–48.—*Mesochorus politus*: 45, wings; 46, gaster, lateral, ♀; 47, head, anterior; 48, gaster, lateral, ♂.

FIG. 56.—*Phaenolobus arator*: claw of middle leg.
FIG. 57.—*Tryphon trochanteratus*: pronotum, lateral, to show epomia.
FIGS. 58–59.—*Orthocentrus*, head: 58, anterolateral; 59, dorsal.



FIGS. 49–50.—*Banchus falcatorius*, ♀ : 49, thorax, lateral (**a**, scutellum of *B. volutatorius*); 50, apex of gaster, lateral.

FIG. 51.—*Pion fortipes :* apex of gaster, lateral, left ovipositor sheath broken to show ovipositor.

FIG. 52.—*Orthocentrus:* wings.

FIG. 53.–*Hadrodactylus tarsator :* ovipositor, lateral.

FIGS. 54–55.—Apex of front tibia : 54, *Hadrodactylus tarsator*, with apical tooth ; 55, *Tryphon trochanteratus*, without apical tooth.

[*Continued opposite*

23 (21) Front tibia with an apical dorsal tooth (fig. 54) (sometimes very small, e.g. *Rhorus mesoxanthus* and *Opheltes glaucopterus*) ; epomia absent or rarely very indistinctly developed (most strongly developed in *Polyrhysia* and then short) ; ♀ ovipositor with a preapical dorsal excision in valvula 2 (fig. 53) except in Catoglyptini, in which the ovipositor is very narrow (fig. 51), and in a few species with modified ovipositors ; ovipositor very rarely exserted (some *Trematopygus*, *Lathrolestes*, *Perilissus* and *Taschenbergia* [2]).
Claws sometimes pectinate ; submetapleural carina not strongly raised anteriorly (*cf.* Lissonotinae) ..... CTENOPELMATINAE (= MESOLEIINAE)

— Front tibia usually with no apical dorsal tooth (fig. 55) ; if present (a few Tryphonini) then the epomia are very strongly developed and reach almost to the upper margin of the pronotum (fig. 57) ; ♀ of many species with the ovipositor conspicuously exserted 24

24 (23) Front and middle claws bifid (fig. 56) except in *Coleocentrus* (doubtfully British) in which they are simple, and which has tergite 8 unusually elongate (*cf.* figs. 65, 66) ; ♀ with the hypopygium long and pointed (figs. 63, 66) ; ovipositor conspicuously exserted and with no preapical notch in valvula 2
PIMPLINAE (ACAENITINI)

— Front and middle claws never bifid ; ♀ if with rather a large hypopygium then not with it long and pointed 25

25 (24) Tergites 2 and 3 with broad laterotergites (figs. 67–8) : gaster without punctures ; claws always strongly pectinate ; genal sulcus absent ; vein $M + Cu_1$ of hind wing not curved before the junction of M and Cu_1 (fig. 69) ; ovipositor with no dorsal notch.
Netelia and *Parabates* are testaceous insects with the thorax sometimes black marked or the apex of the gaster black ; *Phytodietus* are black insects with the head and thorax marked with yellow and sometimes with red, and the abdomen banded with yellow (sometimes narrowly) and with a hastate ovipositor ..... TRYPHONINAE (NETELIINI [3])

— Tergites 2 and 3 normally with narrow laterotergites, if broad then the gaster is punctate, or the genal sulcus is present as a deep groove, or vein $M + Cu_1$ of the hind wing is strongly curved, or the claws are not pectinate 26

26 (25) Gaster with tergites 2–4 with a triangular central area bounded by deep grooves (fig. 73) ; genal sulcus deep ; ♀ ovipositor hastate (fig. 74), the hypopygium with a large, median, membranous, basal area (fig. 72).
Occipital carina complete ; face somewhat dorsally produced between the antennal sockets ..... LYCORININAE

— When, rarely, tergites 2–4 have oblique furrows, then there is no deep groove joining these posteriorly ; genal sulcus often absent ; ovipositor with a preapical dorsal notch in valvula 2 27

27 (26) Pronotum broadly hollowed out dorsally and with a large process (sometimes paired) arising from the posterior face of the hollow (fig. 64) ; ♂ with the flagellum flattened and broadly expanded centrally (fig. 70) ; ♀ with the ovipositor very weak (fig. 71) ..... EUCERATINAE

— Pronotum at most slightly modified dorsally ; ♂ with the flagellum neither flattened nor expanded centrally ; ♀ with a well developed ovipositor 28

28 (27) Middle and/or hind tibiae with the number of spurs reduced
TRYPHONINAE (CTENISCINI, SPHINCTINI)

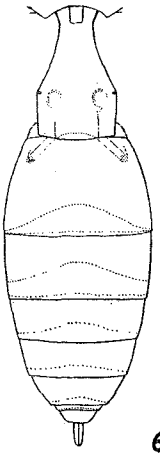
— Middle and hind tibiae with 2 distinct, apical spurs 29

29 (28) Posterior margin of mandible with a strong, upturned flange extending from the base to the base of the teeth (fig. 29) ; gaster petiolate (*cf.* couplet 8)
OPHIONINAE (*Nepiera*, *Tranosema arenicola*, *Phobocampe* in part.)

— Posterior margin of mandible without a carina, or if very rarely present, then the gaster is not petiolate 30

[2] I believe that *Taschenbergia modesta* (Gravenhorst) is best placed in this subfamily for the present.

[3] *Opheltes* would run here if the tooth of the front tibia were overlooked. Differs superficially in the small, pentagonal cell $2Rs$ and in the ♀ having a large, preapical, dorsal notch on the ovipositor.



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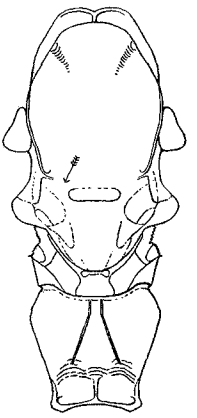

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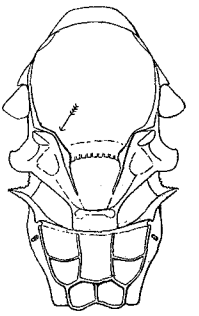

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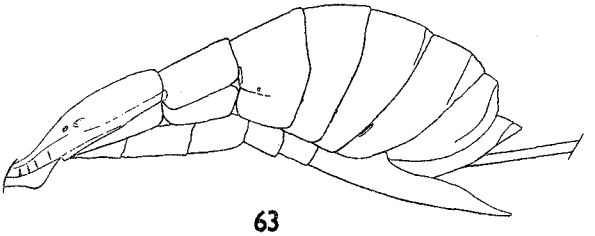

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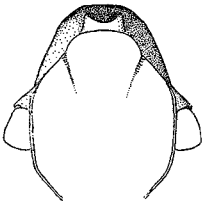

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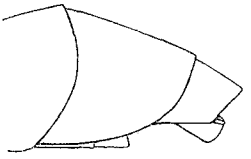

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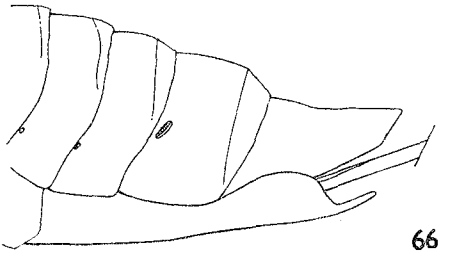

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FIG. 60.—*Adelognathus brevicornis*, ♀: gaster, dorsal.

FIGS. 61–62.—Thorax, dorsal: 61, *Ephialtes tuberculatus*, with lateral carina of mesoscutum absent posteriorly; 62, *Tryphon trochanteratus*, with lateral carina of mesoscutum present posteriorly.

FIG. 63.—*Phaenolobus arator*, ♀: gaster, lateral.

FIG. 64.—*Euceros albitarsus*, ♂: pronotum, dorsal.

FIGS. 65–66.—*Coleocentrus croceicornis*, apex of gaster, lateral: 65, ♂; 66, ♀.

30 (29) Propodeum rather short, rounded, with a single, central, transverse carina (fig. 75); cell 2*Rs* pentagonal ..... CRYPTINAE (*Helcostizus*)

— Propodeum, if with only a single transverse carina, then obviously not evenly rounded and with cell 2*Rs* not pentagonal 31

31 (30) Tergite 1 without glymmae; claws without pectination or long, sinuate, sub-basal hair; metapleurum with the submetapleural carina not raised anteriorly; ♂ with the hypopygium always short.
Ovipositor normally with valvula 2 with a small, preapical, dorsal notch PLECTISCINAE[4] (including OXYTORINI)

— Tergite 1 normally with deep glymmae; if without, then either the claws are pectinate, or have a long, sinuate, sub-basal hair, or metapleurum with the submetapleural carina strongly expanded anteriorly (fig. 76); ♂ sometimes with a long hypopygium 32

32 (31) ♀♀ 33

— ♂♂ 37

33 (32) Valvula 2 with a distinct, preapical, dorsal notch (fig. 77), the ovipositor always conspicuously exserted (shortest in *Exetastes*) and with the sheaths narrow 34

— Valvula 2 with no preapical notch; ovipositor sheaths sometimes conspicuously widened 35

34 (33) Hypopygium large, subquadrate; metapleurum with the submetapleural carina very strongly raised anteriorly (fig. 76) ..... LISSONOTINAE

— Hypopygium small and transverse; metapleurum with the submetapleural carina not raised anteriorly ..... PLECTISCINAE in part (*Allomacrus*, *Aperileptus*, *Entypoma* and *Entelechia*.)

35 (33) Gaster petiolate or subpetiolate; glymmae large and with no lateral projections above these (fig. 80).
Ovipositor sheaths exserted but not longer than tergites 1 + 2 TRYPHONINAE (THYMARIDINI)

— Gaster not petiolate and the glymmae, when present, with dorsal basal projections above these 36

36 (35) Tergites 7 and 8 relatively long, clearly visible, tergite 8 narrowing apically and with a pair of oblique, dorsal furrows; often with a basal lobe on at least the claw of the front leg, the shaft never pectinate (fig. 83); most usually with the ovipositor sheaths exserted by a distance far greater than the length of tergite 1, sometimes longer than the gaster; last segment of flagellum at most twice as long as the preceding segment .... PIMPLINAE in part

— Tergites 7 and 8 most usually concealed under tergite 6, if exposed, then they are very short and tergite 8 has no oblique, dorsal furrows; claws pectinate (fig. 82) or simple, never with a basal lobe; most usually with the ovipositor sheaths shorter than the length of tergite 1 and never more than two thirds the length of the gaster; last segment of flagellum sometimes conspicuously elongate 36*a*

36*a* (36) Apical segment of flagellum more than twice as long as the preceding segment (fig. 81) ..... STILBOPINAE

— Apical segment of flagellum only a little longer than the preceding segment TRYPHONINAE

37 (32) Hypopygium long (fig. 79), pointed or rounded apically .... PIMPLINAE in part

— Hypopygium short and transverse 38

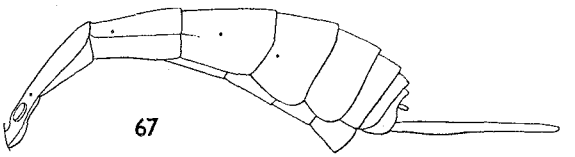
38 (37) Gaster petiolate (*cf.* fig. 80) ..... TRYPHONINAE (THYMARIDINI and GRYPOCENTRINI)

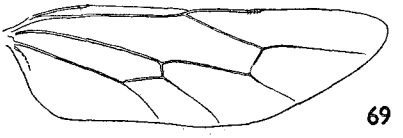
— Gaster sessile 39

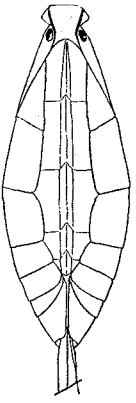
39 (38) Notaulus deep, extending to the disc of the mesoscutum (fig. 78); claws simple.
At least tergites 3 and 4 with more or less well developed tubercles or with a rhomboidal area; mandible always strongly narrowed apically PIMPLINAE (POLYSPHINCTINI) and *Entypoma robusta*, *Entelechia suspiciosa* (PLECTISCINAE)

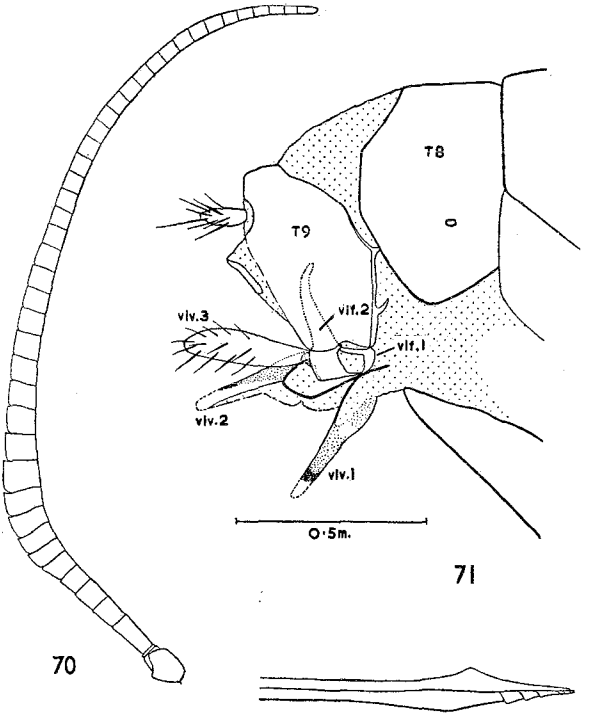
— Notaulus sometimes deep anteriorly but not meeting on the disc of the mesoscutum; claws sometimes pectinate 40

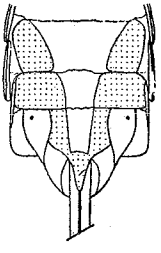
[4] *Sphecophaga*, if not recognized as belonging to the Cryptinae, would run here but can be distinguished by having the scutellar fovea strongly crenulate.

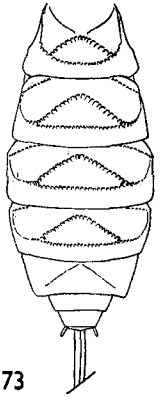












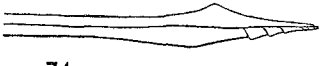


FIG. 67.—*Netelia longipes*, ♀: gaster, lateral.
FIG. 68.—*Phytodietus coryphaeus*, ♀: gaster, ventral.
FIG. 69.—*Netelia*: hind wing.
FIG. 70.—*Euceros albitarsus*, ♂: antenna.
FIG. 71.—*Euceros pruinosus*: apex of gaster, lateral, to show apical sclerites and form of ovipositor (*T*, tergites; *vlf*, valvifer; *vlv*, valvula).
FIGS. 72–74.—*Lycorina triangulifera*, ♀: 72, apex of gaster, ventral; 73, gaster, dorsal; 74, apex of ovipositor, lateral.

40 (39) Clypeus flat, polished, largely unsculptured and bare, thus contrasting markedly with the dull face which is covered with close, silver pubescence (fig. 86), and malar space concave (*Stilbops vetula*); or the labrum clearly visible when the mandibles are closed (*Aphanoroptrum*) (fig. 85).... STILBOPINAE

— Clypeus with at least scattered punctures and otherwise differing; labrum never clearly visible when the mandibles are closed.....41

41 (40) Pronotum dorsally with no transverse groove or with a very shallow one and/or the clypeus inflexed apically, though sometimes narrowly so, and with a row of coarse hairs along the line of inflection; femora thickened; gaster less elongate; sternaulus sometimes present anteriorly..... TRYPHONINAE

— Pronotum dorsally with a deep, transverse groove; femora thin, the legs strongly elongate; gaster elongate; clypeus not inflexed apically, though often strongly convex; never with distinct sternauli.....42

42 (41) Gaster with tergites 3–5 with a large, rather ill-defined tubercle on each side of the middle line (fig. 84)..... PIMPLINAE
(*Zaglyptus varipes*, *Tromatobia variabilis* and *Ephialtes stercorator*.)

— Gaster without tubercles.....43

43 (42) Hind wing with vein $M + Cu_1$ meeting the junction of M and Cu_1 in a strong curve (fig. 88); submetapleural carina not raised anteriorly
PLECTISCINAE
(*Aperileptus*, *Allomacrus*)

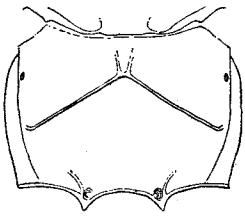
— Hind wing with vein $M + Cu_1$ almost straight (fig. 90); submetapleural carina raised anteriorly (*cf.* fig. 76)..... LISSONOTINAE

ICHNEUMONINAE

In the recognition of the subfamily Ichneumoninae, confusion is most likely to arise with the Cryptinae. In addition to the characters given in the key, the following notes may aid in the placing of the British species. The hind wing has the first abscissa of the median straight, before the transverse median, or at most, in some Phaeogenini, very weakly curved. Thus any species with the median strongly curved before the transverse median (as occurs in some Cryptinae) can be excluded from the Ichneumoninae. Also the form of the transverse median of the hind wings, always broken below the middle and most usually far below the middle, and having the upper abscissa sinuate (*cf.* wing of *Phaeogenes impiger*, fig. 412) is the usual condition found in the great majority of Ichneumoninae and rarely found in the Cryptinae. The transverse median, anyway, is never interrupted at, or above, the middle.

Of the Ichneumoninae, only in three species of *Cratichneumon* (*lanius*, *albilarvatus* and *pseudocryptus*) is the ovipositor of the female conspicuously exserted (subequal in length to the hind tibia), but in these the sheaths are shining and sparsely hairy, not dull and densely haired as is found in sheaths of comparable length in the Cryptinae. However, in the past, these species have been confused with species of *Aptesis*; but these *Cratichneumon*, amongst many other characters, differ from *Aptesis* in their typical Ichneumonine neuration of the hind wings, as described above.

Frequently, the complete absence of some character is of importance in assessing the position of a particular species. Thus no known Cryptine or Pimpline has pectinate claws, whereas this form of claw is sometimes, though rarely, found in the Ichneumoninae. Further, no Ichneumonine or Cryptine ever has glymmae on the first segment of the gaster. Cryptines never have deep gastrocoeli nor large thyridiae. It is really only some species of *Barichneumon*, *Dicaelotus*, *Colpognathus* and *Centeterus* that might at first, from



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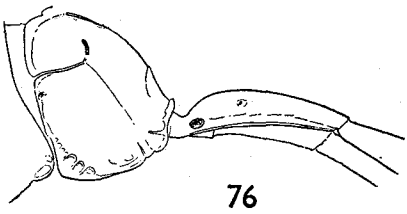

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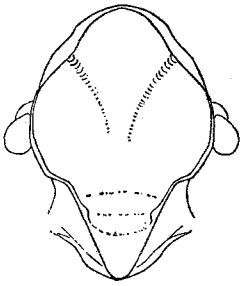

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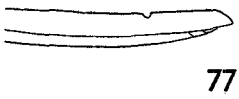

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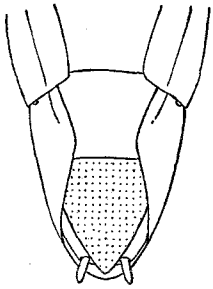

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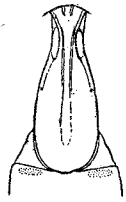

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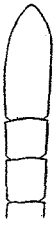

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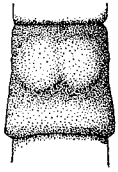

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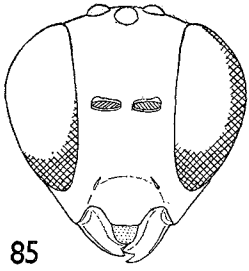

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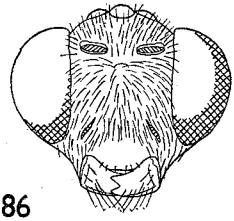

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FIG. 75.—*Helcostizus albator*, ♀: propodeum, dorsal.
FIGS. 76–77.—*Lissonota fundator*, ♀: 76, propodeum and base of gaster, lateral; 77, apex of ovipositor, lateral.
FIG. 78.—*Polysphincta tuberosa*, ♂: mesoscutum.
FIG. 79.—*Pimpla instigator*, ♂: apex of gaster, ventral (hypopygium stippled).
FIG. 80.—*Eclytus fontinalis*, ♀: tergite 1, dorsal.
FIG. 81.—*Stilbops vetula*, ♀: apical segments of antenna.
FIGS. 82–83.—Claws: 82, *Polyblastus strobilator*, ♀; 83, *Pimpla instigator*, ♀.
FIG. 84.—*Zaglyptus varipes*, ♂: tergite 3.
FIGS. 85–86.—Head, anterior: 85, *Aphanoroptrum abdominale*, ♂; 86, *Stilbops vetula*, ♂.

the key, be mistaken for Cryptines in that the gastrocoeli and thyridiae are very small or absent, and the sternauli are more or less developed. But these species have a petiole which, centrally, is quadrate in section and the postpetiole is of the usual Ichneumonine form, whereas in Cryptines, if the postpetiole becomes broad, so also does the petiole, and the whole first segment is widened, and thus appears somewhat as in the Platylabini ; the one species of this tribe, however, with the thyridiae and gastrocoeli very much reduced (*Ectopius rubellus*) has the sternauli represented at most by a weak depression anteriorly.

Of British Cryptinae, the only species known to me without conspicuous sternauli is *Helcostizus albator* (Thunberg), which has the spiracles of the first tergite of the gaster a little before the middle, and for which special provision has thus been made in the key to the subfamilies. A point which perhaps is worthy of note, is that a number of Cryptines have a pair of tubercles on the apical margin of the clypeus whereas these are not found in any British Ichneumoninae.

The Ichneumoninae are parasites of Lepidoptera, the adults emerging from the pupae of the host. Specimens are sometimes taken in which there is a deep pit on the tergites of the gaster, and in some species this pit, though variable in shape, is of very frequent occurrence. It appears to be due to pressure from an internal boss in the pupa of the host. Some species, too, seem frequently to be malformed in the mesoscutum (e.g. *Phaeogenes callopus*) which has a transverse impression, varying in position ; this too probably corresponds with an internal ridge in the host pupa. In fact, malformed specimens are quite frequent in the group and, naturally, can cause difficulty in identification.

I have been conservative in the division of the genera and when, more is known of world species, there will certainly be much further splitting of the present genera, as well as some lumping; but for this it is essential to see the type species of the already described genera, the descriptions of which give few of the characters now used.

In the course of preparing the keys of this subfamily, it has been possible to examine continental specimens of well over 100 species not yet known to occur in the British Isles. Material obtained in the past few years shows that further additions to the British list will be frequent when there is intensive collecting. Some supplementary characters have been added in certain cases which may help to exclude some of the unrecorded species which seem particularly likely to occur in Britain, from running in the keys.

It has been found necessary in the majority of genera to give separate keys to the females and to the males, for sexual dimorphism is very considerable throughout the group. Even in the keys to the genera of Ichneumonini, I have given separate keys to the two sexes as this should lead to rather simpler working. In most cases the females will be found easier to determine than the males. It is to be regretted that at present it is impossible to give keys to the males of certain genera.

Preliminary notes on the exclusion of erroneously determined species and additions to the British list, together with notes on nomenclature and synonymy, will be found in Perkins, 1953, *Bull. Brit. Mus.* (*Nat. Hist.*) *Ent.* **3** (4) : 105–76. A check list was included in this paper, but a few additions (marked with an asterisk) and corrections of nomenclature are made in the *Handbooks* to this subfamily, as follows :

* *Aoplus lariciatae* (Kriechbaumer), (**comb. nov.**).
(syn. *Platylabus lariciatae* Kriechbaumer).
Barichneumon basalis **sp. nov.**
(syn. *B. basiglyptus* (Kriechbaumer Perkins)).
* *Barichneumon bilunulatus* (Gravenhorst).
Barichneumon basiglyptus (Kriechbaumer).
(syn. *B. coxiglyptus* Heinrich), (**syn. nov.**).
Coelichneumon nigricornis (Wesmael).
(syn. *C. impressor* (Zetterstedt Perkins)).
* *Exephanes ulbrichti* Hinz.
Linycus exhortator (F.), (**comb. nov.**).
(syn. *Ectopius exhortator* (F.)).
Melanichneumon leucocheilus (Wesmael), (**comb. nov.**).
(syn. *Barichneumon leucocheilus* (Wesmael)).
* *Poecilostictus cothurnatus* (Gravenhorst).

In a few cases I have been able to examine only one sex of a species, and where the other sex has been included in the key on the basis of published descriptions it has been placed in square brackets.

KEY TO THE TRIBES OF ICHNEUMONINAE

1 Spiracles of propodeum circular or subcircular (length : breadth at most 1·2 : 1) (fig. 89); if the petiole is broad, then the upper abscissa of the transverse median of the hind wing is antefurcal and is not sinuate[5] (*cf.* fig. 291), or receives the spurius vein only just below the middle; at most with the extreme apical margin of the segments very narrowly white. Whole insect (fig. 110) ..... PHAEOGENINI (p. 68)

– Spiracles of propodeum most usually strongly elongate (fig. 202) very rarely length : breadth 1·3 : 1 (*Apaeleticus* and *Listrodromus*), or very rarely subcircular (figs. 203, 204) (*Cyclolabus* and *Ectopius*) in which case the petiole is depressed and is conspicuously wider than high in the middle (*cf.* fig. 104) and the upper abscissa of the transverse median of the hind wing is vertical or postfurcal, and sinuate (*cf.* fig. 9); apical segments of abdomen often with conspicuous ivory or yellow apical spots or bands 2

2 (1) Propodeum sharply falling away before and behind the line of the costulae (fig. 98).
Scutellum pyramidal or very strongly convex; ♀ with the hypopygium much longer than the distance from its apex to the apex of the ovipositor; either tergites 2–5 weakly excavate on each side of the central line and the frons with a pair of central crests, or the wings are yellow with the apical margin more or less infuscate; cell 2*Rs* four sided (sometimes subpetiolate); *Rs* strongly sinuate (fig. 8) ..... TROGINI (p. 29)

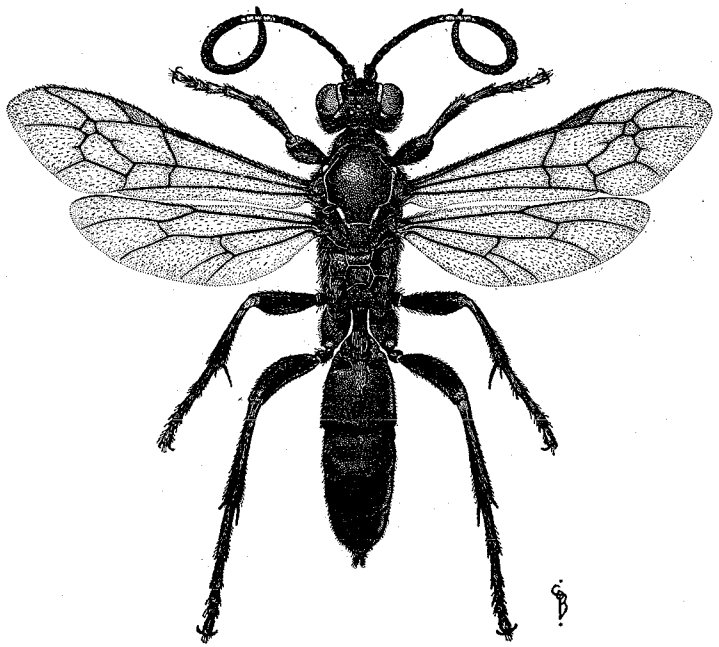
– Propodeum at most evenly rounded across the line of the costulae (*cf.* figs. 95–97) 3

3 (2) Genal carina meeting the hypostomal carina at the base of the mandible (*cf.* figs. 94, 205); scutellum conspicuously rounded from base to apex, or convex or pyramidal (particularly in the ♂); hypopygium of ♀ reaching almost to the line of the last visible tergite; mandible conspicuously bidentate 4

– Genal carina, most usually, meeting the hypostomal carina distinctly away from the base of the mandible (*cf.* figs. 106, 206); if (some *Barichneumon* spp.) the carinae are continuous, then the scutellum is rather flat or in the ♂ very weakly rounded dorsally, and in the ♀ the apex of the hypopygium is further from the apex of the ovipositor than the length of the hypopygium; mandible sometimes appearing unidentate when viewed from below 6

[5] Species with the petiole quadrate may have the transverse median vein of the hind wings with the upper abscissa sinuate.

4 (3) Transverse furrow of pronotum simple ; ♀ claws pectinate.
Propodeum evenly rounded from base to apex, very short ; face, in the central line, not divided from the very weakly convex clypeus (figs. 176, 178–80) ; clypeal foveae minute ; mandible rather broad and hardly contracting towards the apex. Whole insect (fig. 108) . . . . LISTRODROMINI (p. 45)



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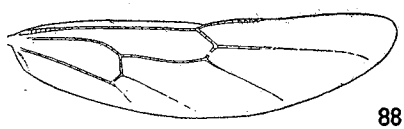

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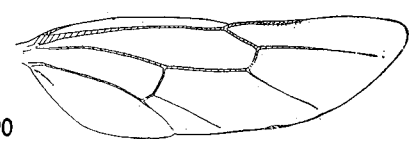

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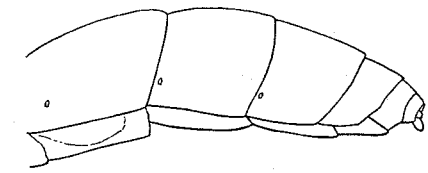
FIG. 87.—*Coelichneumon comitator*, ♀.
FIG. 88.—*Allomacrus pimplarius* : hind wing.
FIG. 89.—*Phaeogenes invisor* : spiracle of propodeum.
FIG. 90.—*Lissonota fundator* : hind wing.



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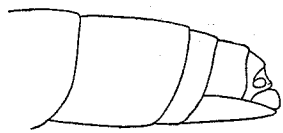

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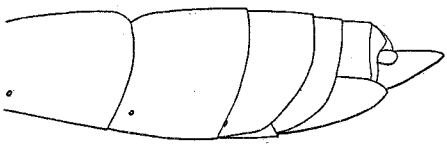

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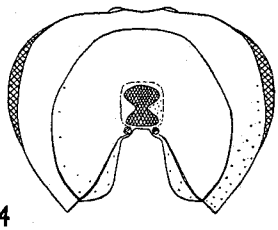

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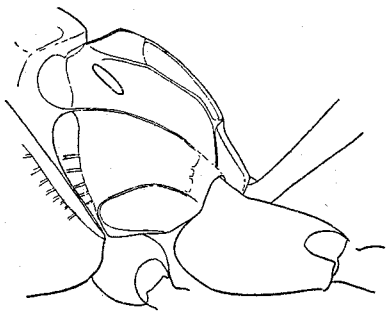

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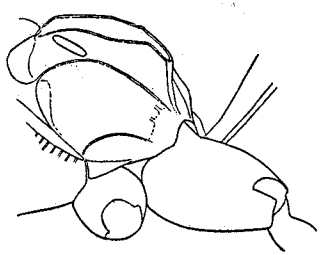

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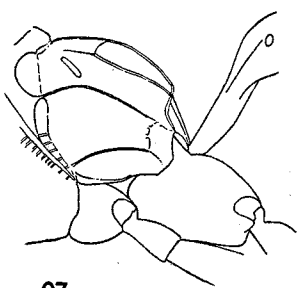

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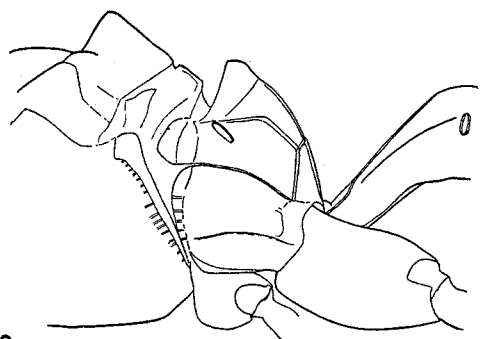

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FIGS. 91–93.—Apex of gaster, ♀, lateral: 91, *Eurylabus tristis*; 92, *Hypomecus quadriannulatus*; 93, *Platylabus pedatorius*.

FIG. 94.—*Listrodromus*: head, posterior.

FIGS. 95–98.—Propodeum, lateral: 95, *Coelichneumon leucocerus*, ♂; 96, *Ichneumon sarcitorius*, ♀; 97, *Stenichneumon rufinus*, ♀; 98, *Trogus l. coerulator*, ♀.

– Transverse furrow of pronotum interrupted centrally by a broad keel or by a tubercle arising from the posterior margin of the furrow (figs. 182, 184, 199); ♀ claws simple 5

5 (4) Mandible with the hind margin not at all raised, and rather broad, hardly contracting from near the base to the base of the teeth; spiracles of propodeum at least twice as long as broad; supraclypeal area not, or weakly raised, and the clypeus conspicuously flat; clypeal foveae minute; propodeum, viewed late rally, evenlyrounded but the line is broken by the short dentiparal spines ..... LISTRODROMINI (*Anisobas*) (p. 46)

– Mandible with the hind margin with a conspicuous raised carina, and strongly narrowing from base to apex; spiracles of propodeum with length : breadth about 1·3 : 1, kidney shaped; supraclypeal area strongly raised, the clypeus strongly convex so that there is a conspicuous depression between these, the clypeus strongly, broadly inflexed apically; clypeal foveae deep and rather large; propodeum, viewed laterally, with a distinct angle at the dentiparal spines between the dorsal and apical surfaces PLATYLABINI (*Apaeleticus*) (p. 68)

6 (3) Propodeum rather short and, viewed laterally, evenly rounded, never with dentiparal teeth or spines, rarely with a tubercle, and the dentiparal area always with the posterior carina distinct (fig. 95); lateral carina of the petiolar area at most as long as the costula (or the width of the dentiparal area at the position of the costula); gastrocoelus always deep.
Area basalis never with a sharp, anterior, median tooth; ♀ never with ivory spots on tergites 7 and 8; mandible bidentate. Whole insect (fig. 87) PROTICHNEUMONINI (p. 31)

– Propodeum with a distinct division into dorsal and posterior surfaces (fig. 96); if somewhat rounded (*cf.* fig. 97), then the lateral carina of the petiolar area is longer than the costula; gastrocoelus often shallow; areation of the propodeum sometimes much reduced 7

7 (6) Petiole conspicuously flattened, centrally distinctly broader than high (fig. 104); ♀ hypopygium large and covering the base of the ovipositor (figs. 91–93).
Flagellum strongly attenuate apically; claws never with the shaft pectinate 8

– Petiole centrally quadrate or even higher than broad (fig. 103); if rarely in some ♀♀, broad, then the hypopygium is small and its apex is conspicuously removed from the (visible) base of the ovipositor (*cf.* fig. 124) 10

8 (7) Clypeus concave, strongly rounded apically (figs. 99, 100); mandible unidentate (fig. 101); tarsi large with segment 1 laterally compressed and deep in both sexes (fig. 102) ..... ZIMMERINI (p. 47)

– Clypeus flat or convex (*cf.* figs. 188, 234); mandible always with 2 teeth; tarsi less broad 9

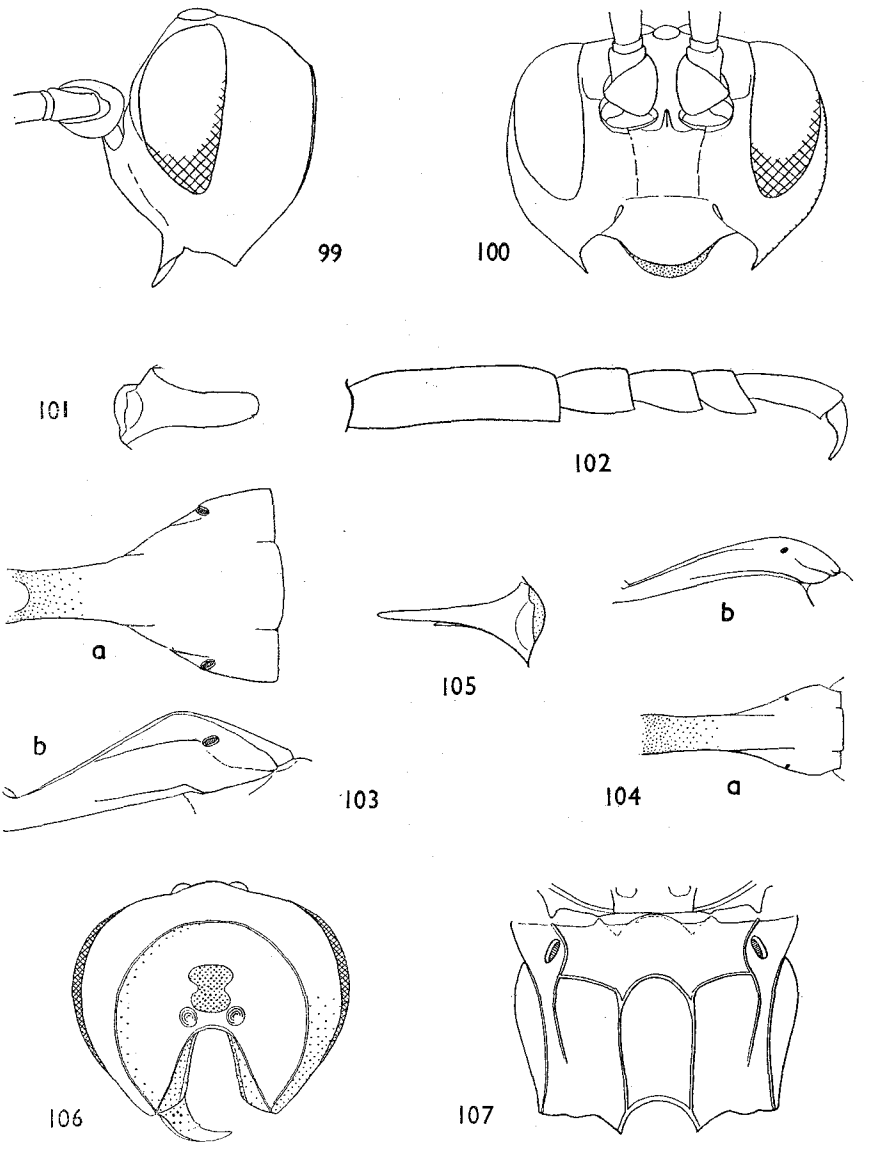
9 (8) Antennal sclerite laterally very narrow (figs. 185, 187, 193); tergite 2 with the gastrocoeli distinct and deep, but the thyridiae absent; scutellum without lateral carinae; ovipositor sheaths viewed laterally, thin and decurved (fig. 91) ..... EURYLABINI (p. 48)

– Antennal sclerite laterally broad and strongly raised (figs. 228–33); tergite 2 with strong thyridiae, or if these are weak, then the gastrocoeli are very small and shallow; scutellum most usually with lateral carinae; ovipositor sheaths straight (fig. 93). Whole insect (fig. 109) ..... PLATYLABINI (p. 50)

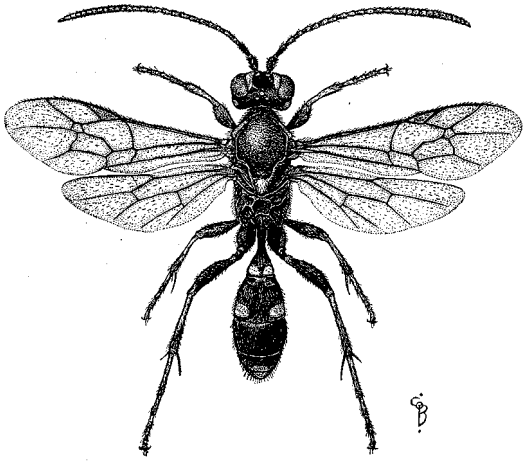
10 (7) Apical half of the punctate scutellum and the postscutellum coriaceous and dull; abdomen elongate, in the ♂ narrowing a little from the base of tergite 3 to the apex of the abdomen, in the ♀ compressed apically and with the apex of the hypopygium reaching beyond the line of the apex of the last tergite (fig. 92) ..... PLATYLABINI (*Hypomecus*) (p. 67)

— Postscutellum smooth, punctate, rugose or with longitudinal striae, but never coriaceous; ♀ with the last sternite at most reaching the line of the apex of the last tergite 11

11 (10) Mandible with the small tooth dorsal so that the mandible appears unidentate when viewed from below (fig. 105); propodeum rather evenly rounded with the dentiparal area completely open posteriorly (fig. 107); genal carina meeting the hypostomal carina immediately behind the base of the mandible (fig. 106); scutellum convex with distinct lateral carinae.



