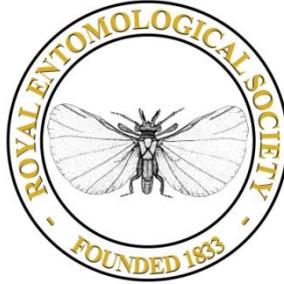


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HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS

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HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS



HYMENOPTERA ICHNEUMONOIDEA

ICHNEUMONIDAE, subfamilies ICHNEUMONINAE II,
ALOMYINAE, AGRIOTYPINAE and LYCORININAE

By J. F. PERKINS

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HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS

The aim of this series of publications is to provide illustrated keys to the whole of the British Insects (in so far as this is possible), in ten volumes, as follows :

- | | |
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Orthoptera. | „ 13. Mecoptera. |
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A list of parts now available appears on the back cover

HYMENOPTERA
ICHNEUMONOIDEA

ICHNEUMONIDAE

**ICHNEUMONINAE—II, ICHNEUMONINI ; ALOMYINAE ;
AGRIOTYPINAE AND LYCORININAE**

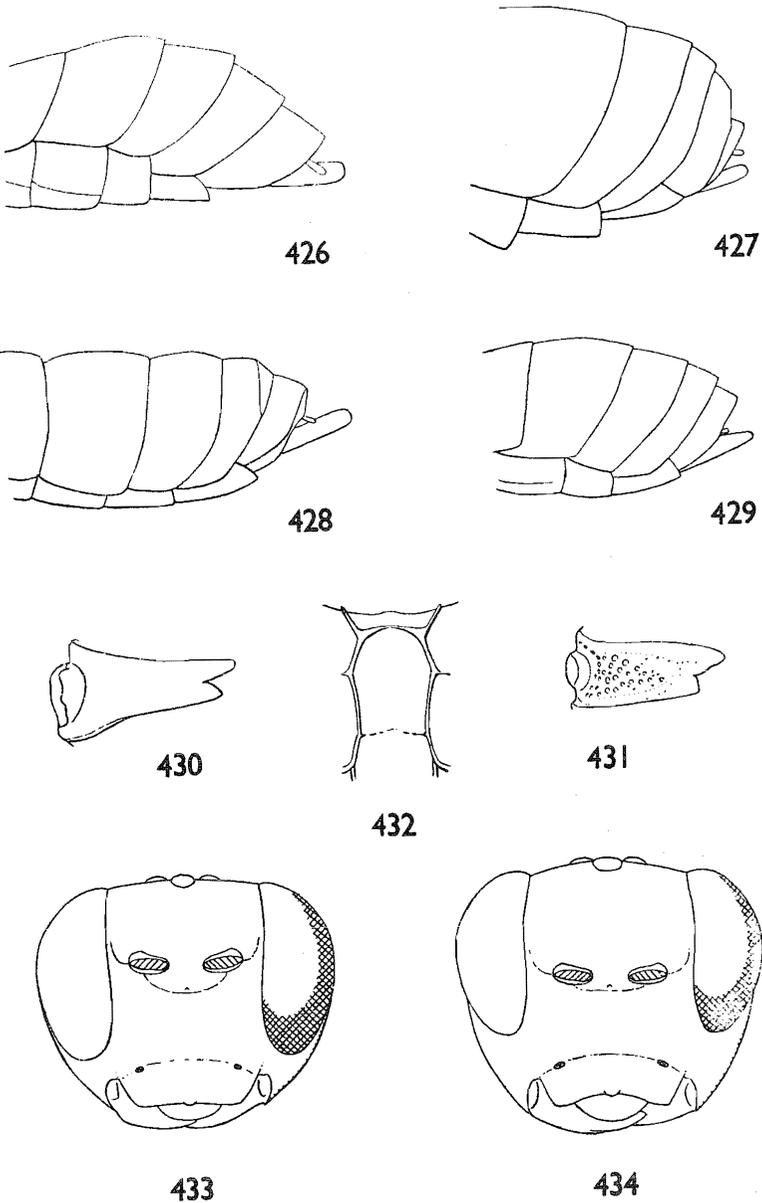
By J. F. PERKINS

IN addition to the remaining tribe of the Ichneumoninae, this section of the *Handbooks* also includes the Alomyinae, Agriotypinae and Lycorininae. The Alomyinae is probably closely related to the Ichneumoninae in which it has been placed by some authors, whereas others include it in the Metopiinae. The Agriotypinae and Lycorininae have no relationship with these subfamilies, but as the requisite figures for their recognition have already been given in the previous section, they are included here for the sake of convenience.

In the introduction to the previous section, I included a list of additions to the check list of British Ichneumoninae that I published in 1953. I have recently determined material of a further species belonging to the Ichneumonini which has not previously been recorded from this country, viz., *Aoplus speciosus* (Wesmael).

Tribe ICHNEUMONINI

In the Palaearctic region this is by far the largest tribe in the subfamily. The keys to genera are given separately for males and females, and it must be admitted they are far from satisfactory. Quite obviously a number of the genera will be split into further genera and some indication is given where this is most likely to occur in the near future. In fact, one of the greatest difficulties in this tribe is in recognizing into which genus or species group to place a species. Unless one has access to a considerable named collection, it would seem even more essential than usual to get together a considerable number of specimens before any progress can be made in identification. On the other hand, when our fauna becomes really well known, it is highly probable that quite simple keys based on colour pattern might be devised for the determination of our relatively limited number of species. At present, it is essential to allow for quite a considerable degree of variation in all characters used, including even those for genera, and where it is found



FIGS. 426-429.—Apex of gaster, lateral, ♀: 426, *Ichneumon extensorius*; 427, *Amblyteles palliatorius*; 428, *Hepiopelmus leucostigmus*; 429, *Ichneumon caloscelis*.

FIGS. 430-431.—Mandible, ♀: 430, *Ichneumon lugens*; 431, *Chasmias motatorius*.

FIG. 432.—Area superomedia: *Chasmias paludator*, ♀.

FIGS. 433-434.—Head, anterior, *Chasmias motatorius*: 433, ♂; 434, ♀.

impossible to run a specimen in the key to species of the genus to which it apparently belongs, it is as well to cast around in the generic key to see what other genera might be possible.

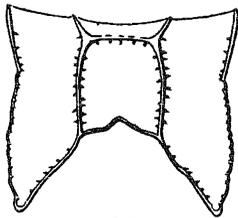
The species of this tribe are almost all parasitic on Macrolepidoptera. Many of the species hibernate as adult females and have only one generation in the year. These species emerge in the late summer (from about July onwards) when, in collecting, mostly males are obtained, and these die off in the autumn. The females can be found in the winter in grass tufts, under bark and in similar hibernaculae, becoming active again in the late spring or early summer.

I have only mentioned ivory markings on the pronotal collar, subalar prominence and scape where these appear to have some particular significance in distinguishing species as these markings normally show considerable variation. The majority of species, in the female, have the flagellum with a white band or streak centrally. The front and middle legs are normally similarly coloured to the hind ones but paler. These characters are thus only mentioned in the notes on colour if they show significant differences.

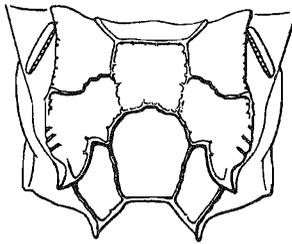
KEY TO GENERA

(Females)

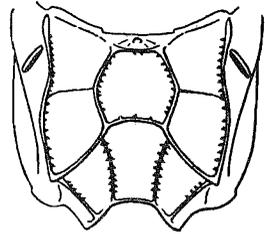
- 1 Tergite 7 conspicuously elongate, tergite 8 conspicuously projecting beyond this (figs. 781-2).
Ovipositor sheaths broad; hypopygium large; pygostyles with long, apical hairs; thyridiae absent. **Exephanes** Wesmael (p. 202)
- If tergite 7 is elongate then tergite 8 is almost or quite concealed by it. 2
- 2 (1) Length of hypopygium less than the distance of its apex from the apex of the ovipositor (fig. 426); ovipositor sheaths often conspicuously projecting beyond the apex of the gaster, which is usually acuminate apically; thyridiae most usually conspicuous. (The cases in which most confusion can arise are with *Hepiopelmus* (fig. 428) and with *Ichneumon caloscelis* (fig. 429)). 3
- Length of hypopygium longer than the distance from its apex to the apex of the ovipositor (fig. 427); ovipositor sheaths projecting very little beyond the apex of the last tergite; thyridiae very frequently absent. 21
- 3 Mandible thin and strongly twisted apically (fig. 473).
Antenna strongly elongate, a little widened beyond the middle and sharply attenuate apically; clypeus strongly convex and with no apical carina; head very strongly narrowed behind the eyes; transverse groove of pronotum complete centrally in British species; propodeum with the dentiparal spines strongly developed (cf. fig. 471); thyridiae at least as far apart as the breadth of a thyridia; apex of gaster with no white marks; ovipositor distinctly exerted. **Hoplismenus** Gravenhorst (p. 131)
- Mandible only weakly twisted; if rather thin, then otherwise disagreeing with the above characters; sometimes mandible unidentate. 4
- 4 (3) Clypeus broadly excised apically, in the middle of this excision is a tooth which does not reach the line of the lateral angles of the clypeus (fig. 434); mandible broad, the width at the base of the teeth about two-thirds the width of the base of the mandible, with a depressed, more or less triangular, punctate area in the basal half (fig. 431).
Area superomedia large, elongate, anteriorly rounded (fig. 432); central area of postpetiole striate or coriaceous and sparsely punctate
Chasmias Ashmead (p. 164)
- Clypeus at most with a very weak, apical emargination, without a central tooth or rarely with the apical margin very weakly bisinuate, in which case the central tooth reaches the line of the lateral angles of the clypeus or projects beyond this (cf. figs. 441-2); mandible variable in form but never as above (cf. *Ichneumon lugens*, fig. 430) 5



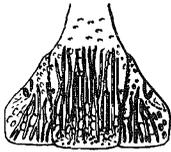
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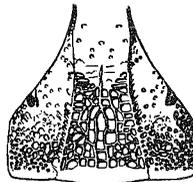
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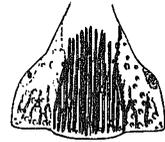
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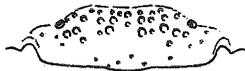
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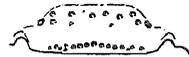
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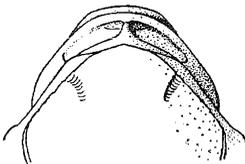
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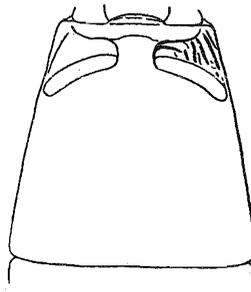
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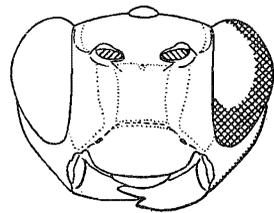
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FIGS. 435-437.—Propodeum, dorsal, ♀ : 435, *Ichneumon extensorius* ; 436, *I. primatorius* ; 437, *Barichneumon albilineatus*.

FIGS. 438-440.—Postpetiole, dorsal, *Ichneumon*, ♀ : 438, *sarcitorius* ; 439, *primatorius* ; 440, *extensorius*.

FIGS. 441-443.—Clypeus : 441, *Melanichneumon leucocheilus*, ♂ ; 442, *M. leucocheilus*, ♀ ; 443, *Barichneumon praeceptor*, ♀.

[Continued opposite

- 5 (4) Area superomedia with the sides feebly arched (figs. 435, 600-7), the anterior carina which is most usually distinct, is subequal to the distance between the lateral, basal carinae of the central area of metanotum, or is broader than this, the posterior carina subequal to the anterior or sometimes distinctly narrower; transverse basal groove of the propodeum deep laterally, the area basalis never with a central tooth or tubercle; postpetiole (figs. 438, 440) with the central area striate, usually with scattered punctures admixed, or sometimes with a narrow, subapical band of punctures (the striae of the central area of the postpetiole in some small species are weak, but in this case the striation is very regular or the area superomedia is very regularly quadrate)..... *Ichneumon* L. (p. 166)
- Area superomedia usually strongly convergent anteriorly so that the anterior side is distinctly shorter than the distance between the lateral carinae of the central area of metanotum; area basalis sometimes with a central tooth or tubercle (fig. 437); central area of postpetiole usually punctate or rugose or coriaceous; if the area superomedia has the form found in *Ichneumon*, then either the postpetiole is coriaceous or rugose or punctate, and/or the basal groove of the propodeum is extremely shallow dorsally, laterally, and sometimes with the base of the area superomedia and area basalis erased..... 6
- 6 (5) Propodeum with strong, though blunt, dentiparal spines (fig. 436).
Hind coxa with a large, ivory, dorsal spot; area superomedia conspicuously narrowed posteriorly; central area of postpetiole coarsely rugose (fig. 439); a large species, 20-22 mm.
Ichneumon primatorius Forster (p. 173)
- Propodeum at most with a dentiparal tubercle..... 7
- 7 (6) Pronotum, dorsally, centrally, with a large tubercle arising from the posterior margin of the transverse furrow (fig. 444).
Scutellum with lateral carinae to just beyond the middle; postpetiole with no raised central area, very weakly alutaceous or completely smooth with few scattered punctures towards the apex; thyridiae very broad
Barichneumon ridibundus (Gravenhorst) (p. 154)
- Pronotum at most shallowly or narrowly carinate or bicarinate in the central line, never with a tubercle..... 8
- 8 (7) Hind coxa with a series of oblique, transverse carinae beneath (figs. 500-1).
Apical tergites with a yellow, apical band, the seventh yellow above, agreeing otherwise with *Cratichneumon*
Cratichneumon Thomson (in part) (p. 141)
(*varipes* (Gravenhorst) and *magus* (Wesmaell))
- Hind coxa punctate beneath or in some species with a scopa..... 9
- 9 (8) Thyridiae very large, the space between them small, the thyridiae at least twice the breadth of the distance between the thyridiae; gastrocoeli deep, shining, with a number of more or less irregular, longitudinal striae (fig. 446) (sometimes weak in *S. rufinus* which has the lateral keels of the scutellar fovea marked with yellow), the anterior margin in the interior half raised into a strong carina; postpetiole striate or coarsely rugose, at most with subapical punctures; apical segments of gaster never marked with ivory
Stenichneumon Thomson (p. 131)
- Thyridiae often small, if very large then the gastrocoeli are closely rugose or coriaceous, or these are extremely short, or the postpetiole has the central area clearly punctate and the apical segments of gaster conspicuously marked with ivory; never with yellow or ivory marks on the lateral keels of the scutellar fovea..... 10
- 10 (9) Thyridiae very broad, the space between them narrow (figs. 494-5) (thyridiae: space between them at least 1.9:1); gastrocoeli coriaceous or very finely rugose; area superomedia large and always conspicuously rounded anteriorly; basal area of propodeum with no sharp, median tubercle though sometimes with the anterior margin weakly sinuate; basal groove of propodeum deep dorsally, laterally, though a little shallower than the central

FIG. 444.—Pronotum: *Barichneumon ridibundus*, ♀.