FIGS. 99–102.—*Zimmeria dirus :* 99, head, lateral ; 100, head, anterior ; 101, mandible ; 102, hind tarsus.
FIGS. 103–104.—Tergite 1 ; (*a*) dorsal ; (*b*) lateral : 103, *Ichneumon extensorius ;* 104, *Asthenolabus vitratorius.*
FIGS. 105–107.—*Heresiarches eudoxius :* 105, mandible ; 106, head, posterior ; 107, propodeum, dorsal.



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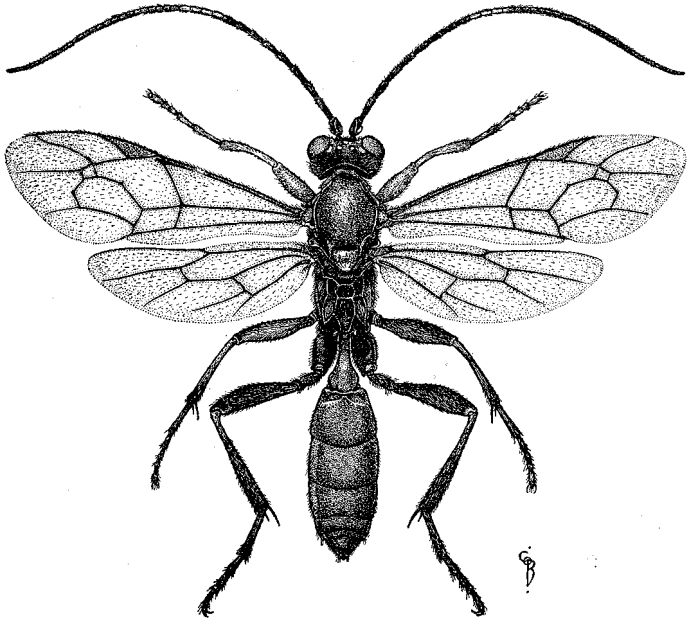

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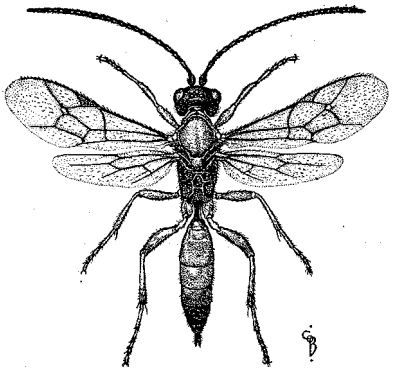
FIG. 108.—*Listrodromus nycthemerus*, ♀.
FIG. 109.—*Platylabus rufus*, ♀.



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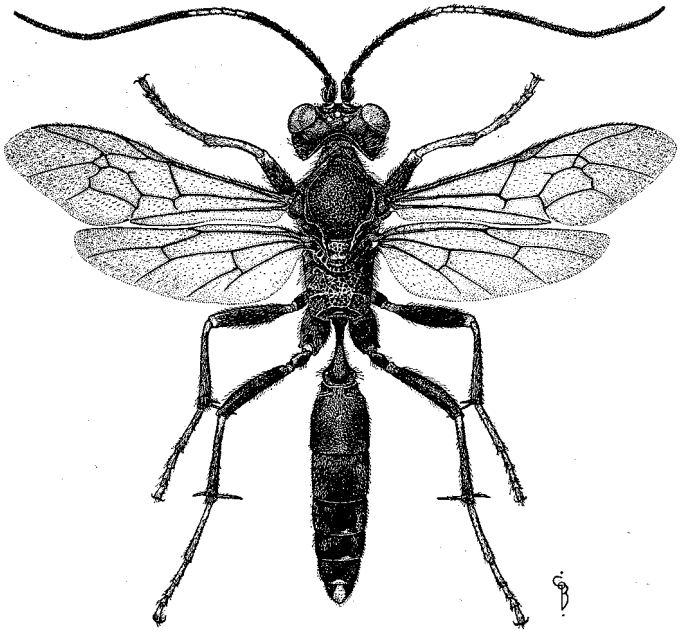

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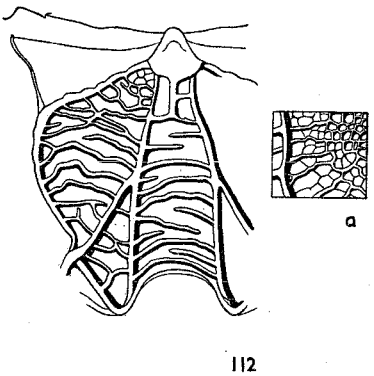
FIG. 110.—*Thyraeella collaris*, ♀.
FIG. 111.—*Goedartia alboguttata*, ♀.

Area superomedia only delimited posteriorly, the position which it should occupy being polished, produced forward over the basal groove of the propodeum and almost meeting the central area of metanotum (fig. 107) HERESIARCHINI[6] (p. 45)

— Mandible most usually clearly bidentate when viewed from below ; if unidentate, or apparently so, then the dentiparal area is closed posteriorly, and disagreeing in at least some other characters.....12

12 (11) Scutellum pyramidal and with strong lateral carinae ; tergite 2 with broad, deep gastrocoeli and large thyridiae ; only sternite 2 with a median longitudinal fold ; tergite 1 with the petiole strongly, laterally compressed, the postpetiole without a central area ; abdomen metallic blue with narrow, apical, ivory bands on tergites 5 (usually) and 6, and a longitudinal, ivory spot on tergite 7 ; postpetiole with a pair of lateral, ivory spots which may be joined centrally. Whole insect (fig. 111)..EURYLABINI (*Goedartia*) (p. 48)

— If with a ventral fold only on sternite 2, then the thyridiae are absent and the scutellum has no lateral carinae and the postpetiole has a central area differentiated ; species with a metallic blue abdomen agree with none of the other characters.....ICHNEUMONINI



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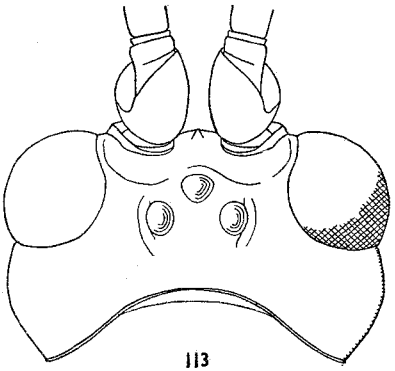

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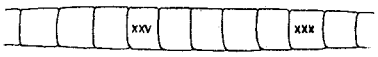

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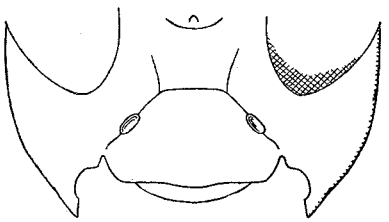

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FIGS. 112–116.—*Callajoppa :* 112, *cirrogaster*, propodeum, dorsal ; **a**, *exaltatoria*, sculpture ; 113, *cirrogaster*, head, dorsal ; 114, *cirrogaster*, face, clypeus and malar space, anterior ; 115, *cirrogaster*, central segments of antenna ; 116, *exaltatoria*, central segments of antenna.

[6] Heinrich has placed these in the Protichneumonini. But the group of genera which belongs here seems to me to be as distinct as most tribes in the Ichneumoninae and I have thus retained this tribe. If the two are amalgamated then Heresiarchini is the older name.

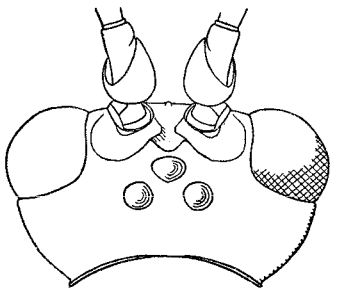
Tribe TROGINI

This tribe, in certain of the non-British genera, approaches very closely indeed to the Protichneumonini, and differentiation is then in some cases difficult. The superficial characters given in the key to the tribes will aid in placing the four British species in this tribe.

KEY TO GENERA

1 Frons with a pair of central crests (which are variable in development); head small and narrowed behind the eyes (figs. 117, 120); clypeus broadly excised apically (fig. 118); wings very weakly infuscate with the apical margins a little darker 2

– Frons with no processes; head with the temples a little swollen behind the eyes (fig. 113); apex of clypeus truncate and weakly produced centrally (fig. 114); wings yellow with the apical margins moderately or strongly infuscate; tergites evenly rounded ..... **Callajoppa** Cameron (p. 30)



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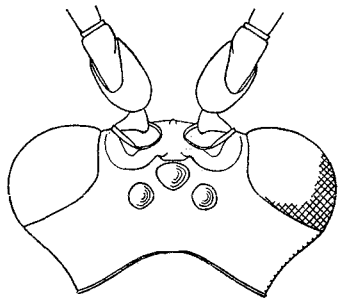

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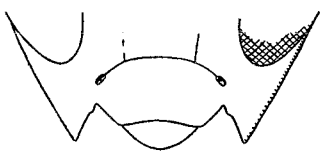

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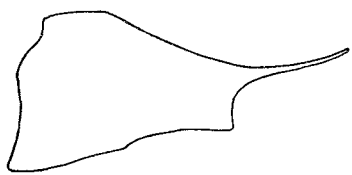

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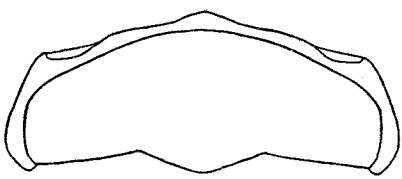

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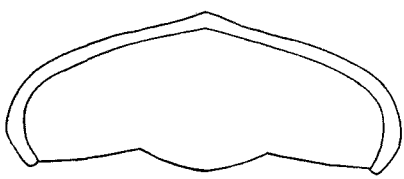

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FIGS. 117–119.—*Trogus l. coerulator*, ♀: 117, head, dorsal; 118, clypeus and malar space, anterior; 119, section of tergite 3.
FIGS. 120–122.—*Psilomastax pyramidalis*: 120, head, dorsal, ♀; 121, genital clasper, ♂; 122, section of tergite 3, ♀.

2 (1) Head more or less intumescent behind the ocelli, the temples convexly narrowed behind the eyes (fig. 117); tergites 2–5 distinctly though shallowly, broadly impressed on each side of the central line, the outer margin of the depression forming an angle with the lateral area of the segment (fig. 119); ♂ genital claspers not produced apically.....**Trogus** Panzer (p. 30)

– Head not at all intumescent behind the ocelli, the temples concave so that the occipital carina is very outstanding (fig. 120); tergites 2–5 at most very weakly and indistinctly impressed on each side of the central line and evenly rounded laterally (fig. 122); ♂ genital claspers, apically, with a strong dorsal spine (fig. 121).....**Psilomastax** Tischbein (p. 30)

Genus **Psilomastax** Tischbein

Generally black; legs red, coxae and trochanters mostly black, front and middle femora and tibiae marked with black, tarsi entirely pale testaceous; face and thorax marked with white; antenna of ♀ with a white central ring. (Figs. 120–22) 15 mm. *Hants.* 1 ♀. *Host*, Apatura iris (*L.*). vii

pyramidalis Tischbein

Genus **Trogus** Panzer

Generally black, in part somewhat bluish metallic; femora and tibiae entirely red, the hind tarsus black, at most with the first and fifth segment in part testaceous; face and thorax never marked with white; antenna of ♀ entirely black; wings very weakly infuscate except for the apical margin. (Figs. 117–9) 15–18 mm. *E. England. Host*, Papilio machaon *L.* vi–vii

lapidator coerulator (F.)

Note.—The typical subspecies *lapidator* (F.) occurs in S. Europe and has wings evenly and deeply infuscate.

Genus **Callajoppa** Cameron

The two British species of this genus are parasites of Hawk Moths. They are two of the largest and most showy species of Ichneumonidae found in this country. However, some difficulty may be experienced in separating the two species unless they can be compared. They are similar in coloration, but are both variable in this respect. Usually they have the following pale markings: base of antenna testaceous, face, clypeus and mandible yellow, frontal orbits, malar space and lower outer orbits yellow fading into testaceous on the rest of the outer orbits (sometimes the head for the greater part pale); pronotal collar centrally and upper margin of the pronotum laterally, yellow, sometimes edged with testaceous and sometimes testaceous on the anterior lateral margin and in the lower angle; scutellum and subalar prominence yellow, keels before the scutellum most usually marked with testaceous; mesoscutum sometimes with the line of the notauli marked with testaceous, mesopleurum and propodeum often marked with testaceous; gaster with at least tergites 1–3 pale, testaceous sometimes marked with yellow; legs testaceous, most usually with the coxae at least marked with black, hind femur often marked with black (always so in *exaltatoria* which also has the apex of the hind tibia more or less infuscate), or sometimes with the hind femur in greater part black. The paler markings are usually more extensive in *cirrogaster* than in *exaltatoria*.

Parasites of Sphingidae.

Key to Species

A Sternites 2 and 3 with a median, longitudinal fold; dentiparal area coarsely, irregularly, transversely costate, rarely with a small rugose area towards the base (fig. 112); the yellow wings with the infuscate apical margin much

paler ; tergite 4 most usually testaceous, frequently with the whole gaster testaceous ; ♀ with gaster more robust and the antenna very conspicuously widened before the apex, at the broadest with the segments about twice as broad as long (fig. 115). 20–27 mm. *Not uncommon.* vii–ix

cirrogaster (Schrank)

B Sternite 2 with a weak fold, sternite 3 evenly sclerotized ; dentiparal area, at least in greater part, rugose (fig. 112*a*) ; the rather deep yellow wings with the apical fuscous band dark ; tergite 4 always black except, sometimes, for the extreme base ; tergites 5–7 black ; ♀ with gaster more elongate and the antenna little widened before the apex, at the broadest with the segments subquadrate (fig. 116). 24–32 mm. *Not uncommon.* vi–vii

exaltatoria (Panzer)

Tribe PROTICHNEUMONINI

This tribe on the one hand very closely approaches the Trogini, *e.g.* such European genera as *Catadelphus*, a species of which was at one time recorded from this country, though there is no evidence that it was in actual fact taken in Britain. On the other hand, some *Coelichneumon* require care in their separation from *Stenichneumon*, in particular *S. rufinus*. Two other species of Ichneumonini which might be confused with *Coelichneumon* are *Barichneumon gemellus* and the male of *Ichneumon deliratorius*. Both these species can be excluded from this tribe on the characters given in the key to the tribes, but care is needed. It may be of interest to point out that the female of *I. deliratorius* is quite typical of its genus and with this sex no confusion arises.

The three British genera of Protichneumonini are by no means easy to separate and in consequence the key is both complicated and difficult. The females of *Amblyjoppa* can be recognized at once by the blunter abdomen, the hypopygium reaching more nearly to the line of the apex of the last tergite. *Coelichneumon* and *Protichneumon* approach each other so closely that it seems doubtful to me whether they should be separated into two genera.

KEY TO GENERA

1 Sternite 2 with a median, longitudinal fold and this fold often weak ; ♀ with the hypopygium at least two-thirds as long as its distance from the apex of the ovipositor (fig. 123) and with the hind coxa having neither a scopa nor a subapical, ventral tubercle, though in *proteus* the coxa is closely hairy beneath.

♀. Propodeum with the area superomedia small and pointed anteriorly or very small and with no differentiated central area (figs. 125, 126) ; thorax, when viewed dorsolaterally, with the pleural-sternal tubercle appearing only as a weak sinuation before the middle coxae ; frontal orbits broadly marked with ivory ; antennae not " rolled " apically

Amblyjoppa Cameron (p. 35)

– Sternites 2–4 in the majority of species with a median, longitudinal fold ; ♀ always with the hypopygium at most half as long as the distance from its apex to the apex of the ovipositor (fig. 124) and with the hind coxa often having a scopa, which may be on a subapical, ventral tubercle 2

2 (1) Propodeum with the area superomedia as broad as long or broader than long (figs. 129–33) ; if, rarely, longer than broad then it is large and the lateral carinae of the scutellar fovea are marked with ivory or the gaster is black ; gaster black, sometimes in part or almost wholly deep red, rarely with ivory spots on the basal segments ; sternopleural tubercle present, but rather weak . . . . . **Coelichneumon** Thomson (p. 35)

– Propodeum with the area superomedia longer than broad (figs. 127–8) ; lateral carinae of the scutellar fovea entirely black ; gaster with at least

tergites 2 and 3 testaceous ; sternopleural tubercle well developed in British species.

Propodeum more strongly declivous on either side of the area superomedia which usually is more prominent apically, particularly in the ♂
Protichneumon Thomson (p. 32)

Genus **Protichneumon** Thomson

Both the British species have the fourth sternite with a membranous, central, longitudinal fold.

The known hosts of the species of this genus are Sphingidae.

Key to Species

(Females)

A Hind coxa with no subapical tubercle nor with a scopa, with coarse and rather close punctures beneath ; pale markings of head, thorax and legs yellow.

Head, thorax and legs black ; yellow are the following—the frontal orbits broadly, the upper margin of the pronotum except centrally, a pair of central spots on the anterior margin of the pronotum (which may coalesce), the scutellum, the subalar prominence, the front tibia dorsally and a broad band on the middle and hind tibiae ; gaster fulvous with tergite 1 black except for the apical margin, sometimes also tergites 4–7 black. 20–24 mm. *Uncommon.* vi–viii..... **pisorius** (L.)

B Hind coxa with a more or less raised tubercle (fig. 134) on which the punctures are very fine and close, so that this area contrasts sharply with the coarsely punctate surrounding area ; with a more or less distinct scopa on the tubercle which sometimes obscures the sculpture ; pale markings on the head and thorax ivory ; the middle and hind tibiae marked with testaceous or almost completely black.

Head and thorax black ; ivory are the following—the frontal orbits (narrowly) which may be joined to a large spot on the orbits of the vertex, a pair of spots on the anterior margin of the pronotum (sometimes), the subalar prominence (sometimes), the scutellum except for the basal quarter ; legs black with the front and middle femora red apically, the front tibia more or less red internally, the hind tibia usually with a red band ; gaster fulvous with segment 1 black except for its apical margin. 17–20 mm. *Uncommon.* vi–viii..... **coqueberti** (Wesmael)

Note.—The continental form of this species differs from the 3 British ♀♀ that I have seen in having ivory markings (1) on the facial orbits, and the frontal orbits more broadly marked and joined to the vertical spot, (2) on the external orbits in part (usually), (3) on the lateral upper margin of the pronotum, (4) on the whole scutellum ; the hind tibia is much more conspicuously marked with red ; the mesoscutum is more conspicuously sculptured between the punctures. (Ten continental ♀♀ examined from Germany, Switzerland and Czechoslovakia.)

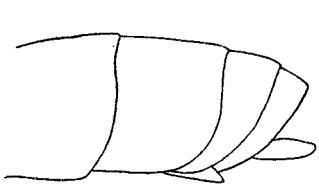
(Males)

A Hind leg with the trochanter and trochantellus and the basal third (approx.) of the hind femur yellow, the hind tibia yellow with the extreme base and the apical quarter black, the hind tarsus with segments 1–3 yellow, narrowly fuscous apically ; segment 1 of front tarsus with a strong, subapical thorn (*cf.* fig. 164).

Face, cheeks, external orbits in part, scape beneath, often a spot on the prepectus laterally, the front and middle legs in large part, yellow ; otherwise with similar coloration to the ♀. 20–24 mm..... **pisorius** (L.)

B Hind legs black with the tibia and basal segments of the tarsus marked with testaceous, or rarely with the tibia more or less marked with dirty white externally and beneath ; segment 1 of front tarsus with a very weak, subapical tubercle (*cf.* fig. 165).

Scape with an ivory spot beneath ; face ivory with a black spot beneath each antennal socket, a fuscous line centrally dorsad, often the apex of the



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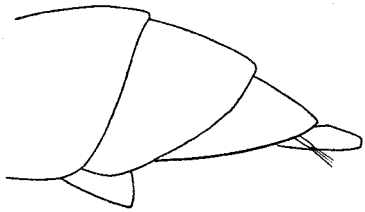

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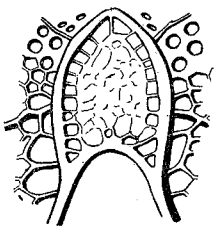

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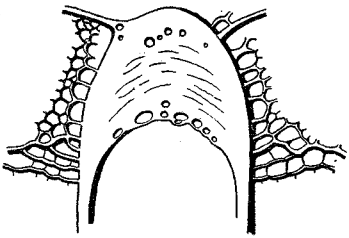

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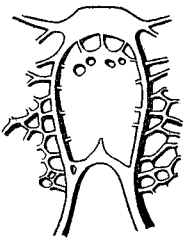

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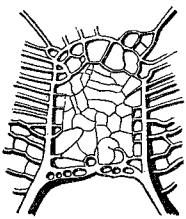

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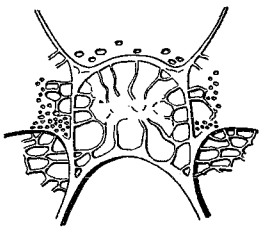

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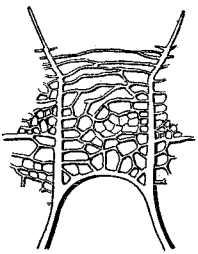

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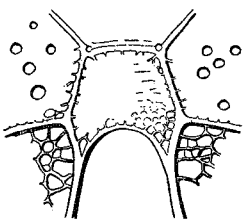

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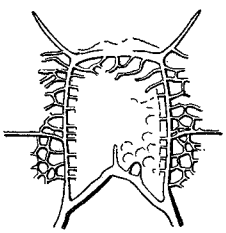

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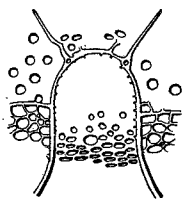

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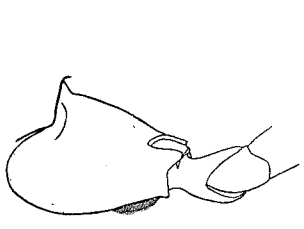
FIGS. 123–124.—Apex of gaster, lateral, ♀: 123, *Amblyjoppa fuscipennis*; 124, *Protichneumon pisorius*.

FIGS. 125–133.—Area superomedia: 125, *Amblyjoppa fuscipennis*, ♀; 126, *A. proteus*, ♀; 127, *Protichneumon pisorius*, ♀; 128, *P. coqueberti*, ♂; 129, *Coelichneumon nigricornis*, ♂; 130, *C. nigricornis*, ♀; 131, *C. comitator*, ♀; 132, *C. microstictus*, ♀; 133, *C. haemorrhoidalis*, ♀.



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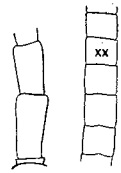

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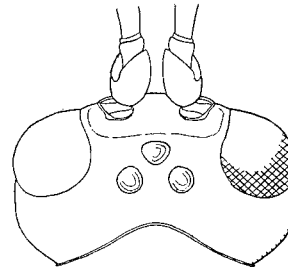

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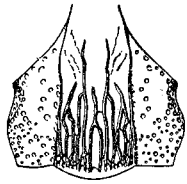

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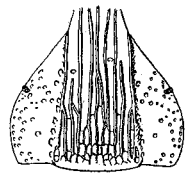

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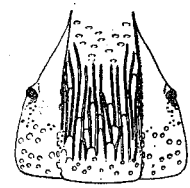

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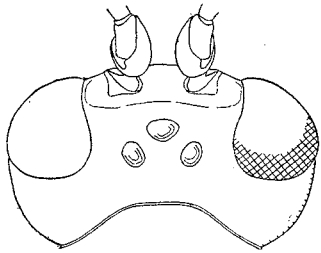

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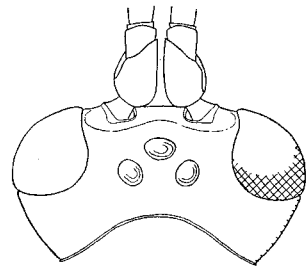

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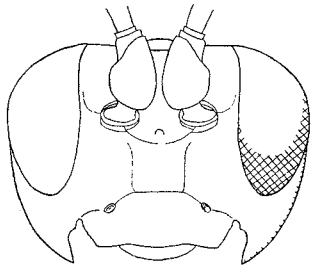

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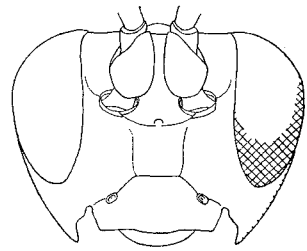

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FIG. 134.—*Protichneumon coqueberti*, ♀ : coxa, lateral.
FIGS. 135–136.—*Coelichneumon nigricornis*, ♀ flagellum : 135, basal segments ; 136, central segments.
FIG. 137.—*Coelichneumon nigricornis*, ♀ : head, dorsal.
FIGS. 138–140.—Postpetiole : 138, *Coelichneumon comitator*, ♂ ; 139, *C. comitator*, ♀ ; 140, *C. auspex*, ♀.
FIGS. 141–142.—*Coelichneumon falsificus*, ♀ head : 141, dorsal ; 142, anterior.
FIGS. 143–144.—*Coelichneumon leucocerus*, ♀ head : 143, dorsal ; 144, anterior.

clypeus centrally and the epistomal suture laterally, infuscate ; outer orbits with a short, ivory stripe ; hind angle of pronotum with an ivory stripe ; scutellum with an ivory, apical spot ; anterior coxae with an ivory spot beneath ; anterior femora in part, and tibiae ivory anteriorly, anterior tarsi broadly marked with ivory ; hind tibia testaceous centrally, sometimes narrowly marked with ivory outwardly, hind tarsus black sometimes with segment 1 marked with ivory outwardly. 16–20 mm..... **coqueberti** (Wesmael)

Note.—Continental specimens differ in having the mesoscutum with more conspicuous microsculpture between the punctures, the outer orbits more conspicuously marked with ivory ; usually with a short, ivory dash in the hind angle of the pronotum, scutellum with a larger, ivory spot ; middle femur more broadly marked with ivory ; hind tibia and tarsus much paler, broadly marked with ivory ; anterior trochanters sometimes with an ivory stripe, but the middle coxa at most with a very small, apical, ivory spot. If the British form is later regarded as a subspecies a new name is necessary.

Genus **Amblyjoppa** Cameron

The two British species of this genus are abundantly distinct. *A. fuscipennis* has been bred in this country from the Small Elephant Hawk Moth, and *A. proteus* is the usual parasite obtained from the pupa of the Elephant Hawk Moth (Sphingidae).

Key to Species

A ♀♂. Gaster red-testaceous with tergite 1 black except sometimes apically ; tibia and tarsi testaceous, the hind tarsi sometimes with the apical segments somewhat infuscate ; area superomedia much larger with a clearly differentiated, central, sculptured area (fig. 125) ; mesoscutum more coarsely punctate and a little more shining, the punctures, laterally, comparable in size with those in the middle ; gastrocoeli a little longer and deeper ; postpetiole centrally more coarsely punctate or rugose-punctate.

♂. Lower margin of mesopleurum, viewed dorsolaterally, with only a weak sinuation. 17–22 mm. *Sometimes common.* vi–viii.... **fuscipennis** (Wesmael)

B ♀♂. Gaster entirely black ; area superomedia very small, with the central area at most very weakly differentiated, and almost devoid of sculpture (fig. 126) ; mesoscutum, centrally with finer punctures, laterally with much finer sculpture ; gastrocoeli shorter and shallower ; postpetiole centrally with finer punctures.

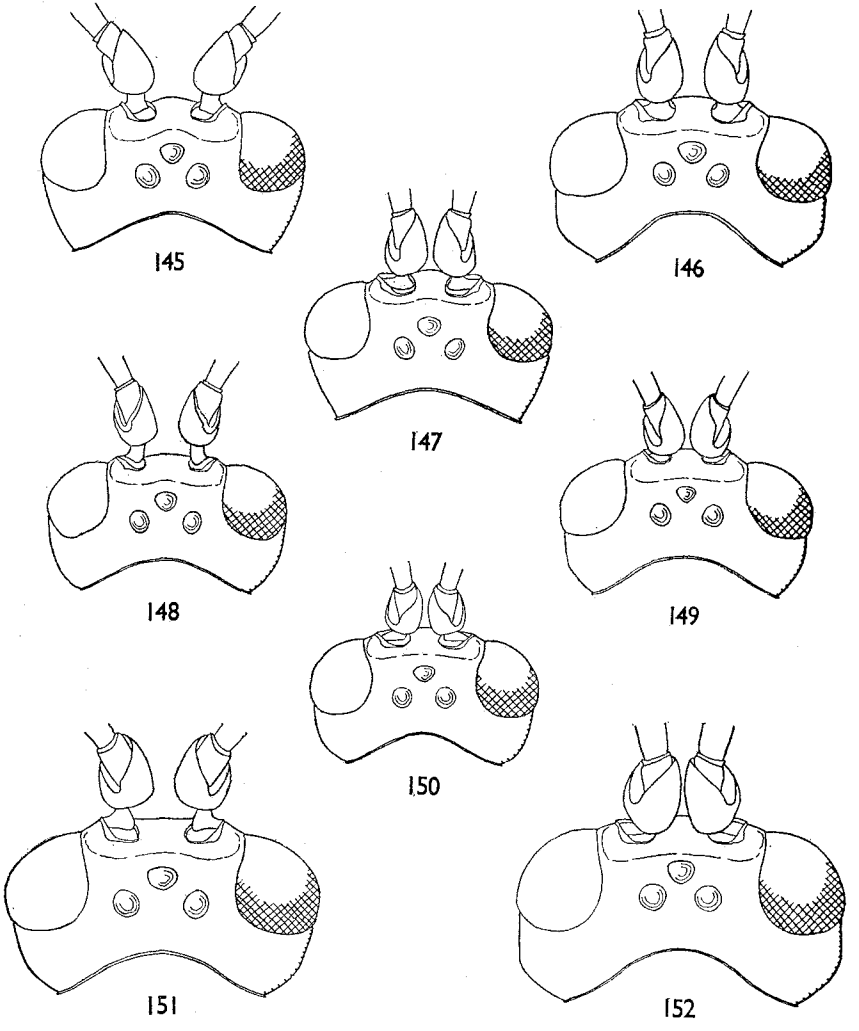
♀. Hind legs entirely black, the front and middle femora usually weakly marked with white apically, the front tibia and basal tarsal segments conspicuously marked with white within.

♂. Coxae marked with white (hind coxa sometimes entirely black) ; trochanters white or marked with white ; front and middle femora marked with white or entirely white, dorsally ; hind femur outwardly with a white spot towards the base ; front and middle tibiae white, black apically beneath, hind tibia white, black apically ; tarsi white with the extreme apices of segments narrowly black or infuscate and segment 5 of the hind tarsus black. 19–25 mm. *Sometimes common.* vi–vii ..... **proteus** (Christ)

Genus **Coelichneumon** Thomson

A number of the species of this genus are difficult to determine. Some of the forms included in this key as species may well prove later to be only aberrations of other species. Thus I have kept separate *truncatulus* (Thomson) from *haemorrhoidalis* (Gravenhorst) and *purpurissatus* Perkins from *comitator* (Linnaeus). Information concerning the biology of these species should elucidate their true status.

The British species of this genus fall broadly into two main groups, the one having a broader post-petiole and the lateral keels of the scutellar fovea usually marked with ivory, and the other having a narrower postpetiole and



FIGS. 145–152.—*Coelichneumon*, ♀ head, dorsal : 145, *haemorrhoidalis* ; 146, *bilineatus* ; 147, *nigerrimus* ; 148, *truncatulus* ; 149, *comitator* ; 150, *ruficauda* ; 151, *microstictus* ; 152, *serenus*.

never with such ivory marks. Within this latter section there are several rather ill-defined subgroups. The greatest difficulty is found in separating the species of the first group, particularly in the males. I have included figures of the middle tarsus of the females of certain of the species in the hope that these may aid in identification. Figures 129 and 130 are of the area superomedia of *nigricornis* and show the type of sexual dimorphism that is not uncommon in this tribe.

I have seen no specimen of the female of *solutus* which is here included from one male (det. A. Roman) from Cairn Gorm. This male is abundantly distinct from any other British species.

The species of this genus are parasites of Noctuidae, several parasitizing species of *Apatele* and related genera.

KEY TO SPECIES
(*Females*)

1 Gaster with ivory spots on the hind margin of at least tergites 2 and 3, towards the outer angle.
Antenna strongly widened beyond the middle and sharply attenuate apically; hind coxa with a distinct scopa; postpetiole not marked with ivory or very rarely with a trace of a pair of ivory spots on the dorsal carinae, apically; abdomen, particularly apically, very strongly metallic blue; cheeks, behind the genal sulcus, with very sparsely, irregularly spaced punctures; frons with the orbits very narrowly marked with ivory and this mark is far removed from the very weak, ivory, orbital spots; hind coxa not marked with ivory, hind tibia entirely black. 14–15 mm. *Widespread.* vi–ix ..... **cyaniventris** (Wesmael)

– Gaster with no ivory spots on tergites 2 and 3, rarely with the postpetiole marked with ivory 2

2 (1) Hind tibia black, with a conspicuous, white, subcentral band.
Hind coxa with a large, distinct scopa; scutellum largely white, varying to black with a pair of ivory, apical spots. 12–16 mm. *Frequent.* v–x
desinatorius (Thunberg)

– Hind tibia entirely black, or red and black, or entirely red 3

3 (2) Scutellum at least with a large subapical, ivory spot; lateral keels of the scutellar fovea entirely black; subalar prominence at least marked with ivory; postpetiole with narrower lateral areas (*cf.* fig. 140).
Flagellum moderately expanded before the apex 4

– Scutellum entirely black, or if rarely marked with ivory laterally or apically, then the lateral keels of the scutellar fovea have a conspicuous ivory mark and the postpetiole is distinctly broader (fig. 139); subalar prominence entirely black in the majority of species 5

4 (3) Hind coxa with a conspicuous scopa; head with the temples narrower and distinctly converging from directly behind the eyes (fig. 143); cheeks less buccate (fig. 144); mesoscutum more clearly and more regularly punctate. 14–18 mm. *Not uncommon.* vi–ix ..... **leucocerus** (Gravenhorst)

– Hind coxa with no scopa, coarsely punctate beneath in the apical half; head with the temples broader and subparallel directly behind the eyes (fig. 141); cheeks distinctly buccate (fig. 142); mesoscutum, particularly centrally, more sparsely punctate and with much more irregularly spaced punctures. 16–17 mm. *Essex*, 1 ♀; *Devon*, 1 ♀. vi ..... **falsificus** (Wesmael)

5 (3) Flagellum with no white ring (on the Continent a form of *C. nigricornis* has been recorded with a few segments white marked but this species has the flagellum not widened beyond the middle (fig. 136)); femora and tibiae bright testaceous; gaster black with no metallic sheen 6

– Flagellum with a white ring and always widened beyond the middle; if very rarely the white ring is small then at least the hind tibia is in greater part black and the gaster has a distinct metallic sheen 7

6 (5) [Postpetiole with the central area coriaceous with a few scattered punctures towards the apex.] *Cairn Gorm*: 3000 *ft.* 27.vi.1934. 1 ♂
solutus (Holmgren)

– Postpetiole with the central area strongly, longitudinally striate.
Flagellum subfiliform and short, attenuate apically (figs. 135–6) ; temples large (fig. 137) ; basal keels of scutellum sometimes with a yellow spot ; propodeum with the area superomedia usually open anteriorly (fig. 130) ; hind coxa with a strong scopa. 15–16 mm. *Not uncommon.* vi–ix
nigricornis (Wesmael)
(= *impressor* (Zetterstedt) Perkins, 1953 nec Zetterstedt.)

7 (5) Propodeum with the area superomedia almost smooth anteriorly and open posteriorly (fig. 133), running directly into the clearly defined, laterally carinate, closely punctate median section of the petiolar area ; hind coxa with the scopa absent.
Flagellum strongly widened beyond the middle ; gaster with a very weak impression at the base of tergite 4 ; postpetiole rather narrow (*cf.* fig. 140) ; basal keels of the scutellum not marked with ivory ; scutellum strongly and rather closely punctate particularly in the basal half.....8

– Propodeum with the clearly (though often shallowly) and coarsely sculptured area superomedia divided from the petiolar area (*cf.* figs. 131–2) ; if weakly closed behind, then either the lateral keels of the basal groove of the scutellum are marked with ivory, or the petiolar area has no clearly, laterally carinate median section ; hind coxa with a strong scopa except in *bilineatus* and *nigerrimus*.....9

8 (7) Head with the temples narrowing from directly behind the eyes and the frons less convex in front of the anterior ocellus (fig. 145) ; gaster red except for the petiole ; hind tibia red except for the apex ; basal segments of the hind tarsus broadly marked with red. 14–15 mm. *Frequent.* vi
haemorrhoidalis (Gravenhorst)

– Head with the temples parallel or very slightly diverging directly behind the eyes, and broader, and the frons distinctly convex in front of the anterior ocellus (fig. 148) ; gaster red with the petiole black and usually with the apical or central segments at least in part infuscate ; hind legs usually black, sometimes with the tibia testaceous in part and the hind tarsus with the basal segments narrowly red basally. Possibly a form of *C. haemorrhoidalis* (Grav.) 10–12 mm. *Frequent.* v–vi.....**truncatulus** (Thomson)
Note.—Continental specimens have the abdomen and legs as in *haemorrhoidalis.*

9 (7) Lateral carinae of the basal groove of the scutellum black ; propodeum with the median section of the petiolar area with strong lateral carinae ; postpetiole with rather narrow lateral areas (*cf.* fig. 140).....10

– Lateral carinae of the basal groove of the scutellum most usually with a conspicuous ivory spot, if black (*consimilis, comitator*) then the propodeum has the median section of the petiolar area only differentiated by the change in sculpture ; postpetiole with the lateral areas always broader than in the above section (fig. 139).
Stigma always black, narrowly white at the base.....12

10 (9) Antenna with segment 5 quadrate (fig. 153).
Flagellum very strongly widened beyond the middle ; hind coxa with a strong scopa ; stigma black ; ovipositor very short. 14–17 mm. *Uncommon.* viii–ix.....**auspex** (Mueller)

— Antenna with segment 5 conspicuously elongate (fig. 154).....11

11 (10) Stigma black ; head with the temples subparallel directly behind the eyes (fig. 146) ; hind coxa with a roundedly raised area on the inner margin which bears a weak scopa ; clypeus weakly bisinuate apically flagellum less expanded before the apex (fig. 166). 12–14 mm. *Generally uncommon but a number of specimens were taken in Suffolk,* 1941 (*C. Morley*). vi–vii
bilineatus (Gmelin)
Note.—I have examined 2 ♀ (Colchester '98, Harwood ; Monks Soham, 1.vii.1943, C. Morley) with no tubercle and with no fine sculpture on this inner area of the hind coxa, but otherwise agreeing with *bilineatus.* These may represent a distinct species, but further material and data are necessary.

— Stigma most usually testaceous rarely infuscate ; head with the temples converging from directly behind the eyes (fig. 147) ; hind coxa with no callus on the inner margin, but beneath, towards the apex, rather finely, closely punctate and hairy ; clypeus truncate ; flagellum very strongly

expanded before the apex, at the widest with the segments having length : breadth at least 1 : 2·5 (fig. 167). 12–14 mm. *Not uncommon.* v–ix
nigerrimus (Stephens)

12 (9) Antenna with segment 4 having length : breadth at least 1·4 : 1 (figs. 155, 156) ; frons always with coarser punctures, the sculpture becoming subrugose in part even in small specimens ; middle tarsus with segments more elongate (figs. 160, 161).....13

— Antenna with segment 4 having length : breadth at most 1·2 : 1 (figs. 157, 158) ; frons most usually with finer and sparser punctures, only coarsely punctate in very large specimens ; middle tarsus with the segments broader (figs. 159, 162–3).....17

13 (12) Gaster with a strong, metallic, blue sheen ; middle coxa, beneath, with very sparse punctures except in the basal third ; propodeum, mesosternum and coxae beneath (except scopa) with dark brown hair ; in British specimens, no ivory spots on the lateral carinae of the scutellar fovea and legs entirely black ; apices of the tergites narrowly red. 11–15 mm. *Cornwall,* 1 ♂, 2 ♀ ; *Devon,* 1 ♂, 1 ♀ ; *Hants,* 1 ♀. v–viii.....**purpurissatus** Perkins
Note.—Some continental forms have the hind femur only in large part red, or the middle and front femora may become progressively red.

— Gaster with only a faint, metallic sheen ; if the lateral keels of the scutellar fovea have no ivory marks, then the legs are largely red and the middle coxa evenly and rather closely punctate beneath ; some species have the propodeum, mesosternum and coxae with pale hairs, and some have the abdomen usually broadly red marked.....14

14 (13) Lateral keels of the scutellar fovea never marked with ivory ; tergite 1 centrally, between the spiracles, very weakly and rather closely, longitudinally striate.
Legs in large part red. 9–11 mm. *Parasite of* Cryphia *spp. Not uncommon.* v–vii.....**consimilis** (Wesmael)

— Lateral keels of the scutellar fovea with very conspicuous ivory marks ; tergite 1 centrally, between the spiracles, with coarse, longitudinal striae.....15

15 (14) Orbits of the temples with a yellow line which may join the yellow line on the frontal orbits ; clypeus convex ; malar space subequal to the breadth of base of mandible ; basal area of propodeum distinctly toothed centrally
cf. *Stenichneumon rufinus* (Gravenhorst)

— Outer orbits at most with an ivory line centrally which does not extend up the temples ; with a conspicuous, ivory, vertical spot ; clypeus flat ; malar space much shorter than the breadth of base of mandible ; basal area of propodeum simple.....16

16 (15) Head with the temples distinctly converging directly behind the eyes (fig. 151) ; propodeum with the area superomedia more conspicuously elongate (fig. 132) ; gaster usually red except for tergite 1 which may also be red apically, varying to the gaster almost entirely fuscous ; femora red with the front and middle femora marked with fuscous and the hind femur sometimes infuscate. 14–16 mm. *Cornwall* ; *Devon* ; *Isle of Wight. Coastal.* vii.....**microstictus** (Gravenhorst)

— Head with the temples subparallel directly behind the eyes (fig. 149) ; propodeum with the area superomedia broader (fig. 131) ; gaster black with a faint, blue, metallic sheen, the apices of the segments red (some continental forms are stated to have the gaster extensively marked with red) ; femora and tibiae entirely black, or entirely red with the apex of the hind tibiae infuscate.
Very similar to *purpurissatus,* but differing, besides in sculpture, in having the hair on the propodeum, mesosternum and coxae pale. 13–14 mm. *The most frequent species of the genus.* v–ix.....**comitator** (L.)
Note.—In C. Europe, this species appears normally to have the femora red (= *ferreus* Grav.) as opposed to the type form in W. Europe which normally has the femora black. I have seen only 1 ♂ of the red legged form from the British Isles.

17 (12) Femora entirely red ; tergites red with tergite 1 (except narrowly apically), the base of tergite 2, and more rarely the base of tergite 3, black or infuscate ; tergite 2 broader ; hind coxa apically, outwardly, with the area of sparse punctures longer. 9–12 mm. *Infrequent, but a series was bred, Essex,* 1922

(*G. Charteris*) *ex* Parastichtis ypsilon (*Schiffermueller*). v–vii
orbitator (Thunberg)

— Femora entirely black or at least the front and middle femora for the most part black ; tergite 2 more elongate ; hind coxa with a smaller area with sparse punctures.....18

18 (17) Head subparallel behind the eyes (fig. 152) ; collar of pronotum with no ivory mark ; mesoscutum with no microsculpture between the punctures which are closer ; dorsolateral area of pronotum (above the lateral groove) more sparsely punctate and strongly shining with at most the faintest indication of microsculpture between the punctures, the punctures coalescing into a rugose area only in a small patch on the hind margin above the groove ; gaster black, varying to red except for tergite 1, or with the apices of the tergites broadly red. 17–18 mm. 1 ♂, *Desvignes Coll.*; 2 ♀, *Old British Collection* (*B.M.*).....**serenus** (Gravenhorst)

— Head a little narrowed behind the eyes (fig. 150) ; collar of pronotum most usually with a pair of conspicuous, ivory spots which may coalesce ; mesoscutum with distinct, coriaceous sculpture between the rather sparse punctures ; dorsolateral area of pronotum with close punctures which in large part coalesce or tend to coalesce to give a substriate sculpture ; the area between the punctures, dorsally, with distinct though fine microsculpture ; gaster black, varying to black with the apices of tergites 2 and 3 narrowly red, tergite 4 rather broadly red and tergites 5–7 entirely red. 11–13 mm. *Infrequent*. v–vii.....**ruficauda** (Wesmael)

(*Males*)

1 Gaster with a pair of ivory spots on the hind margin of at least tergites 2 and 3, towards the outer angle ; hind tibia black, at most with a small, white, basal spot.
Flagellum with a conspicuous, white ring ; middle tarsus entirely black or fuscous ; gaster more oval in shape and with a conspicuous, blue, metallic sheen ; orbits of face and lateral angle of clypeus only, ivory. 13–15 mm.
cyaniventris (Wesmael)

– Gaster most usually with no ivory spots on tergites 2 and 3 (though sometimes the postpetiole may be white-marked apically) ; if (in rare varieties of *desinatorius*) tergite 2 has a pair of ivory spots, then the hind tibia is broadly banded with white.....2

2 (1) Hind tibia black with a conspicuous, white band.....3

– Hind tibia black, red, or red and fuscous.....4

3 (2) Hind tarsus entirely black ; scutellum with fine and sparse punctures. 14–16 mm.....**desinatorius** (Thunberg)

– Hind tarsus with at least segment 1 conspicuously marked with white ; scutellum with close, rather deep punctures.
Antenna with segment 4 subquadrate, length : breadth at most 1·2 : 1 ; mesopleurum shining and rather sparsely punctate ; hind legs with white markings clear. *c.* 17 mm.....**auspex** (Mueller)

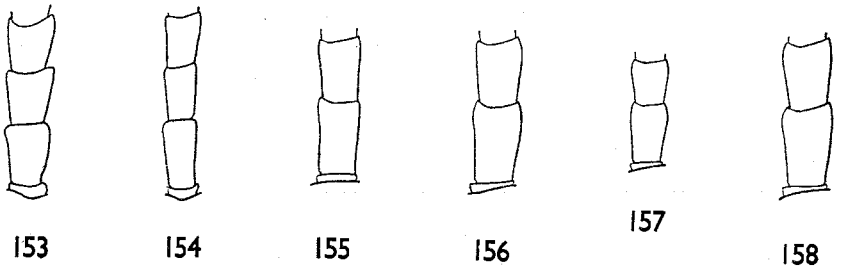
4 (2) Scutellum ivory, at least in the apical half ; lateral keels of the scutellar fovea entirely black ; tergite 3 conspicuously impressed basally.
Flagellum with no white band ; temples rather narrow and distinctly converging directly behind the eyes ; stigma black or fuscous.....5

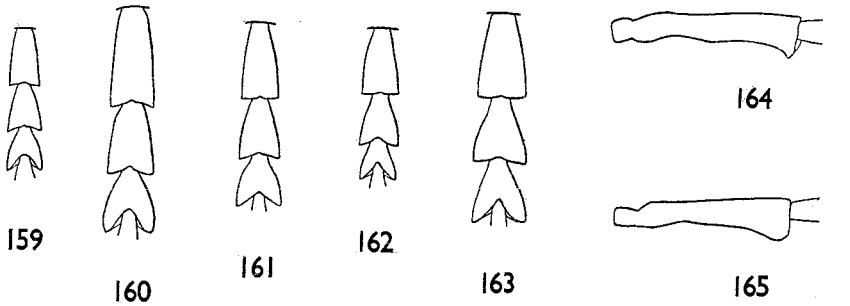
– Scutellum often entirely black ; if marked with ivory which is confined to the apex or lateral lines, then the lateral keels of the scutellar fovea are conspicuously marked with ivory or tergite 3 is very weakly impressed basally....6

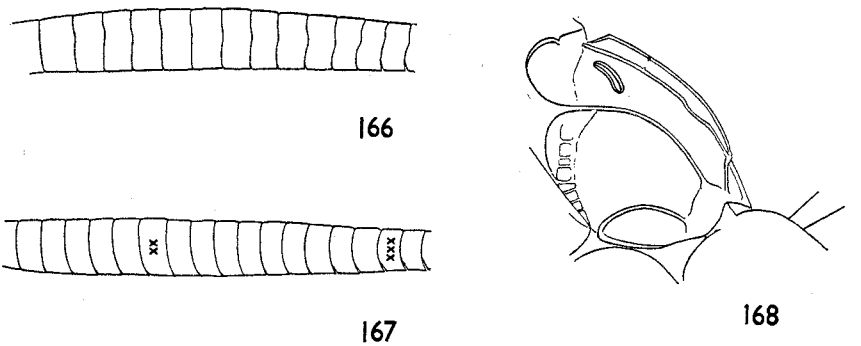
5 (4) Front coxa entirely black ; front tarsus with segment 1 having only a weak, subapical tubercle (fig. 165). 17–19 mm.....**leucocerus** (Gravenhorst)

– Front coxa with a distinct, ventral, ivory spot ; front tarsus with segment 1 having a distinct, subapical thorn (fig. 164).
Mesoscutum a little more elongate. *c.* 15 mm.....**falsificus** (Wesmael)

6 (4) Postpetiole with the central area coriaceous, sparsely punctate towards the apex.
Femora and tibiae red ; head rather narrow in relation to the thorax ; propodeum sharply declivous directly in front of the area superomedia and also from here to the apex (fig. 168) ; segment 1 of front tarsus with a very strong, subapical thorn (*cf.* fig. 164). 11–12 mm.....**solutus** (Holmgren)







FIGS. 153–158.—*Coelichneumon*, ♀, basal segments of flagellum : 153, *auspex* ; 154, *nigerrimus* ; 155, *comitator* ; 156, *microstictus* ; 157, *orbitator* ; 158, *serenus*.

FIGS. 159–163.—*Coelichneumon*, ♀, segments 2–4 of midtarsus : 159, *orbitator* ; 160, *microstictus* ; 161, *comitator* ; 162, *ruficauda* ; 163, *serenus*.

FIGS. 164–165.—*Coelichneumon*, ♂, segment 1 of front tarsus : 164, *falsificus* ; 165, *leucocerus*.

FIGS. 166–167.—*Coelichneumon*, ♀, central segments of flagellum : 166, *bilineatus* ; 167, *nigerrimus*.

FIG. 168.—*Coelichneumon solutus*, ♂ : propodeum, lateral.

– Postpetiole striate or rugose-striate, sometimes also conspicuously punctate..7

7 (6) Central area of postpetiole, measured directly behind the line of the spiracles, conspicuously broader than the lateral area (*cf.* fig. 140); segment 1 of front tarsus with a strongly developed, subapical thorn (*cf.* fig. 164); lateral keels of the scutellar fovea never marked with ivory.
Central section of the petiolar area clearly delimited laterally.....8

– Central area of postpetiole at most as broad as the lateral area (fig. 138); segment 1 of front tarsus in the majority of species with a very weak, indistinct, subapical tubercle; lateral keels of the scutellar fovea marked with ivory in most species.....11

8 (7) Flagellum with tyloidae on segment 2 (rarely 3) to 16 (rarely 15 or 17); outer orbits with an ivory mark; scutellum more sparsely punctate.
Otherwise very similar to *nigerrimus* ♂, but with the clypeus more convex centrally and the face impressed between the supraclypeal area and the clypeus (fig. 170) and tergite 3 more strongly impressed basally. 14–16 mm.
bilineatus (Gmelin)

– Flagellum with tyloidae at most on segments 5–18; outer orbits never marked with ivory; scutellum closely punctate.....9

9 (8) Area superomedia with a distinct posterior carina (*cf.* fig. 131); gaster black (with a very faint, bluish sheen) and at most the extreme apices of the central tergites red; supraclypeal area with subparallel sides and not differentiated from the centre of the clypeus (fig. 169); tergite 3 impressed basally.
Stigma and legs black, the tibiae sometimes weakly reddish towards the base. A single ♂ from Loch Assynt has the stigma testaceous and the legs red with the coxae, trochanters, extreme apex of hind tibia and hind tarsus except for the extreme base of segment 1, black. 11–15 mm.
nigerrimus (Stephens)

– Area superomedia most usually open posteriorly (*cf.* fig. 133), rarely in some specimens more or less closed; gaster usually with at least the apical segments conspicuously marked with red, very rarely entirely black; supraclypeal area with the sides more converging towards the clypeus where it is impressed; tergite 3 weakly impressed basally.....10

10 (9) Temples weakly converging behind the eyes (fig. 173). 13–15 mm.
truncatulus (Thomson)

— Temples strongly converging behind the eyes (fig. 174). 14–16 mm.
haemorrhoidalis (Gravenhorst)

11 (7) Head large, with the temples weakly concave directly behind the eyes so that when viewed from above they are subparallel for a considerable distance behind the eyes (similar to ♀, fig. 137); legs with femora and tibiae bright testaceous, the tibiae at most weakly infuscate at the apex.
Lateral carinae of the scutellar fovea often without a yellow or ivory spot. Area superomedia (fig. 129.) 14–19 mm.....**nigricornis** (Wesmael)

— Head always distinctly narrowing behind the eyes; legs with the hind femora and tibiae black or red.....12

12 (11) Lateral carinae of the scutellar fovea never with an ivory spot; gaster black with no trace of a metallic sheen but sometimes slightly red tinged; postpetiole with the longitudinal striation much weaker than in the remaining species. 9–12 mm.....**consimilis** (Wesmael)

— Lateral carinae of the scutellar fovea with an ivory spot, if, rarely, without (*comitator*) then the gaster has a pronounced, violet, metallic sheen.
No satisfactory characters are known for separating the males of the species (or forms) of this complex.....13

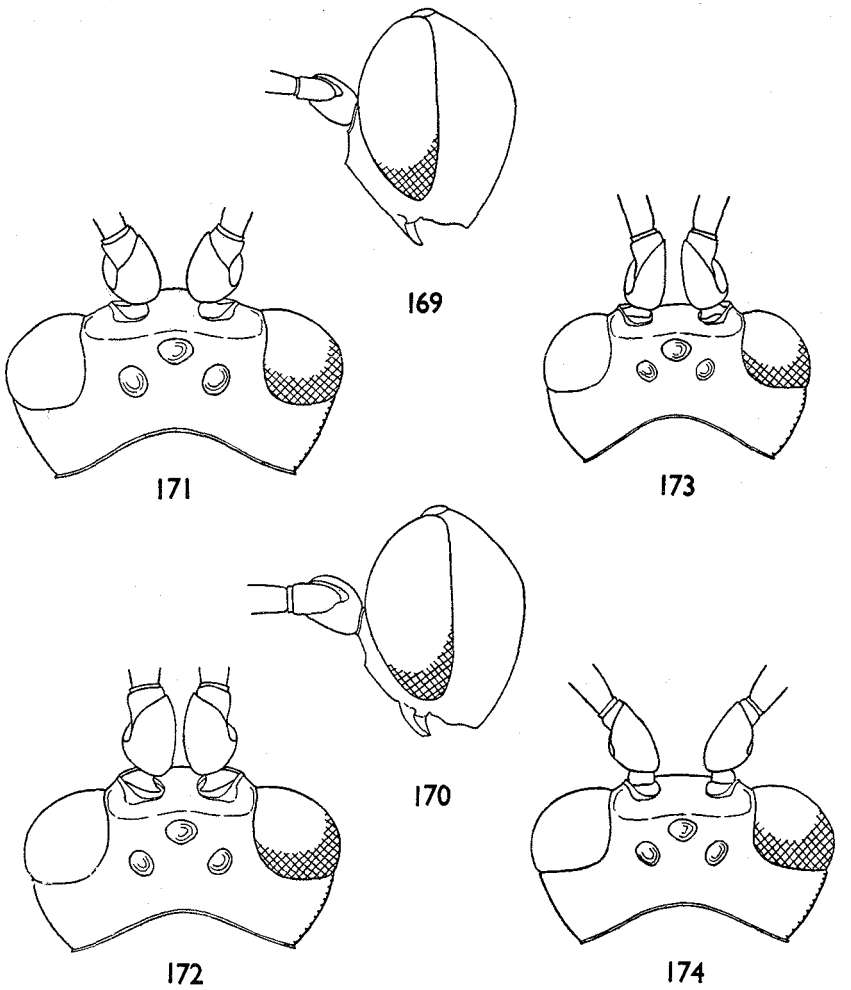
13 (12) Gaster with a strong, violet, metallic sheen; in British examples the lateral carinae of the scutellar fovea with no ivory spot.
Propodeum, mesosternum and underside of coxae with fuscous pubescence. 12–15 mm.....**purpurissatus** Perkins

— Gaster at most with a very weak, bluish, metallic sheen; lateral carinae of the scutellar fovea with a distinct, ivory spot.....14

14 (13) Orbits of the temples with a yellow line; basal area of propodeum with a large, anterior projection .....cf. *Stenichneumon rufinus* (Gravenhorst)

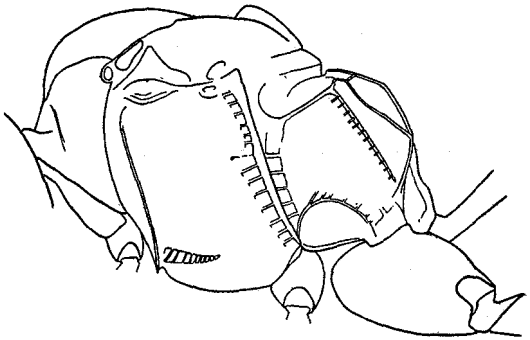
— Orbits of the temples not pale marked (outer orbits centrally and vertical spot usually ivory); basal area of propodeum with no projection.....15

15 (14) Scutellum conspicuously flattened dorsally, centrally (from about one-third to two-thirds the length of the scutellum) and with strong lateral carinae extending to beyond the middle.
Frons rugose-punctate ; pronotum, laterally, with only a faint trace of microsculpture between the punctures. 15–17 mm..... **serenus** (Gravenhorst)
— Scutellum convex centrally.....16



FIGS. 169–170.—*Coelichneumon*, ♂, head, lateral : 169, *nigerrimus* ; 170, *bilineatus*.

FIGS. 171–174.—*Coelichneumon*, ♂ head, dorsal : 171, *microstictus* ; 172, *comitator* ; 173, *truncatulus* ; 174, *haemorrhoidalis*.



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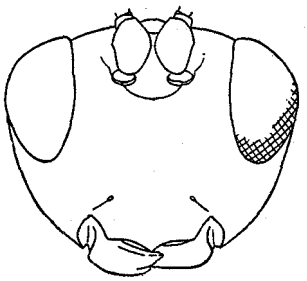

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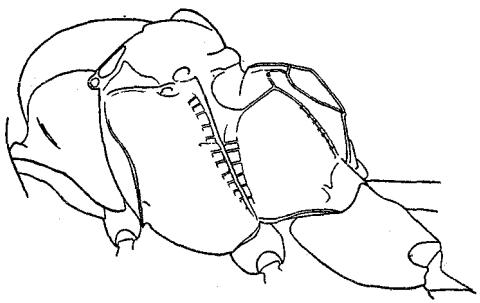

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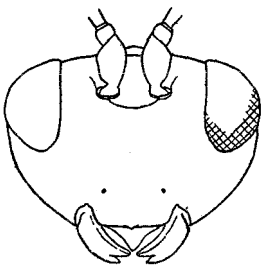

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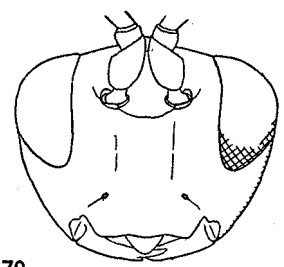

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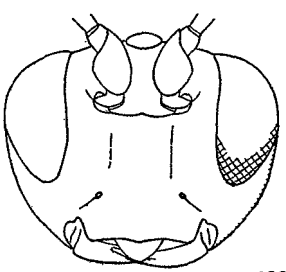

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FIGS. 175–176.—*Listrodromus nycthemerus*, ♀ : 175, thorax, lateral ; 176, head, anterior.

FIGS. 177–178.—*Neotypus nobilitator*, ♀ : 177, thorax, lateral ; 178, head, anterior.

FIGS. 179–180.—*Anisobas*, ♀ head, anterior : 179, *cingulatorius* ; 180, *platystylus*.

16 (15) Frons, in large part, with finer punctures ; pronotum, laterally with finer and closer punctures.....17

— Frons, for the most part, coarsely rugose-punctate ; pronotum, laterally, more coarsely and less closely punctate.....18

17 (16) Femora entirely red ; at least tergites 6 and 7 red, often with tergite 3 apically, and the remaining segments red ; gaster a little broader ; pronotum with, at most, extremely weak microsculpture between the punctures. 11–15 mm. **orbitator** (Thunberg)

— Femora black or at least for the greater part infuscate ; gaster black (in British examples) with at most tergites 5–7 red ; gaster a little narrower ; pronotum with distinct, though fine, microsculpture between the punctures. 11–12 mm. **ruficauda** (Wesmael)

18 (16) Head with the temples more strongly converging behind the eyes (fig. 171) ; gaster most usually with tergites 2–4 conspicuously marked with red, the remainder red ; front and middle femora at least conspicuously marked with fuscous, hind femora sometimes entirely red. 15–18 mm. **microstictus** (Gravenhorst)

— Head with temples weakly (though distinctly) narrowed behind the eyes (fig. 172) ; gaster (at least in British examples) black with a very faint, blue, metallic sheen ; femora either almost entirely black or entirely red (most usually black in British examples).

Very similar to *purpurissatus* but with the propodeum, mesosternum and underside of coxae with pale pubescence. 12–16 mm..... **comitator** (L.)

Tribe HERESIARCHINI

Genus **Heresiarches** Wesmael

♀. Face and clypeus yellow, fuscous centrally, orbits yellow only narrowly interrupted on the malar space ; flagellum with a central, ivory stripe ; pronotal collar centrally, anterior margin of pronotum laterally and upper margin in hind angle, and subalar prominence yellow ; prepectus laterally and mesepimeron marked with yellow ; scutellum laterally and central area of metanotum laterally yellow ; propodeum with a pair of subapical, yellow spots ; front and middle coxae and trochanters yellow, marked with black, rest of the anterior legs red with the femora in part infuscate ; hind leg with the coxa yellow dorsally at extreme base, trochanter yellow apically, femur black, tibia red, infuscate apically, tarsus infuscate ; tergite 1 with a pair of apical, yellow spots, tergite 2 with a pair of lateral, apical spots which are narrowly joined along the apical margin ; tergite 3 similarly marked but with the spots much smaller ; tergites 4 and 5 narrowly margined with yellow, apically, centrally ; tergites 6 and 7 with a conspicuous, apical, yellow spot.

♂. Similar in colour to the ♀ but with the face and clypeus entirely yellow and the yellow, orbital marking interrupted on the vertex ; flagellum not marked with white ; anterior margin of pronotum completely yellow. (Figs. 105–7) 8–10 mm. *Rare*..... **eudoxius** (Wesmael)

Tribe LISTRODROMINI

The species of this tribe may most readily be confused with certain species of *Barichneumon*, which also have the genal carina continuous with the hypostomal carina as shown in the key to the tribes.

Anisobas is very distinct from the other two genera which are closely related and may later prove to be indistinguishable.

The species of this tribe are parasitic on Lycaenidae.

KEY TO GENERA

1 Transverse furrow of pronotum with a large, shining, central keel (figs. 182, 184) ; claws not pectinate ; malar space at most as long as the breadth of the base of the mandible (*cf.* face, figs. 179, 180) ; antenna with at least 30 segments **Anisobas** Wesmael (p. 46)

– Transverse furrow of pronotum with no central tubercle ; claws of ♀ pectinate, simple in ♂ ; malar space conspicuously longer than the breadth of the base of the mandible (*cf.* face, figs. 176, 178) ; antenna at most with 27 segments 2

2 (1) Propodeum with the coxal area sharply differentiated by a strong carina ; sternaulus strongly developed to half and transcostate, subalar prominence rounded (fig. 175) ; clypeus sharply produced apically, centrally (fig. 176) **Listrodromus** Wesmael (p. 46)

– Coxal area not differentiated ; sternaulus very weak, not transcostate, subalar prominence ridge-like (fig. 177) ; clypeus very weakly, or not at all, produced centrally, apically (fig. 178) ..... **Neotypus** Foerster (p. 47)

Genus **Anisobas** Wesmael

I have seen no specimen of the male of *platystylus* which could not therefore be included in the key.

KEY TO SPECIES

A Scutellum black ; tergite 3 conspicuously infuscate ; malar space a little shorter than the breadth of the base of the mandible (fig. 180) ; pronotal keel conspicuously narrower (fig. 182).

♀. Scutellum more sharply raised (fig. 181) ; tergite 2 in general more coarsely punctate and more coarsely striate at the base between the gastrocoeli ; tergite 1 more narrowly red apically, tergite 2 entirely red, tergites 5–7 ivory marked apically ; hind femur red beneath, varying to entirely black. 8 mm. *Staffs.* 1 ♀. vi ..... **platystylus** Thomson

B Scutellum at least ivory marked ; tergite 3 entirely red ; malar space about as long as the breadth of the base of the mandible (fig. 179) ; pronotal keel broader (fig. 184).

♀. Scutellum less sharply raised (fig. 183) ; gaster with tergite 4 sometimes with a small central, ivory, apical spot, tergites 5–7 ivory marked apically ; tergite 2 with the basal declivous area between the gastrocoeli finely striate and behind this, centrally, with a very weakly alutaceous area, and then with clear punctures which are sharply delimited ; tergite 1 red with at most the basal three-quarters of the petiole black, tergites 2 and 3 entirely red ; hind femur black, broadly red centrally.

♂. Scutellum with the declivous apical area without lateral carinae, at the side with no ridge stronger than the general longitudinal striation. 8–9 mm. *S. England. Rare.* vi–vii ..... **cingulatorius** (Gravenhorst)

Note.—Continental specimens that I have seen have the hind femur red, black apically.

Genus **Listrodromus** Wesmael

♀. Black with the following markings : Face yellow with a black median line, varying to black with the area beneath and beside the antennal socket yellow ; frontal orbits yellow ; temples with the outer orbit yellow ; flagellum more or less testaceous in the basal half, scape marked with yellow beneath ; pronotum with the upper margin towards the hind angle marked with yellow, the subalar prominence most usually marked with yellow ; scutellum entirely yellow varying to entirely black ; tergite 1 with the hind angles yellow, these yellow spots may join centrally, tergite 2 with large yellow spots in the hind angles, tergite 3 with or without lateral yellow stripes on the apical margin ; tergites 4–7 with a large, yellow, central, apical, transverse band ; front and middle legs with the coxae sometimes having a yellow spot beneath; femora yellow apically, tibiae and tarsi yellow ; hind tibia with the extreme base fuscous, the apical third black, and the area between these yellow ; hind tarsus sometimes with the basal segments pale basally. (Figs. 108, 175–6.)

♂. Coloration similar to the ♀ but usually with the yellow markings less extensive ; genital claspers yellow. 5–8 mm. *It is the regular parasite that is frequently reared from* Celastrina argiolus (*L.*) v–vi ; viii–x **nycthemerus** (Gravenhorst)

Genus **Neotypus** Foerster

Only one of the three Western European species occurs in Britain. The females of the two non-British species have the propodeum red or extensively marked with red. (Figs. 177–8.)

♀. Colour pattern similar to dark forms of *Listrodromus nycthemerus*, but with the face never marked with yellow, and with mesoscutum, mesopleura in greater part, pronotum dorsad, red, and the legs entirely black.

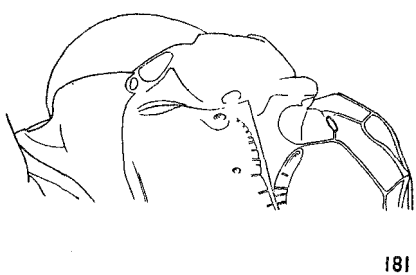
♂. With no red colour, the ivory markings similar to the ♀, but more reduced, the genital claspers ivory. 6–7 mm. *C. and S. England. Rare.* vii–viii..... **nobilitator** (Gravenhorst).

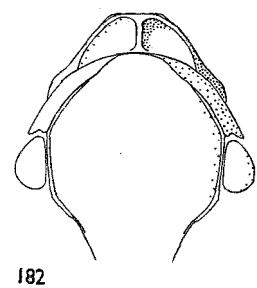
Tribe ZIMMERINI

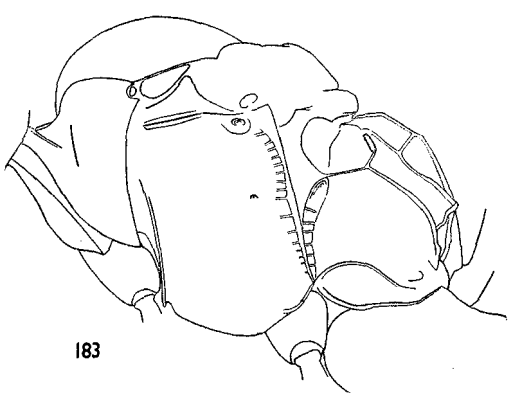
Genus **Zimmeria** Heinrich

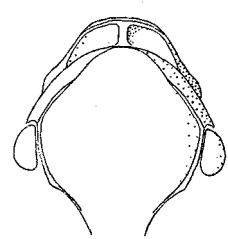
This tribe contains one species. To the characters given in the key to the tribes (figs. 99–102), the following notes are added :

Supraclypeal area strongly raised (fig. 100) ; temples diverging behind the eyes, dorsally, posteriorly, weakly excavate on either side of the central line ; flagellum long, strongly attenuating apically ; scutellum strongly raised ; propodeum short, dorsally with the area superomedia strongly transverse ; petiolar area flat and not divided ; gastrocoeli moderately deep ;









FIGS. 181–182.—*Anisobas platystylus*, ♀ : 181, thorax in part, lateral; 182, pronotum, dorsal.
FIGS. 183–184.—*Anisobas cingulatorius*, ♀ : 183, thorax, lateral; 184, pronotum, dorsal.

thyridiae oblique, large, subequal in breadth to the distance between the thyridiae ; gaster broad, oval ; cell 2*Rs* rhomboidal. ♀ 13–14 mm., ♂ 14–16 mm. *It has been bred in this country from* Eriogaster lanestris (*L.*). *Rare.* vi–viii..... **dirus** (Wesmael)

Tribe EURYLABINI

The two genera occurring in Britain, which have been placed in this tribe by Heinrich, have little in common, and in view of the sort of differences found between other tribes, it might seem reasonable to regard the *Goedartia* group of genera as a tribe distinct from *Eurylabus*. In the key to the tribes, these two genera come down separately, and the differences are not repeated here.

Genus **Eurylabus** Wesmael

KEY TO SPECIES

1 ♀♂. Face, frons, thorax and coxae conspicuously marked with yellow ; femora, tibiae and tarsi red ; flagellum most usually with a white band ; face more deeply impressed on each side of the supraclypeal area (fig. 194).

♀. Gaster rather narrow apically, the apical segments dorsoventrally flattened. 17–18 mm..... **larvatus** (Christ)

Note.—The 2 ♀ seen from the British Isles have the temples converging behind the eyes (fig. 193) ; a specimen from Bavaria has the temples subparallel, and in specimens from the Pyrenees and Algeria the temples diverge ; it is therefore possible that a group of species is mixed under this name.

– ♀♂. Head (except usually for the orbits of the face in the ♂), thorax, coxae, trochanters and abdomen, entirely black ; femora red, front and middle tibiae red and their tarsi infuscate ; hind tibia black usually red or reddish at the base, hind tarsi black ; face hardly impressed on each side of the supraclypeal area (figs. 188, 190).

♀. Gaster narrowed apically, slightly laterally compressed or subcircular in section.....2

2 (1) ♀♂. Sternite 4 with a median, longitudinal fold ; clypeus with apical tubercles on each side of the median line (fig. 188) ; temples a little broader (fig. 185) ; mandibles broader (fig. 191).

♀. Flagellum with a white ring, sometimes with the basal segments red ; tergite 4 at most with minute punctures ; hypopygium onger than the preceding segment (fig. 189). ♀ 11–14 mm., ♂ 13–14 mm. *Rather rare* **torvus** Wesmael

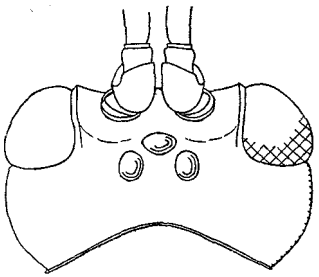
– ♀♂. Sternite 4 with no median, longitudinal fold ; clypeus with no tubercles (fig. 190) ; temples a little smaller (fig. 187) ; mandibles narrower (fig. 192).

♀. Flagellum entirely black dorsally or with the central (and sometimes basal) segments reddish ; tergite 4 with small but conspicuous punctures ; hypopygium conspicuously shorter than the preceding segment (fig. 186). ♀ 12–15 mm., ♂ 10–15 mm. *Not uncommon.* vii–ix. . **tristis** (Gravenhorst)

Genus **Goedartia** Boie

The ♀ is shown in fig. 111. To the characters given in the key to the tribes may be added the following :

♀♂. Mandibles broad and rather short ; clypeus long and flattened in the apical two-thirds ; propodeum coarsely rugose, rather short, with the carinae distinct except for the lateral carinae in front of the costula ; mesoscutum with the line of the notauli coarsely rugose, the area beside and between these, for the most part, rather sparsely and shallowly punctate ; postpetiole weakly, finely striate centrally, polished beside this and punctate laterally ; tergite 2 striate between the thyridiae and centrally, otherwise punctate ; tergite 3 much more finely and rather sparsely punctate, the remaining segments strongly shining ; scutellum at least with an ivory spot.



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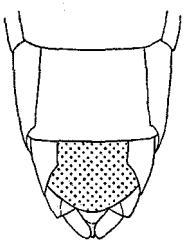

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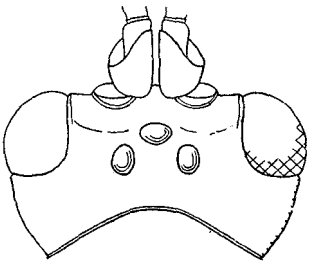

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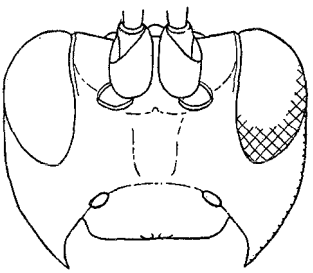

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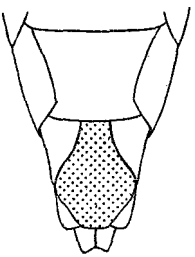

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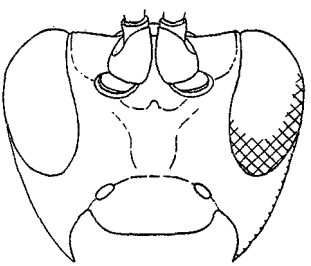

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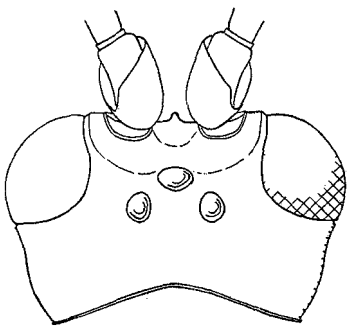
191 192



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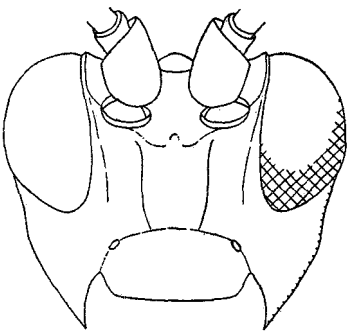

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FIGS. 185–194.—*Eurylabus*, ♀: 185, *torvus*, head, dorsal; 186, *tristis*, apex of gaster, ventral (hypopygium stippled); 187, *tristis*, head, dorsal; 188, *torvus*, head, anterior; 189, *torvus*, gaster, ventral (hypopygium stippled); 190, *tristis*, head, anterior; 191, *torvus*, mandible; 192, *tristis*, mandible; 193, *larvatus*, head, dorsal; 194, *larvatus*, head, anterior.

♀. The long flagellum with a broad, white band ; front and middle femora marked with ivory ; front tibia and tarsus largely marked with ivory ; middle and hind tibiae with an ivory basal mark.

♂. Flagellum strongly crenulate ; front and middle coxae, trochanters and femora marked with ivory ; front and middle tibiae largely marked with ivory ; front tarsus in large part ivory ; hind trochanter marked with ivory and the hind tibia ivory at the base, the mark sometimes extending to about the middle of the tibia. ♀ 14–17 mm., ♂ 15–18 mm. *It has been reared in this country from* Dasychira pudibunda (*L.*). *Rare.* vi–ix

alboguttatus (Gravenhorst)

Note.—The crenulate antennae of the male are similar to those of *Trogus*.

Tribe Platylabini

The species of this tribe are mainly parasites of the caterpillars of Geometrid moths. The genera are, for the most part, poorly differentiated and the key to the genera is difficult when only few species have been seen. In particular, the division in couplet 2 on the form of the spiracles of the propodeum is not easy to use in certain species e.g. *Platylabus concinnus* Thomson. Also the characters of the thyridiae and the depth of the gastrocoeli will be hard to appreciate until experience is acquired ; in order to attempt to overcome this difficulty, *Platylabus punctifrons* and *concinnus* have been taken off in a separate couplet. *P. concinnus* is a small species of the genus and, as so frequently happens in the Ichneumonidae, the differentiating generic characters are ill-developed in this species.

I have recently been able to examine the type species of *Linycus* Cameron, *L. rufipes* Cameron from Ceylon, and have found this to be congeneric with the species which I listed as *Ectopius exhortator* (F.). These species are widely different from *Ectopius* and I am now using the combination *Linycus exhortator* (F.).

Key to Genera

1 Tergite 1 extremely broad (figs. 195–6), the postpetiole being as broad as the distance between the dentiparal spines of the propodeum

Rhyssolabus Berthoumieu (p. 52)

– Tergite 1 with the postpetiole distinctly narrower than the distance between the dentiparal spines (when present) 2

2 (1) Spiracles of propodeum oval or slit-like (fig. 202), at least twice as long as broad ; (only shorter in *Platylabus concinnus* ♀ (fig. 201)) 3

– Spiracles of propodeum circular or at most one and a half times as long as broad (fig. 204) ; (most elongate in *Cyclolabus nigricollis* ♂ (fig. 203)).