FIG. 445.—Head, anterior: *Barichneumon heracliana*, ♂.

FIG. 446.—Tergite 2: *Stenichneumon culpator*, ♀.

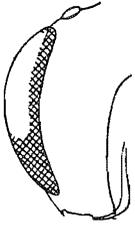
- section of the groove (except in *A. virginalis*); hind tibia never white at the base; postpetiole coriaceous with at most a few, sparse punctures, or finely rugose. **Aoplus** Tischbein (p. 134)
- Thyridiae usually much smaller, if as large as in *Aoplus*, then the gastrocoeli are not finely rugose or coriaceous or are extremely short and the hind tibia is white basally and usually the basal area of the propodeum has a sharp, median tubercle, or the basal groove of the propodeum is filled in dorsally, laterally (in a very few, aberrant species of *Ichneumon*, the area superomedia is very regularly rectangular); central area of postpetiole closely punctate or sometimes striate. 11
- 11 (10) Clypeus with the inflexed apical margin broad and flat (fig. 449).
Tergite 7 with a long, dorsal, ivory spot; similar in general facies to *Chasmodon paludator* (Desv.) **Eristicus** Wesmael (p. 150)
- Clypeus with the apical margin acute. 12
- 12 (11) Claws pectinate.
Of the general facies of *Cyclolabus pactor* (Wesm.), but with the hypopygium a little further removed from the base of the ovipositor which is conspicuously longer, and with the petiole quadrate and the claws pectinate *Platylabops pulchellatus* (Bridgman)¹⁶ (p. 141)
- Claws simple. 13
- 13 (12) Genal carina meeting the hypostomal carina at or immediately behind the base of the mandible (cf. fig. 448).
Thyridia inconspicuous, gastrocoelus small and very shallow. 14
- Genal carina meeting the hypostomal carina distinctly behind the base of the mandible (cf. fig. 447) or gastrocoelus deep. 15
- 14 (13) Sternaulus absent; clypeus broad and more coarsely punctate, somewhat produced centrally, apically (fig. 442); thyridiae absent; tergites 6 and 7 with conspicuous, ivory, dorsal spots. **Melanichneumon** Thomson (p. 150)
- Sternaulus present and deep anteriorly; clypeus narrower, more convex, with no apical projection (cf. fig. 445); thyridiae small but present; tergites 6 and 7 not marked with ivory. **Barichneumon** Thomson (in part) (p. 153)
(*peregrinator* (L.) and *heracliana* (Bridgman))
- 15 (13) Hypopygium extending further towards the apex of the gaster (fig. 428); gaster much blunter apically (fig. 469), the apical tergites black; postpetiole shining, with sparse punctures, or sometimes rather closely punctate near the hind margin, the central area weakly raised with a shallow depression centrally, and before this weakly raised in the line of the spiracles.
Propodeum with the area superomedia subparallel before the costulae, quite strongly narrowed behind these so that the straight front margin is longer than the posterior margin. Whole insect (fig. 469)
Hepiopelmus Wesmael (p. 164)
- Hypopygium further removed from the apex of the gaster (figs. 426, 429) and the gaster acuminate (figs. 547-49) or the postpetiole with quite different sculpture; postpetiole at most with the faintest indication of a depression centrally. 16
- 16 (15) Ovipositor sheaths, viewed dorsally, more than half the length of the gaster (fig. 502). **Craticheumon** Thomson (in part) (p. 141)
- Ovipositor sheaths, viewed dorsally, at most as long as tergite 1. 17
- 17 (16) Gastrocoelus deeply impressed, sometimes very short, if sometimes small and shallow then at least tergites 6 and 7 have a conspicuous, ivory spot; antenna most usually strongly attenuate apically; area superomedia always completely divided from the area basalis; area basalis of most species with a small, sharp, central tubercle (fig. 437); basal groove of propodeum never shallow laterally, dorsally; hind tibia, outwardly, never with a white subcentral spot or streak; claws with the sub-basal hairs never flattened and sinuate. 18

¹⁶ The ♂ recorded by Morley as *Barichneumon eupitheciae* (Brischke), bred from *E. helveticata*, is, from the description, a ♂ of the species that I have called *Cyclolabus pactor* (Wesm.). I have specimens of this species bred from the same host. What the true *Ichneumon eupitheciae* Brischke may be, remains in doubt and I have been unable to include this species in the keys. The specimens now standing in Morley's collection under this name are 2 ♀ *Aoplus virginalis* (Wesm.) and 2 ♂ *Platylabops pulchellatus* (Bridg.).

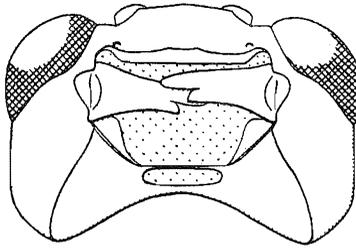
- Gastrocoelus superficial, the thyridia most usually well removed from the base of the segment (if near the base, the basal groove of the propodeum is shallow dorsally, laterally, or the claws have a large, sub-basal, flattened, sinuate seta); antenna frequently not, or only very slightly, attenuate apically; area superomedia and area basalis frequently confluent; area basalis never with a sharp, central tubercle, but basal groove of propodeum often shallow dorsally, laterally (fig. 508); hind tibia of some species with a conspicuous, white, subcentral spot or streak on the extensor surface; tergite 6 never with an ivory spot though sometimes pale and membranous apically, tergite 7 very rarely with a membranous spot. 19
- 18 (17) Area superomedia most usually conspicuously narrowed before the costulae, but with at least the anterior margin conspicuously rounded; central area of postpetiole of many species strongly, regularly punctate (*cf.* figs. 567-8); most species with a central anterior tooth in the area basalis (fig. 437). **Barichneumon** Thomson (p. 153)
- Area superomedia regularly rectangular; central area of postpetiole coriaceous or almost smooth, with few punctures; other than this, having the facies of *Ichneumon*; never with a tooth in the area basalis
cf. *Ichneumon* (p. 166)
- 19 (17) The ridge before the (superficial) gastrocoeli strongly raised and clear; area superomedia closed anteriorly and length: apical breadth at least 1.5:1, with the sides subparallel.
Large species over 12 mm. long, very similar to *Cratichneumon* but with strongly expanded middle tarsus. **Eupalamus** Wesmael (p. 149)
- The ridge before the gastrocoeli at most weakly and irregularly developed; area superomedia most usually shorter, often narrowed anteriorly or open anteriorly. 20
- 20 (19) Head strongly narrowed behind the eyes; antenna elongate and thin, acuminate apically; clypeus long and rounded apically, the supraclypeal area raised but weakly differentiated from the rest of the face (fig. 450); legs thin and elongate; postpetiole with the central area coriaceous with a few, subapical punctures.
Gaster more oval, with the hypopygium longer (similar to *Aoplus humilis* (fig. 492)); gastrocoelus strongly shining, only coriaceous along the inner margin. **Platylabops** Heinrich (p. 141)
- Head weakly narrowed or subparallel behind the eyes; antenna, if acuminate apically, then conspicuously thickened centrally; clypeus rather short and truncate apically, the supraclypeal area usually clearly differentiated from the rest of the face (*cf.* figs. 516-9); legs rather short and thick; postpetiole usually rugose or punctate or very weakly, irregularly, longitudinally striate, if coriaceous then closely punctate as well.
The long sub-basal hair of the claw sometimes flattened and in some species it is distinctly sinuate. **Cratichneumon** Thomson (p. 141)
- 21 (2) Thyridia very large, much broader than the distance between the thyridiae, and comparatively long; gastrocoelus clearly differentiated and deep. . . 22
- Thyridia either completely absent or at least narrower than the distance between the thyridiae; gastrocoelus often very shallow. 23
- 22 (21) Tergites 5-7 with a broad, ivory, apical band; head broader than the thorax measured across the outside of the tegulae; antenna conspicuously elongate; scutellum evenly rounded from base to apex and not strongly raised; postpetiole polished with rather sparse punctures
Tricholabus Thomson (p. 207)
- Tergites 6 and 7 at most with a small, central, yellow spot; head small in comparison with the thorax, narrower than the thorax across the outside of the tegulae; antenna shorter; scutellum strongly raised, roundedly angled between the more or less flat basal and apical faces (fig. 453); postpetiole with the central area longitudinally striate
Thyrateles Perkins (p. 182)
- 23 (21) Gastrocoelus not differentiated (thyridia present, variable and small) (fig. 452).
Clypeus broadly rounded apically (fig. 455). **Acolobus** Wesmael (p. 206)
- Gastrocoelus clearly differentiated though it may be shallow. 24

- 24 (23) Tergite 1 raised centrally with a strong, broad tubercle in the line of the spiracles (figs. 789-90)..... **Probolus** Wesmael (p. 204)
- Tergite 1 at most with the forward extension of the postpetiolar carinae raised into a pair of weak crests 25
- 25 (24) Gaster strongly, laterally compressed in the apical half (fig. 468); clypeus weakly excised apically and with a median, subapical tooth (fig. 456)
Limerodes Wesmael (p. 202)
- Gaster sometimes elongate and tapering but not compressed (*cf.* fig. 714); clypeus never of the above form 26
- 26 (25) Postpetiole polished between the clearly defined punctures (*cf.* couplet 15)
Hepiopelmus Wesmael (p. 164)
- Postpetiole with the central area longitudinally striate or rugose 27
- 27 (26) Gastrocoelus deep or very deep (fig. 451); tergites 6 and 7 never with an ivory, dorsal spot (the gastrocoelus is smaller and shallower in *C. panzeri*).
Thyridia absent **Ctenichneumon** Thomson (p. 182)
- Gastrocoelus shallow or superficial; tergites 6 and 7 of a number of species with ivory, dorsal spots 28
- 28 (27) Mandible broad, somewhat constricted towards the base (*cf.* figs. 661-2, 664-5); pronotum with a weak, transverse groove, the area between this and the front margin broader (fig. 461).
Antenna short; area superomedia conspicuously elongate and not closed posteriorly (fig. 463); front and middle tibiae with strong, short spines
Spilichneumon Thomson (p. 184)
- Mandible narrowing from base to apex; pronotum with a deep, transverse, dorsal groove, the area before this narrow 29
- 29 (28) Tergites 5, 6 and 7 with a central, apical, ivory spot (as in *Ichneumon*); front and middle tibiae with long and thin setae 30
- If, in a few species, tergites 5, 6 and 7 have a central, apical, ivory spot, then the spines of the front and middle tibiae are conspicuously thickened. (A number of species have a narrow, ivory or yellow, transverse, apical band on tergites 5 and 6 which occupies much more than half the breadth of the segment) **Amblyteles** Wesmael (p. 189)
- 30 (29) Hypopygium a little further removed from the apex of the gaster, so that when viewed ventrally, tergite 7 can be seen between the apex of the hypopygium and the ovipositor sheaths (fig. 459); tergites 2 and 3 with coarse punctures which on the third segment are rather constant in size from base to apex **Amblyteles** Wesmael (in part) (p. 189)
(*punctus* (Grav.) and *fabricii* (Grav.))
- Hypopygium more protruding, so that its apex covers tergite 7 ventrally and touches the ovipositor sheaths (fig. 460); tergites 2 and 3 much more finely punctate, tergite 3 apically much more sparsely punctate than basally
Spilichneumon Thomson (in part) (p. 184)
(*raptorius* (L.) and *septemguttatus* (Grav.))
- (Males)
- 1 Hypopygium intumescent centrally, apically, so that the rather broad, median projection is strongly convex with the margin flat and depressed (fig. 467).
Penis valve with a rounded apical hook, rough beneath and the inner margin serrate (fig. 466) **Tricholabus** Thomson (p. 207)
- Hypopygium never with a central swelling 2
- 2 (1) Gaster with tergites 2 and 3 black with the apical margin broadly yellow, the line of the junction being conspicuously bisinuate, the apical segments conspicuously marked with yellow (fig. 575).
Hind femur red, conspicuously black in the apical quarter to half; sternite 4 with a weak, central fold which in dried specimens is often indistinguishable
Ichneumon sarcitorius L. (p. 180)
- If the gaster has both tergites 2 and 3 black and yellow, then the black on at least one of the segments is apical and not basal, or the apical segments are entirely black 3

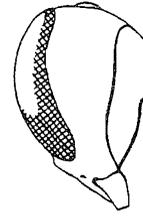
FIGS. 455-458.—Clypeus: 455, *Acolobus sericeus*, ♀; 456, *Limerodes arctiventris*, ♀; 457, *L. arctiventris*, ♂; 458, *Exephanes ischioxanthus*, ♂.



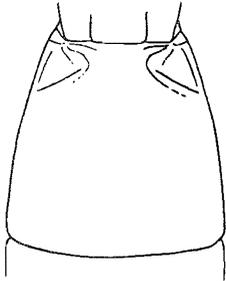
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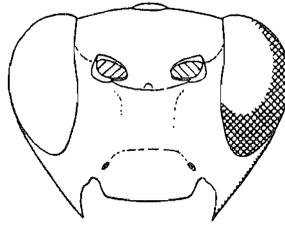
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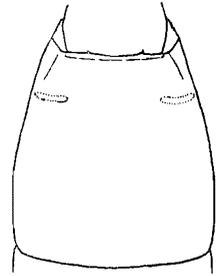
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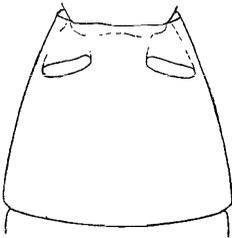
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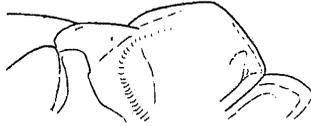
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FIGS. 447-448.—Head, posterolateral, *Barichneumon*, ♂: 447, *praeceptor*; 448, *heracliana*.

FIG. 449.—Head, ventral: *Eristicus clericus*, ♂.

FIG. 450.—Head, anterior: *Platylabops apricus*, ♀.

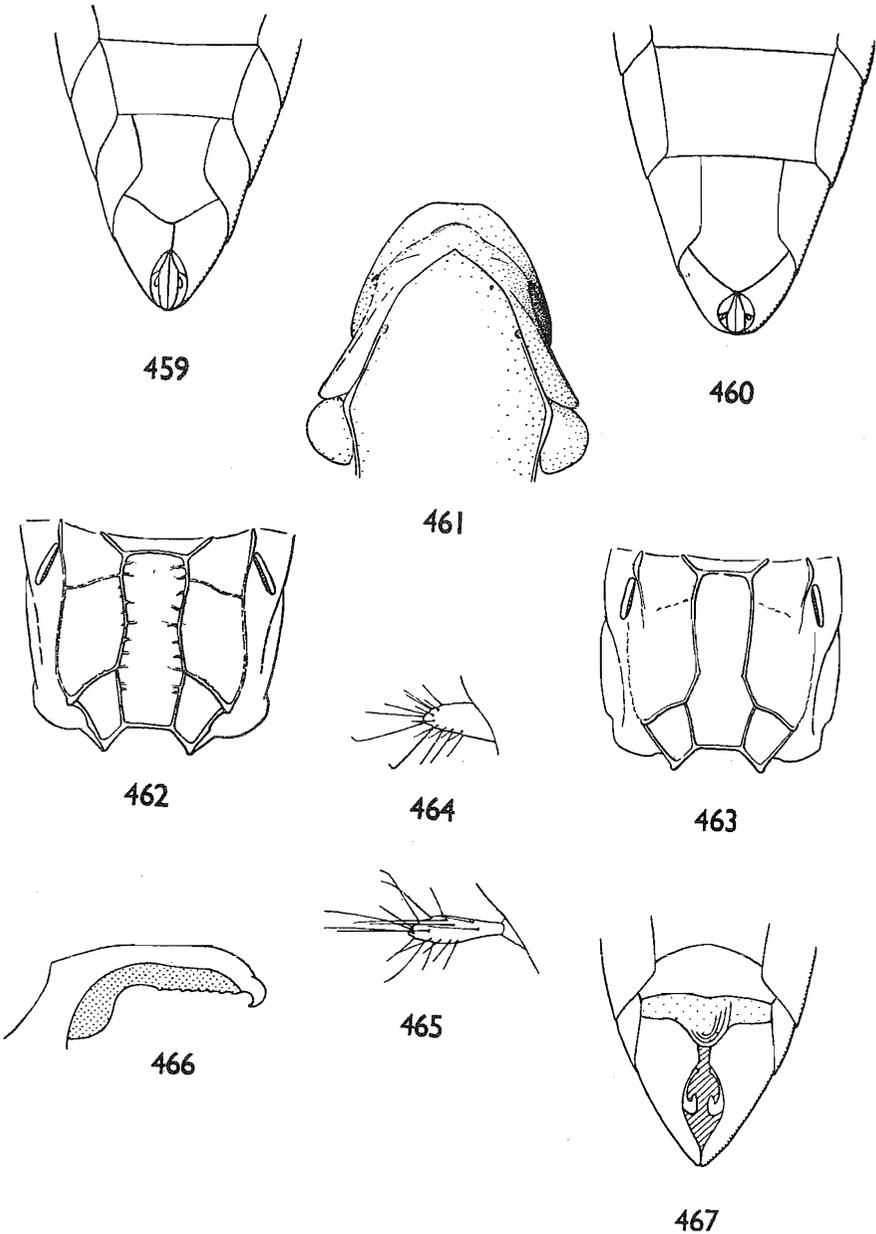
FIGS. 451-452.—Tergite 2, ♀: 451, *Ctenichneumon castigator*; 452, *Acolobus sericeus*.

FIG. 453.—Scutellum, lateral: *Thyrateles camelinus*, ♀.

FIG. 454.—Tergite 2: *Platylabops apricus*, ♂.

[Continued opposite

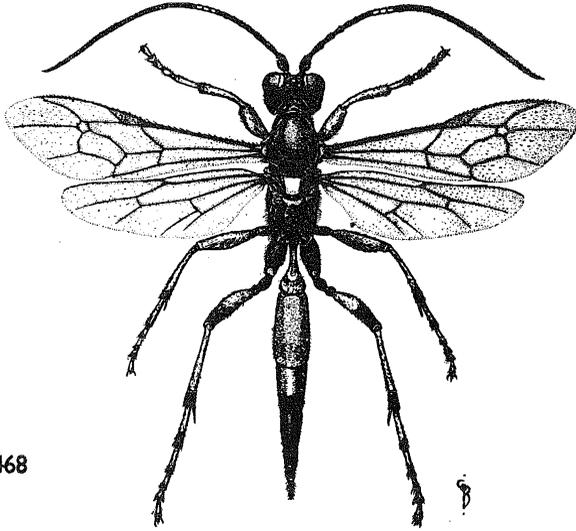
- 3 (2) Thyridia distinct (sometimes in *Barichneumon* very small or minute and in *Melanichneumon* absent, when the central area of the postpetiole is clearly punctate and neither rugose nor striate); sternite 4 with a median, longitudinal fold or in some specimens with a membranous, longitudinal band; hypopygium at most weakly produced centrally. 4
- Thyridia absent, or only vaguely represented by a very narrow, irregular, transverse line, or sternite 4 has no median, longitudinal fold and is evenly sclerotized, or the hypopygium is produced apically into a long process.
Central area of postpetiole with the general sculpture striate or rugose, with only few, sparse punctures. 26
- 4 (3) Mandible thin and conspicuously twisted apically (*cf.* fig. 473).
Clypeus strongly convex and with no apical keel; propodeum with the dentiparal spines strongly developed (fig. 470); thyridiae at least as far apart as the breadth of a thyridia; tergite 7 and genital claspers not marked with ivory. *Hoplismenus* Gravenhorst (p. 131)
- Mandible sometimes somewhat thin, but at most weakly twisted, or sometimes unidentate 5
- 5 (4) Genal carina meeting the hypostomal carina at or immediately adjacent to the base of the mandible (fig. 448). 6
- Genal carina meeting the hypostomal carina at least at a short distance from the base of the mandible (fig. 447). 7
- 6 (5) Sternaulus absent; clypeus broad and with a median, apical tubercle (fig. 441); tergite 7 with a conspicuous ivory spot; thyridia absent
Melanichneumon Thomson (p. 150)
- Sternaulus deeply impressed anteriorly; clypeus narrower, more convex and with no median, apical tubercle (fig. 445); tergite 7 without an ivory mark; thyridia small, but distinct
Barichneumon Thomson (in part) (p. 153)
(*peregrinator* (L.) and *heracliana* (Bridgman))
- 7 (5) Mandible broad, scarcely narrowed from near the base to the apex, in the basal half with a shallowly depressed, punctate area (*cf.* fig. 431).
Central area of postpetiole striate; gastrocoelus deep and the thyridia at least as broad as the distance between the thyridiae. Face (fig. 433)
Chasmius Ashmead (p. 164)
- Mandible most usually conspicuously narrow, if somewhat broad then the base of the mandible is evenly convex and punctate (some *Ichneumon* spp.). 8
- 8 (7) Pronotal furrow interrupted by a large, shining, central tubercle arising from the posterior margin (fig. 444); mandible unidentate (fig. 540)
Barichneumon ridibundus (Gravenhorst) (p. 159)
- If the pronotal furrow is more or less interrupted centrally, then the mandible is bidentate. 9
- 9 (8) Thyridia very large, breadth: distance between the thyridiae at least 2.25:1, they also extend almost to the lateral margin of the segment; postpetiole striate, rugose or coriaceous; hind tibia never white basally. 10
- Thyridia always smaller; breadth: distance between thyridiae less than 2:1; doubt may be experienced with some species of *Barichneumon*, when either the postpetiole is clearly punctate with only very indistinct surface sculpture between the punctures, or the hind tibia is white at the base. 13
- 10 (9) Gastrocoelus deep, shining, more or less longitudinally costate (*cf.* fig. 446).
Spiracle of tergite 2 well removed from the lateral margin
Stenichneumon Thomson (p. 131)
- Gastrocoelus shallow, coriaceous or finely rugose, or (in *Aoplus rubricosus*) rugose and not or hardly differentiated from the area between the gastrocoeli. 11
- 11 (10) Mesoscutum coriaceous between the punctures. *Aoplus* Tischbein (p. 134)
- Mesoscutum polished between the punctures. 12
- 12 (11) Hind tibia black with a white, basal mark
cf. *Barichneumon locutor* (Thunberg) (p. 160)
- Hind tibia white or yellow, black at the base and apex
cf. *Cratichneumon* Thomson (p. 141)
- 13 (9) Postpetiole with the central area, though raised, very weakly differentiated from the lateral areas, shining and usually clearly punctate centrally; scutellum very strongly convex and mesoscutum very closely and rather



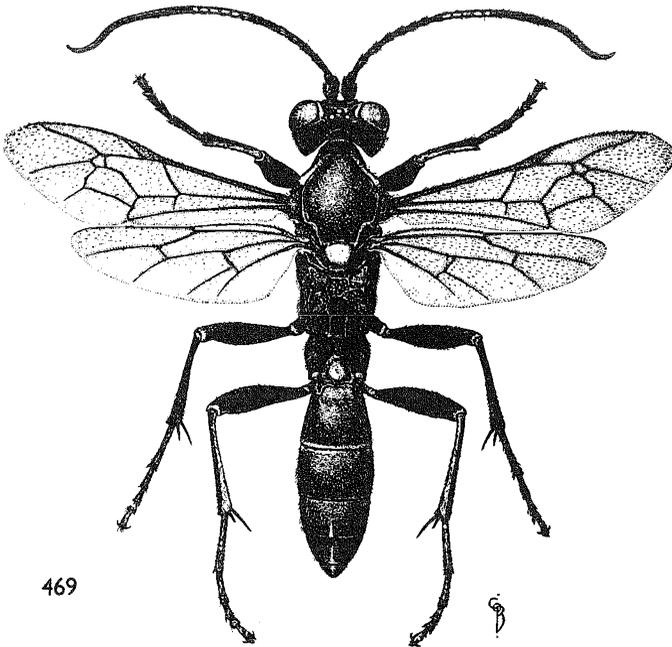
FIGS. 459-460.—Apex of gaster, ventral, ♀: 459, *Amblyteles punctus* ;
 460, *Spilichneumon raptorius*.
 FIGS. 461-463.—*Spilichneumon occisorius* : 461, pronotum, ♀; 462, propodeum,
 dorsal, ♂; 463, propodeum, dorsal, ♀.
 FIGS. 464-465.—Pygostyle, ♂: 464, *Amblyteles palliatorius* ; 465, *Exephanes occupator*.
 FIGS. 466-467.—*Tricholabus strigatorius*, ♂: 466, penis valve, lateral; 467, apex of
 gaster, ventral (hypopygium stippled).

- finely punctate; area superomedia quadrate, laterally arched, a little narrower behind than in front; costula weak, received a little before the middle of the side of the area superomedia; first segment of front tarsus with no ventral, apical tooth; gastrocoelus rather deep; apical tergites black. **Hepiopelmus** Wesmael (p. 164)
- Postpetiole with the central area usually clearly differentiated from the more flattened, lateral areas, most usually striate, rugose or coriaceous; if punctate, then either coriaceous between the punctures and dull, or the apical tergites have conspicuous, ivory spots or bands, or the area superomedia is conspicuously transverse and the gastrocoelus shallow, or the area superomedia is conspicuously narrowed anteriorly, or the first segment of front tarsus with a conspicuous, ventral, apical thorn (*cf.* fig. 563), or the scutellum is only weakly convex and the mesoscutum is less densely and more coarsely punctate 14
- 14 (13) Claws pectinate.
The broad scutellum with strongly raised, lateral carinae in the basal half, strongly arched from base to apex; having the general facies of *Cyclolabus pactor* (Platylabini) and similar to this species in the structure of the head, but with the petiole quadrate, the antenna conspicuously thickened and the claws pectinate
Platylabops pulchellatus (Bridgman) (p. 141)
- Claws with no pecten 15
- 15 (14) Propodeum with the area basalis with a median tubercle or carina projecting into the basal groove¹⁷ (*cf.* fig. 437).
Postpetiole, centrally, most usually punctate, rarely irregularly striate or almost smooth; area superomedia narrowed or conspicuously rounded anteriorly; basal groove of propodeum deep; never with the long, sub-basal hair of the claw flattened and sinuate; gastrocoelus usually deep; many species have the apical tergites with conspicuous, ivory spots or bands. **Barichneumon** Thomson (p. 153)
- Propodeum with the area basalis at most with the anterior margin weakly bisinuate 16
- 16 (15) Scutellum strongly carinate laterally; flagellum with a white band (except rarely as an aberration); hind tarsus conspicuously marked with ivory; tergites 6 and 7 and genital claspers marked with ivory
Barichneumon sanguinator (Rossi) (p. 160)
- If, very rarely, the scutellum is carinate laterally, then with much less profuse ivory markings 17
- 17 (16) Clypeus with a broad, apical, inflexed margin and thus blunt (fig. 449)
Eristicus Wesmael (p. 150)
- Clypeus acute apically 18
- 18 (17) Outer orbits never marked with ivory or yellow; frons, above the rather shorter and usually deeper antennal scrobes, in greater part rugose or rugose punctate with the rugae shining; claws at most with one of the sub-basal setae weakly flattened and very weakly thickened; postpetiole, centrally, most usually rather evenly, longitudinally striate, often with an admixture of sparse punctures, rarely coarsely rugose; gastrocoelus impressed and very often deep, never groove-like. 19
- Outer orbits most usually marked with ivory or yellow; frons dorsal above the rather longer antennal scrobes with distinct interspaces (which are most usually dull and coriaceous) between the punctures (rarely subrugose on a small area in front of the anterior ocellus); claws sometimes with a differentiated, long, sinuate, sub-basal seta; postpetiole most usually rugose, punctate or coriaceous, rarely irregularly striate centrally; gastrocoelus shallow or superficial or reduced to a groove on the outer side 21
- 19 (18) At least tergite 7 with a dorsal, apical, ivory spot; tergites 2 and 3 strongly, longitudinally striate centrally, with the area on each side of this, in greater part, with rather sparse punctures, the interspaces in part being as large as the diameter of a puncture. **Ambyteles** Wesmael (in part) (p. 189)
(*punctus* (Grav.) and *fabricii* (Schrank))

¹⁷ This character is difficult to appreciate in some specimens, particularly of *B. gemellus*; this species, however, can be readily recognized in having the middle femur broadly excised apically.



468



469

FIG. 468.—*Limerodes arctiventris*, ♀.
 FIG. 469.—*Hepiopelmus leucostigmus*, ♀.