Notauli rather strongly impressed and longer than in *Platylabus*, *Asthenolabus* or *Pristiceros* ; costula of propodeum most usually distinct or very strong 7

3 (2) Petiole, centrally, quadrate in section (figs. 197–8) ; central area of metanotum, and scutellum in the apical half, strongly coriaceous

Hypomecus Wesmael (p. 67)

– Petiole, centrally, broader than high ; central area of metanotum and scutellum shining between the punctures or rugosities 4

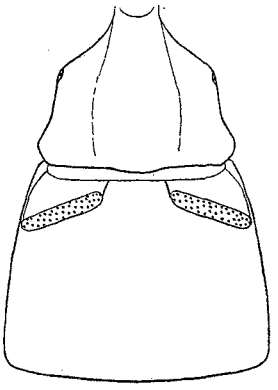
4 (3) Thyridiae at least as near to each other as the breadth of a thyridia, usually much closer (figs. 238, 241–4, 246) ; gastrocoeli always deep.

Claws never with a long, sinuate hair ; ♂ flagellum never serrate

Platylabus Wesmael (p. 56)

Figs. 201–204.—Spiracles of propodeum : 201, *Platylabus concinnus*, ♀ ; 202, *P. pedatorius*, ♀ ; 203, *Cyclolabus nigricollis*, ♂ ; 204, *C. nigricollis*, ♀.

Figs. 205–206.—Head, posterior, ♀ : 205, *Apaeleticus bellicosus* ; 206, *Cyclolabus nigricollis*.



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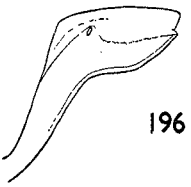

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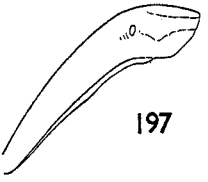

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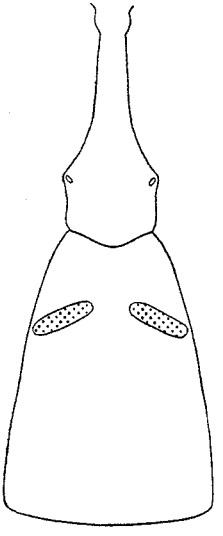

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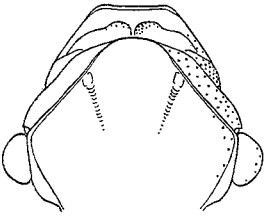

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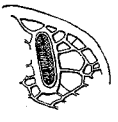

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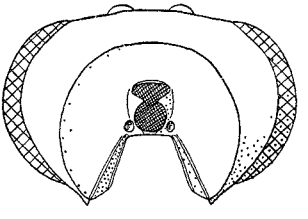

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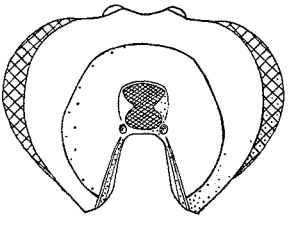

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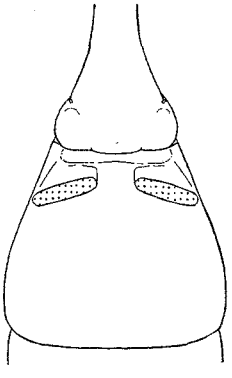

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FIGS. 195–196.—*Rhyssolabus arcticus*, ♀: 195, tergites 1 and 2, dorsal; 196, tergite 1, lateral.

FIGS. 197–198.—*Hypomecus quadriannulatus*, ♀: 197, tergite 1, lateral; 198, tergites 1 and 2, dorsal.

FIGS. 199–200.—*Apaeleticus bellicosus*, ♀: 199, pronotum, dorsal; 200, tergites 1 and 2, dorsal.

[*Continued opposite*

– Thyridiae conspicuously further from each other than the breadth of a thyridia (figs. 239, 240, 245); gastrocoeli shallow (except in two aberrant species of *Platylabus*) 5

5 (4) Area superomedia conspicuously transverse but with the costula absent; either the malar space has a large, white, apical spot or the gastrocoeli, though small, are deeply impressed and the second tergite has only sparse punctures ..... *Platylabus punctifrons* and *concinnus*

– Area superomedia subquadrate (fig. 226) or the costula is very strongly developed (fig. 227); gastrocoeli shallow though sometimes represented by an oblique groove; malar space at most very narrowly white apically; second tergite always closely punctate 6

(5) Propodeum elongate with the area superomedia subquadrate and the costula absent (fig. 226); hind femur conspicuously thickened (figs. 217–8); claws with a long, flattened, sinuate, sub-basal seta which extends to the apex of the claw (fig. 261); ♂ with the flagellum not at all serrate and with no tyloidae ..... **Asthenolabus** Heinrich (p. 52)

Propodeum short with the area superomedia usually transverse and the costula very strongly developed (fig. 227); hind femur normal (fig. 219); claw with no conspicuously modified, sub-basal seta (fig. 260); ♂ with the central segments with conspicuous tyloidae 6*a*

6*a* (6) Clypeus shining between the punctures and not inflexed apically; ♂ with at least the subapical segments more or less serrate (figs. 220–1) **Pristiceros** Gravenhorst (p. 54)

– Clypeus with conspicuous microsculpture between the punctures and inflexed apically; ♂ with the flagellum not serrate. . **Poecilostictus** Ratzeburg (p. 56)

7 (2) Genal carina meeting the hypostomal carina at the base of the mandible (fig. 205); transverse furrow of pronotum with a central tubercle or keel (fig. 199); petiole, centrally, quadrate in section.

Thyridiae broad (fig. 200), the gastrocoeli rather shallow but distinctly impressed ..... **Apaeleticus** Wesmael (p. 68)

– Genal carina meeting the hypostomal carina distinctly behind the base of the mandible (fig. 206); transverse furrow of pronotum not divided; petiole, centrally, broader than high 8

8 (7) Thyridia broader than the distance between the thyridiae (figs. 207, 264–5), the gastrocoeli deeply impressed ..... **Cyclolabus** Heinrich (p. 66)

– Thyridia small, minute or absent (figs. 208, 214); gastrocoeli represented by an oblique furrow 9

9 (8) Malar space with a large ivory spot; frons intumescent in front of the ocelli (fig. 213); abscissa of Cu_1 between cells $2M$ and Cu_1b subequal to vein Cu_1b; pronotal collar broad; area superomedia strongly transverse (fig. 210) ..... **Ectopius** Wesmael (p. 67)

– Malar space at most with a small, testaceous spot adjoining the base of mandible; frons flat (fig. 212); abscissa of Cu_1 between cells $2M$ and Cu_1b conspicuously longer than vein Cu_1b; pronotal collar narrow; area superomedia more elongate (fig. 209) ..... **Linycus** Cameron (p. 67)

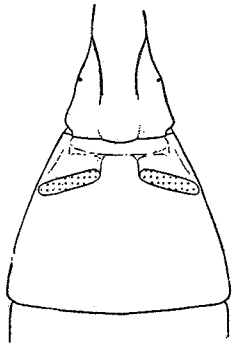
Genus **Rhyssolabus** Berthoumieu

Tergite 1 dorsally rugose, the sculpture becoming rugose-punctate in the lateral, apical angles; thyridiae very broad, the gastrocoeli very short but deep (fig. 195); clypeus strongly convex, weakly emarginate apically, the supraclypeal area very strongly raised; genae, posteriorly, somewhat excised above the base of the mandibles; scutellum convex, the lateral carina extending to about the middle; propodeum with the spiracles short, oval; the costula absent; ♀ with the antenna rather short, the postannellus being about two and a half times its breadth (fig. 211) and with no white ring. ♀ *c.* 9 mm., ♂ 7–8 mm. *The Highlands of Scotland.* (v–vii)

arcticus Hellén

Genus **Asthenolabus** Heinrich

Abdomen at least with the postpetiole and tergites 2 and 3 marked with red, the 2 apical tergites with the hind margin ivory; postscutellum black; hind femur most usually conspicuously red, at least basally.



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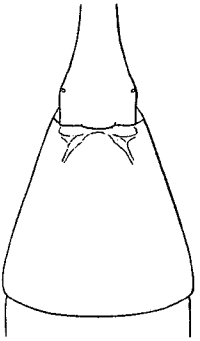

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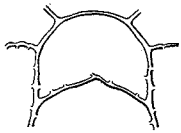

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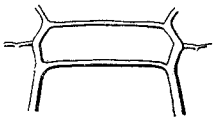

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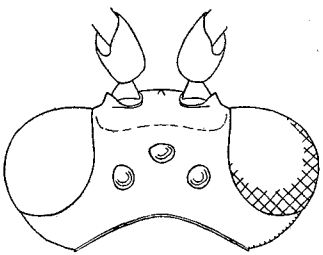

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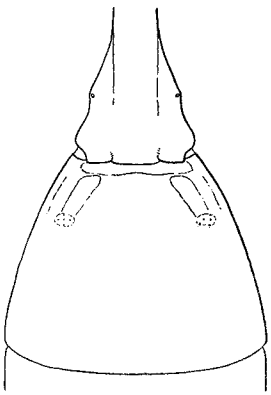

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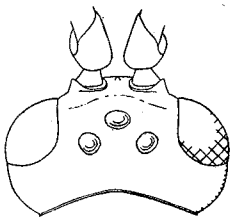

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FIGS. 207–208.—Tergites 1 and 2, dorsal, ♀: 207, *Cyclolabus nigricollis*; 208, *Ectopius rubellus*.

FIGS. 209–210.—Area superomedia, ♀: 209, *Linycus exhortator*; 210, *Ectopius rubellus*.

FIG. 211.—*Rhyssolabus arcticus*, ♀, segments 1 and 2 of flagellum.

FIGS. 212–213.—Head, dorsal, ♀: 212, *Linycus exhortator*; 213, *Ectopius rubellus*.

FIG. 214.—*Linycus exhortator*, ♀: tergites 1 and 2, dorsal.

KEY TO SPECIES

A ♀. Stigma pale centrally; hind legs more slender (fig. 217) with the tibia most usually with a red band towards the base; mesoscutum more finely punctate, dull between the punctures; postpetiole narrower (fig. 222); antenna longer with about 43–44 segments.

♂. Flagellum very long and slender (basal segments, fig. 225) with about 43–44 segments; abdomen at most with tergites 1–4 red, the petiole and tergite 4 most usually, at least in greater part, black, sometimes with tergites 2–3 infuscate centrally; stigma pale centrally; mesoscutum dull with finer punctures. ♀ 8–9 mm., ♂ 8–10 mm. *Not uncommon.* vi–x

vitratorius (Gravenhorst)

B ♀. Stigma black; hind legs stouter (fig. 218) with the tibia entirely black; mesoscutum with coarse punctures and with the interspaces weakly sculptured and shining; postpetiole broader (fig. 223); antenna shorter with about 38 segments.

♂. Flagellum shorter and stouter (basal segments, fig. 224) with about 39 segments; abdomen often with only the petiole black; tergites 5–7 sometimes infuscate or black; stigma black; mesoscutum with coarser punctures, shining between these.

Spiracle of the propodeum usually more elongate than in *vitratorius*. ♀♂ 8–10 mm. *Infrequent.* vi–ix..... **latiscapus** (Thomson)

Genus **Pristiceros** Gravenhorst

The two British species of this genus differ considerably from each other. *P. infractorius* has been placed by Heinrich in his genus *Asthenolabus*, but it is extremely closely related to the continental species, *larvator* Gravenhorst, which he has placed in *Pristiceros*.

KEY TO SPECIES

A ♀. All the tergites with the apical margin conspicuously yellow or ivory; mesoscutum, meso- and metapleurum marked with yellow; hind femur red, black apically.

♂. Flagellum somewhat thickened beyond the middle, weakly serrate (fig. 220), with tyloidae on segments 10–15/16; temples narrower and strongly converging directly behind the eyes (fig. 215); thyridiae long-oval, gastrocoeli shallow and widely separated (fig. 239); black: antenna usually with a small, white, dorsal mark, scape yellow beneath; mandibles yellow, face broadly yellow laterally, clypeus with yellow lateral spots; frontal orbits, orbits of the vertex and external orbits marked with yellow; pronotum, mesoscutum (usually), mesopleurum (as well as the subalar prominence), metapleurum, propodeum, scutellum and central area of metanotum marked with yellow; front and middle coxae marked with yellow, trochanters, femora, tibiae and tarsi red, more or less marked with yellow; hind trochantellus in part red, femur red, black apically, tibia red, black at the base and apex, tarsus with the segments sometimes red at the base; gaster with the apices of the tergites yellow. ♀ 7–8 mm., ♂ 6·5–8·5 mm. *Not uncommon.* vii–ix..... **infractorius** (L.)

B ♀. At most tergites 1 and 2 with a narrow, apical, ivory band; mesoscutum, meso- and metapleurum not marked with yellow; hind femur black, at most very narrowly red basally.

♂. Flagellum very strongly serrate (fig. 221), with tyloidae on segments

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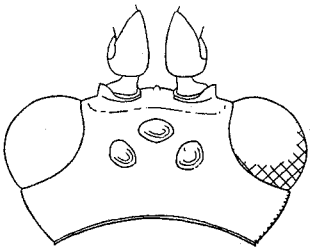
FIGS. 222–223.—*Asthenolabus*, ♀, tergite 1, dorsal: 222, *vitratorius*; 223, *latiscapus*.

FIGS. 224–225.—*Asthenolabus*, ♀, base of flagellum: 224, *latiscapus*; 225, *vitratorius*.

FIGS. 226–227.—Propodeum, dorsal: 226, *Asthenolabus vitratorius*, ♂; 227, *Pristiceros infractorius*, ♀.



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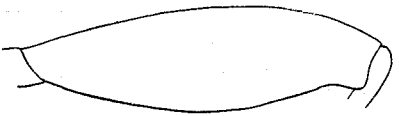

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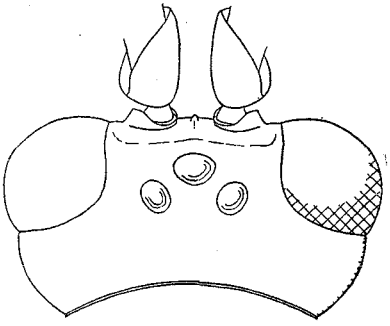

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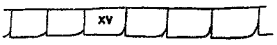

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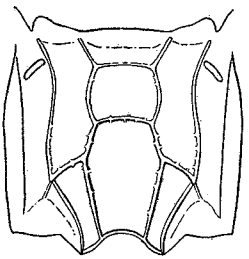

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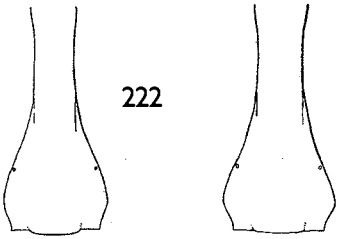

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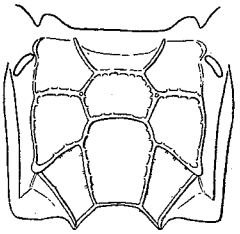

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FIGS. 215–216.—*Pristiceros*, ♂ head, dorsal : 215, *infractorius* ; 216, *serrarius*.
FIGS. 217–219.—Hind femur, ♀ : 217, *Asthenolabus vitratorius* ; 218, *A. latiscapus* ; 219, *Pristiceros infractorius*.
FIGS. 220–221.—*Pristiceros*, ♂, central segments of antenna : 220, *infractorius* ; 221, *serrarius*.

[*Continued opposite*

12–24 ; temples broader, subparallel directly behind the eyes (fig. 216) ; thyridiae small, gastrocoeli very shallow, flat, but broad ; black : antenna with a broad, white band ; usually with mandibles, sides of clypeus, internal and external orbits marked with ivory ; yellow vertical spot present ; pronotum with an ivory line in the hind angles and with an ivory spot in the middle of the lateral part of the anterior margin ; scutellum with an ivory, apical spot ; propodeum marked with ivory around the apex of the dentiparal area ; front and middle legs in part marked with ivory. *Autumnal. Surrey*, 1♂ (*F. Smith*) ..... **serrarius** Gravenhorst

Genus **Poecilostictus** Ratzeburg

I have only seen a single male of this species from Britain, and it has not previously been recorded from these islands. It is a well known parasite of *Bupalus piniarius* (L.) on the Continent and the British male was reared from this host.

Antenna with tyloidae on segments 8/9–15/17 ; tergite 1 with a subapical row of transverse punctures which are usually more or less complete ; tergite 2 rugose in basal two-thirds, the thyridiae absent and the gastrocoeli hardly differentiated.

♂. Black ; flagellum with a white stripe centrally ; face, malar space, frontal orbits, upper margin of pronotum laterally, lower angle of pronotum, scutellum in part, subalar prominence, apical margin of tergite 1, front and middle coxae in greater part, front and middle trochanters, yellow ; front and middle tibiae red, their tarsi infuscate ; hind femur red, broadly black apically, hind tibia red, black apically, hind tarsus yellow, darker basally. (Continental specimens have the legs paler than the single, British male.) 9–11 mm. *Cheshire ; Delamere*, 7.v.1956 (*Forestry Commission*)
cothurnatus (Gravenhorst)

Genus **Platylabus** Wesmael

All the British species of this genus are parasitic on Geometrid moths, except *tenuicornis* and *histrio* which are parasites of Drepanidae.

Much confusion has existed in the *pedatorius* group, and a survey of the continental literature shows that these species have been much misunderstood. They are difficult to determine but appear to be quite distinct. Biological information concerning all the species of the genus would be of particular interest.

In using the key, it is essential to appreciate the differences in the hypostomal carina ; these are difficult to assess unless species of the group with the carina strongly raised can be compared with those having the carina narrow. Some difficulty may be found in running *concinnus* to this genus, but, although the gastrocoeli are small (thus approaching *Pristiceros* and *Asthenolabus*), they are distinctly and quite deeply impressed.

I have seen no female of *gigas*, and the determination of this species must therefore remain doubtful. No male is yet known of *stolidus*.

Key to Species

(*Females*)

1 Head, thorax, gaster and legs in greater part metallic blue.

Head with the frontal orbits, and external orbits in part, ivory ; front, and sometimes the middle, femur and tibia marked with ivory ; head with the interantennal tubercle strong, acute ; hypostomal carina low ; mesoscutum polished between the punctures ; propodeum with the lateral carina of the dentiparal area in large part erased but with conspicuous dentiparal spines ; gastrocoelus short, thyridia very large and broad, about two and a half times as broad as the distance between the thyridiae.

10–11 mm. *Rare.* vi ..... **nigrocyaneus** (Gravenhorst)

– Ground colour black or black and red 2

2 (1) Head, thorax, abdomen and legs in greater part, red ; varying to the head, dorsally, the mesoscutum, the legs and the basal segments of the abdomen conspicuously infuscate, but even in these dark specimens with conspicuous areas of red on the head and thorax ; gaster glabrous except in part laterally.

Gena buccate, hypostomal carina rather narrow ; interantennal tubercle distinct ; abdomen shining with the postpetiole rugose, tergite 2 distinctly punctate in the basal half, tergite 3 at most with scattered basal and sub-basal punctures, tergites 2–4 strongly punctate along the lateral margins which are hairy, otherwise with the apical tergites entirely glabrous ; gastrocoelus short, thyridia very broad and very large, about two and a half times as broad as the distance between the thyridiae ; flagellum sometimes with no white ring ; internal orbits, spot on vertical orbits, external orbits centrally, the apex of the malar space, yellow ; pronotum with the collar centrally, the posterior margin, except centrally, yellow, sometimes with a yellow, lateral spot on the front margin ; the subalar prominence and usually the scutellum apically, yellow ; central area of metanotum sometimes marked with yellow. Whole insect (fig. 108). 8·5–10 mm. *Not uncommon.* vi–x

rufus Wesmael

– Head and thorax never marked with red ; gaster at least in considerable part dorsally, with distinct, though often very short, pubescence 3

3 (2) Gaster at most with tergite 2 obscurely reddish at the base, or with the apices of the central segments very narrowly red ; sometimes with tergites 1 and 2 (and sometimes 3) with the apical margin quite broadly ivory ; frons with at most sparse punctures except in *variegatus* and *concinnus* 4

– Gaster at least with the postpetiole and tergites 2 and 3 red ; basal segments never with an ivory, apical margin ; frons very strongly punctate or rugose-punctate.

Hypostomal carina always very strongly raised ; interantennal tubercle weak 19

4 (3) The whole frons strongly shining, with at most scattered, very shallow irregular punctures and the faintest indication of alutaceous sculpture centrally ; gena strongly buccate and the interantennal tubercle distinct (fig. 234) ; hypostomal carina very narrow.

Clypeus convex ; mesoscutum broader with clear, deep and rather large punctures, centrally and laterally with only a faint indication of micro-sculpture between the punctures ; dentiparal spines small but present ; gastrocoelus very short, thyridia very large and broad, breadth about two and a half times the distance between the thyridiae.

Parasites of Drepanidae 5

– The upper part of the frons dull or weakly shining, alutaceous and punctate or rugose ; either the cheeks not buccate or the hypostomal carina very strongly raised 6

5 (4) Hind tibia entirely black ; dorsal carinae of the petiole strongly raised at the line of the spiracles so that the first segment when viewed laterally has the dorsal margin strongly angled at this position (fig. 249), postpetiole coarsely rugose ; carinae of the propodeum more strongly raised.

Apex of malar space, and orbits sometimes sparsely marked with ivory ; scutellum sometimes marked with ivory apically ; base of tergite 2 sometimes in part reddish ; front and middle legs sometimes conspicuously marked with red and ivory. 9–10 mm. *Norfolk*, 1 ♀. ix

tenuicornis (Gravenhorst)

– Hind tibia with a white band or spot towards the base ; dorsal carinae of the petiole weak, and when the first segment is viewed laterally, the dorsal margin appears evenly rounded across the line of the spiracles (fig. 247), postpetiole rather finely rugose ; carinae of the propodeum much weaker.

Internal orbits, apex of malar space, and outer orbits centrally, pale yellow ; front margin of pronotum sometimes marked with yellow ; upper lateral margins of pronotum and apex of scutellum yellow ; extreme base of tergite 2 sometimes pale, tergites 2 and 4–6 with the apical margin narrowly ivory ; front and middle legs often conspicuously marked with red and ivory. 8–9 mm. *Infrequent.* vii–viii ..... **histrio** Wesmael

6 (4) Dentiparal area with a small but distinct apical tooth which is most usually white (fig. 254) ; tergite 1 with at least the hind angles ivory, tergite 2 with the apical margin conspicuously ivory ; interantennal tubercle sharp and well developed 7

– Dentiparal area with no apical tooth and never with an ivory mark ; tergite 1 never ivory in the hind angles, tergite 2 usually narrowly red apically ; interantennal tubercle weak or absent (except in *punctifrons* and *transversus*) 8

7 (6) Mesoscutum rugose-punctate and with very strong microsculpture, dull ; head strongly and straightly narrowed behind the eyes (fig. 228) ; flagellum thinner ; dentiparal spines stronger ; lateral carina of the dentiparal area erased in part ; tergite 6 and 7 broadly ivory apically ; frons strongly punctate or rugose-punctate.

Orbits, and front and upper margin of hind angles of pronotum with much reduced pale marking ; front and middle legs usually mostly red, with the coxae and trochanters at least in part black ; hind coxa often marked with red, femur red, black apically and the tibia and tarsus black. *c.* 9 mm. *Infrequent.* v–viii ..... **variegatus** Wesmael

– Mesoscutum coarsely punctate, the interspaces weakly sculptured and thus shining ; temples broader, convexly and less strongly narrowed behind the eyes (fig. 229) ; dentiparal spines small ; flagellum thicker ; lateral carina of the dentiparal area complete ; tergites 6 and 7 narrowly marked with ivory apically ; frons finely coriaceous with sparse punctures.

Apex of malar space, internal and vertical orbits broadly marked with yellow, external orbits conspicuously marked with yellow ; front margin of pronotum yellow almost to the lateral angles, upper margin of hind angles yellow ; legs with the femora most usually infuscate ; tibiae white or whitish internally and the front and middle coxae yellow beneath. 7–9 mm. *Cornwall,* 1 ♂ ..... **dolorosus** (Gravenhorst)

8 (6) Hypostomal carina narrow, at most about one and a half times the height of the genal carina (fig. 235) ; hind angle of pronotum never with a yellow streak 9

– Hypostomal carina very strongly raised, at least three times the height of the genal carina (fig. 236) ; hind angle of pronotum (in the smaller species in which the genal carina is difficult to observe) with a conspicuous yellow line 13

9 (8) Mesoscutum very strongly coriaceous between the punctures, dull.

Petiole narrower, about three times as long as broad posteriorly (measured where the dorsal carinae meet the lateral margin) ; area superomedia quadrate or a little broader than long ; distance between the thyridiae conspicuously less than the breadth of a thyridia 10

– Mesoscutum at most with weak microsculpture between the punctures, with at least the lateral lobes centrally conspicuously shining 11

10 (9) Central area of postpetiole strongly raised ; thyridia much broader than the distance between the thyridiae.

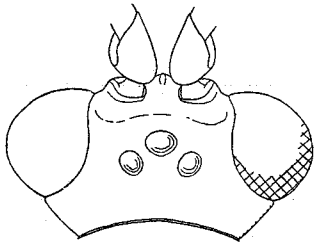
Legs, in British examples, usually for the most part black. 8–9 mm. *Infrequent.* vi ..... **opaculus** Thomson

— Central area of postpetiole only weakly differentiated from the lateral areas ; thyridia about as broad as the distance between the thyridiae. 8–10 mm. *Inverness ; Ross ; Cornwall ;* 3 ♂. vii ..... **intermedius** Holmgren

11 (9) [Postpetiole centrally, longitudinally rugose-striate ; area superomedia narrower ; gastrocoelus large, rather deep and coarsely rugose ; hind femur black except for the base ; petiole a little narrower.] *Hants ;* 1 ♂, *bred from* Selenia tetralunaris (*Hufn.*) ..... **gigas** Kreichbaumer

— Postpetiole centrally, finely alutaceous or polished ; area superomedia very strongly transverse ; gastrocoelus shorter (figs. 245, 246), not so deep and finely rugulose ; hind femur red, sometimes black apically ; petiole very broad, at most twice as long as broad posteriorly 12

12 (11) Hind tibia entirely black or at most with an indistinct, sub-basal, reddish band ; hind femur conspicuously black apically ; postpetiole polished ; central section of petiolar area finely rugose and dull ; scutellum in greater part yellow ; stigma black ; thyridia longer (fig. 246) ; frons with the



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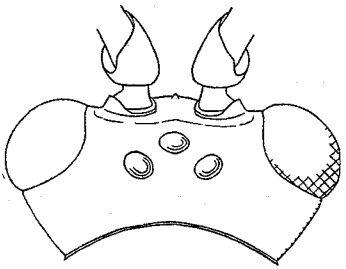

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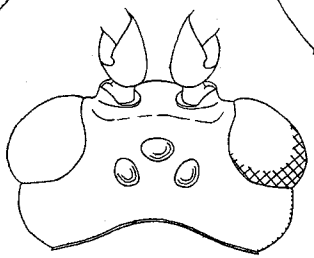

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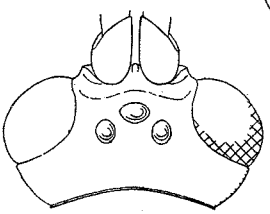

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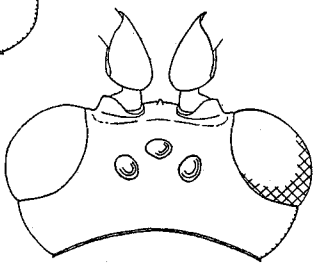

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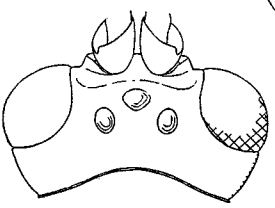

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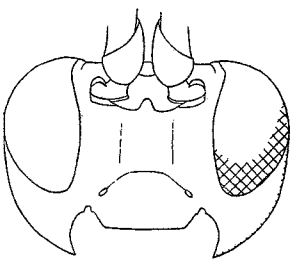

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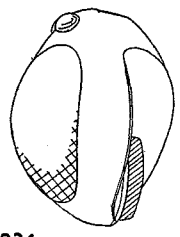

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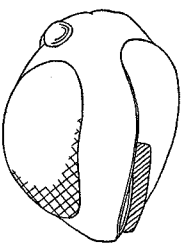

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FIGS. 228–233.—*Platylabus*, ♀ head, dorsal : 228, *variegatus* ; 229, *dolorosus* ; 230, *decipiens* ; 231, *vibratorius* ; 232, *stolidus* ; 233, *pedatorius*.

FIG. 234.—*Platylabus histrio*, ♀ head, anterior.

FIGS. 235–236.—*Platylabus*, ♀ head, lateroposterior : 235, *opaculus* ; 236, *pedatorius*.

punctures at most very shallow ; tergite 2 coriaceous with sparse, shallow punctures. 8–9 mm. *Norfolk ; Cambs. ; Hants.* vi–vii
transversus Bridgman

— Hind tibia red, black in apical third ; hind femur entirely red ; postpetiole coriaceous except for the apical margin, sometimes also with scattered punctures ; central section of the petiolar area distinctly defined laterally, coarsely rugose and shining ; scutellum only yellow apically ; stigma at least somewhat paler centrally, sometimes conspicuously pale ; thyridia very short (fig. 245) ; frons with the punctures clear and moderately close ; tergite 2 rugose basally, otherwise rather closely punctate with rather weak microsculpture between the punctures. 7–8 mm. *Suffolk ; Essex ; Kent.* viii–ix ..... **punctifrons** Thomson

13 (8) Upper lateral margin of pronotum black ; scutellum at most yellow in apical third ; frons very shallowly, but distinctly impressed laterally, just in front of the line of the front margin of the anterior ocellus 14

— Upper lateral margin of pronotum with a distinct, yellow line at least in the hind angle ; scutellum at least yellow in the apical half ; frons more convex and not impressed laterally, beside the eye 17

14 (13) Epicnemial carina strongly raised on each side of the middle line, about three times as high, here, as on the mesopleurum.
Distance between the thyridiae : breadth of a thyridia = 1 : at most 1·3 ; stigma black ; hind femur black apically ; lateral lobes of mesoscutum shining with weak microsculpture between the punctures ; antenna with 39–40 segments, flagellum more slender than in *pedatorius* ; tergite 2 dull with very strong coriaceous sculpture between the punctures ; segment 1 of hind tarsus subequal to segments 2 + 3 + 4. 7–9 mm. *Frequent.* v–vi ..... **obator** (Desvignes)

— Epicnemial carina more evenly and less strongly raised, at most one and a half times as high, ventrally, as on the mesopleurum ; distance between the thyridiae : breadth of a thyridia = 1 : at least 1·5 15

15 (14) Head with the temples broad, subparallel behind the eyes (fig. 232) ; hind femur conspicuously marked with black apically.
Very similar to *pedatorius*, but, as well as the above characters, differing in having the gena broader and more buccate, the thyridiae a little further apart ; antenna with 39 segments ; segment 1 of hind tarsus distinctly longer than segments 2 + 3 + 4 ; stigma black. 8–9 mm. *Essex*, 1 ♀
stolidus Perkins

— Head with the temples narrow and strongly converging behind the eyes (fig. 233) ; hind femur entirely red or at most very narrowly infuscate apically 16

16 (15) Stigma distinctly paler centrally ; lateral lobes of mesoscutum shining with at most a weak indication of microsculpture between the punctures ; flagellum expanded beyond the white, dorsal stripe, antenna with 35–38 segments ; tergite 2 with the area behind the thyridiae more closely punctate ; segment 1 of hind tarsus distinctly longer than segments 2 + 3 + 4 (fig. 253). 7–8·5 mm. *Infrequent but apparently commoner in the North.* vi–x
pedatorius (F.)

— Stigma black ; mesoscutum dull, evenly and distinctly coriaceous between the punctures ; flagellum very thin, only very weakly expanded beyond the white, dorsal stripe, antenna usually with 39–40 segments ; tergite 2 with the area behind the thyridiae more sparsely punctate ; segment 1 of hind tarsus subequal to segments 2 + 3 + 4 (fig. 252). 7·5–10 mm. *Infrequent.* viii–x ..... **odiosus** Perkins

17 (13) Frons strongly, closely and deeply punctate ; tergite 2 very sparsely punctate in the apical half ; vertical orbits with a yellow spot ; gastrocoelus small (so approaching *Pristiceros*) but distinctly impressed, the thyridia narrow, breadth : distance between the thyridiae = about 0·7 : 1 (fig. 240). 5–7 mm. *Infrequent* ..... **concinnus** Thomson

— Frons alutaceous with fine, scattered punctures ; tergite 2 rather evenly punctate ; vertex with no orbital spots ; gastrocoelus broad and deep, the thyridia broad, breadth : distance between the thyridiae = about 2 : 1 .. 18

18 (17) Hind femur red, conspicuously marked with black apically ; flagellar segments at the broadest, transverse ; propodeum shining with the petiolar area,

centrally, at least in part smooth, polished. 6–7 mm. *The only specimens seen were reared from* Eupithecia albipunctata (*Haw.*). iv–v

pumilio Holmgren

— Hind femur entirely red, or with the apex very narrowly infuscate; flagellar segments at the broadest, subquadrate; petiolar area conspicuously rugose, the whole propodeum being much more dull. 5–7 mm. *Frequent.* vi–viii.

iridipennis (Gravenhorst)

19 (3) Abdomen red except for the petiole, sometimes tergites 6 and 7 infuscate; thyridia narrower, at most as broad as the distance between the thyridiae.

Hind angle of pronotum most usually with an ivory stripe. *Devon*, 1 ♂. viii. ..... **rufiventris** Wesmael

— Abdomen with at least tergites 6 and 7 black (with an ivory, apical margin); thyridia conspicuously broader than the distance between the thyridiae. . 20

20 (19) Antennal sclerite very strongly raised, particularly outwardly and dorsolaterally, and head roundedly narrowed behind the eyes (fig. 231); breadth of a thyridia : distance between the thyridiae = about 1·6 : 1 (fig. 241); tergite 4 red.

Lateral carinae of the scutellum strongly developed to about the middle; very variable in the carinae of the scutellum and propodeum. 6–10 mm. *Common.* vii–ix. ..... **vibratorius** (Thunberg)

— Antennal sclerite normal and head strongly, rectilinearly narrowed behind the eyes (fig. 230); breadth of a thyridia : distance between the thyridiae = about 2 : 1 (fig. 242); tergite 4 for the most part black. 21

21 (20) Scutellum with the lateral carinae only at the extreme base; tergite 4 conspicuously punctate; propodeum with the lower margin of the spiracle nearer to the subspiracular carina than its length; hind femur black, only narrowly red basally, hind tibia black somewhat red-marked towards the base. 10–11 mm. *Rare*. ..... **decipiens** Wesmael

— Scutellum with strong lateral carinae to the middle; tergite 4 shining, at most with few, very shallow punctures; propodeum with the spiracles much further from the subspiracular carina than their length; hind femur red, black apically, hind tibia red, narrowly black at the base, broadly black at the apex. 6–7 mm. *Kent; Cornwall*, 1 ♂, 2 ♀

tricingulatus (Gravenhorst)[7]

(*Males*)

Flagellum with no tyloidae unless otherwise stated.

1 Metallic blue.

Flagellum with a conspicuous white band; face and clypeus for the greater part, or entirely, ivory : otherwise similar in colour and sculpture to the ♀ but with the lateral carina of the dentiparal area more or less distinct. 9–10 mm. ..... **nigrocyaneus** (Gravenhorst)

– Ground colour black, or black and red. 2

2 (1) The line of the notauli red; pronotum, mesopleurum and sometimes the metapleurum and scutellum marked with red.

Face and clypeus for the most part, or entirely, ivory, otherwise with the ivory markings similar to those of the ♀; coxae and trochanters black, those of the front and middle legs sometimes marked with ivory, hind coxa sometimes red; front and middle legs otherwise red with the tarsi infuscate, varying to these legs becoming almost entirely infuscate; hind femur red, black apically, hind tibia black, red basally, hind tarsus black, varying to the hind legs entirely black; central area of postpetiole strongly differentiated and coarsely rugose, tergite 2 coarsely punctate, tergites 3, 4 and 5 conspicuously punctate, these and the apical tergites conspicuously pubescent; abdomen red with segment 1 black, sometimes with tergites 2 and 3 in large part, or entirely, black. 9–12 mm. ..... **rufus** Wesmael

– Thorax not marked with red 3

3 (2) Either the flagellum has conspicuous tyloidae and/or at least tergite 2 is entirely clear red. 4

– Flagellum never with tyloidae; tergite 2 at most narrowly red basally and apically 9

[7] Cf. notes on male, p. 62.

4 (3) Scutellum ivory or ivory marked.....5
– Scutellum entirely black..... cf. *Cyclolabus nigricollis* (Wesmael).

5 (4) Gastrocoelus and thyridia small (approaching *Asthenolabus*) (*cf.* fig. 240); gaster black with the apices of the tergites narrowly yellow or reddish, tergite 1 with a yellow spot in each hind angle; tergite 2 irregularly rugose at the base, sparsely, coarsely, shallowly punctate behind this and with shallow microsculpture between the punctures, and shining; tergite 3 similar in sculpture to the apical half of tergite 2.
Black; other ivory marks as follows: scape sometimes beneath, inner orbits, and at least the lateral and most usually the apical margins of the clypeus, vertical spot, a line on the outer orbits, mandibles except the teeth, front margin of pronotum centrally and also often with a lateral streak, hind angles of pronotum along the dorsal margin, scutellum centrally or entirely, subalar prominence, usually with marks on the front and middle coxae and on the genital claspers; middle and hind femora black in British examples examined, front legs in part infuscate (red, infuscate apically in continental specimens); tibiae dull testaceous, strongly infuscate apically on posterior legs; tarsi infuscate, the hind ones black. *c.* 6·5 mm.
concinnus Thomson
– Gastrocoelus and thyridia larger, the thyridia at least as broad as distance between the thyridiae; gaster with at least tergite 2 entirely red; tergite 2 closely punctate.....6

6 (5) Gaster red except for the petiole; distance between the thyridiae subequal to the breadth of a thyridia (fig. 237).
Hind angle of pronotum with an ivory line. 8–9 mm.
rufiventris Wesmael
– Gaster with at least tergites 6 and 7 black, sometimes with a narrow, ivory, apical band; distance between the thyridiae conspicuously narrower than the breadth of a thyridia.....7

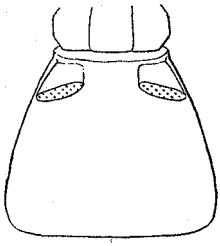
7 (6) Tergite 4 red; antennal sclerite outwardly, very strongly raised and the head much more convexly narrowed behind the eyes (*cf.* fig. 231).
Very variable in the scutellum and development of the carinae of the propodeum. 6–10 mm.....**vibratorius** (Thunberg)
– Tergite 4 black, at least in greater part; antennal sclerite much more weakly raised and the head obliquely narrowed behind the eyes (*cf.* fig. 230).....8

8 (7) Propodeum with the spiracle much nearer to the metapleural carina than the length of the spiracle; scutellum laterally with the carinae a little shorter
decipiens Wesmael
– Spiracle of the propodeum as far from the metapleural carina as the length of the spiracle; scutellum with very strong and longer lateral carinae. *c.* 8 mm.
tricingulatus (Gravenhorst)
Note.—Wesmael examined the type of *tricingulatus* (Gravenhorst). The specimen standing under this name in the Wesmael collection differs from the specimens from Britain and S. Sweden in having the notauli more deeply impressed and the stigma somewhat pale centrally. I regard them, however, as being conspecific.