- If tergite 7 has an ivory spot, then the area on each side of the less strong median striation of tergites 2 and 3 is closely punctate 20
- 20 (19) Scutellum black, strongly raised with a declivous anterior and posterior face and not flattened dorsally (cf. fig. 453) *Thyrateles* Perkins (p. 182)
- If, rarely, the scutellum is black, then it is flattened dorsally
- 21 (18) Scutellum with strongly raised lateral carinae extending to the middle
Ichneumon L. (p. 166)
- Scutellum at most with very weak, lateral carinae at the base 22
Platylabops Heinrich (p. 141)
- 22 (21) Clypeus strongly rounded anteriorly and usually weakly, angularly produced centrally (cf. fig. 455); gastrocoelus not differentiated (cf. fig. 452), thyridia very small, round *Acolobus* Wesmael (p. 206)
- Clypeus truncate or very weakly emarginate apically; gastrocoelus differentiated, though shallow or sometimes only represented by a groove 23
- 23 (22) Antenna not crenulate and never with a white band; head with the temples strongly converging behind the eyes; postpetiole centrally, irregularly, longitudinally striate; thyridia very small when present
 cf. *Amblyteles* Wesmael (in part) (p. 189)
- Antenna conspicuously crenulate particularly in the apical half (fig. 531), or with a white band; head with the temples weakly and convexly converging behind the eyes; postpetiole most usually punctate or irregularly rugose, rarely more or less longitudinally striate; thyridia always conspicuous 24
- 24 (23) Thyridia about three times as broad as the distance between the thyridiae; hind tibia with a white band in about the basal fifth; head with the orbits of the vertex with a large, yellow spot
Barichneumon locutor (Thunberg) (p. 160)
- Most usually with the thyridia less than one and a quarter times the distance between the thyridiae; if rarely larger than this, then either the hind tibia is not white marked basally or the vertex has no yellow, orbital spots 25
- 25 (24) Area superomedia with the lateral carina longer than the breadth at the posterior carina; tergite 3 with even, rather deep, regular punctures from base to apex *Eupalamus* Wesmael (p. 149)
- Area superomedia most usually conspicuously transverse; if rarely, longer than the breadth at the apical carina, then tergite 3 has no clearly defined punctures in the posterior third *Craticheumon* Thomson (p. 141)
- 26 (3) Central area of tergite 1 raised into a cone at the line of the spiracles (cf. fig. 790) *Probolus* Wesmael (p. 204)
- Central area of tergite 1 at most with the lateral carina somewhat raised at the line of the spiracles 27
- 27 (26) Thyridia large and conspicuous, gastrocoelus deep; hind tibia in the basal half, dorsally, white to the extreme base; abdomen black, slightly metallic; hypopygium with a distinct, but short, projection; sternite 4 usually with a distinct, central fold, but in some very dark, dried specimens this is not visible cf. *Ichneumon deliratorius* L. (p. 180)
- If the gastrocoelus is deep, then either the thyridia is completely absent or the hypopygium has a very long, spine-like, apical process; hind tibia most usually marked with yellow, if in a few species, white, then the base as well as the apex of the tibia is black or the gaster is conspicuously marked with red centrally 28
- 28 (27) Gastrocoelus deeply impressed and broad (thyridia completely absent) (cf. fig. 451); hypopygium never with an apical projection; sternite 4, and sometimes 3, evenly sclerotized.
- Flagellar segments, except the first, subapically expanded beneath
Ctenichneumon Thomson (p. 182)
- Gastrocoelus shallow or superficial, if somewhat deep, then the hypopygium has a very strong, central projection (cf. figs. 747-8); sternite 4 of many species with a median, longitudinal fold or membranous area 29
- 29 (28) Clypeus with a small but distinct apical, central tooth (fig. 457)
Limerodes Wesmael (p. 202)
- Clypeus with no tooth (cf. fig. 458) 30
- 30 (29) Hypopygium with no apical projection (cf. fig. 750) 31
- Hypopygium with an apical projection (cf. figs. 677-9, 783-4) 32

- 31 (30) At least tergite 7 with a conspicuous, median, apical, ivory spot; tergites 2 and 3 yellow or testaceous. *Spilichneumon* Thomson (in part) (p. 184)
(*septemguttatus* (Grav.) and *raptorius* (L.))
— Apical tergites without ivory marks though sometimes with the apical segments having a yellow, apical band; if with ivory spots (*A. oratorius* (F.)) then tergites 2 and 3 are black with, sometimes, white markings
Amblyteles Wesmæel (p. 189)
- 32 (30) Pygostyles, apically, with a small tuft of long, black hairs which are at least as long as segment 4 of the middle tarsus (fig. 465).
Sternites 2, 3 and 4 with a median, longitudinal fold (or membranous area); area superomedia usually elongate. *Exephanes* Wesmæel (p. 202)
— Pygostyles, apically, with spreading hairs, and the longest hairs are conspicuously shorter than segment 4 of the middle tarsus (fig. 464). 33
- 33 (32) Area superomedia conspicuously longer than its apical breadth, often evenly rounded into the petiolar area (fig. 462).
Sternites 2 and 3 with a median, longitudinal fold, sternite 4 evenly sclerotized *Spilichneumon* Thomson (p. 184)
— Area superomedia quadrate or transverse, conspicuously divided from the petiolar area. 34
- 34 (33) Hypopygium with a conspicuous, central projection which is truncate or weakly excised apically (fig. 677)
Spilichneumon johansonii (Holmgren) (p. 187)
— Hypopygium sometimes with a central, apical projection but this is not truncate apically. *Amblyteles* Wesmæel (p. 189)

Genus *Hoplismenus* Gravenhorst

There is much confusion in the names that should be applied to the two species recognized below. The males are easy to determine, the females present considerable difficulty. The males of the British species have the hind tibia white banded; the females have black antennae with a white band centrally and the inner orbits of the eyes ivory marked; the scutellum is ivory, or marked with ivory, in both sexes.

Species of the genus have been reared from Vanessids and Satyrids.

KEY TO SPECIES

- A ♂. Scutellum strongly raised (fig. 474), the lateral carinae strong on the antero-dorsal surface, when viewed at right angles to this surface, and with a strong, apical carina separating it from the strongly declivous, apical portion (fig. 471); face at most with the orbits white, clypeus black; gaster black sometimes with tergites 1 and 2 in part and 3-6 entirely red. 11-12 mm.
♀. A larger species, 10-11 mm.; gaster usually black or with tergites 2, 3 and 4 in part or wholly red. *Rather rare*. *bidentatus* (Gmelin)
- B ♂. Scutellum less strongly raised and with weak, lateral carinae, with no transverse carina (fig. 472); face usually entirely white, rarely with conspicuous, black markings, clypeus usually entirely white; gaster usually entirely red except for the first and one or two apical tergites, rarely more extensively marked with black. 7-8 mm.
♀. A smaller species, 7-9 mm.; gaster most usually red with only the petiole black; tergites 5, 6 and 7 rarely somewhat infuscate (fig. 470). *Not uncommon*. *albifrons* (Gravenhorst)

Genus *Stenichneumon* Thomson

The five British species of this genus are abundantly distinct, though certain of the species may be confused with other genera.

Heinrich (1951, *Bonner Zoologische Beiträge* 1951: 253) has placed *rufinus*, *lineator* and *scutellator* in *Coelichneumon*, but the form of the clypeus

and area basalis of the propodeum as well as the less rounded area dentipara seem to relate the species more with *Stenichneumon*, where they were placed by Thomson, than with *Coelichneumon*. *S. lineator* and *scutellator* will probably be placed in a separate genus eventually. The British species most likely to be confused with *Coelichneumon* is *S. rufinus*, and this I have also included in the key to that genus. *S. culpator* and *militarius* are parasites of Plusiidae, *lineator* is a common parasite of the Magpie moth.

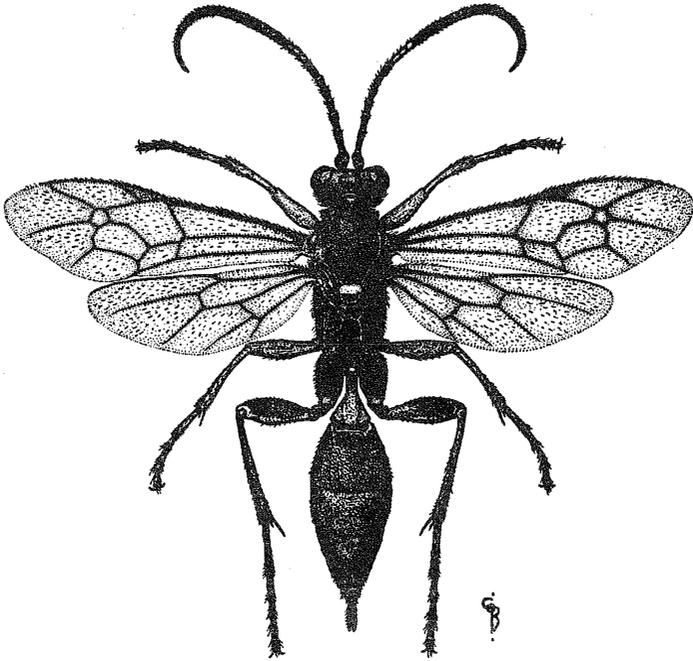
KEY TO SPECIES

(Females)

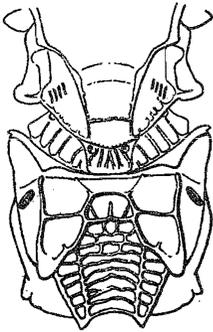
- Hind coxa beneath with a large, blunt tooth (fig. 475).
 Flagellum with a white ring; subalar prominence sharply angled anteriorly (fig. 476); tergites 2 and 3 sometimes red; tibiae sometimes red marked. 13-15 mm. *Abundant*.....**culpator** (Schrank)
- Hind coxa with no trace of a tooth.....2
- 2 (1) A bluish-black species with the tibiae broadly banded with white; scutellum entirely white; subalar prominence sharply angled anteriorly (cf. fig. 476). Area superomedia less strongly contracted anteriorly. 13-15 mm. *Uncommon*.....**militarius** (Thunberg)
- Tibiae red or fuscous; scutellum black with either the sides yellow or the basal carinae ivory; subalar prominence evenly rounded anteriorly (fig. 477).....3
- 3 (2) Scutellar fovea with the lateral carinae ivory marked; scutellum sometimes narrowly ivory laterally; tergite 3 with a deep, basal, transverse impression which is strongly, longitudinally carinate; frontal orbits narrowly ivory, separated from the narrow vertical and upper, outer, orbital stripe; gaster red with tergite 1 in part or wholly black.
 Femora red with the hind femur black apically varying to almost entirely black; tibiae in part red in paler specimens. c. 10 mm. *Uncommon*
**rufinus** (Gravenhorst)
- Scutellar fovea with the lateral carinae black; scutellum normally margined with ivory laterally; tergite 3 weakly impressed basally and the impression at most longitudinally carinate only in the middle; frontal orbits usually ivory, and often with an ivory, orbital spot on the vertex; tergites black in British examples.....4
- 4 (3) Stigma black; temples narrower (fig. 482), measured behind the eye the greatest breadth is at most equal to the length of the first flagellar segment; genal carina meeting the hypostomal carina conspicuously behind the base of the mandible; hind femur and tibia normally black, sometimes both red, black apically. 11-12 mm. *A common parasite of Abraxas grossulariata (L.)*.....**lineator** (F.)
- Stigma pale; temples less narrowed behind the eyes (fig. 483), the greatest breadth is about one and one-third times as long as the first flagellar segment; genal carina meeting the hypostomal carina immediately behind the base of the mandible; hind femur and tibia red. 10-11 mm. *Rare (Dorset)*
**scutellator** (Gravenhorst)

(Males)

- 1 Hind tibia with a broad, white band; middle femur sharply excised beneath towards the apex so that the femur appears to be bluntly toothed at the proximal end of the excision (fig. 480); scutellum entirely ivory.
 The general colour somewhat bluish. 14-17 mm...**militarius** (Thunberg)
- Hind tibia red or fuscous; middle femur not sharply excised towards the apex, the proximal end of the excision evenly rounded (fig. 481); scutellum at most ivory laterally and apically.....2
- 2 (1) Scutellum black; antenna most usually white banded; face and clypeus black; stigma testaceous.
 Tergites 2 and 3 sometimes red; hind tibia sometimes in part red. 17-18 mm.**culpator** (Schrank)



470



471



472



a



b

473



474

FIG. 470.—*Hoplismenus albifrons*, ♀.

FIGS. 471-474.—*Hoplismenus*: 471, *bidentatus*, ♂, scutellum and propodeum, dorsal; 472, *albifrons*, ♂, scutellum, dorsal; 473, *bidentatus*, ♀, mandible; a, showing maximum size of teeth, b, viewed directly on basal third to show twisting; 474, *bidentatus*, ♂, mesoscutum and scutellum, lateral.

- Scutellum and/or the lateral carinae of the scutellar fovea marked with ivory; antenna very rarely with a white band; face and clypeus ivory laterally, and usually ivory beneath the antennal sockets and on frontal orbits; stigma most usually black. 3
- 3 (2) Temples broad (*cf.* fig. 483), their greatest width, behind the eyes, about one and a half times the length of the second middle tarsal segment; front and middle coxae (and trochanters narrowly) ivory marked.
Vertex with a small ivory spot; upper margin of pronotum laterally, conspicuously marked with ivory; femora and tibiae red. 12 mm.
scutellator (Gravenhorst)
- Temples narrow (*cf.* fig. 482), their greatest width, behind the eyes, subequal in length to the second middle tarsal segment; front and middle coxae without ivory markings. 4
- 4 (3) Flagellum with no tyloidae on segments 7 and 8; gaster black with at most the apices of the tergites narrowly red; lateral carinae of the scutellar fovea most usually black (if with a yellow spot then the antenna is white banded); the tubercle at the base of the area basalis of the propodeum weak (fig. 479); vertical orbit with a small, yellow spot; upper margin of pronotum ivory only in the hind angle; femora and tibiae usually black, sometimes red except for the apex. 11-14 mm. **lineator** (F.)
- Flagellum with tyloidae on segments 7 and 8; gaster with tergites at least apically and laterally red; lateral carina of the scutellar fovea with a distinct ivory mark; antenna never with a white ring; the tubercle at the base of the area basalis of the propodeum distinct (fig. 478); outer orbits narrowly ivory; upper margin of pronotum, laterally, ivory; legs mostly black, the red usually distinct on the front and middle pair. 9-10 mm.
rufinus (Gravenhorst)

Genus *Aoplus* Tischbein

The species of *Aoplus* are, on the one hand, similar to *Stenichneumon*, and on the other to *Cratichneumon*. I have placed *Ichneumon humilis* Wesmael tentatively in this genus but in the form of the gaster of the female it approaches *Platylabops apricus* (Grav.). The British species divide into four groups: the *humilis* group (with *A. speciosus*) having a very strong interantennal tubercle and the genal carina very strongly incurved; the *ratzeburgii* group (*ratzeburgii*, *virginalis*) with a very deep, anterior groove in the pronotal collar; the *castaneus* group (*castaneus*, *defraudator*, *altercator*) with a very weak interantennal tubercle, less strongly incurved genal carina, narrower anterior groove of pronotum and the female with no white spot on tergite 7 (*lariciatae* appears to belong to this group); the *ochropis* group (*ochropis*, *rubricosus*, *ruficeps*) in which tergite 7 of the female has a white, membranous, dorsal spot and the male has white banded antennae. It is this last group which approaches *Cratichneumon*, in which *rubricosus* and *ruficeps* have formerly been placed in this country, the remainder having been put in *Stenichneumon* except *humilis* in *Barichneumon*.

The flagellum of the female most usually has a white band or stripe. The males most usually have the scutellum marked with ivory. No clear differences have been found between certain of the males so that the key to species of this sex is of a very tentative nature.