9 (3) The whole frons strongly shining, with at most scattered, very shallow, irregular punctures; gena buccate (*cf.* fig. 234); hypostomal carina very narrow.....10
– The upper part of the frons dull, or weakly shining, alutaceous and punctate or rugose; either with the gena not buccate or with the hypostomal carina very strongly raised.....11

10 (9) Dorsal carina of tergite 1 strongly raised in the line of the spiracles (fig. 248); tergite 2 rugose behind the thyridiae; inner orbits white, extreme lateral angles of the clypeus and apex of the malar space yellow; hind tibia at most with a dull testaceous sub-basal ring. 10–11 mm.
tenuicornis (Gravenhorst)
— Tergite 1 raised between the spiracles but with no carinae (*cf.* fig. 247); tergite 2 punctate behind the thyridiae; face, clypeus, malar space and lower outer orbits all yellow; hind tibia with a conspicuous, white, sub-basal ring. *c.* 10 mm.....**histrio** Wesmael

11 (9) Dentiparal area with a small, but distinct, apical tooth which is most usually



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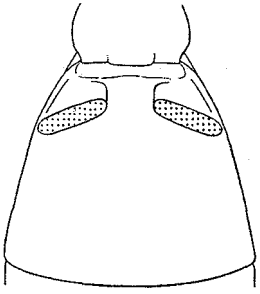

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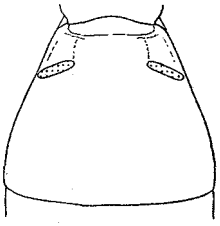

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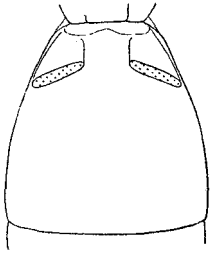

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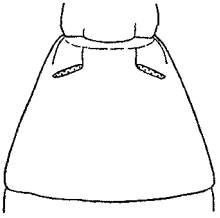

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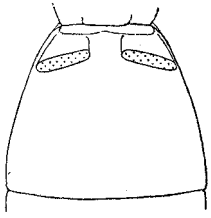

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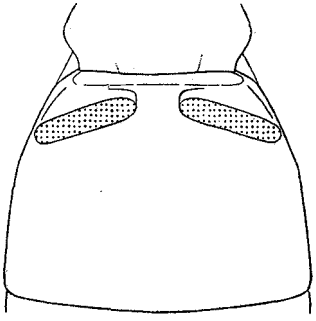

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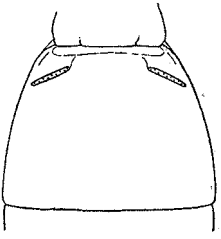

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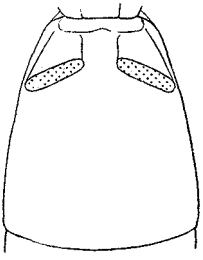

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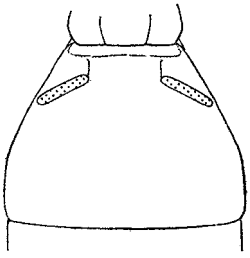

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FIGS. 237–246.—Tergite 2 to show thyridiae (stippled) and gastrocoeli : 237, *Platylabus rufiventris*, ♂ ; 238, *P. obator*, ♂ ; 239, *Pristiceros infractorius*, ♂ ; 240, *Platylabus concinnus*, ♀; 241, *P. vibratorius*, ♀; 242, *P. decipiens*, ♀; 243, *P. pedatorius*, ♂ ; 244, *P. odiosus*, ♂ ; 245, *P. punctifrons*, ♀ ; 246, *P. transversus*, ♀.

ivory (*cf.* fig. 254) ; tergite 1 with at least the hind angles ivory ; tergite 2 with the hind margin conspicuously ivory ; interantennal tubercle sharp and well developed.....12

— Dentiparal area with no apical tooth and never with an ivory mark ; tergite 1 never marked with ivory in the hind angles ; tergite 2 usually narrowly red apically ; interantennal tubercle weak or absent, except in *punctifrons*.....13

12 (11) Mesoscutum rugose punctate, with very strong microsculpture, and dull ; head strongly and straightly narrowed behind the eyes (*cf.* fig. 228) ; lateral carina of the dentiparal area erased in part ; antenna with a white, central, dorsal streak ; tergites 3–5 with the apical margin ivory, 6 and 7 mostly or entirely ivory ; head with the inner orbits and lateral angles of the clypeus (usually) ivory. 8–9 mm.....**variegatus** Wesmael

— Mesoscutum coarsely punctate, the interspaces weakly sculptured and thus weakly, but distinctly shining ; temples broader, convexly and less strongly narrowed behind the eyes (*cf.* fig. 229) ; lateral carina of the dentiparal area complete, strong ; antenna centrally, not marked with white ; apical tergites not marked with ivory ; orbits of frons, face and clypeus (both sometimes infuscate dorsally, centrally), malar space and lower outer orbits, yellow. 8–9 mm.....**dolorosus** (Gravenhorst)

13 (11) Hind angle of pronotum with a conspicuous yellow line.
Genal carina quite strongly raised ; mesoscutum shining ; scutellum usually entirely yellow, rarely only yellow centrally.....14

— Hind angle of pronotum at most with a yellow spot in the hind angle.....15

14 (13) Propodeum with the dentiparal area having distinct punctures and rugosities, the whole propodeum being more dull ; flagellum thinner centrally. 6–7·5 mm.....**iridipennis** (Gravenhorst)

— Propodeum with the dentiparal area having at most vague rugosities, the whole propodeum more shining ; flagellum distinctly thickened centrally. 7–8 mm.....**pumilio** Holmgren

15 (13) Hypostomal carina very strongly raised (*cf.* fig. 236).....20

— Hypostomal carina narrow, not more than one and a half times the height of the genal carina (*cf.* fig. 235).....16

16 (15) Mesoscutum dull with deep coriaceous sculpture between the punctures....17

— Mesoscutum conspicuously shining particularly in the middle of the lateral lobes.....18

17 (16) Tergite 1 with the central area not laterally carinate at the line of the spiracles (fig. 251), the postpetiole coriaceous ; tergite 2 centrally punctate except at the extreme base between the gastrocoeli where it is finely rugose ; flagellum most usually with a distinct, central, white, dorsal stripe. *c.* 9 mm.
intermedius Holmgren

— Tergite 1 with the central area strongly carinate laterally at the line of the spiracles (fig. 250), the postpetiole coarsely rugose laterally ; tergite 2 centrally with rugose sculpture extending from the base to the middle of the segment ; flagellum with no white stripe. 9–11 mm.....**opaculus** Thomson

18 (16) Postpetiole longitudinally rugose-striate centrally ; gastrocoelus large, rather deep and strongly rugose ; hind femur black, only narrowly red at the base. (*cf.* Heinrich, 1928, *Konowia* **8** : 16). *c.* 14 mm.....**gigas** Kriechbaumer[8]

— Postpetiole centrally alutaceous ; gastrocoelus shorter and very finely rugose ; hind femur red, at most narrowly black apically.....19

19 (18) Hind tibia entirely black or at most with an indistinct sub-basal reddish band ; hind femur conspicuously black apically ; postpetiole polished ; central section of the petiolar area not or ill-defined laterally, finely rugose and dull ; thyridiae as far from each other as the breadth of a thyridia. 9–10·5 mm.....**transversus** Bridgman

— Hind tibia red, black in the apical third ; hind femur entirely red ; postpetiole dull except for the apical margin, sometimes also with scattered punctures ; central section of petiolar area clearly defined laterally, coarsely rugose and

[8] I believe that *Platylabus pedatorius* var. 2 Wesmael is this same species ; in these specimens the apex of the dentiparal area is slightly more produced and the area superomedia is broader than in the British specimen ; the hind femur too, is red, black apically. It is probable, however, that this represents only individual variation.

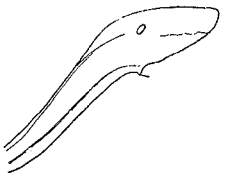
shining ; thyridiae very short and conspicuously further from each other than the breadth of a thyridia. *c.* 8 mm. ..... **punctifrons** Thomson

20 (15) Epicnemial carina strongly raised on each side of the middle line and much higher there than on the mesopleurum ; thyridia narrower and conspicuously oblique (fig. 238). 8–10 mm. ..... **obator** (Desvignes)

— Epicnemial carina very little higher ventrally than on the mesopleurum ; thyridia broader (figs. 243, 244) 21

21 (20) Mesoscutum with the lateral lobes with distinct microsculpture between the punctures ; gastrocoelus subquadrate, thyridia oblique (fig. 244). 9–10 mm. **odiosus** Perkins

— Mesoscutum with the lateral lobes at most with a faint indication of microsculpture between the punctures ; gastrocoelus very short, thyridia subtransverse (fig. 243). 7·5–9 mm. ..... **pedatorius** (F.)



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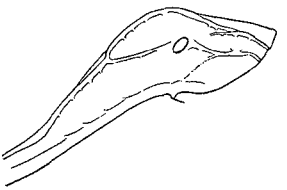

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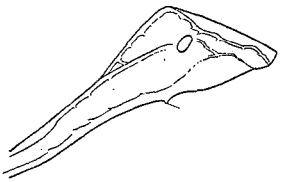

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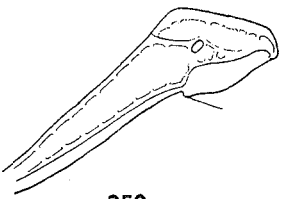

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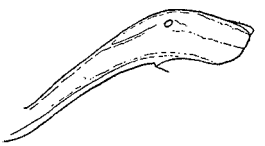

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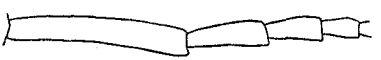

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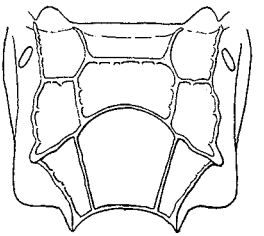

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FIGS. 247–251.—*Platylabus*, tergite 1, lateral : 247, *histrio*, ♀ ; 248, *tenuicornis*, ♂ ; 249, *tenuicornis*, ♀ ; 250, *opaculus*, ♂ ; 251, *intermedius*, ♂.

FIGS. 252–253.—*Platylabus*, ♀ hind tarsal segments 1–4, lateral : 252, *odiosus* ; 253, *pedatorius*.

FIG. 254.—*Platylabus dolorosus*, ♀ propodeum, dorsal.

Genus **Cyclolabus** Heinrich

Much confusion still exists in the species of this genus. *C. nigricollis* is quite distinct, but the successful elucidation of the *pactor* complex in this country requires the examination of very much additional material. I have seen no specimens from this country which agree completely with *pactor* Wesmael, of which I have seen the type. It is possible (though improbable) that in the *pactor* group we are dealing with one extremely variable species.

Key to Species

1 Head and thorax black, at most with a small, yellow spot on the orbits of the vertex ; vertex short and the temples strongly narrowed behind the eyes (fig. 255) ; tergites 1 and 2 more coarsely sculptured ; claws short and thick and strongly curved apically (fig. 259), on the hind leg the inner claw is a little longer and less curved apically than the outer claw.

In pale examples the anterior femora and tibiae are red (tarsi fuscous) ; hind femur red, black apically, hind tibia red, black apically and hind tarsus fuscous ; tergites 1–3 red, this can vary to the red being almost completely suffused by black ; tergites 5–7 with a white apical band ; flagellum of ♀ always, of the ♂ sometimes, with a white band, ♀ 5·5–8 mm., ♂ 6·5–7·5 mm. *Not uncommon.* vi–viii..... **nigricollis** (Wesmael)

– Head and thorax conspicuously marked with ivory, at least with the scutellum and subalar prominence for the most part ivory ; vertex longer and the temples more convex and less converging behind the eyes (figs. 256, 257), and most usually with a large vertical spot on the orbit ; tergites 1 and 2 more finely sculptured particularly in the ♀ ; flagellum of ♂ with no white band, ♀ with a white band ; claws longer and thinner and more weakly curved apically (fig. 258), on the hind leg not dimorphic.

Face and clypeus of ♂ ivory (sometimes infuscate centrally in *dubiosus*) ; frontal orbits most usually with an ivory streak in ♂ and ♀ ; most usually with the anterior margin of the pronotum centrally, the upper margin of the pronotum laterally, and frequently the post-scutellum, ivory ; ♂ often with the anterior margin of pronotum laterally pale ; anterior femora and tibiae red, sometimes infuscate, tarsi more or less infuscate ; hind femur red, black apically and sometimes considerably infuscate ; hind tibia red, infuscate basally and apically, sometimes almost completely infuscate ; hind tarsus black ; ♂ most usually with the front coxa and trochanter conspicuously marked with ivory. *Parasites of* Eupithecia *and related genera.*

2 (1) Thyridia very broad, the distance between the thyridiae : breadth of a thyridia about 1 : 1·9 (fig. 264) ; scutellum at most with the lateral keels present at the extreme base ; area superomedia usually receiving the costula behind the middle, rarely in the middle ; mesopleurum more sparsely, and in the ♀, more coarsely punctate ; mesoscutum with the lateral areas polished between the punctures ; abdomen red with tergite 1 black basally ; tergite 5 narrowly ivory apically, 6 and 7 broadly ivory apically (particularly in the ♀), basally 6 and 7 may be infuscate or black, and in the ♂ tergite 5 also. ♀♂ 6–7·5 mm. *Not uncommon.* vi–ix..... **pactor** (Wesmael)

– Thyridia narrower, the distance between the thyridiae : breadth of a thyridia about 1 : 1·5 (fig. 265) ; scutellum most usually with the lateral keels very strongly developed and extending to the middle of the scutellum where they are inwardly curved ; area superomedia usually receiving the costula before the middle, rarely in the middle ; mesoscutum with the lateral areas sculptured between the punctures ; mesopleurum more closely, and in part subrugosely, punctate in the ♂, in the ♀ more finely and more closely punctate ; abdomen with the apex of tergite 1 and 2–4 red, varying in the ♂ to black with the apices of the central segments red ; tergite 5 with a very indistinct, whitish, apical margin, 6 and 7 distinctly ivory apically. ♀ 5·5 mm., ♂ 5–7·5 mm. *Not uncommon.* vi–viii..... **dubiosus** Perkins

Genus **Ectopius** Wesmael

Only one British species is now retained in this genus, although, when more material is available, it is possible that this really represents a species group, as the material examined from Western Europe shows considerable variation in characters that normally are valid for the differentiation of species in the Platylabini. *E. rubellus* might quite easily be confused with the Phaeogenini and special provision has been made for this in the key to the tribes.

Temples roundly narrowed, only weakly converging directly behind the eyes and the frons, dorsad, very conspicuously convex (fig. 213); propodeum more elongate than in *Linycus exhortator* with the area superomedia about three times as broad as long (fig. 210); tergite 1 with at most a weak indication of dorsal keels (fig. 208); tergite 2 rather sparsely but coarsely punctate basally; the whole insect with the punctures rather sparse.

Malar space with a large white spot adjoining the base of the mandible; thorax and propodeum always black; abdomen usually black, sometimes with tergite 1 apically and tergites 2 and 3 red, apical tergites not marked with ivory; anterior femora, tibiae and tarsi red, hind femur red often infuscate apically, hind tibia red infuscate apically, hind tarsus fuscous or black; flagellum black, rarely in the ♀ with a very narrow, white, central band; tegula yellow. ♀♂ 6–7 mm. *Bred from* Perizoma bifasciata (*Haworth*). *Rare*..... **rubellus** (Gmelin)

Genus **Linycus** Cameron

Temples very strongly converging behind the eyes (more marked in the ♀ than in the ♂), frons almost flat (fig. 212); propodeum shorter than in *Ectopius rubellus* but with the area superomedia longer (breadth : length less than 2 : 1) (fig. 209); tergite 1 with strong dorsal carinae (fig. 214); tergite 2 centrally, basally, coarsely rugose; the whole insect rather coarsely sculptured.

Malar space black, at most with a very small, testaceous spot adjoining the base of the mandible; ♂ thorax black, usually with the propodeum at least marked with red; ♀ with the thorax in greater part red, with the propodeum entirely red; anterior femora, tibiae and tarsi red, hind femur red, black apically, hind tibia usually broadly red centrally, hind tarsus infuscate; ♂ at most with the hind coxa marked with red; ♀ with the front coxa often marked with red, middle coxa usually red at least in greater part, hind coxa red and the hind trochanters red except for the base; tergites 1 and 2 red, the second rarely infuscate in the ♂; tergites 4 (rarely 3 or 5) to 7 in the ♂, and 5 (rarely 6) to 7 in the ♀, with a conspicuous, central, ivory, apical band; flagellum with a conspicuous white band in the ♂ and ♀, in the ♀ also red basally; tegula black. ♀ 6–8 mm., ♂ 7–8 mm. *Frequent*. vi–ix **exhortator** (F.)

Genus **Hypomecus** Wesmael

Only one species of *Hypomecus* is known from Europe. This genus is of rather uncertain position, differing from other Platylabini in having the petiole quadrate in section. In consequence of this the genus will best be recognized in the key to the tribes in which it is taken off in a separate couplet.

♀♂. Propodeum with the costula, and the lateral carina anteriorly, completely absent; thyridiae very broad (fig. 198), gastrocoeli superficial and coriaceous.

♀. Abdomen narrow, somewhat compressed apically. Black: flagellum with a short, white, central stripe, scape reddish beneath; head with the

inner orbits, malar space and outer orbits ventrad, clypeus laterally and mandibles marked with ivory and with an ivory, vertical, orbital spot; pronotum with the collar centrally and sometimes laterally, and upper margin posteriorly, ivory; subalar prominence ivory; scutellum with a pair of ivory spots which may coalesce; central area of metanotum sometimes ivory marked; legs red with the hind trochanter and trochantellus, apex of hind femur black, hind tibia sordid, hind tarsus fuscous with segments 2 and 3 sordid testaceous varying to the legs (particularly the hind ones) largely black; abdomen and propodeum sometimes marked with red.

♂. Similar in colour to the ♀ but with the face entirely ivory and the sternal parts of the thorax marked with ivory as is the mesepimeron; anterior coxae and trochanters conspicuously ivory marked beneath; hind tarsus with segments 3 and 4 white. Antennal segments 12–18/19 with very large tyloidae. ♀♂ 9–11 mm. *Frequent.* v–viii

quadriannulatus (Gravenhorst)

Genus **Apaeleticus** Wesmael

The true position of this genus still remains in doubt. It is here retained in the Platylabini; this position is based on the form of the apex of the abdomen and of the hypopygium of the female. I find no other characters which would associate it with this tribe. It can readily be confused with the Phaeogenini on account of the short spiracles of the propodeum.

Key to Species

A ♀. Mesoscutum conspicuously marked with red; flagellum shorter (fig. 263) with the second segment conspicuously shorter than the malar space.

♂. Flagellum shorter and more conspicuously thickened; postpetiol smooth apically and irregularly, longitudinally striate between the spiracles.

♀. 5–6 mm., ♂ 6–7 mm. *Bucks.*, 1 ♂; *Suffolk*, 2 ♀. viii

inimicus (Gravenhorst)

B ♀. Mesoscutum entirely black; flagellum long (fig. 262) with the second segment conspicuously longer than the malar space.

♂. Flagellum longer; postpetiole evenly, coarsely punctate.

♀. 7–8 mm., ♂ 5·5–8 mm. *Infrequent.* vii–viii . . . . . **bellicosus** Wesmael

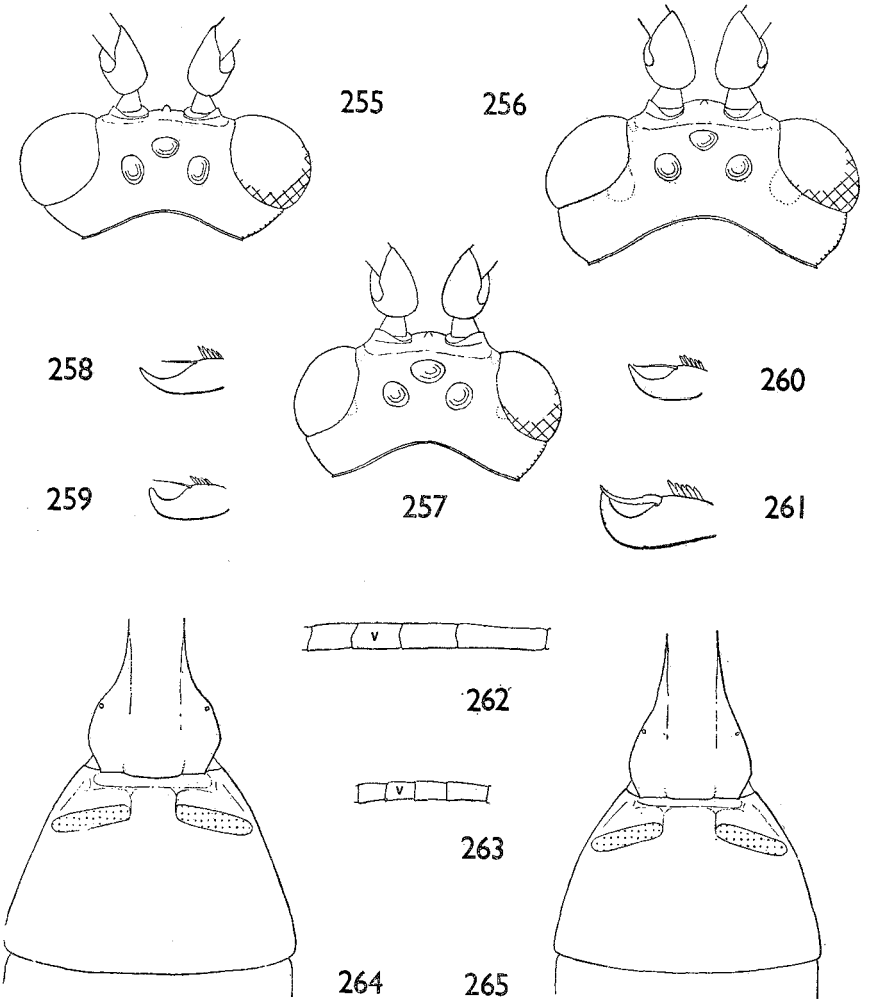
Tribe Phaeogenini

The Phaeogenini contain the smallest species of the Ichneumoninae, and they are all of rather small size.

In this tribe, again, many genera are ill-defined. *Heterischnus* is completely distinct from any of the other genera. *Notosemus*, too, appears to be rather an anomalous genus in the tribe and its true affinities may lie elsewhere, perhaps with *Apaeleticus*. *Stenodontus*, *Hemichneumon* and *Nematomicrus* are also rather distinct from the rest of the tribe, *Hemichneumon* having the petiole flattened and thus approaching such genera as *Ectopius* in the Platylabini. Of the British genera, the remainder appear to form a fairly compact group, though in the past there has been some confusion with *Barichneumon* in the determination of specimens; in fact *Barichneumon vacillator* and *heracleanae* do seem to show points of resemblance with some of the Phaeogenini. It should also be pointed out that *Colpognathus* may prove to be further removed from these genera, being the only one of this complex which has the hypopygium of the female reaching close to the apex of the ovipositor.

In determining the species, I have made much use of Thomson's paper in his *Opuscula Entomologica*, supplemented first with the original descriptions of Wesmael, and later by examination of the Wesmael collection.

Unfortunately, the later continental authors who have described species of this tribe have failed to mention certain characters which these two authors used, and which seem to me to be fundamental. In particular may be mentioned the form of the hypostomal and genal carinae as well as the clear appreciation of the gastrocoeli and thyridiae. Almost no figures have been given of the carinae on the hind coxae of the females, and from the



FIGS. 255–257.—*Cyclolabus*, ♀ head, dorsal : 255, *nigricollis* ; 256, *pactor* ; 257, *dubiosus*.
FIGS. 258–261.—Hind claw, ♀ : 258, *Cyclolabus pactor* ; 259, *C. nigricollis* ; 260, *Pristiceros infractorius* ; 261, *Asthenolabus vitratorius*.
FIGS. 262–263.—*Apaeleticus*, ♀ base of flagellum : 262, *bellicosus* ; 263, *inimicus*.
FIGS. 264–265.—*Cyclolabus*, ♀ tergite 2 to show thyridiae (stippled): 264, *pactor* ; 265, *dubiosus*.

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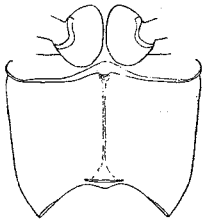

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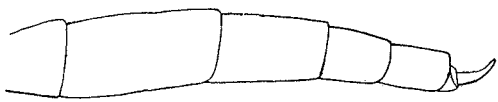

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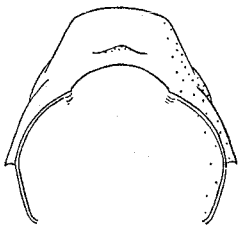

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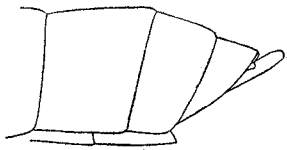

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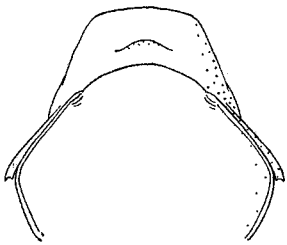

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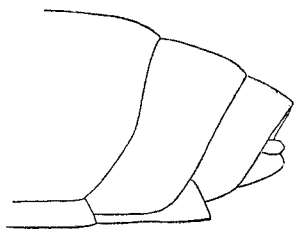

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FIG. 266.–*Misetus oculatus*, ♀ : clypeus, face and malar space, anterior.
FIGS. 267–268.—*Heterischnus* (*R.*) *nigricollis*, ♀ : 267, mesosternum ; 268, mandible, anterior.
FIG. 269.—*Stenodontus marginellus*, ♀ : mandible.
FIG. 270.—*Misetus oculatus*, ♀ : apex of gaster, lateral.

[*Continued opposite*

descriptions appreciation of these characters is extremely difficult. The only series of figures of these carinae that has been given is that of Morley in his *British Ichneumons*. Difficulty will no doubt be experienced in determining even the genera of a number of the males. For myself, I have found that to appreciate the characters at the apex of the clypeus requires a magnification of about × 60.

In all probability it would be better to synonymize certain of the genera e.g. *Aethecerus, Orotylus* and *Phaeogenes*, until such time as many more species can be studied together, when it might be found that this complex really represents a considerable number of divergent groups. I have, however, retained *Aethecerus* as a separate genus, for undoubtedly, as with most Ichneumonidae, many more species will be found to occur in this country and in determining these, the continental literature has to be searched. Another instance is *Eriplatys*, for the single species known from this genus seems closely related to the *Herpestomus nasutus* group and there would perhaps be more reason for separating *H. brunnicornis* from these than *Eriplatys*.

Due to the difficulty of associating the sexes and in part to lack of material, no key has been given to the males of *Phaeogenes, Colpognathus* and *Dicaelotus*. Also in these genera in this country the females have on the whole been taken much more freely than the males, and there are a number of species groups of which I have yet seen no males.

The Phaeogenini appear to be parasites only of Microlepidoptera. In the majority of species, the females appear to hibernate as adults and the males occur in the summer.

KEY TO GENERA

1 Mandibles unindentate and strongly geniculate (fig. 268); epicnemial carina strongly raised centrally and flexed over the base of the front coxa (fig. 267); claws strongly setose-pectinate or pectinate, at least in the ♀.
Elongate species; clypeus large; abdomen with the central segments impressed at the base; genal carina subcontinuous though sometimes excised before meeting the hypostomal carina; head large, the temples subparallel behind the eyes; scutellum strongly raised; notauli distinct in anterior half of mesoscutum ..... **Heterischnus** Wesmael (p. 77)

– Mandibles bidentate in the majority of genera, if unidentate then the epicnemial carina is not strongly raised; claws always simple 2

2 (1) Clypeus with a very strong, median, apical tooth (fig. 266).
Genal carina meeting the hypostomal carina at the base of the mandible; ♀ ovipositor sheaths narrow and recurved (fig. 270)
Misetus Wesmael (p. 78)

– Clypeus at most with a very weak, central, apical tubercle 3

3 (2) Propodeum with the area superomedia absent, or open at least posteriorly, evenly sloping from the base to the apex, very long (figs. 278–80), or the frons is polished (cf. *Trachyarus*) though in part pubescent but with no clearly defined punctures 4

– Propodeum with the area superomedia closed posteriorly, sometimes long, when there is a distinct dorsal and apical face (figs. 275–7); frons strongly punctate or strongly coriaceous 6

4 (3) Tergite 2 with a pair of deep, basal pits; thyridiae absent; thorax very strongly dorsoventrally flattened; scrobis frenalis with no groove posteriorly

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FIGS. 271–272.—Pronotum, dorsal, ♀: 271, *Centeterus confector*; 272, *Colpognathus celerator*.
FIGS. 273–274.—Apex of gaster, lateral, ♀: 273. *Centeterus confector*; 274, *Colpognathus celerator*.

separating it from the propodeum ; ♀ with the plane of the face nearly at right angles to the long axis of the eye (fig. 279); upper tooth of mandible conspicuously longer than the lower..... **Nematomicrus** Wesmael (p. 80)

– Tergite 2 with the gastrocoeli shallow but normally developed ; thyridiae large ; thorax less strongly or not dorsoventrally flattened ; scrobis frenalis separated from the propodeum by a deep groove ; ♀ with the plane of the face making an acute angle with the axis of the eye (fig. 278) ; mandible with the apical teeth subequal.....5

5 (4) Propodeum sharply sloping from the anterior margin of the area superomedia to the apex (fig. 280) ; mesopleurum in part rugose, otherwise much more coarsely punctate ; tergite 3 dull except for the narrow apical margin **Trachyarus** Thomson (p. 80)

– Propodeum gradually sloping from the base to the apex (fig. 278) ; mesopleurum with finer punctures which are distinct, and is in no part rugose ; tergite 3 strongly shining in the apical third..... **Hemichneumon** Wesmael (p. 79)

6 (3) Thyridiae absent ; tergite 2 with no transverse impression towards the base..7

– Thyridiae large and distinct ; if obscure or (*Eparces* (fig. 282) and *Micrope*) absent, then with a conspicuous transverse impression towards the base of tergite 2 10

7 (6) Area superomedia a little broader than long, heart-shaped, and receiving the costula behind the middle (fig. 307).

Mandible long, evenly tapering from the base to apex (figs. 338–9) ; pronotum short ; ♀ with the hypopygium far removed from the apex of the ovipositor (figs. 308–9)..... **Dicaelotus** Wesmael (p. 83)

– Area superomedia at least as long as broad, receiving the costula at, or before, the middle (fig. 306).....8

8 (7) Frontal orbits yellow in both sexes ; genal carina meeting hypostomal carina directly behind the base of mandible.

Mandible very strongly tapered, the lower tooth weakly differentiated (fig. 340) ; pronotum short ; ♀ with the hypopygium well removed from the apex of the ovipositor.... **Dicaelotus** (section **Deloglyptus** Foerster) (p. 85)

– Frons entirely black ; genal carina meeting the hypostomal carina conspicuously behind the base of mandible.....9

9 (8) Pronotal collar shorter (fig. 272) ; ♂ head distinctly transverse (fig. 353), temples narrower, distinctly shorter than the breadth of an eye ; ♀ with the hind margin of the mandible very strongly excised towards the base (figs. 357–9) ; hypopygium reaching close to the apex of the ovipositor (fig. 274) **Colpognathus** Wesmael (p. 95)

– Pronotum collar long (fig. 271) ; ♂ head more quadrate, temples broader, at least as long as the breadth of an eye (figs. 354, 360) ; ♀ with the mandible not strongly tapering and with no excision on the hind margin (fig. 356) ; hypopygium removed from the apex of the ovipositor by a distance at least equal to its length (fig. 273)..... **Centeterus** Wesmael (p. 95)

10 (6) Mandible unidentate (fig. 269).

Petiole with no lateral carinae ; clypeus large and widely divided from face, the whole rather convex ; head and thorax of ♀ a little dorsoventrally flattened..... **Stenodontus** Berthoumieu (p. 80)

— Mandible with two distinct teeth.....11

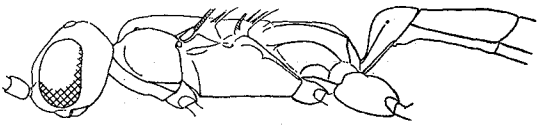
11 (10) Tergite 1, dorsally, strongly intumescent ; thorax long and dorsoventrally flattened, the propodeum about twice as long as the breadth of the petiolar area ; ♀ with the face almost at right angle to the axis of the eye (fig. 275) **Eriplatys** Foerster (p. 81)

— Tergite 1, dorsally, at most evenly curved ; thorax very rarely long and flattened, the propodeum mostly not flattened ; face rarely strongly inflexed 12

12 (11) Notaulus deeply impressed in the anterior third of the mesoscutum (fig. 287) ; postpetiole broad, closely and deeply punctate.

Transverse groove of pronotum interrupted centrally **Herpestomus brunnicornis** (Gravenhorst)[9] (p. 81)

[9] *Apaeleticus* (Platylabini) would run here if wrongly determined in the key to the tribes. It differs superficially from *H. brunnicornis* in having the gaster at least in considerable part red in British species and in the ♀ in having the hypopygium reaching to the line of the apex of the last tergite.



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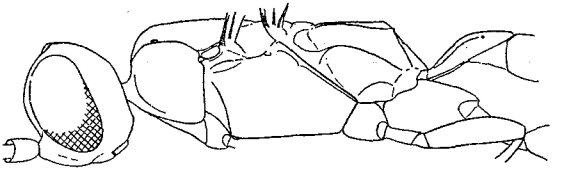

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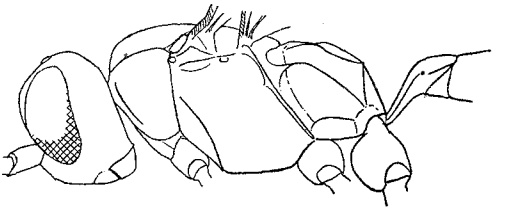

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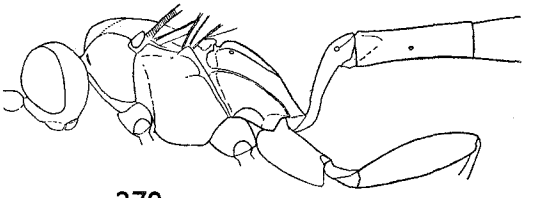

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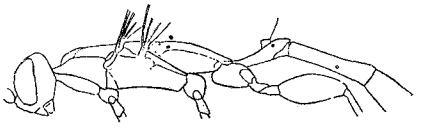

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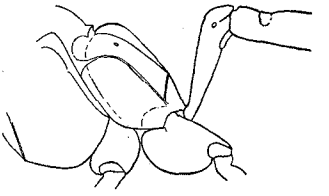

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FIGS. 275–280.—Thorax and base of gaster, lateral, ♀: 275, *Eriplatys ardeicollis*; 276, *Herpestomus wesmaeli*; 277, *H. nasutus*; 278, *Hemichneumon elongatus*; 279, *Nematomicrus tenellus*; 280, *Trachyarus corvinus* (propodeum only).

— Notaulus at most very indistinctly impressed to a third, and only deeply impressed directly behind the anterior margin of the mesoscutum (fig. 286) 13

13 (12) Postpetiole closely punctate (rarely in occasional males the punctures tend to run into striae); hind wing with Cu_1 strongly antefurcal (*cf.* fig. 291); scape normal; clypeus truncate or weakly rounded apically, convex with a narrow, flattened, apical margin.

Thyridiae well removed from the base of tergite 2

Herpestomus (**nasutus** group) (p. 81)

— Postpetiole most usually smooth, coriaceous or very sparsely punctate; if conspicuously punctate, then Cu_1 of the hind wing is postfurcal or the scape is expanded basally or the clypeus is of quite a different form.....14

14 (13) Vein 3*rm* absent and the propodeum coriaceous and dull, this sculpture being particularly even in the area petiolaris.....**Epitomus** Foerster (p. 87)

— Vein 3*rm* present though sometimes unpigmented; propodeum never closely coriaceous and with the area petiolaris polished, punctate, rugose or transstriate.....15

15 (14) Head subquadrate and strongly incised posteriorly (fig. 295); ♂ with a large, yellow, orbital spot on the vertex, ♀ with a red, orbital spot on the vertex.

Genal carina meeting the hypostomal carina at the base of the mandible; propodeum with the spiracle very small, but with the opening oval; thyridiae large and far removed from the base of tergite 2; ♀ gaster narrow, parallel-sided from the middle of tegite 2 onwards, tergites 6 and 7 strongly transverse and with the apical margin excised (fig. 294)

Notosemus Foerster (p. 87)

— Head more transverse; neither the ♂ nor ♀ with yellow or red spots on the vertex.....16

16 (15) Hind wing with vein Cu_1 very strongly antefurcal (fig. 291).

♀ with the face, clypeus and lower frontal orbits red, varying to in part (usually) or wholly yellow; pronotum with a long, yellow line on the upper margin of the hind angle, which may be interrupted centrally or confined only to the hind angle; anterior margin of pronotum yellow centrally; postpetiole smooth or weakly, longitudinally striate.

♂ with the face, clypeus, malar space anteriorly and the lower orbits yellow; hind angles of pronotum with a long and strong yellow line, collar of pronotum centrally yellow; scutellum yellow at least laterally and apically; front and middle coxae straw yellow except for the extreme base, front trochanter straw yellow, middle trochanter straw yellow sometimes infuscate dorsally.....**Herpestomus arridens** (Gravenhorst) (p. 81)

— Hind wing with vein Cu_1 most usually postfurcal (*cf.* fig. 412), rarely opposite in a few species of *Phaeogenes*.

♀ very rarely with yellow or red markings.....17

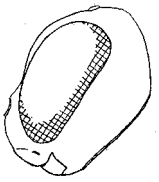
17 (16) Clypeus, apically, centrally, with a large, semicircular depression and with no subapical ridge (fig. 292).

Otherwise similar to *Aethecerus* but with the face longer and the hind margin of the mandible more convex; the genal carina approaching more closely to the base of the mandible; ♀ with the third antennal segment a little shorter than the fourth; ♂ with no sub-basal swelling of the scape

Oiorhinus Wesmael (p. 96)

— Clypeus usually of quite different form, sometimes with a centrally impressed or interrupted subapical ridge but never with a semicircular depression...18

18 (17) Hypostomal carina very strongly raised behind the base of the mandible (figs. 368–9); gena weakly excised in the ♀, strongly excavate in the ♂; clypeus impressed apically, above this is a more or less distinct ridge which is strongly impressed or obliterated centrally (fig. 293); face and clypeus very short in the ♀; supraclypeal area transverse or quadrate; scape more or less raised dorsally, sub-basally in most species and strongly so in the ♂ of many species, apically widened and thus more or less bell-shaped (figs. 362, 364); postannellus of flagellum subequal to segment 2 or distinctly longer than this; hind coxa of ♀ at most with a small tubercle or a small, very short, raised carina .....**Aethecerus** Wesmael (p. 97)



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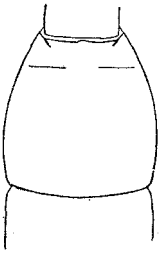

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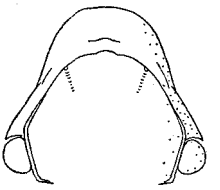

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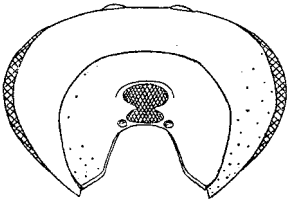

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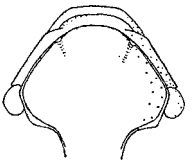

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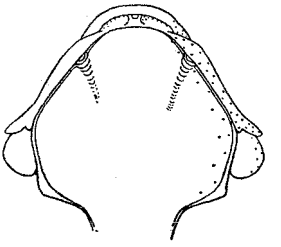

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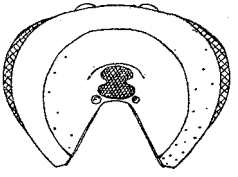

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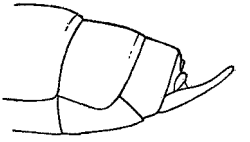

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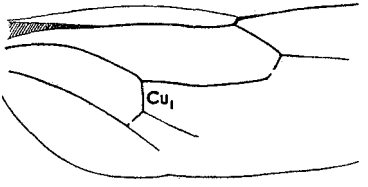

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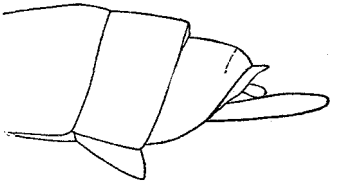

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FIGS. 281–283.—*Eparces grandiceps*, ♀: 281, head, lateral; 282, tergite 2, dorsal; 283, pronotum, dorsal.
FIGS. 284–285.—*Herpestomus*, ♀ head, posterior: 284, *brunnicornis*; 285, *arridens*.
FIGS. 286–287.—*Herpestomus*, ♀ pronotum, dorsal: 286, *nasutus*; 287, *brunnicornis*.
FIG. 288.—*Herpestomus brunnicornis*, ♀: hind coxa, lateral.
FIGS. 289–290.—Apex of gaster, lateral, ♀: 289, *Heterischnus pulex*; 290, *Heterischnus* (*R.*) *nigricollis*.
FIG. 291.—*Herpestomus arridens*, ♀: base of hind wing.

— If the hypostomal carina is strongly raised behind the base of the mandible, then either the clypeus is evenly convex with no ridge above the inflexed apical margin or the postannellus of the flagellum is conspicuously shorter than segment 2; if the clypeus has an interrupted subapical ridge (*Phaeogenes fulvitarsis* group), the hypostomal carina is only moderately raised and in the ♂ the gena is not excised posteriorly

Gena excavate only in the ♂ of *P. ophthalmicus*.....19

19 (18) Genal carina meeting the hypostomal carina immediately behind the base of the mandible and the gena not expanded behind the base of the mandible (fig. 318).

Face and clypeus long (fig. 317); ♀ with the hind coxa unarmed.....20

— Genal carina meeting the hypostomal carina well behind the base of the mandible and the gena expanded behind the base of the mandible (*cf.* fig. 331).

Scutellum most usually conspicuously flattened dorsally, rarely weakly convex; ♀ never with the mesoscutum red marked

Note.—*Diadromus subtilicornis* approaches the above group most closely in the form of the genal carina (fig. 343), but in the ♀ the mesoscutum is black and tergites 2 and 3 have conspicuous coriaceous sculpture; in the ♂ the face and clypeus are entirely black.....21

20 (19) Front wing with vein *cua* received in cell *R* or rarely interstitial with *M*; clypeus, viewed ventrally, with the apex finely rugose and very weakly differentiated from the face (fig. 317); clypeal foveae smaller; area superomedia elongate, the petiolar area weakly impressed, almost flat apically, basal groove of propodeum little widened centrally (fig. 324); ♀ with the flagellum long, all the segments elongate; mesoscutum and scutellum red (black varieties however occur); tergites 2–4 conspicuously coriaceous, though progressively less strongly sculptured from the base of tergite 3 onwards.

♂ much less extensively marked with red than the ♀; rare, I have seen only 2 males in Coll. Bridgman.....**Thyraeella** Holmgren (p. 88)

— Front wing with vein *cua* received in cell 1*M*; clypeus when viewed ventrally, rather weakly coriaceous, divided from the face by a sharp groove (figs. 319, 320); clypeal foveae large; area superomedia transverse, the petiolar area distinctly excavate to the base of the abdomen, basal groove of propodeum conspicuously widened centrally (fig. 321); ♀ with the flagellum rather short, the seventh and following segments subquadrate; tergite 2 coriaceous only between the thyridiae and the base of the segment, the rest of the abdomen strongly shining with weak surface sculpture

Mevesia Holmgren (p. 88)

21 (19) Posterior transverse carina of mesosternum complete or almost complete; frons with no antennal scrobes, coriaceous to the antennal sclerites, sometimes with scattered punctures.

Elongate species with the propodeum a little produced apically; pronotal collar long; gastrocoeli not impressed; ♀ gaster somewhat clavate, coriaceous, with the ovipositor sheaths rather broad and a little exserted....21a

— Posterior transverse carina of mesosternum conspicuously interrupted ventrolaterally; frons with shallow antennal scrobes which are polished or sculptured differently from the rest of the frons.....22

21a (21) Clypeus raised centrally where there is a wide, apical excision (fig. 370); frons weakly convex; thyridiae distinct (fig. 371)..**Paraethecerus** Perkins (p. 97)

— Clypeus convex, impressed subapically to the narrow, shining apical margin: frons intumescent; thyridiae not present but the position discernible by a transverse groove.....**Microp**e Thomson (p. 96)

22 (21) Clypeus, centrally and apically, strongly and deeply punctate or striate and dull in a more or less distinct depression, or when viewed from beneath, with the centre of the inflexed, apical area closely punctate.

Face and clypeus short or strongly convex; flagellum with postannellus in many species shorter than segment 2

Phaeogenes Wesmael in part (p. 99) and **Orotylus** Holmgren (p. 102)

— Clypeus with the apical margin smooth or very rarely coriaceous, but never closely punctate.....23

23 (22) Propodeum conspicuously produced apically, centrally (fig. 297); head strongly, obliquely and straightly narrowed behind the eyes (fig. 299).
An elongate species; face and clypeus rather long and flat (fig. 298); antenna strongly elongate; femora narrow (fig. 296); tergite 2 strongly striate basally; ♀ with the hind coxa having a small tubercle; ♂ with tergite 2 most usually with a pair of fuscous subapical spots
Oronotus Wesmael (p. 87)

— Propodeum only very slightly produced apically, centrally; head at most roundedly narrowed behind the eyes.....24

24 (23) Thyridiae absent, but with a transverse impression, laterally, in the position of these (fig. 282); pronotal collar long (fig. 283) and in the ♂ with the anterior margin not upturned centrally; ♀ with the head somewhat prognathous (fig. 281).....**Eparces** Foerster (p. 96)

— Thyridiae distinct; if the pronotal collar is long in the ♂ then the anterior margin is upturned centrally; ♀ with the head hypognathous.....25

25 (24) Clypeus not separated from the weakly differentiated supraclypeal area, or at most with a vague impression between these (figs. 344, 346); face and clypeus rather long (shortest in *quadriguttatus* (figs. 345, 347)); clypeus sharply impressed apically, the upper face of the impression being almost at right angles to the general plane of the clypeus and having ↳ form in section, though often centrally with the apical downwardly directed margin extremely narrow, and the ridge usually with a small ⋀-shaped excision centrally; antenna long in most species and with the postannellus longer than segment 4 (subequal in *quadriguttatus*).....**Diadromus** Wesmael (p. 90)

— Clypeus separated from the supraclypeal area, which is usually conspicuously differentiated by a sharp groove; face and clypeus conspicuously short, particularly in the ♀, and if the clypeus is inflexed apically, at most with an apical downwardly directed margin towards the lateral angles; antenna short, particularly in the ♀, and some species have the postannellus shorter than segment 4.....**Phaeogenes** Wesmael in part (p. 99)

Genus **Heterischnus** Wesmael

The two groups, *Heterischnus* and *Rhexidermus*, formerly regarded as distinct genera are here treated as subgenera. As a whole, *Heterischnus* as here constituted represents a group totally distinct from anything else in the Phaeogenini. The male of *H. pulex* is not easily separated from the males of *Rhexidermus*, the main character being that the claws have a pecten of distinct teeth towards the base whereas the claws of *Rhexidermus* are setose. I have given few structural characters for separating the species of *Rhexidermus* except the relative length of the malar space. Their colour, however, is in most cases a sufficient guide to the separation of the species.

Key to Subgenera

A Claws with a long, stout pecten towards the base; antenna shorter, in the ♀ with segments 16 or 17 becoming quadrate.
Black with red legs, the apex of posterior tibiae and posterior tarsi more or less infuscate, the hind tibia with a white, basal spot; pronotum of ♂ usually with a yellow or red mark in the hind angle; ♀ with the ovipositor conspicuously upwardly curved (fig. 289). 6·5–7·5 mm. *Rare.* x
subgen. **Heterischnus pulex** (Gravenhorst)

B Claws setose towards the base; antenna conspicuously elongate, and in the ♀ with segments 16 and 17 distinctly elongate.
♀ with the ovipositor straight (fig. 290)....subgen. **Rhexidermus** Foerster

Subgenus **Rhexidermus** Foerster

KEY TO SPECIES

(*Females*)

A Mesoscutum black, scutellum red, pronotum often red dorsally ; malar space equal to the greatest breadth of the mandible basally ; head and pronotum not marked with yellow ; flagellum often with no white stripe ; thorax not, or very inconspicuously, red marked laterally ; gaster usually with tergites 2–4 broadly banded with red centrally ; legs red with the posterior tarsi infuscate and the hind tibia with a paler, basal spot and infuscate apically. 7–9·5 mm. *Not uncommon.* v–vii

nigricollis (Wesmael)

B Mesoscutum red, scutellum often yellow marked apically ; malar space slightly shorter than the greatest breadth of the mandible basally ; frontal orbits yellow marked ; flagellum with a white, central, dorsal stripe ; pronotum, mesopleurum and mesosternum almost completely red, propodeum conspicuously marked with red ; gaster rarely somewhat reddish centrally ; hind tibia dirty white with a white, basal spot and a fuscous band below this, apically deeply infuscate ; anterior coxae and trochanters conspicuously yellow marked ; hind trochanter black and yellow ; except for these markings the legs are for the most part red with the anterior tibiae and tarsi infuscate in part, and the apices of the basal, hind tarsal segments, and the apical segments wholly, infuscate. 8–9 mm. *Not uncommon.* vii–viii ..... **thoracicus** (Gravenhorst)

(*Males*)

A Hind tibia with a conspicuous, white stripe on the outer surface ; pronotum, mesoscutum, mesopleurum and mesosternum at least in large part red ; pronotum with upper margin and anterior margin centrally marked with yellow, scutellum red, yellow apically, subalar prominence usually yellow, sometimes with a yellow mark on the pleurum ; anterior coxae, trochanters and trochantelli ivory ; hind coxa red, usually marked with yellow and black, hind trochanter black basally, ivory apically, hind trochantellus ivory ; face, clypeus and frontal orbits broadly ivory. *c.* 10 mm.

thoracicus (Gravenhorst)

B Hind tibia with only a small, dirty, white, basal spot, more or less infuscate and darker apically ; mesoscutum, mesepimerum, mesosternum and propodeum (except for the extreme apex above the hind coxa), black ; no yellow markings on pronotum or scutellum but the hind angle of pronotum and the scutellum are usually red marked ; coxae and trochanters red, trochanters sometimes pale apically, trochantelli in part pale. 8·5–9·5 mm.

nigricollis (Wesmael)

Genus **Misetus** Wesmael

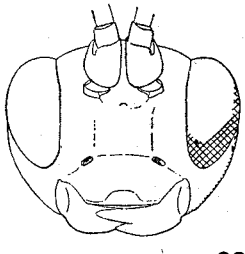
The single species of this genus is easily determined (figs. 266, 270).

♀. With the basal 5 or 6 segments of the antenna red, and the following segments (up to segments 11 or 12) white, the remaining segments black ; orbits, near the antennal sockets usually yellow marked ; scutellum red, yellow apically ; gaster red, with fuscous markings apically ; the legs red, the front coxa infuscate basally ; notaulus distinctly impressed anteriorly ; tergite 1 with punctures and rugae apically, tergite 2 distinctly coriaceous in the basal two-thirds, the following segments shining with at most a weak trace of coriaceous sculpture.

♂. With the antenna black to fuscous, pale beneath ; orbits more conspicuously marked with yellow ; scutellum black sometimes piceous apically ; gaster black with the apex of tergite 1, base and apex of tergites 2 and 3 often red ; legs with the hind coxa black basally ; notaulus deeper than in the ♀ ; the gaster more heavily sculptured with tergites 2 and 3 in part with conspicuous punctures. 6–6·5 mm. *Rare* .... **oculatus** Wesmael

Genus **Hemichneumon** Wesmael

♀. Wings shortened, variable in length but when folded back not reaching the apex of the gaster ; gena buccate and strongly, inwardly curving to the base of the mandible ; mesoscutum sparsely punctate ; hind coxa with a ventral ridge apically ; gaster with tergite 1 rather weakly sculptured, tergite 2 coriaceous and punctate, the sculpture in part tending to form longitudinal rugae, polished at the apical margin ; tergite 3 coriaceous and punctate basally, clearly punctate apically, the remaining segments sparsely punctate ; antenna reddish beneath and with the basal flagellar segments



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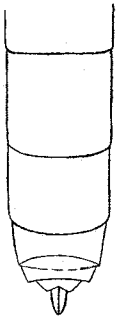

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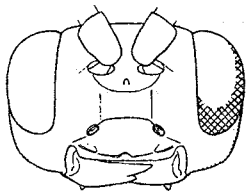

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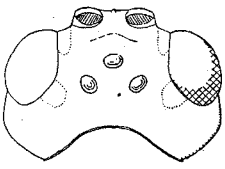

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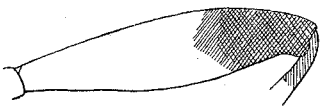

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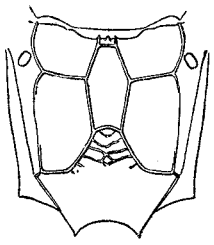

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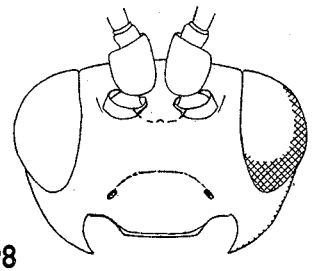

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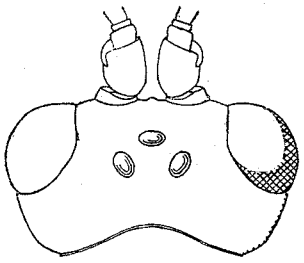

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FIGS. 292–293.—Head, anterior, ♀ : 292, *Oiorhinus pallipalpis ;* 293, *Aethecerus nitidus.*
FIGS. 294–295.—*Notosemus bohemani*, ♀ : 294, apex of gaster, dorsal ; 295, head, dorsal.
FIGS. 296–299.—*Oronotus binotatus*, ♀ : 296, hind femur ; 297, propodeum, dorsal ; 298, head, anterior ; 299, head, dorsal.

red ; legs red with the coxae black in part ; gaster with tergite 1 apically and tergites 2 and 3 in part red. (Fig. 278).

♂. Fully winged ; gena similar to ♀ ; mesoscutum similar to ♀ ; hind coxa with only a weak ridge ; gaster with the sculpture similar to the ♀ but the punctures, particularly of the apical segments, less distinct ; much darker than the ♀ ; the antenna with only the scape pale beneath ; coxae and trochanters black, tarsi infuscate ; gaster with apex of tergite 2 and base of tergite 3 narrowly red. ♀ 6–8·5 mm., ♂ 6–7·5 mm. *Reared from cases of* Taleporia *and* Solenobia..... **elongatus** (Ratzeburg)

Genus **Trachyarus** Thomson

♀. Malar space a little longer than the breadth of the base of the mandible ; pronotum laterally and the mesopleurum in part, rugose ; gaster with tergite 1 coriaceous, tergites 2 and 3 coriaceous with scattered punctures, the following segments shining with ill-defined sculpture basally ; black, tergites 2, 3 and sometimes 4 narrowly yellow apically ; base and apex of femora, tibiae and tarsi in part, somewhat reddish. (Fig. 280).

♂. Malar space a little shorter than the breadth of the base of the mandible ; sculpture similar to that of the ♀ but the pleurum of the thorax is more punctate ; clypeus yellow, at least in greater part ; front legs usually marked with yellow in part. 3–4 mm. *Hosts*, Luffia lapidella (*Goeze*) *and* Narycia monilifera (*Geoffroy*)..... **corvinus** Thomson

Genus **Nematomicrus** Wesmael

The genus is quite readily recognized and is peculiar in having the scrobis frenalis not separated from the propodeum by the basal propodeal groove (fig. 279).

♀. With the frontal orbit marked with yellow ; upper margin of pronotum with a long yellow stripe in the hind angle ; tegula yellow ; anterior coxae and trochanters most usually marked with yellow, rarely entirely black or entirely yellow ; anterior trochantelli yellow ; rest of the anterior legs more or less infuscate with testaceous and yellow markings ; hind coxa and trochanter usually narrowly yellowish apically, trochantellus usually yellow marked, rest of the hind leg infuscate with the tibia and tarsal segments usually pale at the base.

I have seen specimens in which the flagellum is a little thickened with segments 6–8 quadrate. Such specimens are usually larger, being 5–6 mm. long. I have, however, observed no other constant difference between these two forms and thus, at present, I prefer to regard them as belonging to one species. 4–6 mm. *Uncommon*. v–vi..... **tenellus** Wesmael

Genus **Stenodontus** Berthoumieu

♀. Malar space a little shorter than the breadth of the base of the mandible ; clypeus large and rounded apically ; basal segments of flagellum very short, subquadrate ; mesoscutum rather coarsely and sparsely punctate ; propodeum with the area superomedia conspicuously elongate ; gaster with sparse, shallow and ill-defined punctures ; frontal orbit yellow, orbit of temple yellowish to red ; pronotum with the collar centrally and the hind angle marked with yellow ; subalar prominence marked with yellow ; scutellum with lateral yellow stripes or spots ; gaster with tergites 2 and 3 only narrowly yellowish banded apically ; legs red, hind coxa sometimes infuscate ; tarsi in part more or less infuscate (fig. 269).

♂. Malar space much shorter than in ♀ ; flagellum with segment 2 having length about 1·4 times the breadth ; sculpture similar to the ♀ ; area superomedia a little longer than apically broad ; colour similar to that of the ♀ but with the facial orbit and sometimes the genal orbit also yellow ; anterior coxae black and yellow ; trochanters usually infuscate ; hind coxa most usually largely fuscous to black. *c.* 6 mm. *Uncommon*

marginellus (Gravenhorst)

Genus **Eriplatys** Foerster

A black species with the punctures on tergites 2 and 3 coarse and clearly defined in both sexes ; legs of the ♀ in part reddish ; in the ♂ with the face, clypeus, malar space in part, and mandible yellow, the hind angle of pronotum and the subalar prominence in part yellow ; the front and middle legs with the coxae, trochanters and trochantelli pale yellow, femora and tibiae pale red and tarsi infuscate, the front coxa sometimes fuscous marked ; hind leg with the coxa infuscate above, reddish beneath, the rest of the leg reddish, in large part infuscate. (Fig. 275). 3·5–4 mm. *Uncommon*

ardeicollis (Wesmael)

Genus **Herpestomus** Wesmael

The species included in this genus may be divided into three very distinct groups of which the characters are given in the key. In fact, I have found it advisable to take off *arridens* and *brunnicornis* each as separate entities in the key to the genera. The remaining two species are very closely related. The key is to both males and females. I have included *Eriplatys* in the key as without experience of this genus it might be confused with *Herpestomus*.

Key to Species

1 Genal carina strongly inflexed and meeting the strongly raised hypostomal carina well behind the base of the mandible (fig. 285) ; postpetiole sparsely punctate or almost smooth in the ♀, usually punctate-striate in the ♂.

Of the general facies of a *Phaeogenes*, but with vein Cu_1 of the hind wing strongly antefurcal (fig. 291). (*cf.* generic key for colour description.) ♀ 5–6·5 mm., ♂ *c.* 5·5 mm. *Rather rare*.....**arridens** (Gravenhorst)

– Genal carina meeting the hypostomal carina at the base of the mandible (fig. 284) ; postpetiole strongly, closely punctate in ♀ and ♂.....2

2 (1) Notauli deeply impressed on anterior third of the mesoscutum (fig. 287) ; ♂ with the face entirely yellow and the mesoscutum convex though somewhat elongate ; ♀ with the hind coxa with a small subapical tubercle (fig. 288), the area on and before this closely and finely punctate.

♀. Face most usually with a pair of yellow spots just below and between the lower margin of the antennal sockets ; apex of malar space often narrowly yellow or reddish ; clypeus and supraclypeal area often reddish ; flagellum in large part reddish ; hind angle of pronotum often yellow or red ; subalar prominence (usually) and the tegula yellow ; anterior legs red with the coxae and trochanters usually pale yellow marked and the tibiae and tarsi more or less marked with fuscous, hind legs red with trochanters more or less yellow marked, the apex of the femur infuscate, tibia white or whitish at base, reddish centrally and infuscate apically, tarsus infuscate with the base of the segments more or less whitish.

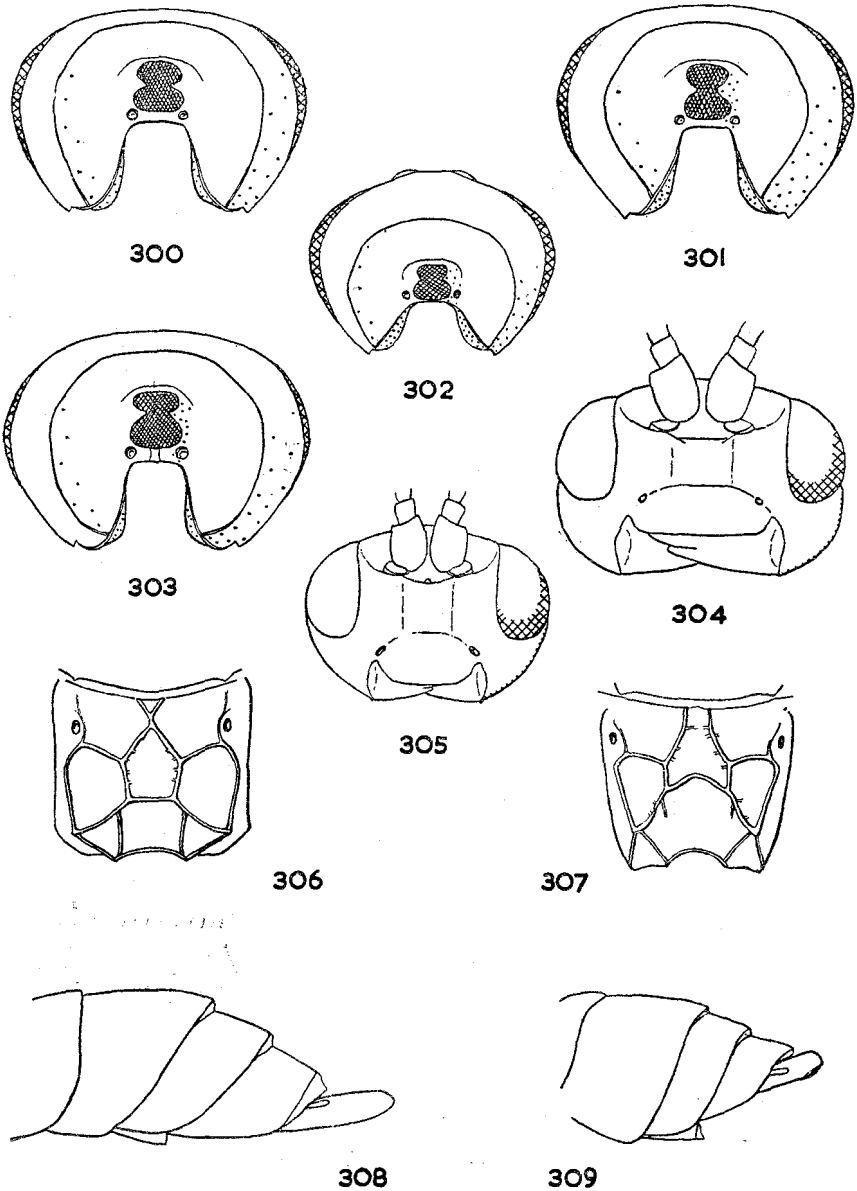
♂. Similar to ♀ in colour but with the face entirely yellow, scape and flagellum yellow beneath ; anterior margin of pronotum often yellow marked centrally ; coxae and trochanters more extensively (anterior usually entirely) pale yellow ; tergites 2–4 narrowly pale yellow apically. ♀ 5·5–7 mm., ♂ 5–7 mm. *A common parasite of* Yponomeuta

brunnicornis (Gravenhorst)

– Notauli very shallow except near the anterior margin of the mesoscutum (fig. 286) ; ♂ either with a subquadrate, yellow spot on the face, or, if entirely yellow then the mesoscutum is conspicuously flattened ; ♀ with no tubercle on the hind coxa.....3

3 (2) Mesoscutum conspicuously flattened (figs. 275–6) ; propodeum flat dorsally and more elongate ; tergite 1 shorter ; face more strongly inclined ; tergites 2 and 3 polished between the punctures ; ♂ with the face entirely yellow ; ♀ usually with a spot beneath and another beside each antennal socket...4

– Mesoscutum more convex (fig. 277) ; propodeum more rounded dorsally, and shorter ; tergite 1 a little more elongate ; tergites 2 and 3 with conspicuous microsculpture between the punctures ; ♂ with the face with a yellow, central spot, ♀ usually only with a spot beneath each antennal socket.



FIGS. 300–303.—*Dicaelotus*, ♀ head, posterior : 300, *morosus* ; 301, *rufoniger* ; 302, *pudibundus* ; 303, *pumilus*.
FIGS. 304–305.—*Dicaelotus*, ♀ head, anterior : 304, *pictus* ; 305, *pudibundus*.
FIGS. 306–307.—*Dicaelotus*, ♀ propodeum, dorsal : 306, *pictus* ; 307, *pudibundus*.
FIGS. 308–309.—*Dicaelotus*, ♀ apex of gaster, lateral : 308, *ruficoxatus* ; 309, *pumilus*.

Scape in large part red in the ♀, yellow beneath in the ♂; usually with the anterior margin of the pronotum centrally, hind angle of pronotum, subalar prominence, yellow (and the anterior coxae and trochanters yellow in the ♂); hind coxa usually red in the ♀, infuscate in the ♂; gaster usually more or less marked with red. 3·5–5·5 mm. *Not uncommon*..... **nasutus** Wesmael

4 (3) Area superomedia (though ill-defined) conspicuously further from the base of the propodeum than the length of the central area of metanotum; a more elongate species, but with tergite 1 very short and strongly intumescent centrally, particularly in the ♀ (fig. 275); anterior margin of the pronotum usually marked with yellow; ♂ with the anterior coxae entirely yellow and the hind angle of the pronotum with a yellow spot or line. (A single ♀ from Inverness has the area superomedia a little shorter and broader than in other examples examined.) 3·5–4 mm. *Uncommon*
Eriplatys ardeicollis (Wesmael)

– Area superomedia (well defined in the ♀, often ill defined in the ♂) about as far from the base of the propodeum as the length of the central area of the metanotum; a more robust species, particularly in the ♀ and with tergite 1 a little longer and in the ♀ not intumescent centrally (fig. 276), in the ♂ somewhat intumescent; ♂ with the anterior coxae black basally; ♀ with the central tergites often more or less reddish marked, particularly apically. 4–5 mm. *Rare*..... **wesmaeli** Perkins

Genus **Dicaelotus** Wesmael

I have included *Deloglyptus* with this genus, the differences between these two genera being rather weak; if this division is made, then certain other species groups should be divided off as new genera.

D. orbitalis, *pudibundus*, *pictus*, *punctiventris*, *parvulus* and *ruficoxatus* should cause no difficulty in identification, but the remaining eight species are very difficult to separate and it is doubtful whether this can be achieved unless considerable material is available for study. It is quite probable, too, that further species will be found in this genus.

I have been unable to key the males, and in fact I have seen few males, but by judicious use of the key to the females and making due allowance for the normal sexual differences found in the Ichneumoninae, it should be possible to determine at least some of the more conspicuous species. In the *pumilus* group, however, the problem of the association of the males is very difficult.

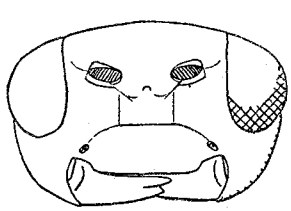
Key to Species

(*Females*)

1 Frontal orbits conspicuously marked with yellow.
Ovipositor distinctly exserted; antenna most usually in large part red or reddish.....2

– Frontal orbits with no pale marks.
Lower tooth of mandible strong; area superomedia rather broad and very strongly narrowed anteriorly.....5

2 (1) Genal carina strongly rounded apically and meeting the hypostomal carina well behind the base of the mandible, the gena thus distinctly inflexed behind the base of the mandible (*cf.* fig. 303, *pumilus*); lower tooth of mandible conspicuous and less far removed from the apex of the upper tooth (*cf.* fig. 338, *pumilus*); gena shining and more coarsely and less closely punctate; malar space about two-thirds the breadth of the base of the mandible; postpetiole more or less striate; tergites 2 and 3 more remotely punctate; gaster red with the petiole and tergites 5–7 black; legs red, the hind trochanter, the apex of the hind femur, and the apical hind tarsal segment usually more or less infuscate; extreme hind angle of pronotum and subalar prominence usually marked with yellow. 4–6 mm. *Rare*.
orbitalis Thomson



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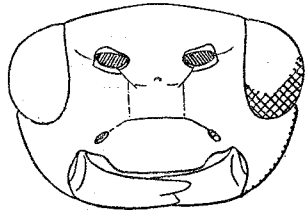

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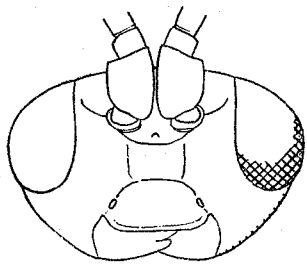

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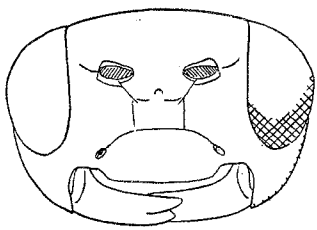

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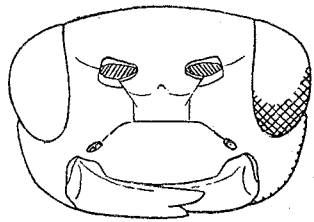

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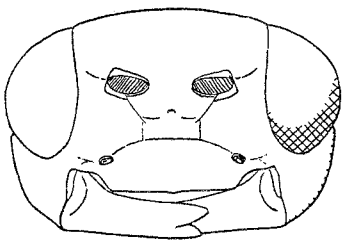

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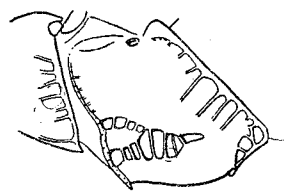

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FIGS. 310–315.—*Dicaelotus*, ♀ head, anterior : 310, *cameroni* ; 311, *rufoniger* ; 312, *parvulus* ; 313, *pumilus* ; 314, *erythrostomus* ; 315, *fitchi*.

FIG. 316.–*Dicaelotus suspectus*, ♀ : mesopleurum.

– Genal carina at most weakly rounded and meeting the hypostomal carina close to the base of the mandible (fig. 302), the gena very narrowly inflexed behind the base of the mandible; lower tooth of mandible small and far removed from the apex of the upper tooth (fig. 340); gena more closely and finely punctate; postpetiole and tergites 2–3 closely punctate; gaster either black, or entirely red except for the petiole.....3

3 (2) Malar space (fig. 304) about two-thirds as long as the breadth of base of mandible; gaster black; dentiparal prominences very weak; thorax somewhat dorsoventrally flattened; area superomedia pentagonal, strongly elongate (fig. 306).....(section **Deloglyptus** Foerster) 4

– Malar space about as long as the breadth of base of mandible (fig. 305); gaster entirely red; dentiparal prominences subacute, though small; thorax with the dorsal surface more rounded; area superomedia rather elongate, strongly narrowed anteriorly where it fuses into the area basalis (fig. 307).

Face red; pronotum with the anterior margin marked with red and usually with a pair of yellow, central spots; hind angle with a yellow mark which may extend considerably anteriorly; subalar prominence with a yellow spot; scutellum yellow laterally; legs red with the coxae and sometimes the trochanters more or less infuscate. 4–5 mm. *Rare.*
pudibundus (Wesmael)

4 (3) Face red; pronotum with the anterior margin in considerable part red, with a pair of yellow, central spots, hind angle with a yellow mark, and with a yellow mark on each side anteriorly; scutellum yellow laterally; subalar prominence with a yellow spot; legs red with the hind coxa in part infuscate and the hind tibia with a white, basal spot; mesoscutum polished between the punctures (face, fig. 304). 6–7 mm. *Rare*....**pictus** (Schmiedeknecht)

– Face at most weakly castaneous on the supraclypeal area; thorax unmarked with yellow; legs in large part black or infuscate, the hind tibia with no white, basal spot; mesoscutum coriaceous between the punctures and duller. 4–5 mm. *Rare*.....**punctiventris** (Thomson)

5 (1) Malar space (fig. 312) a little longer than the breadth of base of mandible; mandible strongly narrowing apically (fig. 339); a small robust species with the gaster ovate; postannellus longer than segment 2 of flagellum (fig. 328).

Antenna sometimes reddish beneath; legs red, the coxae and trochanters black (often, for the most part, red in continental examples, which also usually have the rest of the legs more extensively red); front femur sometimes infuscate basally beneath, middle femur often infuscate apically, hind femur conspicuously infuscate apically, middle tibia usually infuscate apically, hind tibia infuscate at base and apex, at least the posterior tarsi infuscate; apex of postpetiole most usually red, tergites 2 and 3 red often with a conspicuous, central, infuscate or black spot; ovipositor distinctly exserted. 3·5–4·5 mm. *Infrequent*.....**parvulus** (Gravenhorst)

– Malar space at most two-thirds as long as the breadth of base of mandible; mandible less strongly narrowed (fig. 338); a more elongate species with the abdomen, centrally, more or less parallel-sided; postannellus shorter than segment 2 of flagellum.....6

6 (5) Flagellum thinner, segment 2 about twice as long as broad (fig. 330); tergites 2 and 3 more evenly and closely punctate from the base to the narrow, smooth, apical margin; ovipositor distinctly exserted (fig. 308).

Antenna usually red or reddish beneath; malar space about half as long as the breadth of base of mandible; pronotum with a central, anterior, red spot; propodeum sometimes marked with red apically; legs red with the trochanters and femora black or marked with black, hind coxa often infuscate dorsally, anterior tibiae and tarsi usually marked with fuscous, hind tibia usually infuscate apically, rarely entirely infuscate, hind tarsus infuscate; postpetiole strongly striate; tergites 1–3, and usually base of 4, red; 5–6 mm. *Not uncommon*.....**ruficoxatus** (Gravenhorst)

– Flagellum more robust, segment 2 at most one and a half times as long as broad (fig. 329); tergites 2 and 3 less closely punctate, tergite 3 at least becoming sparsely punctate in the apical quarter; ovipositor only very little exserted (fig. 309).....7

7 (6) Malar space (fig. 315) very short, about one third the breadth of base of mandible.

Genal carina not inwardly curved before it meets the hypostomal carina 8

– Malar space half to two thirds as long as the breadth of base of mandible (figs. 310–11, 313–4) 9

8 (7) Tibiae red, becoming gradually paler towards the base, sometimes somewhat infuscate apically.

Scape often broadly red beneath or at least marked with red ; flagellum red beneath ; legs red, the hind coxa and trochanter often in part infuscate, sometimes the whole leg infuscate ; postpetiole red apically, tergites 2 and 3 red with a pair of fuscous spots centrally, varying to black with only the apical margin pale ; postpetiole rather broad and evenly punctate laterally, more or less smooth centrally and rather flat. 6–7 mm. *Rare*

fitchi Perkins

– Tibiae infuscate with an ivory, basal spot ..... **fitchi** ab.

9 (7) Scape entirely red ; legs entirely red with the hind tarsus more or less infuscate.

Frons closely, deeply punctate ; postpetiole rather broad, rather evenly punctate laterally, more or less smooth centrally ; tergites 2 and 3 red, broadly black centrally and apically (in continental specimens described as having tergite 2 red).

Very similar to *fitchi* ; malar space (fig. 314) half as long as the breadth of base of mandible. *c.* 6 mm. *Rare* ..... **erythrostomus** Wesmael

– Scape usually black or at least broadly black dorsally ; legs at least with the hind coxa infuscate 10

10 (9) Mesopleurum with an oblique, crenulate furrow joining the crenulate sternaulus anteriorly (fig. 316) ; mesosternum with an almost complete and strong posterior transverse carina which is only extremely narrowly interrupted on each side at the angle with the mesopleurum ; scape broadly testaceous beneath.

Frons sparsely punctate ; malar space about 0·6 times as long as the breadth of base of mandible ; genal carina strongly incurved before meeting the hypostomal carina ; front leg testaceous, middle leg testaceous with the femur sometimes obscurely infuscate behind, hind leg with the coxa infuscate, femur infuscate apically, tibia a little sordid and weakly infuscate apically, tarsus infuscate ; postpetiole not broad and more or less striate laterally. 3·5–4·5 mm. *Rare* ..... **suspectus** Perkins

— No oblique, crenulate furrow on the mesopleurum, the sternaulus only present ; mesosternum with a conspicuous break laterad in the posterior transverse carina, and here quite closely punctate (except in very small specimens) ; scape at most obscurely reddish beneath 11

11 (10) Malar space (figs. 310–11) about two-thirds as long as the breadth of base of mandible ; front and middle femora entirely red 12

— Malar space (fig. 313) half as long as the breadth of base of mandible ; front and middle femora at least in part infuscate 13

12 (11) Pronotum centrally with a conspicuous, yellow mark ; genal carina very straight as in *morosus* (*cf.* fig. 300) ; abdomen piceous to black with the apices of the tergites yellow ; legs red with the hind coxa, hind trochanter in part and apical hind tarsal segments infuscate ; postpetiole with clear punctures.

Clypeus in large part yellow ; flagellum reddish apically. *c.* 5 mm. *Norfolk*, 1 ♀, 18.viii.1880, Type[10] (Bridgman Coll.) ..... **cameroni** Bridgman

— Pronotum entirely black centrally ; genal carina (fig. 301) slightly incurved ventrad ; tergite 1 black except for the extreme apex, rest of abdomen red, varying to the segments largely infuscate centrally or becoming black except for their apical margins ; leg colour similar to *cameroni* but with the hind femur most usually infuscate apically ; postpetiole most usually striate-punctate. 5–6 mm. *Uncommon* ..... **rufoniger** Berthoumieu

13 (11) Genal carina only very feebly arcuate and meeting the hypostomal carina nearer to the base of the mandible (fig. 300) 14

— Genal carina strongly arcuate before meeting the hypostomal carina considerably behind the base of the mandible (fig. 303).

[10] I have also seen a single ♀ of this species from Germany, Ruthe Coll.

Base of flagellum (fig. 329); postpetiole rather narrow and conspicuously raised just in front of the line of the spiracles, and conspicuously striate-punctate; abdomen black with only the apices of the segments pale, and the apical segments reddish laterally. 5-6 mm. *Abundant*
pumilus (Gravenhorst)

14 (13) Postannellus subequal to flagellum 2 (fig. 327); abdomen black or piceous with only the apices of the central tergites narrowly yellow.
Frons evenly and deeply punctured; tergite 2 most usually deeply and more closely punctured; collar of pronotum entirely black. 4-5 mm. *Frequent* ..... **morosus** Wesmael

— Postannellus distinctly shorter than flagellum 2 (fig. 326); abdomen marked with red at least at the base of tergite 2.
Frons rather sparsely punctate; tergite 2 very sparsely and shallowly punctate even in large specimens; collar of pronotum most usually marked with testaceous or yellow centrally.
Very similar to *cameroni* but with the malar space shorter, and the post-annellus very short. *c.* 6 mm. *Rare* ..... **inflexus** Thomson

Genus **Epitomus** Foerster

The two British species of this genus have, for the greater part, coriaceous sculpture which, particularly on the pleurum of the thorax and on the post-petiole, may run towards longitudinal striation. The two species are similarly coloured, having the following yellow markings (though these are usually less developed in *proximus* than in *parvus*, and in both species may be considerably reduced): ♀—anterior coxae, trochanters and trochantelli, anterior margin of pronotum centrally and laterally, hind angle of pronotum, subalar prominence, apex of hind coxa; ♂—with these markings more extensive and with the face and clypeus (at least apically) yellow, and the scape yellow beneath; ♂♀—with the central tergites of the abdomen usually red (or yellowish) marked.