The species are parasites of Geometrids.

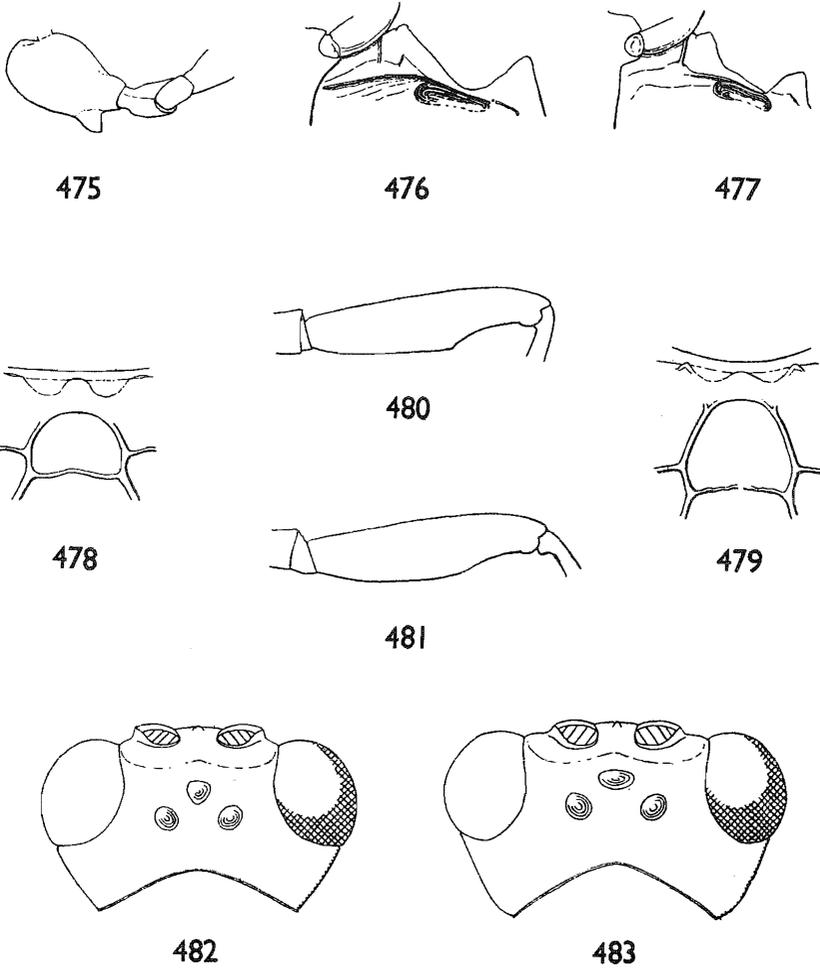
KEY TO SPECIES

(Females)

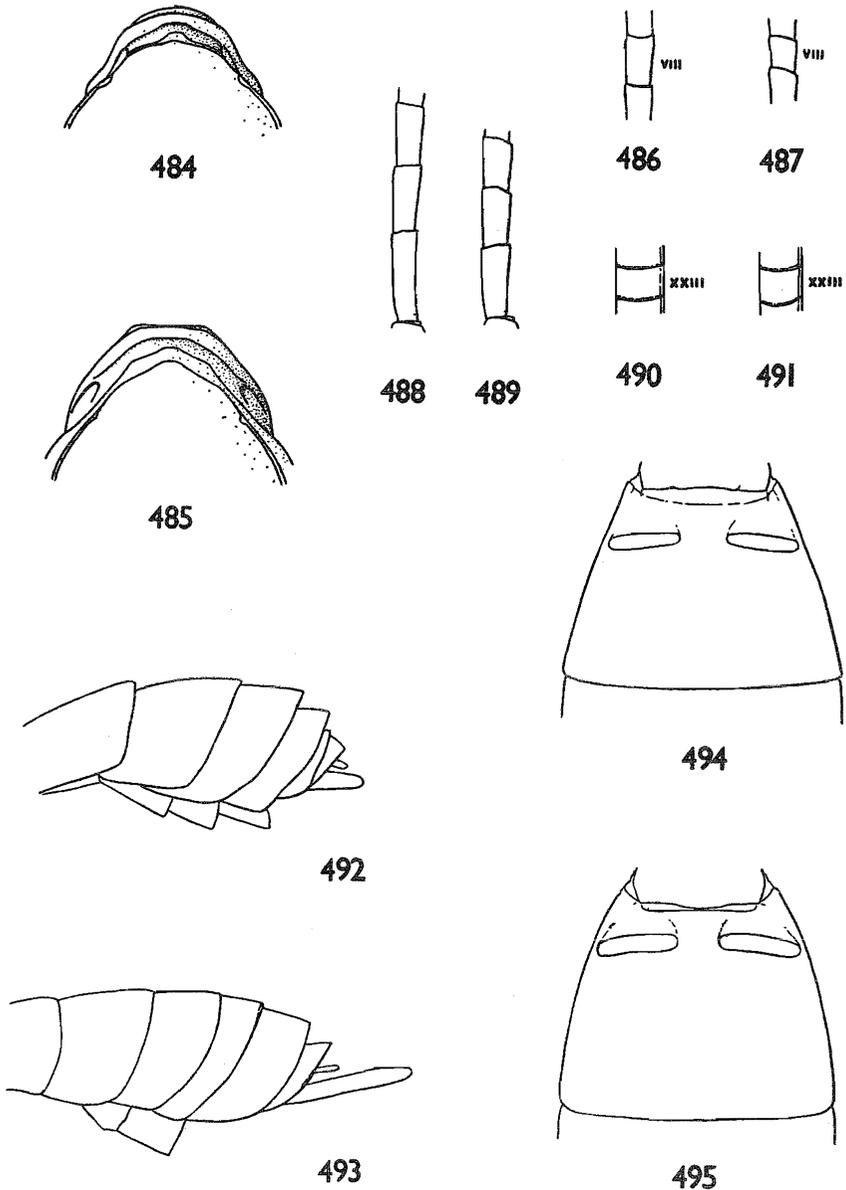
- 1 Tergite 6 with a small, central, apical, membranous, ivory spot, tergite 7 with a large and very conspicuous, apical, membranous, ivory spot; subalar

prominence not ivory marked though sometimes red.

Head and thorax dorsally often red or conspicuously marked with red. . 2
 Tergites 6 and 7 with no trace of white markings; subalar prominence most
 usually ivory marked. 4



FIGS. 475-483.—*Stenichneumon*.
 FIG. 475.—*culpator*, ♀; hind coxa, lateral.
 FIGS. 476-477.—Subalar prominence, ♀: 476, *culpator*; 477, *rufinus*.
 FIGS. 478-479.—Area superomedia, ♂: 478, *rufinus*; 479, *lineator*.
 FIGS. 480-481.—Mid-femur, posterior, ♂: 480, *militarius*; 481, *culpator*.
 FIGS. 482-483.—Head, dorsal, ♀: 482, *lineator*; 483, *scutellator*.



FIGS. 484-495.—*Aoplus*, ♀.

FIGS. 484-485.—Pronotum, dorsal : 484, *ratzeburgii* ; 485, *castaneus*.

FIGS. 486-487.—Flagellar segment 8 : 486, *ochropis* ; 487, *ruficeps*.

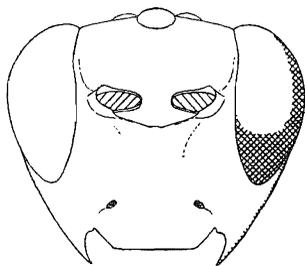
FIGS. 488-489.—Flagellar segments 1-3 : 488, *castaneus* ; 489, *altercator*.

FIGS. 490-491.—Flagellar segment 23 : 490, *defraudator* ; 491, *castaneus*.

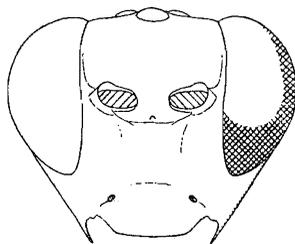
FIGS. 492-493.—Apex of gaster, lateral : 492, *humilis* ; 493, *altercator*.

FIGS. 494-495.—Tergite 2, dorsal : 494, *rubricosus* ; 495, *ruficeps*.

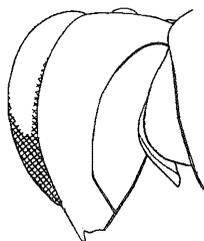
- 2 (1) Antenna elongate, strongly attenuate apically and with segment 8 conspicuously elongate (fig. 486) (length : breadth about 1.5 : 1) ; head and thorax usually with few red markings, sometimes with head, mesoscutum, scutellum and dorsum of propodeum red.
 Basal tergites of gaster usually reddish marked ; legs usually extensively red and sometimes almost entirely so. 7-10 mm. *Common*
- ochropis** (Gmelin)
- Antenna rather short, very slightly attenuate apically and with segment 8 subquadrate (fig. 487) ; thorax dorsally, extensively red marked. 3
- 3 (2) Thyridia very broad (fig. 495), breadth of thyridia : distance between thyridiae about 3 : 1 ; a more slender species ; hind coxa with a strong scopa ; head and dorsum of thorax most usually largely red, gaster red ; legs red with the coxae and trochanters usually in part infusate. c. 10 mm. *Rare*
- ruficeps** (Gravenhorst)
- Thyridia much less broad (fig. 494), breadth of thyridia : distance between thyridiae about 1.9 : 1 ; a more robust species ; hind coxa with no scopa, shining beneath, where there are large, scattered punctures ; gaster with the central segments often reddish marked ; front and middle legs with the femora, tibiae and tarsi extensively testaceous, of the hind legs more infusate and sometimes black. c. 9 mm. *Rare, apparently northern*
- rubricosus** (Holmgren)
- 4 (1) All the coxae conspicuously marked with ivory ; basal groove of propodeum interrupted dorsolaterally.
 Flagellum a little attenuate apically ; temples strongly rounded behind the eyes though short and the frons somewhat intumescent ; inner orbits and lower, outer orbits ivory marked, large orbital spots on vertex ivory ; upper margin of pronotum with a long, ivory line in the hind angle ; front and middle trochanters marked with ivory, femora, tibiae and tarsi red, sometimes more or less infusate ; tergites 2-4/5 and apex of tergite 1 red. 6-7 mm. *Rare* **virginalis** (Wesmael)
- At least the hind coxa black, sometimes marked with red ; basal groove of propodeum deep dorsolaterally (except *ratzeburgii*) 5
- 5 (4) Subapical flagellar segments at least one and a half times as broad as long (fig. 490).
 Frontal orbits ivory ; upper margin of pronotum with a long, yellowish stripe in the hind angle ; mesoscutum black, scutellum red, usually white in the apical half ; stigma infusate ; legs, except coxae and trochanters, sometimes red varying to infusate in large part ; tergites 1-4 red varying to these segments in large part infusate or black. (Very similar to *castaneus*.) 8-10 mm. *Not uncommon* **defraudator** (Wesmael)
- Subapical flagellar segments less than one and a quarter times as broad as long (fig. 491) 6
- 6 (5) Pronotum and mesothorax at least in part, usually in greater part, red, conspicuously marked with yellow ; head conspicuously yellow marked ; pronotal collar, centrally, with a deep, anterior groove (fig. 484) ; antenna a little more slender, often with no white, central band ; stigma a little broader and darker ; scutellum more flattened dorsally ; petiolar area distinctly impressed centrally.
 Hind coxa with a scopa ; front and middle coxae sometimes ivory marked, hind coxa and trochanter often red marked, legs otherwise red but frequently more or less marked with fuscous ; gastrocoelus very short ; gaster red with tergite 1 black basally, rarely tergite 2 is infusate basally. 7-10 mm. *Not uncommon, on Geometrids on Pinus* **ratzeburgii** (Hartig)
- Pronotum and thorax black with at most the scutellum, postscutellum, anterior margin of pronotum in part and the hind angle of pronotum marked with red ; head with at most an orbital spot on the vertex, and orbits of the frons and face marked with yellow ; pronotal collar with a shallow, narrow, anterior groove (fig. 485) ; antenna a little thicker (except *lariciatae*) ; stigma a little narrower and often paler ; scutellum more rounded dorsally ; petiolar area not impressed centrally 7
- 7 (6) Black, with inner orbits in part and an orbital spot on the vertex ivory ; front tibia marked with ivory internally, hind femur sometimes narrowly red at extreme base and apex, hind tarsus in part chestnut marked ; flagellum



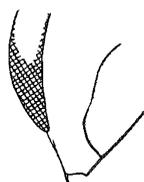
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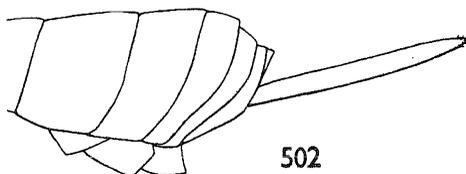
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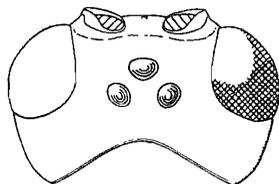
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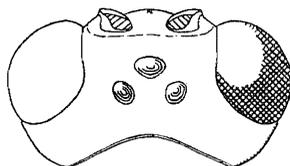
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Figs. 496-497.—Head, anterior, ♀: 496, *Aoplus castaneus*; 497, *A. humilis*.
 Figs. 498-499.—Head, posterolateral, ♀: 498, *Platylabops apricus*; 499, *Aoplus humilis*.
 Figs. 500-501.—Hind coxa, ventral, ♀: 500, *Cratichneumon varipes*.; 501, *C. magus*.
 FIG. 502.—Apex of gaster, lateral, ♀: *Cratichneumon lanivus*.
 Figs. 503-504.—Head, dorsal, ♀: 503, *Cratichneumon lanivus*; 504, *C. pseudocryptus*.

thin and long, the widest segments with the flattened, ventral area a little elongate, and usually with a short, dorsal, white, central stripe extending over 2 or 3 segments.

Apex of gaster similar to *humilis* (cf. fig. 492); hind coxa with no scopae. c. 6 mm. *Rare, ex Eupithecia lariciata Freyer*

lariciatae (Kriechbaumer)

- At least tergites 2 and 3 red; flagellum shorter with the ventral areas of the widest segments transverse 8
- 8 (7) Orbit without an ivory spot; genal carina meeting the less curved hypostomal carina at an obtuse angle; hypopygium far removed from the apex of the longer ovipositor (fig. 493); hind coxa with a scopae; interantennal tubercle weak (fig. 496) 9
- Orbit of vertex with a small, ivory spot; genal carina strongly rounded before meeting the hypostomal carina and thus these carinae meet at approximately a right angle (fig. 499); hypopygium nearer the apex of the ovipositor (fig. 492); hind coxa with no scopae; interantennal tubercle strong (fig. 497) 10
- 9 (8) Flagellum thinner and longer (fig. 488), segment 2 longer than the malar space (1.1 : 1).