A Genal sulcus strongly impressed, the gena, behind, almost devoid of micro-sculpture; femora most usually marked with fuscous; hind tibia fuscous becoming paler from apex to base, ♂ usually with a sub-basal whitish spot; ♂ with frontal orbit black. 2·25-4 mm. *Not uncommon* .. **parvus** Thomson

B Genal sulcus rather weakly impressed, the gena, behind, conspicuously coriaceous, though somewhat shining; femora frequently red; hind tibia fuscous becoming paler from apex to base, ♂ with no white sub-basal spot; ♂ with the frontal orbit most usually marked with yellow ventrad. 2·5-4 mm. *Less common* ..... **proximus** Perkins

Genus **Oronotus** Wesmael

Head and thorax coarsely punctate; gaster finely coriaceous with fine, scattered punctures; tergite 2 with the area before, behind and between the very large thyridiae with longitudinal striations. (Figs. 296–9).

♀. Antenna basally red, beyond this black with a white ring on segments 9–12 (sometimes reduced to segments 10–11); gaster red with tergite 5 black, red laterally and the following segments black; legs red, front and middle legs basally very pale, hind femur broadly black apically, hind tibia black basally and apically, the apical tarsal segments of all legs black.

♂. Antenna red, infuscate apically; gaster similar to ♀ but with a pair of fuscous spots on tergite 2; colour of legs similar to the ♀ but with the tarsi a little more infuscate. 7·5-9 mm. *Not uncommon.*
binotatus (Gravenhorst)

Genus **Notosemus** Foerster

♀. Clypeus large with the apical margin broadly inflexed centrally; antenna incrassate apically; gaster with tergites 2, 3 and 4 coriaceous, with

the smooth apical area becoming progressively broader with each segment ; face marked with red ; frontal orbit, occipital spot and a genal orbital spot yellow or yellowish ; pronotum with a yellow spot in hind angle, before this with a reddish area ; mesoscutum red ; mesopleurum and sternum and metapleurum in large part red ; subalar prominence marked with yellow ; scutellum red, yellow apically, central area of metanotum yellow ; legs red, front and middle coxae, trochanters, trochantelli, tibiae and tarsi very pale, the apical tarsal segments infuscate ; hind trochanter and trochantellus very pale, the rather swollen tibia pale, somewhat infuscate basally and apically, the tarsal segments infuscate especially apically. (Figs. 294–5).

♂. Clypeus similar to ♀ ; gaster with shallow punctures as well as less defined microsculpture ; face, clypeus, malar space and genae yellow, frontal orbit and orbital spot on the vertex yellow ; hind angle of pronotum yellow, the collar sometimes more or less marked with yellow ; subalar prominence yellow, mesopleurum sometimes red-marked, scutellum except at base, and central area of metanotum yellow ; legs very pale red-yellow, tarsi more or less infuscate apically (of hind legs infuscate), the unswollen hind tibia somewhat infuscate basally and apically. 5–6 mm. *Rare*

bohemani (Wesmael)

Genus **Mevesia** Holmgren

I include in this genus two British species which are not at all closely related.

Key to Species

A Clypeus inflexed apically before the conspicuous, flattened apical margin (fig. 320) ; notaulus distinctly impressed to about a quarter ; frons distinctly intumescent ; petiolar area of propodeum strongly excavate (fig. 321) ; gena evenly punctate, the punctures becoming a little finer below ; gaster very weakly sculptured except at the base of tergite 2 (tergite 1 may sometimes be distinctly striate), the large, sparse punctures very shallow and very difficult to see, or absent.

Face often marked with red or yellow ; posterior angle of pronotum and subalar prominence usually marked with yellow ; scutellum sometimes marked with red ; gaster usually red with the petiole black and the middle segments most usually infuscate centrally. 3–4·5 mm. *Not uncommon*

arguta (Wesmael)

B Clypeus inflexed apically but with no flattened apical margin (fig. 319) ; notaulus very short ; frons very weakly intumescent ; petiolar area only moderately excavate ; gena quite, or almost, impunctate below, posteriorly ; gaster with more distinct sculpture, though strongly shining, the large, sparse punctures distinct.

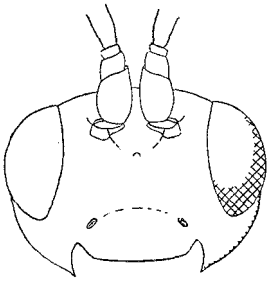
Black, the apex of clypeus and flagellum reddish ; gaster with tergites 2–4 red, marked with fuscous ; legs red, the coxae, trochanters, hind femora and apical tarsal segments marked with fuscous. *c.* 5 mm. *Rare.*

guttata Perkins

Genus **Thyraeella** Holmgren

This genus is here kept distinct from *Diadromus* on account of the form of the genal carina and the clypeus ; but with the study of further world material, this position may prove untenable (figs. 317–8, 324).

♀. Face, gena and frons with coarse punctures and in part coriaceous ; clypeus polished except for the punctate base and the dull, inflexed, apical margin ; mesoscutum with rather coarse punctures and in part coriaceous ; mesepisternum with the punctures coarse ; propodeum (fig. 324) ; gaster with the postpetiole somewhat striate, tergites 2–3 coriaceous with scattered, indistinct punctures, the following segments with the sculpture becoming progressively much weaker ; flagellum red, infuscate apically ; thorax red, sternum, metanotum and propodeum black ; gaster with tergites 2–4 red ;



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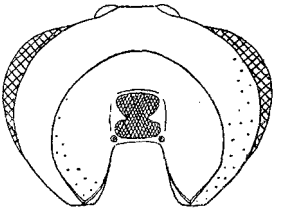

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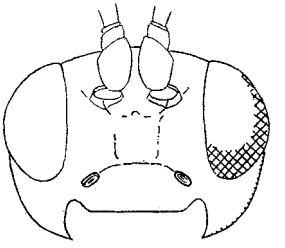

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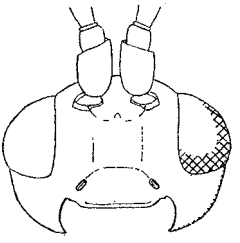

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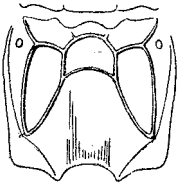

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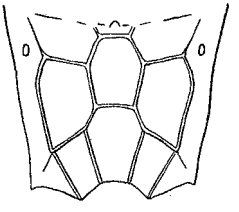

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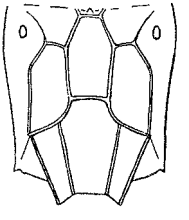

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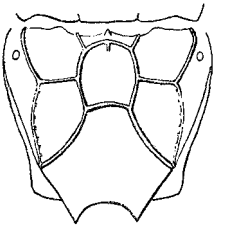

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FIGS. 317–318.—*Thyraeella collaris*, ♀ head : 317, anterior ; 318, posterior.

FIGS. 319–320.—*Mevesia*, ♀ head, anterior : 319, *guttata* ; 320, *arguta*.

FIG. 321.—*Mevesia arguta*, ♀ : propodeum, dorsal.

FIG. 322.—*Aethecerus placidus*, ♀ : area superomedia.

FIGS. 323–325.—Propodeum, dorsal, ♀ : 323, *Aethecerus nitidus* ; 324, *Thyraeella collaris* ; 325, *Aethecerus longulus*.

legs red with the apical tarsal segment infuscate, hind femur apically, hind tibia basally and apically infuscate ; variations occur from the above normal coloration to the insect becoming almost entirely black.

♂. Very rare, similarly coloured to the ♀ but much more extensively marked with fuscous or black than in the normal form of the ♀. 5–6 mm. *A regular and common parasite of* Plutella maculipennis (*Curtis*)

collaris (Gravenhorst)

Genus **Diadromus** Wesmael

Diadromus has usually been recognized by the longer and, in the lateral view, evenly curved face and clypeus, but this is very difficult to appreciate without direct comparison of specimens ; moreover certain groups of *Phaeogenes* approach this closely, and *Orotylus mitis* (fig. 372) is intermediate between these two genera. I believe that the form of the apex of the clypeus is a better guide to the recognition of the genus. I have retained *Thyraeella* as a distinct genus on the form of the genal carina, but this may later be found untenable ; *D. subtilicornis* is the British species which in general characters seems to be nearest to *Thyraeella*. *D. quadriguttatus*, with its much shorter face, is the most *Phaeogenes*-like species that is placed in *Diadromus* but it should be distinguishable on the form of the clypeus.

Key to Species

(*Females*)

1 Gaster red with only tergite 1 black, rarely with the central segments somewhat infuscate.

Length of malar space : breadth of base of mandible about 0·8 : 1 (face, fig. 346) ; flagellum rather stout, usually reddish and usually with two or three central segments white marked above ; scutellum usually with a pair of yellow, subapical spots ; legs rather stout ; anterior legs red, often with the coxae, the front femur narrowly, and the mid femur broadly, infuscate ; hind coxa and femur in greater part fuscous, hind tibia and tarsus weakly infuscate ; face and malar space shining except for the line of the genal sulcus, moderately closely punctate. 5·5–7 mm. *Frequent*

troglodytes (Gravenhorst)

– Abdomen with at least tergites 5–7 black 2

2 (1) Malar space long, its length : breadth of base of mandible about 0·9 : 1 (face, fig. 342) ; hind coxa with a short keel ; face and malar space coriaceous with sparse punctures.

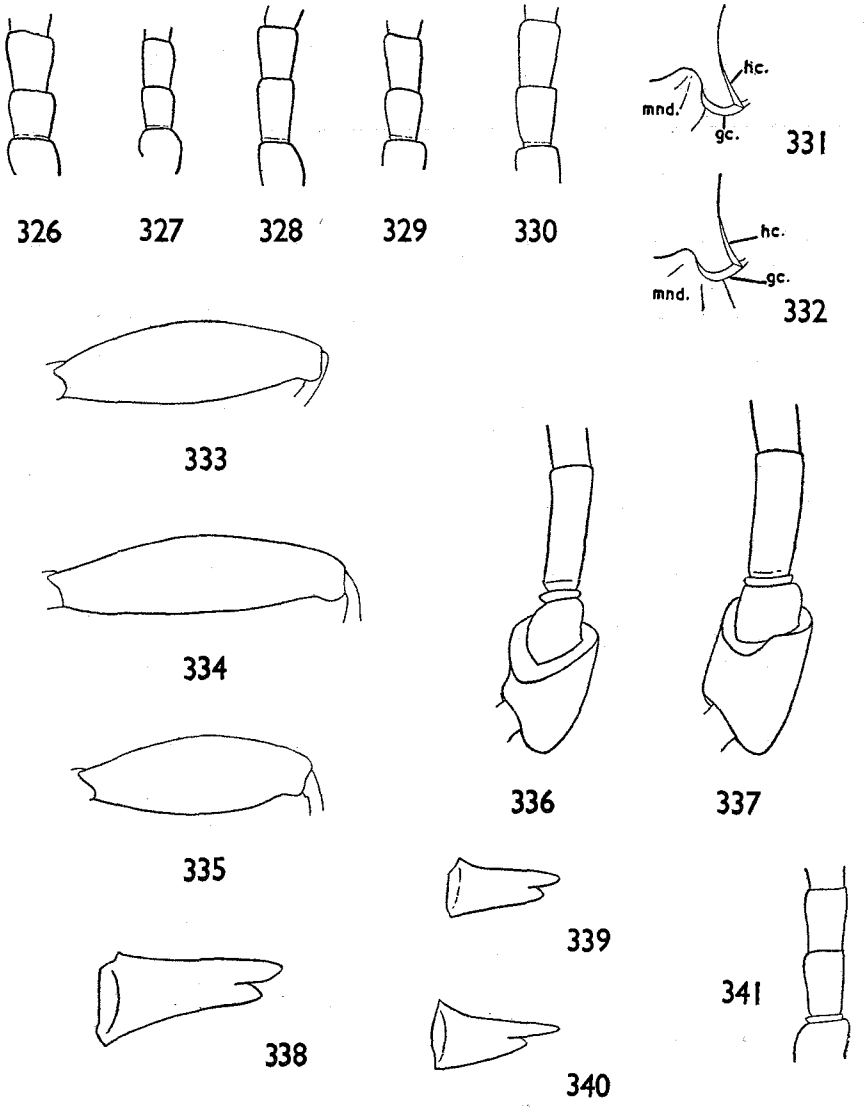
Flagellum at most with a weak, white, central mark ; legs red with at least the base of the hind coxa, apex of hind femur, base and apex of hind tibia, and hind tarsus, infuscate ; tergites 2 and 3 usually red ; flagellum thin and moderately long. 5–6 mm. *Rare*.... **subtilicornis** (Gravenhorst)

– Malar space shorter, its length : breadth of base of mandible at most 0·7 : 1 (*cf.* figs. 347, 350) ; hind coxa with no keel ; face and malar space shining (except for the line of the genal sulcus), closely punctate (except in *quadriguttatus*) 3

3 (2) Flagellum with the segments short (fig. 341), segments 8–15 quadrate or transverse ; legs stouter (fig. 335) and the tarsal segments shorter ; gaster rather narrow and only very weakly coriaceous between the moderately sparse, deep punctures and strongly shining, black with only the apices of the segments red ; head, viewed from above, more quadrate with the temples subparallel behind the eyes ; flagellum reddish usually with about three central segments white marked above ; ovipositor sheaths, viewed laterally, rather thick.

Legs red, often with the coxae and trochanters black or marked with black. *c.* 6 mm. *Uncommon*..... **quadriguttatus** (Gravenhorst)

– Flagellum conspicuously elongate (figs. 336–7), segments 8–15 conspicuously longer than broad, usually tricoloured ; legs rather elongate (figs. 333–4) ; gaster more robust, strongly coriaceous and with tergites 2–3



FIGS. 326–330.—*Dicaelotus*, ♀, basal segments of flagellum : 326, *inflexus* ; 327, *morosus* ; 328, *parvulus* ; 329, *pumilus* ; 330, *ruficoxatus*.

FIGS. 331–332.—*Diadromus*, ♀, junction of genal carina (*hc*) and hypostomal carina (*gc*) and base of mandible (*mnd*), viewed posteriorly : 331, *tenax* ; 332, *varicolor*.

FIGS. 333–335.—*Diadromus*, ♀ hind femur : 333, *albinotatus* ; 334, *varicolor* ; 335, *quadriguttatus*.

FIGS. 336–337.—*Diadromus*, ♀ basal antennal segments : 336, *tenax* ; 337, *varicolor*.

FIGS. 338–340.—*Dicaelotus*, ♀ mandible : 338, *pumilus* ; 339, *parvulus* ; 340, *pudibundus*.

FIG. 341.—*Diadromus quadriguttatus*, ♀ : base of flagellum.

or 4 dull, moderately sparsely, or sparsely, punctate ; tergite 1 apically, and tergites 2–4 or 5, red ; head, viewed dorsally, more transverse, the temples at least a little converging behind the eyes; flagellum usually with a conspicuous, white, central, dorsal mark ; ovipositor sheaths, viewed laterally, conspicuously narrower 4

4 (3) Scape, beneath and apically, strongly and rather broadly outwardly expanded as in *Aethecerus* (fig. 336) ; pedicel more roundly intumescent dorsally ; space between the genal carina and base of the mandible very narrow (fig. 331) ; tergite 5 sometimes red.

Legs red with the anterior coxae in part, the hind coxa and all the trochanters (at least in greater part), black ; hind femur somewhat infuscate apically, hind tibia and tarsus usually more or less infuscate. 6–7 mm. *Rare* ..... **tenax** Wesmael

– Scape, beneath, with at most the apical margin very narrowly and weakly out-turned (fig. 337) ; pedicel at most very weakly intumescent dorsally ; distance between the genal carina and base of mandible broader (fig. 332) ; tergite 5 at most red at base and apex 5

5 (4) Hind angle of pronotum black or at most very narrowly marked with testaceous ; coxae in greater part red ; hind femur narrower (fig. 334) ; face entirely black ; flagellum usually clear testaceous basally.

Tergites 2 and 3 with the shallow punctures difficult to differentiate from the dull and deep coriaceous sculpture ; gena with close, deep punctures ; legs red, the hind femur infuscate apically (often broadly), hind tibia infuscate basally and apically, hind tarsus infuscate. 6–7 mm. *Not uncommon* ..... **varicolor** Wesmael

– Hind angle of pronotum conspicuously ivory marked ; hind coxa for the most part black ; hind femur distinctly thickened (fig. 333) ; face often with a testaceous spot between antennal sockets and eye ; flagellum more infuscate basally 6

6 (5) Tergites 2 and 3 with clear, deep though somewhat sparse punctures and not so heavily coriaceous ; gena with rather shallow and sparser punctures ; epicnemial carina high and weakly bowed between the front coxae (*cf.* fig. 349).

Colour as in *varicolor* but with the coxae and trochanters black, the anterior femora marked with fuscous and the hind femur almost entirely infuscate. *c.* 7 mm. *Rare* ..... **albinotatus** (Gravenhorst)

– Tergites 2 and 3 coriaceous with the shallow punctures (which are mostly in a central, longitudinal band) difficult to differentiate ; gena with close, deep punctures ; epicnemial carina narrower and straight centrally and the mesopleurum much more closely punctate.

Colour, other than in the points already given, similar to *varicolor*, but with the subalar prominence also conspicuously marked with ivory. *c.* 7 mm. *Rare* ..... **candidatus** (Gravenhorst)

(*Males*)

1 Malar space subequal to the breadth of base of mandible.

Face entirely black, gena weakly coriaceous between the sparse punctures. 5–6 mm. ..... **subtilicornis** (Gravenhorst)

– Malar space conspicuously shorter than the breadth of base of mandible 2

2 (1) Face with at least the orbits broadly pale yellow ; scutellum most usually with a pale yellow, subapical spot ; anterior coxae and trochanters ivory.

Front margin, centrally, and the hind angle of pronotum, and the subalar prominence, ivory marked 3

– Face and scutellum entirely black ; anterior coxae and trochanters red or black 6

3 (2) Face (except rarely for a short narrow, fuscous mark beneath the interantennal tubercle) and clypeus (at least basally) yellow.

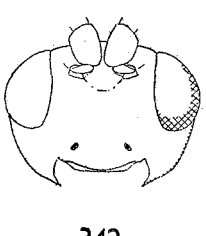
Malar space subequal to half the breadth of the base of mandible 4

– Face yellow laterally, sometimes with the markings joining dorsad ; clypeus black 5

4 (3) Epicnemial carina rather high and outwardly bowed between the front coxae (fig. 349) ; lower tooth of mandible very small (fig. 348) ; tergites 2, 3 and 4 broadly black centrally ; gena with the rather shallow punctures for the

most part further from each other than their diameter ; tergites 2 and 3 coarsely and closely, deeply punctate with weak sculpture between the punctures ; hind femur a little more strongly thickened. *c.* 7 mm.
albinotatus (Gravenhorst)

– Epicnemial carina narrow and straight centrally ; lower tooth of mandible longer ; tergites 2, 3 and 4 fuscous with the thyridiae (of 2) and hind margins pale ; gena with deep punctures which for the most part are as close or closer to each other than their diameter ; tergites 2 and 3 coriaceous with rather sparse, clearly defined punctures ; hind femur a little less thickened. *c.* 7 mm..... **candidatus** (Gravenhorst)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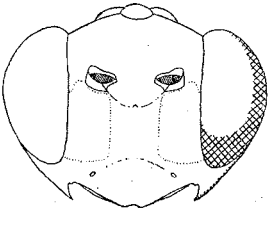
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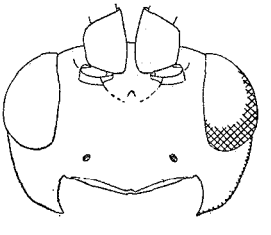
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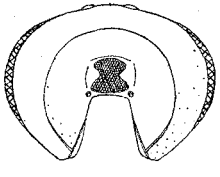
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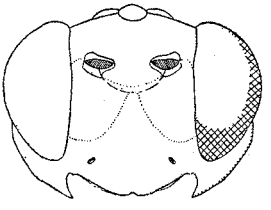
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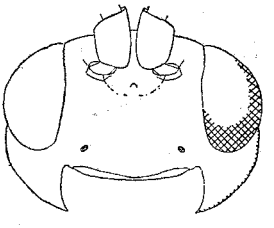
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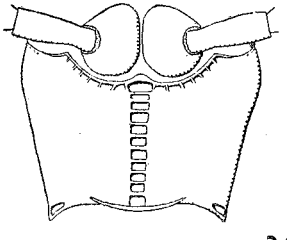
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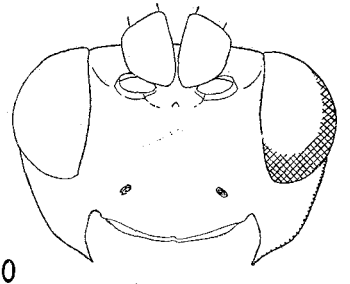
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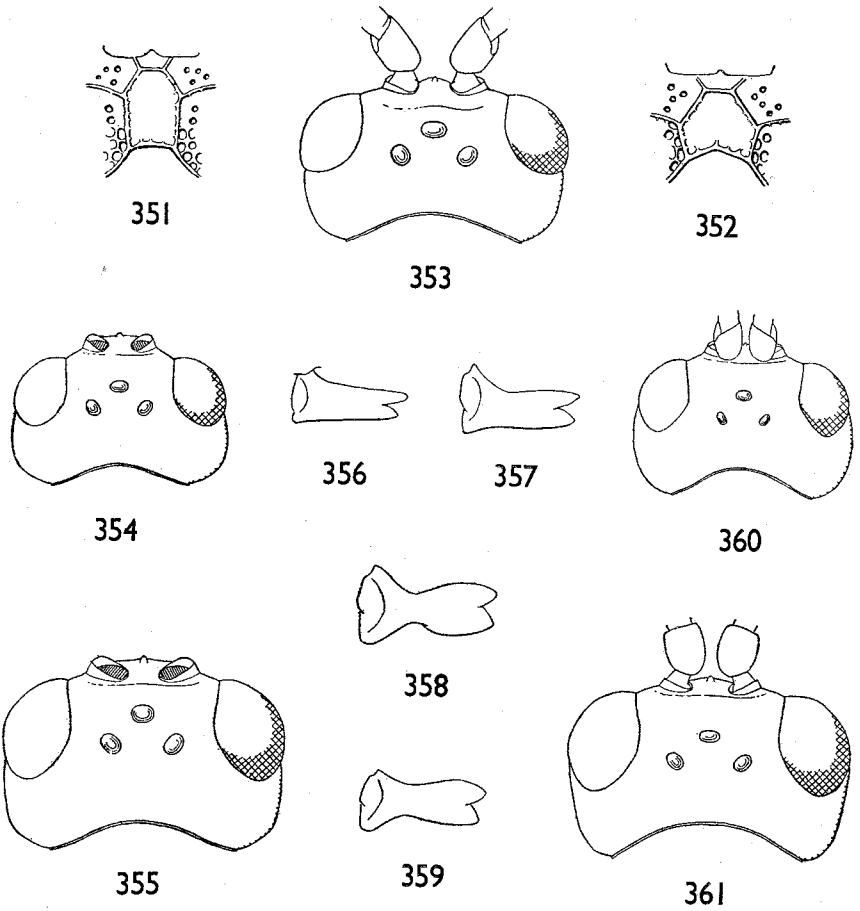
FIGS. 342–343.—*Diadromus subtilicornis*, ♀ head : 342, anterior ; 343, posterior.
FIGS. 344–347.—*Diadromus*, head, anterior : 344, *troglodytes*, ♂ ; 345, *quadriguttatus*, ♂ ; 346, *troglodytes*, ♀ ; 347, *quadriguttatus*, ♀.
FIGS. 348–349.—*Diadromus albinotatus*, ♂ : 348, mandible ; 349, mesosternum.
FIG. 350.–*Diadromus varicolor*, ♀ : head, anterior.

5 (3) Malar space longer, subequal to half the breadth of base of mandible ; scape ivory beneath ; face with the lateral yellow marks subquadrate (fig. 344) ; hind femur black. 5·5–7 mm..... **troglodytes** (Gravenhorst)

– Malar space short, subequal to one third the breadth of base of mandible ; scape entirely black ; face usually with the lateral marks at least approximated under the antennal sockets (fig. 345) ; hind femur red, only narrowly and indistinctly infuscate apically. 7–8 mm... **quadriguttatus** (Gravenhorst)



FIGS. 351–352.—*Colpognathus*, ♀ area superomedia : 351, *divisus* ; 352, *celerator*.

FIGS. 353–355.—Head, dorsal, ♂ : 353, *Colpognathus celerator* ; 354, *Centeterus opprimator* ; 355, *C. confector*.

FIGS. 356–359.—Mandibles : 356, *Centeterus confector*, ♀ ; 357, *Colpognathus celerator*, ♂ ; 358, *C. celerator*, ♀ ; 359, *C. divisus*, ♀.

FIGS. 360–361.—*Centeterus*, ♀ head, dorsal : 360, *opprimator* ; 361, *confector*.

6 (2) Tergites 2 and 3, which are usually black except for the apical margin,[11] with conspicuous, coriaceous sculpture between the shallow punctures; scape little expanded apically, the pedicel only weakly expanded dorsally; coxae and trochanters red varying to black. 7·5–9 mm..... **varicolor** Wesmael

– Tergites 2 and 3, which are most usually red, with very weak, coriaceous sculpture between the clearly impressed punctures; scape conspicuously expanded apically, the pedicel conspicuously expanded dorsally; coxae and trochanters black. 8–9·5 mm..... **tenax** Wesmael

Genus **Colpognathus** Wesmael

I have been unable to differentiate satisfactorily the males of this genus and I am giving no key to these. The males, too, can be confused quite readily with those of *Centeterus*, although the females of the two genera are easily distinguished.

The females are similarly coloured except for the antennae. They have tergite 1, except basally, and tergites 2–4, red; legs red with coxae and trochanters black, apex of hind femur, base and apex of hind tibia, and posterior tarsi, infuscate.

Key to Species

(*Females*)

A Mandible with a rather weak, sub-basal constriction (fig. 359); flagellum never white centrally, with the basal flagellar segments red or reddish, scape black or largely black in British specimens; area superomedia conspicuously elongate (fig. 351). 6·5–7·5 mm. *Not uncommon*

divisus Thomson

B Mandible with a sharp, sub-basal constriction (fig. 358); flagellum tricoloured except in occasional aberrations in which the white band is almost, or entirely, lost; area superomedia about as long as its posterior carina (fig. 352).

Postpetiole at most weakly sculptured laterally, tergite 2 weakly punctate and with a conspicuous, smooth area basally which rarely has a few widely scattered punctures. 6·5–9·5 mm. *Not uncommon*

celerator (Gravenhorst)

Genus **Centeterus** Wesmael

The males of this genus may easily be confused with those of *Colpognathus* though the females are readily distinguishable. Some specimens of *Eparces grandiceps* might be confused with this genus, but superficially it can be easily distinguished by the coriaceous sculpture between the punctures on the abdomen, whereas in British species of *Centeterus* the abdomen is polished between the punctures.

Neither of the two British species has the hypostomal carina strongly raised. The females are similarly coloured except for the coxae and trochanters; they have the pronotum with a broad, central anterior, yellow or red spot; gaster with tergite 1 at least apically, and tergites 2–4, red; femora red, the hind femur infuscate apically, tibiae red, hind tibia infuscate basally and apically, the hind, and usually the middle, tarsi more or less infuscate.

[11] The single ♂ taken by Bridgman with typical *varicolor* and named by him as *intermedius* Wesmael, has the coxae and trochanters black, the hind femur more strongly infuscate apically and tergites 2–4 red. Otherwise it appears to agree with *varicolor*, but being carded various characters are unobservable.

KEY TO SPECIES

(*Females*)

A Flagellum most usually marked with white centrally, often reddish basally ; head with the temples smaller and weakly converging behind the eyes (fig. 361).
Pronotum sometimes entirely red in continental specimens. 6–8 mm. *Not uncommon*.....**confector** (Gravenhorst)

B Flagellum never with a white mark, the basal segments reddish ; head with the temples very broad and weakly diverging behind the eyes (fig. 360). 4·5–6·5 mm. *Not uncommon*.....**opprimator** (Gravenhorst)

(*Males*)

A Head more transverse, the temples shorter and less diverging behind the eyes (fig. 355) ; tergites 2–4 entirely red. 5·5–6·5 mm.
confector (Gravenhorst)

B Head more cubic, the temples very broad and conspicuously widened behind the eyes (fig. 354) ; tergites 2–4 varying to only tergite 2 with a conspicuous, fuscous mark. 5–6 mm.....**opprimator** (Gravenhorst)

Genus **Eparces** Foerster

This genus is only doubtfully distinct from *Centeterus* (figs. 281–3).

♀. Gaster with tergites 2–4 with distinct microsculpture between the clear punctures ; scape red beneath, flagellum red basally ; pronotal collar marked with red centrally ; gaster with tergites 1–4 red, tergite 1 marked with black or basally black ; legs red, hind coxa marked with black, hind femur black apically, hind tibia infuscate basally and apically, the apical tarsal segments of all legs infuscate. ♂ unknown to me. *c.* 6·5 mm. *Rare*
grandiceps Thomson

Genus **Microp**e Thomson

I have adopted the Thomson interpretation of this species as I was uncertain whether the specimens in the Wesmael collection were types.

Mostly coriaceous, in part with scattered punctures ; propodeum rugose punctate with the carinae very ill defined.
♀. Scape and pedicel in part red, flagellum red beneath ; legs red, apex of hind femur, base and apex of hind tibia and apical tarsal segments infuscate ; gaster with tergites 2–5 red, conspicuously marked with fuscous.
♂. Similar in colour to ♀ but with the red markings more reduced, the coxae being in part black. ♀ *c.* 4 mm., ♂ 4–5 mm. *Rare*
macilenta (Wesmael)

Genus **Oiorhinus** Wesmael

Quite distinct from any other British genus in the form of the clypeus (fig. 292).

♀. Flagellum red beneath, basally ; gaster with tergite 1 red apically, tergites 2–4 or 5 red, the following tergites black, reddish apically ; front leg red, middle leg red with the tibia apically and the tarsus in part, infuscate ; hind leg with the coxa red, black basally, trochanter and trochantelli red, femur black, red basally, tibia red, black basally and apically, tarsus infuscate.
♂. Tyloidae on antennal segments 7/8–11/12 ; mandible black ; colour similar to that of the female but the dark markings of the hind leg more extensive and tergite 2 infuscate except apically, 3 and 4 strongly infuscate centrally. ♀ 4·5–6 mm., ♂ 5–6.5 mm. *Not uncommon*
pallipalpis Wesmael

Genus **Paraethecerus** Perkins

♀. Antenna relatively short, about 19-segmented, with segment 3 slightly shorter than segment 4; an elongate species with the frons not impressed, coriaceous and sparsely punctate; mesoscutum punctate and in part coriaceous; scutellum punctate; propodeum rugose punctate, dull, the area superomedia strongly elongate; tergites 2 and 3 of gaster coriaceous with sparse punctures, the following segments progressively more weakly sculptured; antenna with the segments marked with testaceous; gaster with tergites 2–5 red, tergite 1 in part red apically; legs red, hind femur infuscate apically, middle and hind tibiae infuscate basally and apically, the tarsi with the apical segments infuscate. (Figs. 370–1.) ♂ unknown. *c.* 5 mm. *Rare* ..... **elongatus** Perkins

Genus **Aethecerus** Wesmael

This genus is closely related to *Phaeogenes* from which it is not easily separated without some experience. The genae, however, are more deeply excavate in all the British species than in any *Phaeogenes*, and the form of the clypeus is also quite distinct, though considerable confusion has arisen between *Aethecerus* and the *fulvitarsis* group of *Phaeogenes*. The form of the scape is also distinctive, though certain species of *Diadromus* have a scape of similar form; this character is not found in *Phaeogenes*, and in some species of *Aethecerus* it is only slightly developed. *Oiorhinus* also has a similar form of scape but differs in having a large, semicircular, apical impression on the large clypeus.

I have so far seen no males of *A. placidus* Wesmael and have endeavoured to include this species on the characters given by Thomson.

Keys to Species
(*Females*)

1 Propodeum conspicuously produced apically, beyond the base of the hind coxa (fig. 325).
Frons rather sparsely and coarsely punctate, shining between the punctures; mesoscutum and scutellum rather coarsely and deeply punctate; area superomedia strongly elongate; tergites 2–4 strongly coriaceous with few scattered punctures; hind coxa, beneath, unarmed; flagellum tricoloured, scape in part red or reddish; hind angle of pronotum red; legs red, with the hind leg having the apex of femur, base and apex of tibia, and the apical tarsal segment, infuscate; tergites 2–4 red. *c.* 6 mm. *Uncommon.* **longulus** Wesmael

– Propodeum not, or hardly, projecting beyond the base of the hind coxa (fig. 323) 2

2 (1) Flagellum with a conspicuous, white, central, dorsal stripe; frons with sparse, rather fine punctures and very strongly shining.
Head, when viewed dorsally, more transverse; area superomedia about twice as long as apically broad; area basalis distinct, subequal in length to its apical breadth and with strong lateral carinae; hind coxa, beneath, with a strong, oblique, posterior carina; flagellum tricoloured; tergites 2–4 red; legs red with the hind coxa (largely), apex of hind femur, apex of hind tibia and hind tarsus, infuscate. 6–7 mm. *Uncommon*... **dispar** Wesmael

– Flagellum at most with a very indistinct, whitish, central, dorsal stripe, and in those species in which this is occasionally present, the frons is closely punctate above the antennal scrobes 3

3 (2) Frons with the area above the antennal scrobes with coarse, rather sparse punctures, which in large part are as far, or further from each other than the diameter of the punctures; scape with a conspicuous, dorsal, basal swelling (figs. 364–5) 4

– Frons with the area above the antennal scrobes more finely and closely punctate, or punctate striate; scape at most with a hardly perceptible basal swelling (fig. 366).

Postpetiole smooth or sparsely punctate ; hind coxa at most narrowly testaceous apically ; a variable species, or perhaps a species group ; large specimens tend to have the area superomedia more elongate. 5–6 mm. *Not uncommon*..... **discolor** Wesmael

4 (3) Tergites 2–4 dull and strongly coriaceous between the punctures ; tergite 4, at least in greater part, red (usually entirely red) ; hypostomal carina very strongly raised at, and in front of, the junction with the genal carina (fig. 368) ; area superomedia strongly elongate (fig. 323).

Scape at least black above ;[12] hind coxa sometimes black. 5–6·5 mm. *Rather uncommon*..... **nitidus** Wesmael

– Tergite 2 shining and only weakly coriaceous between the punctures ; tergite 4 in greater part black ; hypostomal carina less strongly raised at, and in front of, the junction with the genal carina (fig. 369) ; area superomedia broader (fig. 322). *c.* 4·5 mm. *Rare* ; *I have only examined material from Ireland* ..... **placidus** Wesmael

(*Males*)

1 Propodeum distinctly produced beyond the base of the hind coxa (*cf.* fig. 325).

Antenna black, the scape little expanded basally ; clypeus and mouth black ; frons shining, sparsely punctate ; femora and tibiae red with the hind femur black basally and the hind tibia at most red in the middle ; petiole short ; abdomen black with the thyridiae and apices of the segments red. *c.* 6·5 mm..... **longulus** Wesmael

– Propodeum slightly produced beyond the base of the hind coxa.....2

2 (1) Scape basally, raised into a very prominent, sharp carina (fig. 367).

Clypeus black ; femora and tibiae marked with fuscous (the hind ones much more than the anterior), tarsi infuscate ; abdomen with tergites 2–4 red at the base and apex. 5–6 mm..... **dispar** Wesmael

– Scape basally, with a rounded tubercle which may be strongly developed (figs. 362–3).....3

3 (2) Clypeus white or broadly marked with white ; scape very weakly intumescent basally (fig. 363) ; anterior coxae and trochanters ivory, hind coxae black, most usually marked with ivory apically.

Femora red with the hind ones infuscate apically, tibiae red with the hind ones infuscate at least basally and apically, tarsi infuscate ; abdomen black with the apices of the segments red, and somewhat shining between the punctures. (Large specimens are proportionately a little more elongate than the small ones.) 5–7 mm..... **discolor** Wesmael

– Clypeus black ; scape distinctly intumescent basally (fig. 362) ; anterior coxae black, sometimes somewhat marked with red.....4

4 (3) Hypostomal carina very strongly raised ; tergites 2–4 in large part red, dull and very strongly coriaceous.

Anterior femora and tibiae red, hind femur red, broadly infuscate apically, hind tibia red centrally ; tarsi infuscate. *c.* 7 mm..... **nitidus** Wesmael

– [Hypostomal carina only moderately raised ; tergites 2–4 in large part black **placidus** Wesmael]

Genus **Orotylus** Holmgren

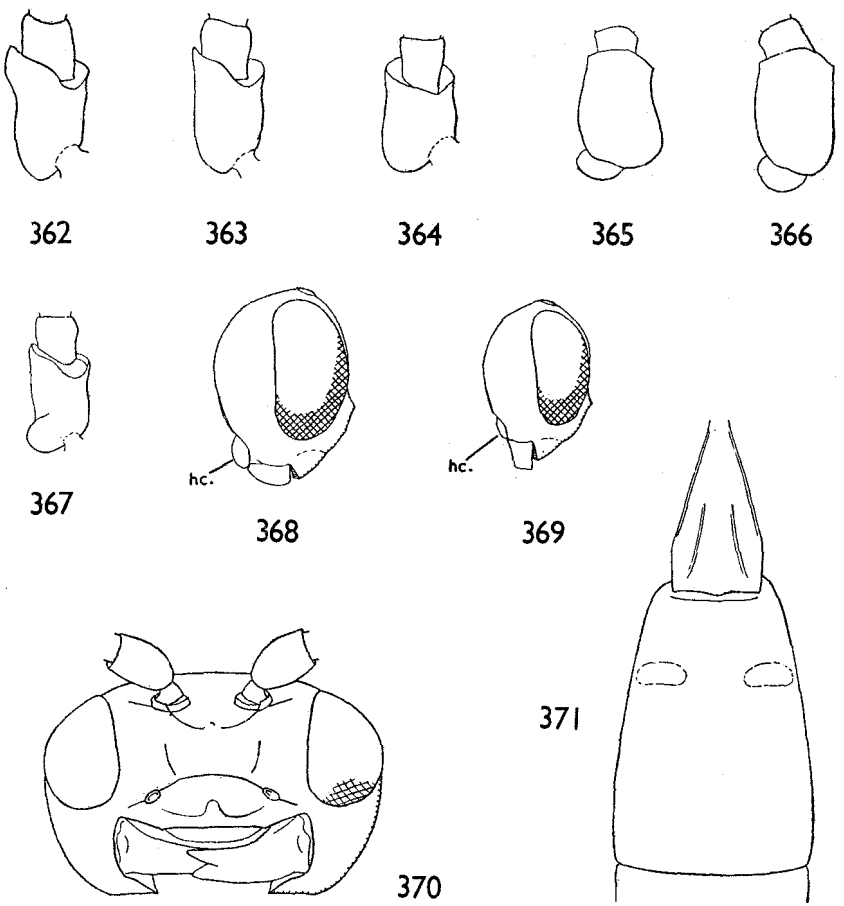
I have included the single species of this genus in the key to *Phaeogenes* as being the most convenient place to recognize it superficially (figs. 372, 373). The male can be distinguished from any of the British *Phaeogenes* (for which no key is given) by the following superficial characters :

♂. Scutellum except sometimes for the extreme base, and central area of metanotum yellow ; face with a central, yellow mark below the antennal sockets. 5·5–6·5 mm. *Rare*..... **mitis** (Wesmael)

[12] In German specimens that I have examined, the scape is entirely red.