Frontal orbits narrowly ivory; flagellum sometimes red basally; upper margin of hind angle of pronotum and the subalar prominence not marked with red or ivory; scutellum and central area of metanotum sometimes red; legs red with the coxae and trochanters black, the hind tarsus infusate, varying to the hind femur and trochantellus largely black and the anterior femora in part infusate, hind femur sometimes more or less infusate apically; gaster red with only the petiole black, varying to tergites 5-7 black (4 also in some continental specimens). 8-10 mm. *Not uncommon*

castaneus (Gravenhorst)

- Flagellum thicker and shorter (fig. 489), segment 2 shorter than the malar space (0.9 : 1).
- Similar in coloration to *castaneus*, but with the facial and frontal orbits marked with red and ivory; flagellum never red basally; hind angle of pronotum and subalar prominence conspicuously red marked; gaster with at least tergites 6 and 7 black. (Possibly only a form of *castaneus*.) 8-10 mm. *Less common* **alterator** (Wesmael)

- 10 (8) Genal carina meeting the narrower hypostomal carina at a distance from the base of the mandible about equal to 0.75 the breadth of base of mandible (fig. 499); femora and tibiae red, the front and middle femora and tibiae obscurely ivory marked, tarsi infusate; flagellum shorter with the segments in the white band quadrate; gaster with tergite 1 apically, tergites 2 and 3 and base of 4, red. c. 8 mm. *Rare* **humilis** (Wesmael)
- Genal carina meeting the strongly raised hypostomal carina nearer the base of the mandible, this distance being conspicuously less than half the breadth of base of mandible; front and middle legs black, the femora, tibiae and (usually) the tarsi marked with ivory; hind femur red, black apically, hind tibia infusate, reddish basally, hind tarsus infusate; flagellum longer with the segments in the white band distinctly elongate; gaster red with the base of petiole, tergite 5 apically and the following segments black. 9-10 mm. *Wales, Capel Curig, a series emerged xii. 1958 ex Ortholitha mucronata (Scopoli) (G. Haggatt)* **speciosus** (Wesmael)

(Males)

- 1 Flagellum with a broad, central, ivory band.
Gaster black with the apex of the central tergites and base of tergite 2 frequently red or reddish 2
- Flagellum entirely black dorsally 4
- 2 (1) Outer orbits, ventrad, broadly marked with ivory; upper margin of pronotum laterally with an ivory stripe; hind tarsus with the apical segments sometimes ivory; front coxa, usually the middle coxa and sometimes the apex of the hind coxa, ivory; pronotal collar with an ivory, central mark 3
- Outer orbits black; upper margin of pronotum with only an ivory mark

- in the hind angle ; hind tarsus testaceous or fuscous ; anterior coxae black ; pronotal collar with no ivory mark. 8-12 mm. **ochropis** (Gmelin)
- 3 (2) *Gastrocoelus coriaceus*, the thyridiae closer together than the least breadth of the petiole (*cf.* fig. 495) ; generally rather paler, with the apical segments of the hind tarsus in part white, hind coxa often white apically ; scape frequently conspicuously marked with red, ivory beneath. 10-12 mm. **ruficeps** (Gravenhorst)
- *Gastrocoelus rugose*, the thyridiae further apart than the least breadth of the petiole (*cf.* fig. 494) ; generally darker, with the hind tarsal segments black, hind coxa not white marked ; scape black, ivory beneath. c. 12 mm. **rubricosus** (Holmgren)
- 4 (1) *Mesoscutum* in greater part polished between the punctures ; genal carina very strongly inflexed.
Mandible with an ivory spot ; facial and lower frontal orbits, supraclypeal area usually in part, and clypeus usually laterally, ivory ; vertical orbit with an ivory spot ; hind angle of pronotum ivory, usually the subalar prominence ivory, scutellum black rarely with a pair of small, apical, ivory spots **4a**
- *Mesoscutum*, in greater part, sculptured between the punctures ; genal carina weakly inflexed.
Interantennal tubercle weak or absent. 5
- 4a (4) Front and middle legs black, femora, tibiae and tarsi ivory marked, front coxa marked with ivory beneath ; hind femur red, black apically, hind tibia infusate, reddish basally, the tarsus infusate ; tergite 1 apically, 2-4 and base of 5, red ; interantennal tubercle weak ; genal carina meeting the strongly raised hypostomal carina at a distance from the base of the mandible conspicuously less than half the breadth of base of mandible ; postpetiole centrally, coriaceous in part with weak, irregular, longitudinal striae. 9-10 mm. **speciosus** (Wesmael)
- Femora and tibiae red, the hind tibia infusate apically, the front and middle femora and tibiae ivory marked, but not the front coxa ; tergite 1 apically, 2, 3 (usually marked with fuscous) and sometimes extreme base of 4, red ; interantennal tubercle strong ; genal carina meeting the less raised hypostomal carina at a distance from the base of the mandible conspicuously more than half the breadth of base of mandible ; postpetiole with strong, irregular, longitudinal striae. 9-10 mm. **humilis** (Wesmael)
- 5 (4) [Hind coxa dorsally with a conspicuous, ivory mark. 6-7 mm. (Roman, 1914, *Ark. Zool.* 9(2) : 9)]. **virginalis** (Wesmael)
- Hind coxa not ivory marked. 6
- 6 (5) Tergite 1 except the petiole, and at least tergites 2 and 3, red. 7
- Gaster black with at most the extreme apex of tergite 1, the base and apex of tergite 2 and the apex of tergite 3 red. 8
- 7 (6) Upper, lateral margin of pronotum with a long, ivory stripe ; anterior coxae and trochanters ivory, hind coxae marked with ivory ; scutellum red marked basally and more broadly ivory apically ; stigma fuscous. 9-10 mm. (Only continental specimens seen) **defraudator** (Gravenhorst)
- Upper, lateral margin of pronotum only ivory in the hind angle ; front coxa only marked with ivory, anterior trochanters only marked with ivory ; scutellum black basally and less strongly marked with ivory apically ; stigma pale centrally. 10-12 mm. (Only continental specimens seen) **castaneus** (Gravenhorst)
- 8 (6) Orbits of the vertex with a yellow spot. 9
- Orbits of the vertex without a yellow spot.
Thorax, except the scutellum, never marked with red ; pronotal collar with a shallow, narrow, anterior groove (*cf.* fig. 485). 10
- 9 (8) Usually conspicuously red marked ; orbits of frons and face, sides of clypeus and lower, outer orbits, yellow, rest of face and clypeus usually red ; upper margin of pronotum laterally, collar centrally and laterally, subalar prominence, apex of scutellum and central area of metanotum usually marked with yellow ; coxae usually marked with yellow and red, femora and tibiae red, the hind femur infusate apically and hind tibia infusate basally and apically, tarsi fuscous ; pronotal collar, centrally, with a deep, anterior groove (*cf.* fig. 484). 8-10 mm. **ratzeburgii** (Hartig)

- Black; with only the inner orbits, spot on orbits of the vertex, clypeus, face centrally, subalar prominence and hind angle of pronotum marked with yellow; spot on front and middle coxae and stripe on front femur and tibia yellow; hind femur narrowly at base and sometimes apex, and hind tibia in part, castaneous; pronotal collar with a shallow, anterior furrow (cf. fig. 485). c. 7 mm. *lariciatae* (Kriechbaumer)
- 10 (8) Anterior coxae and trochanters ivory, hind coxae usually marked with ivory; mesopleurum less coarsely punctate; a more elongate species. 9-10 mm. (Scotch and Irish specimens)..... *defraudator* (Gravenhorst)
- Front coxa ivory beneath, middle coxa with a small, ivory, apical spot; mesopleurum coarsely punctate; a more robust species. c. 9 mm. *alterator* (Wesmael)

Genus *Platylabops* Heinrich

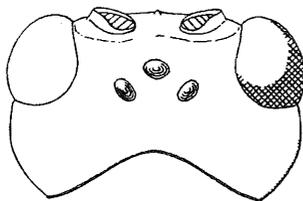
The two species included here are widely divergent and probably represent distinct genera; they are therefore run down separately in the key to the genera and the characters given there are not repeated here.

KEY TO SPECIES

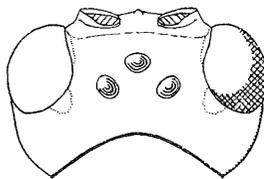
- A Superficially similar to *Aoplus humilis* (Wesmael) with the gaster of the ♀ rather blunt apically.
 - ♂♂. Flagellum very elongate with about 41 segments; clypeus weakly rounded apically (fig. 450); genal carina (fig. 498) less strongly inflexed than in *humilis* (fig. 499); scutellum with clear, lateral carinae to the middle; hind coxa with no scopa.
 - ♀. Frontal orbits narrowly ivory marked; tergite 1 apically and 2 and 3 red; hind tibia marked with red. c. 8 mm.
 - ♂. Facial orbits, and sometimes the clypeus, ivory; tergites 2 and 3 red, often in part black; tibiae in part red. 9-10 mm. *Rather rare, ex Horisme tersata* (Schiff.)..... *apricus* (Gravenhorst)
- B Superficially resembles *Cyclolabus pactor* (Wesmael), but is distinguished from this and all other British Ichneumonini by the coarsely pectinate claws.
 - ♀. Flagellum somewhat thickened apically, with no white band; head with the frontal orbits ivory, a spot on the orbit of the vertex ivory; hind angle of pronotum and subalar prominence marked with ivory; scutellum carinate laterally to beyond the middle, and strongly arched, ivory with a black basal spot; propodeum strongly carinate with the area superomedia transverse; postpetiole weakly rugose centrally, red apically; tergites 2-4/5 red; thyridiae closer to each other than the width of a thyridia; front and middle femora pale testaceous, in large part infusate, hind femur red, more weakly infusate, the tibiae testaceous, tarsi testaceous and infusate. 6-7 mm.
 - ♂. Similar to ♀, but additionally with the clypeus, centre of face and malar space in part, ivory; anterior margin of pronotum, laterally, ivory marked; scutellum more strongly raised. 7-8 mm. *Infrequent, ex Eupithecia pulchellata Steph.*..... *pulchellatus* (Bridgman)

Genus *Cratichneumon* Thomson

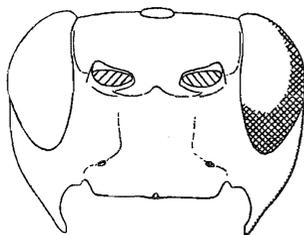
The species at present placed in *Cratichneumon* show quite a wide range of structure and it is most probable that later the genus will be divided into a number of genera. From the known hosts, most species seem to be parasites of Geometrids and in this show affinity with *Aoplus* and the *lineator* group of *Stenichneumon*. The three species with long ovipositors are of considerable interest, and have been much confused with species of *Aptesis*; but they can be distinguished at once from that genus of Cryptinae in that the hairs on the third valvulae are sparse and the surface is polished, whereas



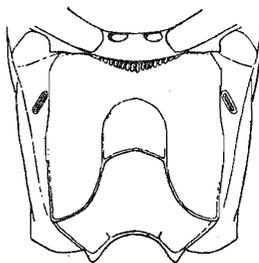
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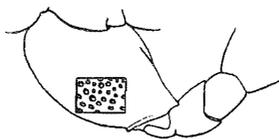
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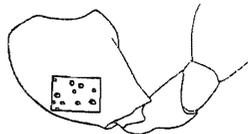
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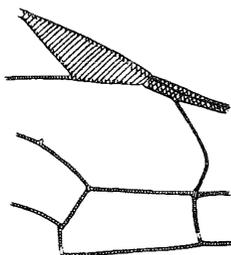
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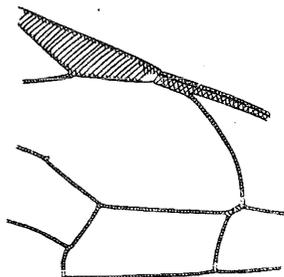
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FIGS. 505-514.—*Cratichneumon*, ♀.

FIGS. 505-506.—Head, *clarigator*: 505, dorsal; 506, anterior.

FIG. 507.—Head, dorsal: *jocularis*.

FIG. 508.—Propodeum, dorsal: *rufifrons*.

FIGS. 509-510.—Base of flagellum: 509, *infidus*; 510, *culex*.

FIGS. 511-512.—Hind coxa, lateral: 511, *semirufus*; 512, *fugitivus*.

FIGS. 513-514.—Fore wing, showing vein *Rs + M*: 513, *foersteri*; 514, *sicarius*.

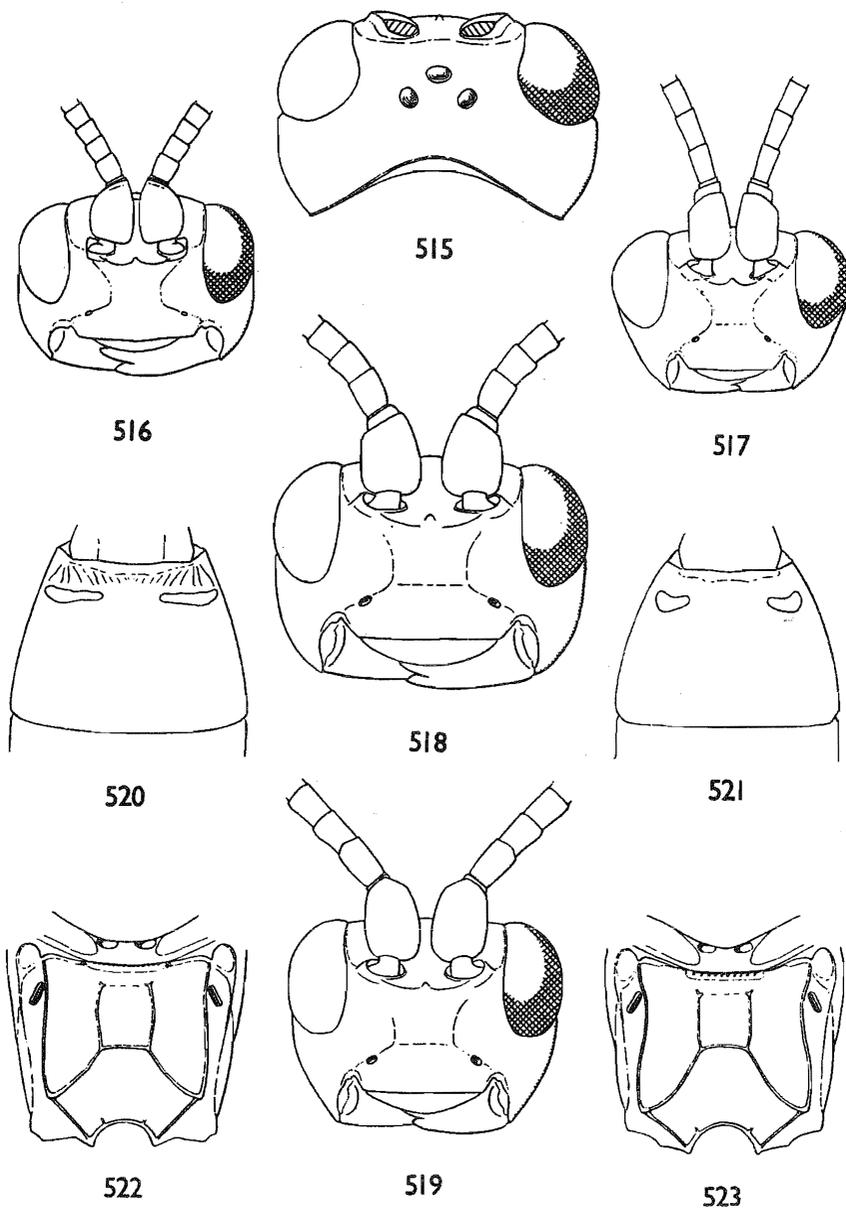
in *Aptesis* the hairs are close and the surface, in considerable part, towards the base is trans-striate.

The females of this genus do not hibernate, and it appears that quite a number of the species, at least, have two generations appearing in May and June and again in August.

KEY TO SPECIES

(Females)

- 1 Ovipositor sheaths (fig. 502) a little longer than the hind tibia, highly polished and at most with sparse pubescence.
Hind coxa evenly punctate beneath and with no scopa; scutellum often in part reddish..... 2
- Ovipositor sheaths at most half as long as the hind tibia, dull and closely pubescent..... 4
- 2 (1) Postpetiole evenly punctate and a little transverse; ovipositor sheaths glabrous except at the apex; gaster with at least tergite 2, in part, and the following tergites red; antenna with 29 or more segments; disc of mesoscutum polished between the punctures; temples more weakly narrowed behind the eyes (fig. 503)..... 3
- Postpetiole irregularly, weakly, longitudinally striate between the spiracles, broadly polished apically, and quadrate; ovipositor sheaths with conspicuous, though sparse pubescence; gaster black with apices of tergites 1-4 testaceous apically, as well as the base and sides of tergite 2 (the apical tergites membranous and ivory apically); antenna with about 26 segments; disc of mesoscutum at least in part coriaceous between the rather close punctures, the lateral lobes entirely coriaceous between the punctures; temples strongly narrowed behind the eyes (fig. 504).
Flagellum reddish basally, strongly widened beyond the middle and strongly acuminate apically, the basal segments more elongate; area superomedia transverse and clearly delimited; hind femur red basally, tibia red basally. 6-7 mm. *Rare*..... **pseudocryptus** (Wesmael)
- 3 (2) Tergite 2 shining, not coriaceous between the punctures; flagellum widened centrally but only weakly acuminate apically; area superomedia complete anteriorly; area basalis weakly differentiated; mesoscutum with sparser punctures and with the lateral lobe polished between the punctures; hind tibia in part reddish. 7-8 mm. *Common*..... **lanius** (Gravenhorst)
- Tergite 2 dull, coriaceous between the punctures; flagellum strongly widened beyond the middle and strongly acuminate apically; area superomedia anteriorly and area basalis erased; mesoscutum more closely punctate and with the lateral lobe weakly coriaceous between the punctures; hind tibia black. 9-10 mm. *Less common*..... **albilarvatus** (Gravenhorst)
- 4 (1) Hind coxa beneath, with a series of oblique, subparallel ridges (figs. 500-1)..... 5
- Hind coxa with no ridges beneath, punctate or with a scopa..... 6
- 5 (4) Hind coxa with a series of 6-8 strong, oblique ridges (fig. 500); hind tibia red or fuscous at the base, fuscous in the apical quarter, and white in the middle, this white area may be more or less suffused with red.
Clypeus pale testaceous, the face chestnut marked, scape pale testaceous beneath; scutellum reddish sometimes becoming yellow apically, the central area of metanotum usually reddish; front and middle legs testaceous, in part pale, the coxae and sometimes the femora fuscous marked; hind leg with the trochanter pale testaceous, the femur infuscate, reddish at base, tibia testaceous basally, fuscous apically with a vague, whitish, subcentral, posterior area; gaster highly polished, with sparse pubescence and with clear punctures only on the postpetiole, laterally, and in the basal half of tergite 2; tergites piceous with the segments apically (and of 2 basally) paler, and tergites 5-7 yellowish apically. British examples appear to be darker than those from central Europe. 4.5-6 mm. *Common*
varipes (Gravenhorst)
- Hind coxa with 3 or 4 strong, oblique ridges (fig. 501); hind tibia red, infuscate apically.
Clypeus red apically; scutellum reddish; legs red, front and middle coxae



FIGS. 515-523.—*Cratichneumon*, ♀.

FIG. 515.—Head, dorsal: *albifrons*.

FIGS. 516-519.—Head, anterior: 516, *fugitivus*; 517, *semirufus*; 518, *albifrons*; 519, *fabricator*.

FIGS. 520-521.—Tergite 2, dorsal: 520, *versator*; 521, *culex*.

FIGS. 522-523.—Propodeum, dorsal: 522, *insidus*; 523, *culex*.

marked with fuscous, hind coxa black; gaster with tergite 2 rather evenly punctate, the postpetiole sparsely punctate, the following segments more closely pubescent than *varipes*; tergite 1 red apically, the following tergites red, the tail sometimes more or less infuscate. *c.* 6 mm. *Rare*

magus (Wesmael)

- 6 (4) Temples dilated behind the eyes (fig. 505); hind tibia red, black apically; clypeus with an outwardly directed, small but distinct, subapical tooth (fig. 506).

Antenna strongly attenuate apically, second flagellar segment about as long as broad; pronotum with the transverse groove very weak, the area before this long, the anterior margin extremely weakly reflexed; propodeum with the areae weak, the area supermedia oblong, about twice as long as apically broad; costulae absent; basal groove of propodeum deep centrally, weakly, narrowly impressed laterally on the dorsum; hind coxa with no scopa, evenly and fairly closely punctate, beneath and outwardly; gaster red except for tergite 1 in greater part, varying to black with only tergites 2 and 3 red; postpetiole irregularly rugose; gastrocoelus superficial; thyridia transverse, breadth of a thyridia: distance from base of tergite = 1:0.8; length of exerted part of ovipositor sheath, ventrally: hind tibia = 0.4:1; stigma pale centrally. 10-11 mm. *Rare*. *clarigator* (Wesmael)

- Temples parallel or contracting behind the eyes; hind tibia of a number of species with a white, central mark; clypeus with no outwardly directed, apical tubercle, though sometimes inconspicuously produced centrally, apically..... 7

- 7 (6) Vertex, with the orbits of the eye at least, marked with red, yellow or white. .8

- Vertex entirely black, though the orbits of the frons may be pale.....12

- 8 (7) Hind coxa with a scopa.

Pronotum with the transverse groove shallow, the collar large and flattened; postpetiole irregularly punctate; upper margin of pronotum marked with red, pronotal collar centrally, subalar prominence, scutellum and often the central area of metanotum, ivory to yellow; hind tibia reddish except the apex; tergites, in part, reddish marked. 10-14 mm. *Very rare*

luteiventris (Gravenhorst)

- Hind coxa without a scopa.....9

- 9 (8) Vertex with a yellow spot on the orbit (fig. 507), frons with the orbits narrowly yellow.

Mesoscutum dull, the puncturing of the lateral lobes similar to that of the central lobe before the disc, at least for the greater part strongly coriaceous between the punctures; hind coxa beneath with the punctures only a little more widely spaced in the apical half; hind femur and tibia red, at most weakly and narrowly infuscate apically, the tarsus usually red. 7 mm. *Northern*.....*jocularis* (Wesmael)

- Vertex and frons with the orbits broadly yellow, ivory or red.....10

- 10 (9) Orbits of frons white, or marked with yellow or red; mesoscutum dull with distinct microsculpture between the punctures; central area of postpetiole rugose; basal furrow of propodeum deep; scutellum entirely yellow....11

- Orbits testaceous; mesoscutum shining with only very weak microsculpture between the punctures; central area of postpetiole punctate; basal furrow of propodeum very shallow on either side of the basal area (fig. 508); scutellum testaceous, paler apically. 6-8 mm. *Common*. *rufifrons* (Gravenhorst)

- 11 (10) Hind femur black; hind tibia black, or fuscous with at most the extreme base testaceous; mesoscutum with very strong microsculpture between the punctures; *cua* strongly postfurcal, and the basal vein (*Rs* and *M*) weakly curved (fig. 514); pronotum with the upper margin ivory except narrowly, centrally. 9-11 mm. *Rare*.....*sicarius* (Gravenhorst)

- Hind femur and tibia red with their apices black; mesoscutum with much shallower (though distinct) microsculpture between the punctures; *cua* interstitial, and the basal vein (*Rs* and *M*) strongly curved so that the anterior section makes an angle of about 120° with the posterior section (fig. 513); pronotum usually pale testaceous in hind angle. 7-10 mm. *Rather rare*

foersteri (Wesmael)

- 12 (7) Hind coxa without a scopa.....13

- Hind coxa with a scopa.....17

- 13 (12) Gaster in large part red; hind tibia red, infuscate apically..... 14
 — Gaster fuscous or black; hind tibia white centrally..... 15
- 14 (13) Hind coxa polished beneath, with large, widely scattered punctures (fig. 512); antenna very short, segment 4 transverse; scutellum black; head (fig. 516) large, the face and clypeus broad, with a broad mouth opening; malar space about half as long as the breadth of the base of the mandible; area superomedia with the sides subparallel, and more or less open anteriorly. 8-9 mm. *Uncommon*..... **fugitivus** (Gravenhorst)
- Hind coxa finely, closely punctate beneath along the inner margin (fig. 511); antenna rather long with segment 4 elongate; scutellum ivory; head smaller and conspicuously narrowed behind the eyes, the face (fig. 517) longer and the mouth opening narrower; malar space about as long as the breadth of the base of the mandible; area superomedia with the sides strongly converging anteriorly where it is closed. c. 8 mm. *Uncommon*
semirufus (Gravenhorst)
- 15 (13) Interval between the thyridiae more than twice the breadth of a thyridia (fig. 521); hind tibia less broadly white centrally..... 16
 — Interval between the thyridiae about one and a quarter times the breadth of a thyridia (fig. 520); hind tibia externally, only black at the extreme base and apex. 8-9 mm. *Uncommon*..... **versator** (Thunberg)
- 16 (15) Antennal segments 4-5 quadrate or subquadrate (fig. 510); face very rarely marked with yellowish-red on the facial orbits just below the level of the antennae; basal groove of propodeum occluded on each side of the deep, central area (fig. 523); area superomedia weak or erased anteriorly; malar space very slightly shorter than the breadth of base of mandible. 6-8 mm. *Very common*..... **culex** (Mueller)
- Antennal segments 4-5 a little (but distinctly) elongate (fig. 509); face most usually with a clear, yellow spot on the facial orbits just below the level of the antennal sockets; basal groove of the propodeum complete but with the anterior end of the lateral carinae of the basal area of the propodeum projecting over the groove (fig. 522); area superomedia with the lateral carina strong; malar space very slightly longer than the breadth of base of mandible. c. 6.5 mm. (No British female seen)..... **infidus** (Wesmael)
- 17 (12) Hind tibia black, at most reddish at the extreme base; tergite 3 with only the faintest trace of microsculpture.
 Claws with a strong, sub-basal, sinuate bristle; tergite 1 red apically, the rest of the tergites red. 7-11 mm. *Not uncommon*..... **corruscator** (L.)
- Hind tibia with a white, dorsal spot which is sometimes very small, or very rarely wanting, in which case, tergite 3 has conspicuous microsculpture. . 18
- 18 (17) Malar space, measured along the genal groove, two-thirds the breadth of the base of the mandible (fig. 518).
 A robust species; temples large (fig. 515); hind femur black; gaster with at least the apical tergites dull red, sometimes entirely dull red with only tergite 1 black except for the apex. 10-11 mm. *Uncommon*
albifrons (Stephens)
- Malar space, measured along the genal groove, equal to the breadth of the base of the mandible (fig. 519)..... 19
- 19 (18) Tergite 3 with shallower, indistinct punctures; propodeum with the lateral carina of area superomedia absent or very weak anteriorly; propodeum dorsally a little shorter, and the basal groove, dorsally, laterally, shallow; malar space a little shorter.
 Gaster varying from black to red with only tergite 1 black, red apically; hind femur varying from black to red. 7-10 mm. *Common*..... **fabricator** (F.)
- Tergite 3, in large part, with distinct punctures; propodeum with the lateral carina of area superomedia distinct to the base; propodeum a little longer, and the basal groove, dorsally, laterally, deep; malar space a little longer.
 Gaster sometimes in part reddish; hind femur varying from black to red. 7-10 mm. *Rather common*..... **nigritarius** (Gravenhorst)

(Males)

- 1 Mesoscutum dull with distinct microsculpture between the punctures on the lateral lobes.

- Antenna without a white ring; thyridiae very small, the distance between them at least four times their breadth (fig. 528); (if the thyridiae are small, antenna not white ringed and the lateral lobes of the mesoscutum faintly alutaceous, see couplet 14); face, frontal and vertical orbits, malar space and outer orbits ventrad, ivory; pronotum with the anterior margin and the upper margin (except very narrowly, centrally) ivory; scutellum ivory; pro- and mesosternum in large part ivory; front and middle coxae and trochanters ivory; hind tibia white in the basal two-thirds; hind tarsus with segments 2-5 usually white. 10-12 mm. **sicarius** (Gravenhorst)
- Mesoscutum strongly shining between the punctures on the middle of the lateral lobes; thyridia usually larger. 2
- 2 (1) Thyridiae distinctly nearer to the base of tergite 2 than their breadth (at most 0.6:1) (fig. 527). 3
- Thyridiae at least 0.8 times their breadth from the base of tergite 2 (figs. 524-6). 8
- 3 (2) Vertex with a conspicuous, yellow spot (*cf.* fig. 507); face entirely yellow.
- Antenna usually with a white band; face, and usually the outer orbits below, ivory; malar space black; lateral lobes of mesoscutum coarsely punctate, the punctures comparable with those on the middle lobe before the disc; front coxa and trochanter at most weakly marked with ivory; middle coxa and trochanter rarely with ivory marks; hind femur narrowly infuscate at the apex, hind tibia infuscate at most in the apical quarter; tarsi often, at least in part, pale. 7-9 mm. **jocularis** (Wesmael)
- Vertex with no yellow spot; face often black marked. 4
- 4 (3) Antenna never with a white band. 5
- Antenna with a white band. 12
- 5 (4) All trochanters and trochantelli ivory; gaster, from the pale thyridiae to the apex, polished between the punctures.
- Face, frontal orbits, malar space and lower outer orbits ivory; anterior femora, tibiae and tarsi red, the coxae marked with red and ivory; hind femur somewhat red basally, hind coxa often ivory marked beneath, hind tibia whitish, narrowly fuscous at base, broadly black apically, hind tarsi often pale apically; tergite 2 pale banded apically; scutellum often ivory apically. 6-8 mm. **varipes** (Gravenhorst)
- All trochanters and trochantelli black; gaster, from the thyridiae to apex, at least in greater part distinctly coriaceous between the punctures. 6
- 6 (5) Outer orbits not marked with ivory.
- Clypeus, inner orbits in part and marks below the base of the antenna, yellow; hind femur and tibia red, apically infuscate. c. 7 mm.
- Outer orbits marked with ivory above. **magus** (Wesmael) 7
- 7 (6) Hind tibia externally with a distinct, white patch or with a band; sculpture at base of tergite 2 stronger, coarsely or strongly striate; gaster black; face entirely ivory. 10-13 mm. **versator** (Thunberg)
- Hind tibia red with black apex, or entirely black, very rarely with a small, sordid, white area towards the base; tergite 2 at base, finely striate or punctate striate; gaster often marked with red and sometimes entirely red except tergite 1; face yellow and most usually black centrally, often with only the orbits and a pair of spots beneath the antennal sockets yellow. Hind femur usually black but varying to entirely red. 8-13 mm.
- 8 (2) Antenna with a distinct, white ring. **fabricator** (F.)¹⁸ 9
- Antenna not white ringed.
- Face and frontal orbits ivory or yellow. 13
- 9 (8) Face entirely ivory; thyridiae less well developed. 10

¹⁸ The form with the red gaster has been much confused with *fugitivus*, but can at once be distinguished, superficially, from that species in having no yellow mark on the lower, outer orbit. I have seen occasional aberrations of this species in which the anterior tibiae are marked with white and the hind tibia has a small area of sordid white, thus approaching more the colour of the tibiae of the female. On the Continent, this species almost always has the femora red and the gaster black, but I have seen no British specimen which agrees entirely with this coloration.