Genus **Phaeogenes** Wesmael

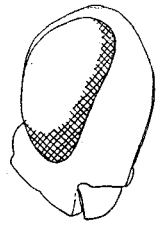
At present I am only able to give a key to the females of this genus. I have included *Orotylus mitis* in this key ; although in the key to the genera it runs to *Phaeogenes*, yet it does show certain characters which indicate that it is best to keep it in a separate genus at present, *e.g.* in the form of the convex face which is particularly noticeable in the male ; in this it shows in some respects the form found in *Diadromus* but the apex of the clypeus



FIGS. 362–367.—*Aethecerus*, scape : 362, *nitidus*, ♂, ventral ; 363, *discolor*, ♂, ventral ; 364, *nitidus*, ♀, ventral ; 365, *nitidus*, ♀, dorsal ; 366, *discolor*, ♀, dorsal ; 367, *dispar*, ♂, ventral.

FIGS. 368–369.—*Aethecerus*, ♀ head, lateral, showing hypostomal carina (*hc*) : 368, *nitidus* ; 369, *placidus*.

FIGS. 370–371.—*Paraethecerus elongatus*, ♀ : 370, head, anteroventral ; 371, tergites 1 and 2.



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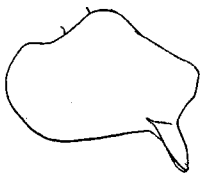

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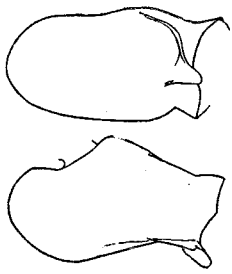

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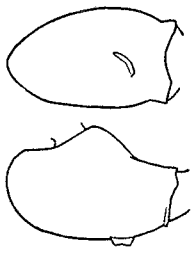

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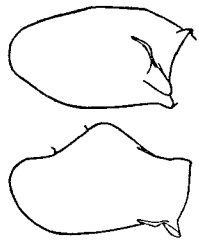

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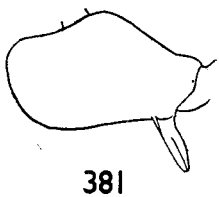

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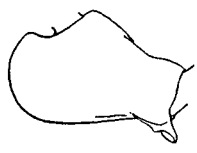

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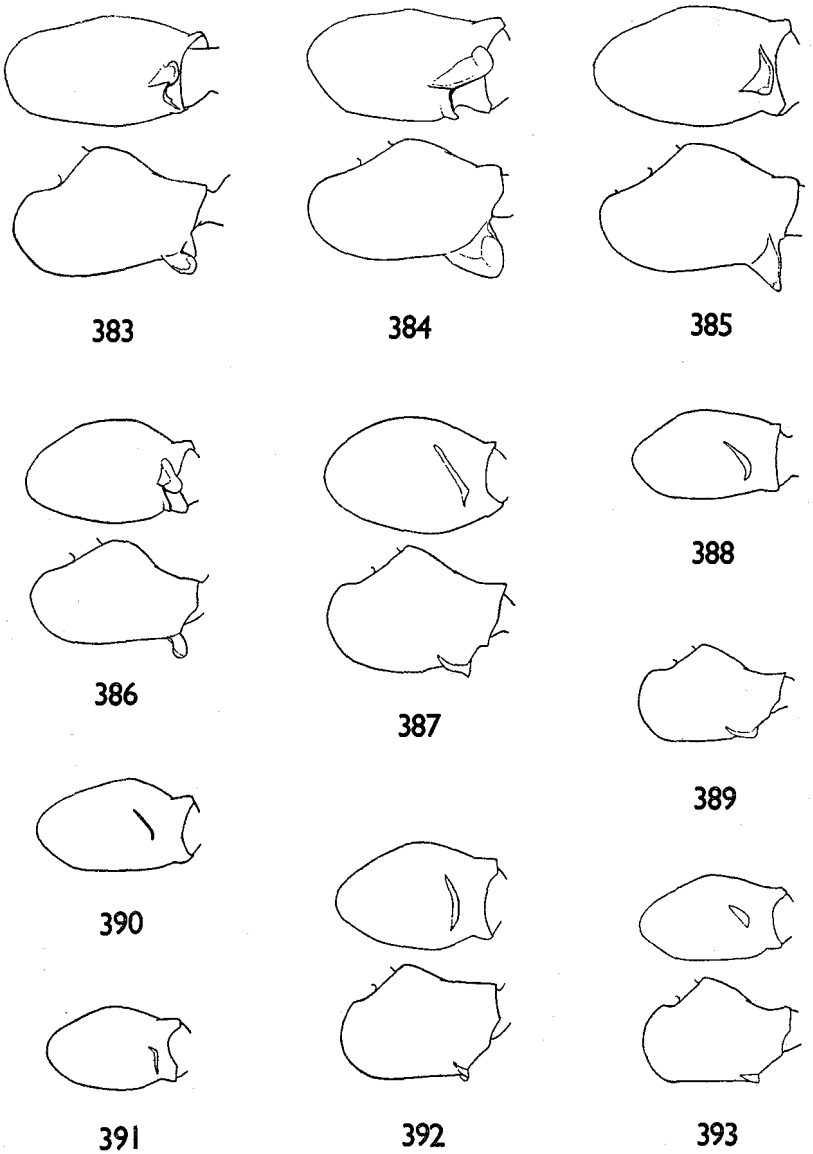
FIGS. 372–373.—*Orotylus mitis*, ♀ : 372, head, lateral ; 373, hind coxa, ventral.

FIGS. 374–382.—*Phaeogenes*, ♀ hind coxa : 374, *ophthalmicus*, ventral ; 375, *maculicornis*, lateral ; 376, *callopus*, lateral ; 377, *invisor*, ventral and lateral ; 378, *rusticatus*, ventral and lateral ; 379, *fulvitarsis*, ventral and lateral ; 380, *stipator*, ventral and lateral ; 381, *semivulpinus*, lateral ; 382, *mysticus*, lateral.



FIGS. 383–393.—*Phaeogenes*, ♀ hind coxa: 383, *planifrons*, ventral and lateral; 384, *curator*, ventral and lateral; 385, *heterogonus*, ventral and lateral; 386, *melanogonos*, ventral and lateral; 387, *bellicornis*, ventral and lateral; 388, *modestus*, lateral; 389, *osculator*, lateral; 390, *ischiomelanus*, ventral; 391, *distinctus*, ventral; 392, *eques*, ventral and lateral; 393, *fuscicornis*, ventral and lateral.

keeps it distinct from that genus. I do not, however, distinguish *Proscus* from *Phaeogenes* for it is less well defined, even as a species group, from the rest of *Phaeogenes* than, say, the *fulvitarsis* species group. None of the species formerly included in *Proscus* has the spines or carinae on the female hind coxae which are present in most of the other species of the genus. Their form is of the greatest importance in recognizing very many of the species.

A number of the species are difficult to determine and it is possible that certain of the forms retained as distinct species in the key may well prove to be only varieties. In particular this is true of *trepidus* which could be a small dark form of *fuscicornis*. On the continent, *fuscicornis* appears usually to have the hind femora red whereas in British examples these are black ; *trepidus* seems to have been recorded from this country on account of this difference of coloration. In the Bridgman collection are specimens named as *trepidus* by Bridgman and *fuscicornis* by Thomson ; these appear to me to be all specimens of *fuscicornis*. British specimens of *flavidens*, too, are by no means easy to separate from *suspicax* as there is a great tendency for individuals in this country to lose the ivory markings which are a feature of the continental specimens of the former that I have examined ; they do however appear to be genuinely distinct.

The form of the hind margin of the mandible is important in recognizing the *semivulpinus* group. The species related to this are found in couplets 12–15 of the key, but *stipator* which runs to this section of the key should be placed in a separate group ; *ophthalmicus* (couplet 2) also belongs to this group. As already mentioned, the *fulvitarsis* group with the central, subapical impression on the clypeus also appears to form a natural group. In the key these species are found in couplets 5–9. *P. bellicornis* and *osculator* form another group distinguished by the characters of the clypeus. *cephalotes*, *elongatus*, *coriaceus*, *suspicax* and *flavidens* belong to *Proscus* if this genus is recognized. The remaining species are all closely related, the most distinct being *modestus*, which has the sculpture of the abdomen similar to that of the *bellicornis* group.

Key to Species

(*Females*)

1 Hind coxa beneath with a strong, transverse carina which joins, on the inner margin, a longitudinal carina that extends almost to the apex of the coxa (figs. 373–4), the area before this obliquely transverse striate.
Antenna with the postannellus a little shorter than segment 4 ; red at the base and such segments sometimes infuscate dorsally ; hind margin of mandible weakly convex in the basal half (fig. 401) 2

– Hind coxa beneath never with such an angled carina 3

2 (1) Scutellum most usually with a pair of apical, yellow spots, and usually red before these ; hypostomal carina narrow, face more convex (fig. 372) ; clypeus with a subapical ridge which is interrupted centrally ; pronotum dorsally with a rather broad collar, this area ivory ; hind coxa and trochanter red, the hind coxa (fig. 373) with no impression before the transverse carina ; hind angle of pronotum testaceous or yellow ; mandible with the shaft yellow ; face and clypeus sometimes in part reddish ; legs red with the anterior coxae and trochanters marked with ivory and the hind tibia sometimes in part very weakly infuscate ; gaster red with tergite 1 basally, and tergites 5–7 infuscate. 5·5–6·5 mm. 1 ♂, 1 ♀, *Bridgman Coll.*
Orotylus mitis (Wesmael) (p. 98)

– Scutellum black ; hypostomal carina strongly raised behind the base of the mandible ; face a little flatter ; clypeus convex with no subapical ridge ; pronotum dorsally with a narrow collar, this area sometimes testaceous ; coxae and trochanters black, the hind coxa (fig. 374), before the transverse carina, with an impression which is bounded internally by a rounded ridge ; hind angle of pronotum black ; mandible black ; supraclypeal area and the inner orbits in part, sometimes red ; legs with the coxae and trochanters black ; rest of the anterior legs red with the tarsi infuscate apically ; hind femur red, black apically, hind tibia red, narrowly infuscate apically, hind tarsus fuscous ; gaster red with tergite 1 basally, and tergites 5–7 black. 6·5–8 mm. *Not uncommon*..... **ophthalmicus** Wesmael

3 (1) Face with the orbits beside and below the antennal sockets broadly marked with yellow, or at least a yellow spot near the antennal sockets ; hind coxa with a long, flattened process beneath (fig. 375) ; lower tooth of the mandible very small and far removed from the apex of the upper tooth ; mandible with the hind margin almost straight in the basal half (fig. 403).

Flagellum elongate with the postannellus about two and a half times its breadth ; clypeus with the subapical ridge coarsely punctate, but not or only weakly coriaceous centrally ; clypeus sometimes yellow centrally ; frons, above, coarsely and closely punctate, the antennal scrobes irregularly trans-striate ; pronotum with the anterior margin centrally, and the dorsal margin at least in the extreme hind angles, ivory ; tegula and subalar prominence ivory ; scutellum with a pair of apical, yellow spots which often fuse centrally ; gaster red with tergite 1 black (except apically), varying to almost entirely black ; anterior coxae and trochanters usually marked with ivory, hind coxa sometimes in part red ; femora, tibiae and tarsi red, most usually in part infuscate and sometimes conspicuously so. 6–8 mm. *Not uncommon*..... **maculicornis** (Stephens)

– Face most usually entirely black ; if very rarely with the orbits marked with yellow or with red, then the hind coxa is unarmed or with a completely different armature ; only *semivulpinus* (fig. 381) with a similar process on the hind coxa ; lower tooth of the mandible strong and less removed from the apex of the upper..... 4

4 (3) Clypeus, apically, centrally with an impression which is punctate and coriaceous, and inflexed on either side of this (fig. 404) ; epistomal suture deep centrally.

Hind coxa beneath with an oblique, transverse costa which is raised into a tooth at the inner and sometimes also at the outer end ; flagellum red or marked with red basally ; gaster with tergites becoming less sculptured from base of tergite 2 to the apex ; tergites 2 and 3 coriaceous with rather sparse punctures except in *invisor* ; hind margin of mandible weakly concave in basal half..... 5

– Clypeus, apically, centrally smooth with at most scattered punctures, or if the sculpture approaches the above, then the whole apical margin of the clypeus is broadly inflexed with no medial depression..... 10

5 (4) Gaster strongly shining, tergites 2 and 3 with only very weak coriaceous sculpture between the punctures ; hind coxa (fig. 377) beneath, weakly excavate before the carina which is very strongly raised on the inner side into a spine.

Flagellum testaceous, darker apically, centrally with a short, white, dorsal stripe ; basal segments elongate, the postannellus with length : breadth about 1·7 : 1 ; mandible with the shaft mostly yellow ; pronotum usually with a yellow, central, anterior mark, the hind angle most usually with a yellow spot ; tegula testaceous ; gaster black with the apex of tergites 2 and 3 conspicuously red, sometimes with both these segments conspicuously reddish ; legs red with the base and apex of the hind tibia, and the hind tarsus fuscous or black, the coxae frequently infuscate and more rarely the trochanters also, the hind femur sometimes infuscate apically. 7–8·5 mm. *Common*..... **invisor** (Thunberg)

– Gaster dull and with tergites 2 and 3 strongly coriaceous between the punctures which are sparser ; hind coxa beneath, with the carina having the spine always shorter (longest in *mysticus*) 6

6 (5) Gaster black with at most the apices of the central segments red.
White band of antenna frequently greatly reduced, or absent in some individuals.....7

– Gaster with at least tergites 2 and 3 red, tergite 1 usually red apically.
Legs red, the anterior coxae and trochanters sometimes marked with ivory, the hind coxa sometimes infuscate basally; hind femur black apically, hind tibia paler and infuscate at the base and apex, hind tarsus fuscous; anterior margin of pronotum, centrally, most usually with an ivory mark, hind angles of pronotum usually marked with ivory; tegula testaceous or yellow.....8

7 (6) Hind tibia white, black at the base and in the apical half to two-thirds; hind tarsus with segments 1–4 white, black apically, and segment 5 black; rest of the legs red, the anterior legs often conspicuously marked with ivory, and the last tarsal segments infuscate; hind coxa at the extreme base, and the hind femur apically, black; coxal carina not dentate outwardly, and with a smaller tooth inwardly (fig. 376); frons less closely and more finely punctate; flagellum thinner and with the basal segments more elongate, the postannellus with length : breadth about 1·8 : 1, the fifth segment conspicuously elongate (fig. 396); pronotum sometimes marked with ivory centrally on the anterior margin, hind angles usually ivory; tegula ivory varying to testaceous. 5·5–7·5 mm. *Not uncommon*....**callopus** Wesmael

– Legs entirely red with the tarsi infuscate; coxal carina raised into an obtuse tooth outwardly, inwardly with a longer tooth (fig. 382); frons closely and less finely punctate; flagellum stout, postannellus with length : breadth about 1·5 : 1, the fifth segment subquadrate (fig. 397); anterior margin of pronotum not pale marked, hind angles usually with an ivory spot; tegula testaceous. *c.* 6 mm. 1 ♀, *Stephens coll.*.....**mysticus** Wesmael

8 (6) Hind coxa, viewed laterally, with the longer, inner tooth of the carina arising almost directly from the hind margin of the coxa (fig. 379); the carina, outwardly, raised into a more conspicuous obtuse or right-angled tooth.
Tergites 2–4 entirely red, often with 5 in part, or wholly red; tergites 2 and 3 a little more shallowly and a little more sparsely punctate; temples less strongly narrowing behind the eyes; head with the occiput much less excised posteriorly and the posterior ocellus further from the occipital carina than the distance between the posterior ocelli. 6–7 mm. *Uncommon*.
fulvitarsis Wesmael

– Hind coxa, viewed laterally, with the shorter, inner tooth of the carina arising distinctly before the hind margin of the coxa (fig. 378); the carina, outwardly, at most very slightly raised.....9

9 (8) Antenna with the fourth segment (fig. 394) a little longer than the distance between the posterior ocelli; notauli, though very short, distinctly impressed behind the pit on the anterior margin of the mesoscutum (fig. 406). 5·5–6·5 mm. *Common*.....**rusticatus** Wesmael

– Antenna with the fourth segment (fig. 395) a little shorter than the distance between the posterior ocelli, the flagellum stouter; notauli only faintly indicated behind the pit on the anterior margin of the mesoscutum (fig. 407). 4–5 mm. *Not uncommon*.....**foveolatus** Perkins

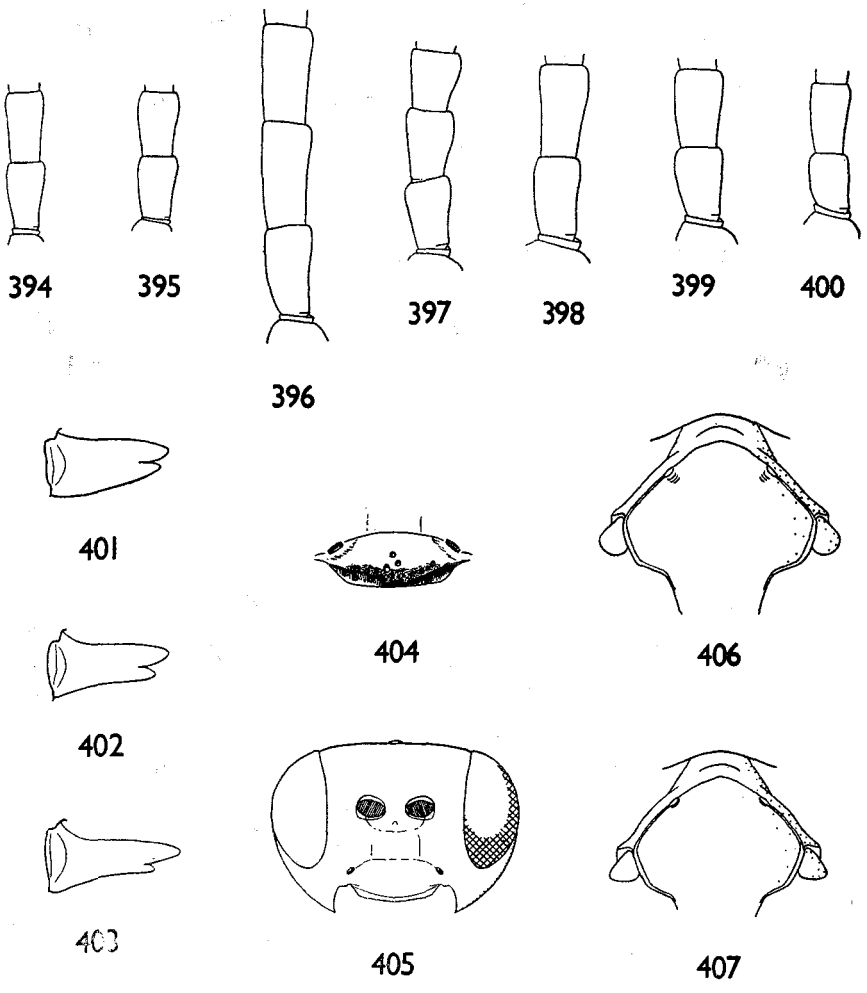
10 (4) Clypeus rather broadly and sharply inflexed apically; hind coxa with a conspicuous carina or flattened spine; flagellum tricoloured; posterior margin of mandible weakly convex in the basal half (*cf.* fig. 401) except in *stipator*.
In most species, antenna with about 27 segments; mandible and tegula black; hypostomal carina strongly raised behind the base of the mandible; face rather evenly convex from the inflexion of the clypeus to the antenna; epistomal suture almost erased centrally; pronotal collar rather long....11

— Clypeus narrow apically, when viewed from beneath, or if more conspicuously inflexed, then the hind coxa is unarmed, or with at most a very small and very inconspicuous tubercle; pronotal collar usually narrower; posterior margin of mandible weakly concave or straight in the basal half, but never convex (*cf.* fig. 402).....16

11 (10) Coxae and trochanters black; mandible black; tegula black or piceous.
Antenna with about 27 segments; gastrocoelus usually very short, in *planifrons* short.....12

— Coxae and trochanters entirely red ; mandible broadly marked with yellow or testaceous ; tegula testaceous or piceous.....15

12 (11) Hind coxa with a long, flattened spine which is at least three times as long as broad at the base (fig. 381), viewed from in front with a constriction just before the base.



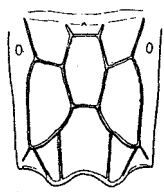
FIGS. 394–400.—*Phaeogenes*, ♀, basal segments of flagellum : 394, *rusticatus*, 395, *foveolatus* ; 396, *callopus* ; 397, *mysticus* ; 398, *semivulpinus* ; 399, *heterogonus* ; 400, *curator*.

FIGS. 401–403.—*Phaeogenes*, ♀ mandible : 401, *ophthalmicus* ; 402, *rusticatus* ; 403, *maculicornis*.

FIG. 404.—*Phaeogenes rusticatus*, ♀ : clypeus.

FIG. 405.—*Phaeognes bellicornis*, ♀ : head, anterior.

FIGS. 406–407.—*Phaeogenes*, ♀ mesoscutum : 406, *rusticatus* ; 407, *foveolatus*.



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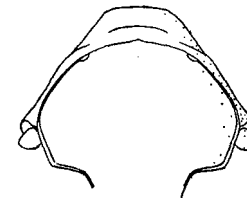

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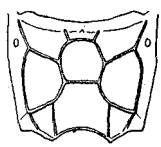

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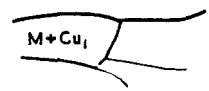

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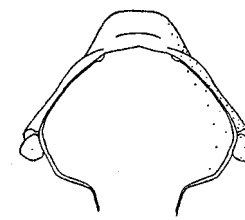

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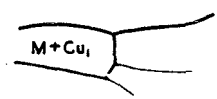

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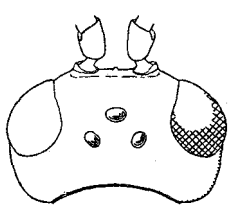

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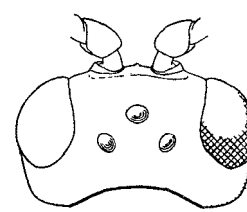

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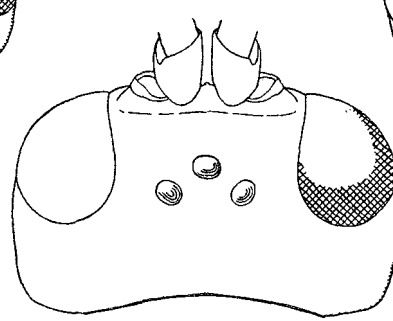

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FIGS. 408–409.—*Phaeogenes*, ♀ propodeum, dorsal : 408, *elongatus* ; 409, *suspicax*.
FIGS. 410–411.—*Phaeogenes*, ♀, base of flagellum : 410, *suspicax* ; 411, *flavidens*.
FIGS. 412–413.—*Phaeogenes*, ♀, cell $M + Cu_1$ of hind wing : 412, *impiger* ; 413, *suspicax*.
FIGS. 414–415.—*Phaeogenes*, ♀ pronotum, dorsal : 414, *flavidens* ; 415, *suspicax*.
FIGS. 416–418.—*Phaeogenes*, ♀ head, dorsal : 416, *suspicax* ; 417, *flavidens* ; 418, *cephalotes*.

Flagellum with the postannellus a little shorter than segment 2 (fig. 398); head strongly transverse, but with the temples parallel behind the eyes (fig. 424); tergite 1 apically, and tergites 2–5, red; anterior femora, tibiae and tarsi red, hind femur red, broadly infuscate apically, hind tibia red, infuscate at base and apex, hind tarsus fuscous. 7–9 mm. *Not uncommon* **semivulpinus** (Gravenhorst)

— If the hind coxa has a spine, it is broad and with the height subequal to its breadth at the base.

Abdomen with the apex of tergite 1 and tergites 2–4 red, tergite 5 sometimes red at the base 13

13 (12) Head, viewed dorsally, strongly transverse and with the vertex more narrowed centrally so that a posterior ocellus is conspicuously nearer to the occipital carina than the distance between the posterior ocelli (fig. 425); hind coxa with a conspicuous tooth on the inner surface (fig. 383).

Anterior femora and tibiae red, tarsi infuscate, hind femur red, broadly infuscate apically, tibia red, infuscate at base and apex, tarsus infuscate; form of the head similar to *semivulpinus*, but even more strongly transverse. 6–8 mm. *I have only seen examples from Ireland* ..... **planifrons** Wesmael

— Head less transverse and less emarginate posteriorly, so that a posterior ocellus is at least as far from the occipital carina as the distance between the posterior ocelli (fig. 423); hind coxa with no tooth on the inner surface but with a keel in *curator* 14

14 (13) Ventral process of the hind coxa with the inner margin weakly angled towards the central line of the insect and the outer margin strongly curving towards this apically, inner surface of hind coxa without a carina (fig. 385); anterior femora and tibiae red, the tarsi infuscate; hind femur red, black apically, hind tibia red, infuscate at base and apex, hind tarsus infuscate; postannellus subequal to third flagellar segment (fig. 399). 7–7·5 mm. *Not uncommon* ..... **heterogonus** Holmgren

— Ventral process of hind coxa with the outer margin more or less straight and the inner margin strongly curved towards this apically, inner surface of hind coxa with a strong keel and with a rather broad and deep groove behind this (fig. 384); anterior femora black, red apically, tibiae red somewhat infuscate apically, hind femur black, hind tibia red, infuscate at base and apex, hind tarsus black; postannellus conspicuously shorter than third flagellar segment (fig. 400). 6–7 mm. *Rare*, 1 ♀, *Stephens coll.*, 1 ♀, *Monmouth* ..... **curator** (Thunberg)

15 (11) Hind coxa beneath, with a flattened process and with a tooth on the inner surface (fig. 386); antenna with 24–27 segments; inflexed apical margin of the clypeus punctate, black; hind margin of mandible weakly convex in basal half (*cf.* fig. 401); tergites 1–4 red, 1 often infuscate at the base, 5 sometimes red at the base; anterior legs red with the apical tarsal segment infuscate, hind leg red with the apex of the femur black, the tibia with the apex and usually also the base, infuscate, hind tarsus rather weakly infuscate; gastrocoelus short. 5·5–6·5 mm. *Rare* ..... **melanogonos** (Gmelin)

— Hind coxa beneath, with a short, oblique, transverse carina (fig. 380); an elongate species with the head more quadrate; antenna with 21–23 segments; inflexed apical margin of the clypeus polished, impunctate, testaceous; hind margin of mandible straight in basal half (*cf.* fig. 402); tergites 1–4 entirely red, 5 sometimes red at the base; anterior legs red with the apical tarsal segment infuscate, hind leg red with the apex of the femur black, the base and apex of the tibia and tarsus infuscate; gastrocoelus rather long. 7–8 mm. *Not uncommon* ..... **stipator** Wesmael

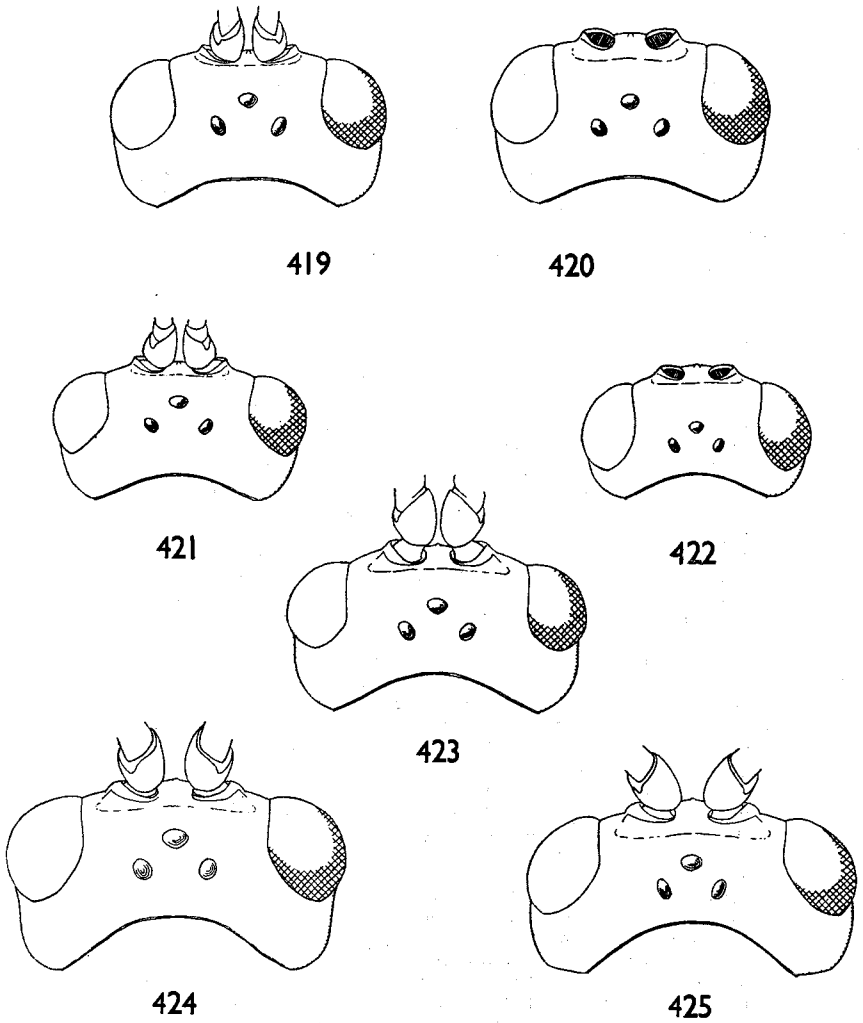
16 (10) Clypeus with the apical margin narrowly but distinctly flattened, above this evenly convex to the base (fig. 405).

Frons centrally with rather sparse punctures, or at least in large part with the punctures further from each other than the diameter of the punctures and usually in part coriaceous between the punctures; gaster with the postpetiole usually in part coriaceous and with scattered punctures, tergites 2 and 3 coriaceous with sparse or rather sparse, shallow punctures; hind coxa with an oblique, transverse keel; tibiae and tarsi testaceous, the tarsi more or less infuscate apically; gaster red centrally, sometimes in part infuscate 17

— If the clypeus has a flat apical margin, either it is only present laterally or the clypeus above it is not evenly convex.....18

17 (16) Antenna tricoloured ; hind coxa with the keel raised at the inner end (fig. 387) ; at least front and middle femora most usually red, rarely weakly infuscate. 6–7 mm. *Not uncommon*.....**bellicornis** Wesmael

— Antenna black with the apices of the basal flagellar segments more or less testaceous and sometimes with an indication of whitish spots on antennal segments 9–11 ; carina of the hind coxa less high and not expanded at the inner end (fig. 389) ; all the femora conspicuously marked with fuscous. 4·5–5·5 mm. *Rather common*.....**osculator** (Thunberg)



FIGS. 419–425.—*Phaeogenes*, ♀ head, dorsal : 419, *fuscicornis* ; 420, *eques* ; 421, *trepidus*; 422, *distinctus* ; 423, *heterogonus* ; 424, *semivulpinus* ; 425, *planifrons*.

18 (16) Hind coxa unarmed; hind wing with vein Cu_1 opposite and forming a conspicuous angle with *cua* (fig. 413); head with the temples large; clypeus conspicuously inflexed apically 19

— Hind coxa most usually with a tubercle or a carina; if unarmed then Cu_1 of the hind wing is conspicuously postfurcal (fig. 412) 23

19 (18) Tergite 2 coarsely, longitudinally striate between the gastrocoeli and extending to about a quarter the length of the segment, behind this the segment somewhat shining, shallowly coriaceous with sparse, scattered punctures as is tergite 3, the following tergites more polished with progressively weaker sculpture; gaster black with the apices of the tergites red (in some continental forms the abdomen is almost completely red).

Flagellum black with a white ring; head more cubic (fig. 418). 8–9 mm. *Rare* ..... **cephalotes** Wesmael

— Tergite 2 with no longitudinal striae between the gastrocoeli, but coriaceous or rugose here; tergites 2 and 3 otherwise more closely punctate, usually red, tergite 4 also sometimes in part or (in *elongatus* sometimes) wholly red 20

20 (19) Species more elongate with the propodeum having the declivous apical area, centrally, about as long as the dorsal length (length of area basalis + superomedia) (fig. 408); postpetiole longitudinally striate.

Tergites 2–4 red 21

— Species a little more robust with the declivous apical area of the propodeum conspicuously longer than the length of the area basalis + superomedia (fig. 409); postpetiole not, or only indistinctly striate 22

21 (20) Tergites 2–4 with the coarse punctures in considerable part closer to each other than the diameter of the punctures, shining; face never marked with yellow, at most the apex of the clypeus reddish. 5–6·5 mm. *Uncommon*
elongatus Thomson

— Tergites 2–4 with very conspicuous coriaceous sculpture, and dull, tergite 2 with the ill-defined punctures very widely spaced, punctures of tergites 3 and 4 less close than in *elongatus*; face frequently with a red or yellow spot between the antennal sclerite and the orbit; clypeus conspicuously red apically, sometimes yellow laterally. 5·5–7 mm. *Uncommon*
coriaceus Perkins

22 (20) Pronotal collar conspicuously elongate (fig. 415); frons with the punctures less close, in front of the anterior ocellus the punctures in considerable part are further from each other than their diameter; a rather more slender species with the abdomen a little more shining; area superomedia elongate; temples (fig. 416) less closely punctate; postannellus shorter (fig. 410); flagellum reddish towards the base, sometimes with two segments more or less white marked; legs red with the hind coxa, the middle and hind trochanters in part, the hind tibia at base and apex, and the apical tarsal segments, infuscate varying to very largely black; anterior margin of pronotum sometimes marked with yellow centrally; tegula yellow varying through testaceous to black; tergites 2 and 3 and sometimes base of 4 red, varying to almost entirely black; postpetiole sometimes marked with red. 4·5–6 mm. *Rather common* ..... **suspicax** Wesmael

— Pronotal collar shorter (fig. 414); frons very closely punctate, subrugose punctate in front of the anterior ocellus or at least (in small specimens) with the punctures closer than their diameter; a somewhat more robust species with tergites 2 and 3 more deeply coriaceous; area superomedia usually about as long as broad; temples (fig. 417) strongly and rather closely punctate; postannellus longer (fig. 411); similarly coloured to *suspicax* but with two or three flagellar segments marked with white; legs most usually strongly infuscate with the coxae black; abdomen more rarely has tergites 2 and 3 infuscate. 4·5–6 mm. *Not uncommon*
flavidens Wesmael[13]

[13] British specimens examined (12 ♀) are less marked with yellow than in some specimens seen from the continent, in which the base of the mandibles, the clypeus, the hind angle of the pronotum, the subalar prominence and the anterior coxae and trochanters may be marked with ivory.

23 (18) Tergite 2 sparsely punctate, distinctly coriaceous; clypeus rectangularly (though rather narrowly) inflexed apically; hind wing with vein Cu_1 opposite or subopposite; tegula black, piceous or dull testaceous.
Hind coxa with a keel (fig. 388); femora, tibiae and tarsi (except for apical segments) red; tergites 1–4 red; tergites 2-3 strongly coriaceous with widely scattered punctures.[14] 4–6 mm. *Rare* (*Bridgman Coll.*)
modestus Wesmael

— Tergite 2 most usually strongly shining between the punctures; if tergite 2 is coriaceous and dull then the clypeus is not inflexed apically; Cu_1 of hind wing postfurcal; tegula yellow in a number of species.....24

24 (23) Hind coxa unarmed.
Antenna more or less red basally; postpetiole and tergites 2 and 3, and 4 in part, red; legs red with the hind coxa infuscate basally. 5–6 mm. *Rare.*
impiger Wesmael

— Hind coxa with an oblique, transverse carina.....25

25 (24) Flagellum conspicuously marked with white centrally.
Tegula yellow or testaceous.....26

— Flagellum not marked with white or (*infimus*) with at most 2 segments very inconspicuously spotted with white.....28

26 (25) Gena impressed before the hypostomal carina; anterior trochanters and hind trochantellus usually conspicuously marked with pale lemon yellow; scape black, flagellum with only the basal segments marked with red; legs red with the hind coxa and trochanter basally infuscate, the hind femur and tibia very weakly infuscate apically; mandible largely testaceous, clypeus narrowly testaceous apically.
Transverse carina of hind coxa conspicuously but not very strongly raised (fig. 390); gaster with the postpetiole, tergites 2–4 and often at least the base of 5, red; tergite 2 rarely somewhat infuscate in part. 4·5–7 mm. *Common* .....**ischiomelanus** Wesmael

— Gena flat before the hypostomal carina; anterior trochanters and hind trochantellus more red; scape, and flagellum basally, clear red; legs red with the hind femur and tibia conspicuously infuscate apically, hind tarsus in considerable part infuscate; mandible largely testaceous (or in part yellow), clypeus narrowly testaceous apically.....27

27 (26) Transverse carina of hind coxa very strongly raised (fig. 392); tergites 2 and 3 coarsely and closely punctate, the interspaces weakly sculptured; gaster with the postpetiole (and sometimes the petiole in part), and tergites 2–4, red; temples longer (fig. 420); frons closely, coarsely punctate becoming subrugose in part. *c.* 7 mm. *Rare*.....**eques** Wesmael

— Transverse carina of hind coxa rather narrow (fig. 391); tergites 2–3 coriaceous, sparsely punctate, in greater part with the punctures further from each other than the diameter of the punctures; gaster with the apex of the postpetiole and tergites 2 and 3 red; temples short (fig. 422); frons coarsely, sparsely punctate. *c.* 5·5 mm. *Surrey*: 1 ♀ (*Type*), *Caterham*; 1 ♀, *Mickleham* (*G. C. Champion*).....**distinctus** (Bridgman)

28 (25) All the coxae and trochanters black.....29

— Anterior coxae and trochanters red; hind coxa usually red apically.
Remainder of the legs red with the hind femur and tibia fuscous apically and the apical tarsal segments infuscate; basal flagellar segments red; mandible and clypeus usually marked with red. Larger specimens have tergites 2 and 3 not marked with fuscous centrally, tergite 4 usually in large part red; tegula usually yellow or testaceous; frons and abdomen deeply and more closely punctured (= *limatus* Wesmael, Thomson *nec* Wesmael; *Ireland*, 5 ♀, *A. W. Stelfox*); varying to smaller specimens with tergites 2 and 3 red, at least tergite 2 with a conspicuous, central, fuscous patch; tegula black or piceous; frons and abdomen with shallower and sparser punctures. *Suffolk*, 2 ♀, *Morley Coll.* 4–6·5 mm.....**infimus** Wesmael

[14] A series of 9 ♀ all taken in Bentley Woods, Ipswich, in 1899–1903 by C. Morley have the abdomen less strongly coriaceous, tergites 1 and 4 infuscate and the femora, tibiae and tarsi infuscate; they are smaller than Wesmael's and Bridgman's specimens of *modestus*, which are all similar. For the moment, however, I regard them all as being conspecific.

29 (28) Head with the temples parallel behind the eyes (fig. 419) ; malar space shorter, about half the breadth of the base of the mandible.

Mandible and clypeus rarely obscurely marked with red ; base of flagellum at most obscurely marked with red ; legs black, anterior legs with the trochantellus, extreme base and apex of femora, red, anterior tibiae and base of tarsi red, hind tibia red, infuscate at base and apex ; gaster with apex of postpetiole and tergites 2–4 red, tergite 4 often largely or wholly black, and tergites 2 and 3 sometimes largely black centrally ; coxa (fig. 393). 4·5–7 mm. *Common*.....**fuscicornis** Wesmael[15]

— Head with the temples roundly narrowed behind the eyes (fig. 421) ; malar space a little longer and the genae linearly narrowed towards the mouth. 5–6 mm. *Rare*.....**trepidus** Wesmael

[15] Some continental forms often have the legs (except coxae and trochanters) red, and the base of the flagellum conspicuously red.

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Principal references are given first; where there are two, the former refers to the female and the latter to the male. Heavy type refers to a page with an illustration. Synonyms are in italics.

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