- Face with only the orbits ivory, or rarely ivory marked dorsally between these ;
thyridiae strong.
Antenna somewhat thickened ; outer orbits not marked with ivory ;
scutellum flat. 12
- 10 (9) Flagellum never with tyloidae on segments 2 and 3, but 4 often with a small
tyloida ; gaster dull with distinct microsculpture between the punctures
on tergite 2. 11
- Flagellum with well-marked tyloidae on segments 3 and 4, often with a tyloida
present on segment 2 (fig. 529) ; gaster strongly shining with only faint
microsculpture between the punctures. 8–13 mm. *culex* (Mueller) ab.
- 11 (10) Scutellum black, strongly punctate in the apical half, not conspicuously
raised centrally ; gaster usually conspicuously marked with red ; external
and frontal orbits not marked with ivory, though the face entirely ivory ;
antenna conspicuously thickened, the middle segments conspicuously
tuberculate centrally (fig. 531), and in the white band the segments at least
as broad as long ; hind legs black. 9–12 mm. *albilarvatus* (Gravenhorst)
- Scutellum ivory in the apical half, where it is finely, shallowly punctate, a
little more raised in the middle ; gaster at most with tergite 2 narrowly
testaceous apically ; external and frontal orbits marked with yellow ;
antenna not thickened, the middle segments very weakly tuberculate cen-
trally (fig. 530), and in the white band the segments a little longer than
broad ; hind femur and tibia red, black at their apices.
Basal vein less angled than in the ♀. 9–12 mm. *foersteri* (Wesmael)
- 12 (4) Clypeus black laterally, facial orbits sometimes ivory ; thyridiae a little larger
(fig. 526).
Hind femur black varying to red. 9–13 mm. *nigritarius* (Gravenhorst)
- Clypeus yellow laterally, sometimes also with a pair of dorsal marks between
the ivory, facial orbits ; thyridiae smaller (fig. 524). c. 8 mm.
infidus (Wesmael)
- 13 (8) [Scutellum with conspicuous, sharp, lateral keels ;
Flagellum short ; propodeum unusually short, the central length of the
horizontal part only a third as long as the area posteromedia ; postpetiole
smooth and shining, the following segments with weak sculpture. (Heinrich,
1944, *Mitt. dtsch. ent. Ges.* 13 : 110)]. *pseudocryptus* (Wesmael)
- Scutellum at most with lateral keels at the extreme base. 14
- 14 (13) Gaster strongly shining ; tergite 2 (at about two-thirds from base) with the
shallow punctures about as far from each other as the diameter of the
punctures, the area between the gastrocoeli, for the most part, punctate ;
tergite 3 polished between the superficial punctures.
Very variable in colour, the propodeum of the second generation often
conspicuously marked with yellow as are the central segments of the gaster.
9–14 mm. *corruscator* (L.)
- Gaster less shining and more closely punctate, the punctures of tergite 2
(at two-thirds from the base) closer to each other than the diameter of the
punctures, though sometimes shallow ; tergite 3 at least in considerable
part coriaceous or alutaceous. 15
- 15 (14) Head with the temples broad, subparallel behind the eyes ; front and middle
coxae ivory marked beneath.
External orbits with an ivory spot ventrad ; clypeus apically with a
small, central tubercle ; tergite 2 coarsely rugose at the base and rugose
punctate behind the thyridiae. 12–13 mm. *clarigator* (Wesmael)
- Head with narrower temples which converge behind the eyes ; front coxa
either entirely pale yellow or entirely black. 16
- 16 (15) Front coxa entirely pale yellow ; front and middle trochanters entirely pale
yellow (except in occasional aberrations of *rufifrons*).
Hind coxa usually pale marked beneath, apically. 17
- Front coxa entirely black ; front and middle trochanters black. 19
- 17 (16) Petiole dorsally narrow and polished, without hairs except at apex ; gaster
and legs usually for the greater part testaceous ; pronotum with the dorsal
groove very shallow, the area before this broad and conspicuously flattened ;
face, malar space and orbits yellow ; scutellum entirely yellow ; propodeum
sometimes red marked. 13–16 mm. *lutiventris* (Gravenhorst)
- Petiole dorsally sculptured and evenly, fairly closely, pubescent except the

- basal fifth; gaster mostly black or in large part deep red; hind leg with only the base of the hind tibia sordid testaceous or white; pronotum with the dorsal groove deep, the area before this narrower and convex; face, malar space, frontal orbits and outer orbits below, ivory; scutellum apically marked with ivory, rarely almost entirely ivory. 18
- 18 (17) Propodeum with the basal groove smooth centrally; gaster most usually in large part red; hind leg with only the extreme base of the tibia sordid testaceous, tarsus black; gaster with the punctures more clearly impressed; mesosternum marked with ivory. 7-10 mm. **lanius** (Gravenhorst)
- Propodeum with the basal groove strongly trans-striate centrally; gaster black with the apical margin of tergite 2 usually dirty white; hind leg most usually with the basal quarter of the tibia, and tarsal segments 2 to base of 5 ivory, though aberrations occur in which the hind leg is almost entirely black; gaster with the punctures very shallow and ill-defined except at the base of tergite 2; mesosternum not ivory marked. 7-9 mm.
ruffrons (Gravenhorst)
- 19 (16) Epicnemium, ventrally, bilobed and strongly raised (fig. 533).
 Inner orbits marked with ivory, sometimes with marks on the clypeus and face and a mark on the outer orbit above; scutellum apically ivory and sometimes only with the base black; tergite 1 apically, 2 and 3 entirely, 4 at least basally, red; hind tibia sordid red basally; claws with strong, sinuate, sub-basal seta (fig. 532). 9-10 mm. **semirufus** (Gravenhorst)
- Epicnemium narrow, not bilobed. 20
- 20 (19) Hind tibia with a broad, ivory spot or band; base of tergite 2 very strongly rugose or striate. **versator** (Thunberg)
- Hind tibia testaceous or yellow, marked with black, or sometimes entirely black; base of tergite 2 with finer sculpture. 21
- 21 (20) Flagellum with tyloidae on segments 5-15 or 16, thus without tyloidae on segments 3 and 4.
 Face and mark on outer orbits above, ivory; hind femur sometimes reddish. 11-15 mm. **albifrons** (Stephens)
- Flagellum with tyloidae on segments 2 or 3-15 to 20, thus with tyloidae on segments 3 and 4 (fig. 529). 22
- 22 (21) Gaster in large part red; face black centrally; external orbits with an ivory mark below; hind femur black or piceous, hind tibia dull red, infusate apically. 10-12 mm. **fugitivus** (Gravenhorst)
- Gaster black; face entirely ivory; external orbits ventrad entirely black, though marked with ivory above; hind femur and tibia red with the apex infusate. 8-13 mm. **culex** (Mueller)

Genus *Eupalamus* Wesmæl

This genus is very closely related to *Cratichneumon*, the males in particular being difficult to recognize. The hosts of this genus are uncertain. The two British species are normally larger than our species of *Cratichneumon*.

KEY TO SPECIES

- A ♀♂. Hind tibia with a distinct, white band, femora black; mesoscutum more sparsely punctate; scutellum ivory in apical half (in ♂ sometimes entirely ivory).
 ♀. Tarsi of front and middle legs broader (fig. 535); antenna, at its widest, with the flattened, ventral area of the segments at most twice as broad as long. ♀ c. 15 mm., ♂ c. 18 mm. *Rare*. **wesmaeli** Thomson
- B ♀♂. Hind tibia with no white band, femora red or black; mesoscutum more closely punctate; scutellum black.
 ♀. Tarsi of front and middle legs not so conspicuously expanded (fig. 534); antenna, at its widest, with the flattened, ventral area of the segments two and a half times as broad as long. ♀ c. 13 mm., ♂ c. 15 mm. *Rare*.
lacteator (Gravenhorst)

Genus *Eristicus* Wesmael

♀. Clypeus with the apical margin thickened; head cubic, parallel or slightly dilated behind the eyes, broader than the thorax; antenna elongate, markedly attenuate apically, the second flagellar segment with length: breadth = 1.9:1; mandible narrowed apically; pronotum dorsally with the transverse groove weak, the area before this rather long and the anterior margin weakly reflexed; areae of propodeum more or less clearly defined, the area superomedia hexagonal with the posterior, lateral carinae subparallel; basal groove of propodeum deeper centrally but well developed, though a little narrower and shallower on the dorsum laterally; stigma fuscous; hind coxa with no scopa; gaster small, more or less parallel-sided; postpetiole with the central area depressed centrally, irregularly rugulose; gastrocoelus shallow, poorly defined; thyridia rather oblique, breadth: distance from the base of the tergite = 1:0.8; ovipositor exerted, length of exerted part of sheath: hind tibia = 0.7:1; tergite 7 ivory dorsally. c. 12 mm.

♂. Clypeus with its apical margin broad (fig. 449); head with the temples conspicuously widened behind the eyes; external orbits entirely black; antenna not white ringed; mesoscutum strongly shining, polished between the punctures on the middle of the lateral lobes; stigma centrally testaceous; front and middle coxae white marked beneath; hind tarsus black, hind tibia testaceous in basal half; tergite 2 irregularly striate at the base and behind the thyridiae; thyridia as far from the base of the tergite as its breadth; tergite 3 in considerable part coriaceous. 10-13 mm. *Rare*.

clericus (Gravenhorst)

Genus *Melanichneumon* Thomson

There is only one British species. A point of note in this and related exotic genera is that the plane of the hypostoma is little different from that of the postgena whereas in the *Barichneumon* group the hypostoma is more sharply angled with the postgena, and this is enhanced by the broader hypostomal carina which is usually more strongly raised.

M. leucocheilus belongs to the same species group as the continental *fortipes* (Wesmael). Both are characterized by the form of the mandible which approaches that of *Chasmius*, the projection on the clypeus, the superficial and small gastrocoeli and the thyridiae being almost eliminated.

♀. Head with no ivory markings and with the temples weakly narrowed behind the eyes; clypeus (fig. 442) with a weak, rather broad, central projection; basal area of propodeum with a very weak tubercle; mouth opening broad and the genal carina meeting the low hypostomal carina almost at the base of the mandible; gastrocoelus shallow, striate and very small, thyridia represented by a very thin line or absent.

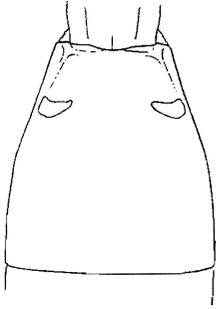
♂. Clypeus with a conspicuous, central, apical projection (fig. 441); genal carina meeting the hypostomal carina almost at the base of the mandible; gastrocoelus represented by a weak groove, thyridia minute; gaster elongate; face with internal orbit ivory marked; thorax black; coxae and trochanters black, rest of anterior legs red, in part sometimes infusate, hind femur infusate, tibia and tarsus black; gaster black with apex of tergites 1-3 red, tergite 7 with a large, dorsal, ivory spot. ♀ 10 mm., ♂ 11 mm. *Rare*..... *leucocheilus* (Wesmael)

FIGS. 530-531.—Central segments of flagellum, *Cratichneumon*, ♂: 530, *foersteri*; 531, *albilavatus*.

FIG. 532.—Claw: *Cratichneumon semirufus*, ♂.

FIG. 533.—Mesothorax, pleuroventral: *Cratichneumon semirufus*, ♂.

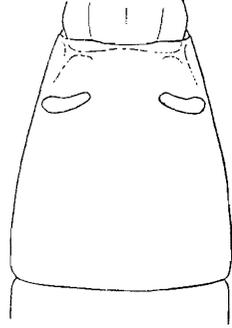
FIGS. 534-535.—Mid-tarsal segments 1-3, *Eupalamus*, ♀: 534, *lacteator*; 535, *wesmaeli*.



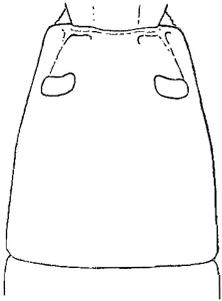
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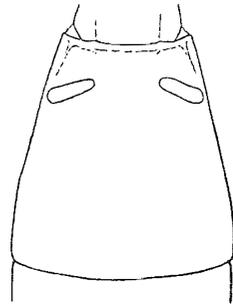
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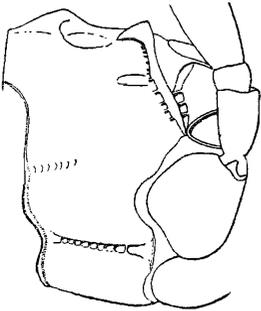
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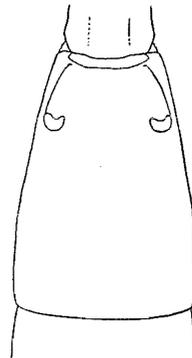
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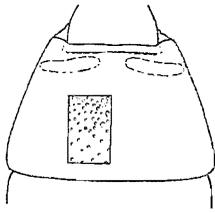


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FIGS. 524-528.—Tergite 2, dorsal, *Cratichneumon*, ♂: 524, *infidus*; 525, *culex*; 526, *nigritarius*; 527, *fabricator*; 528, *sicarius*.

FIG. 529.—Base of flagellum: *Cratichneumon culex*, ♂.

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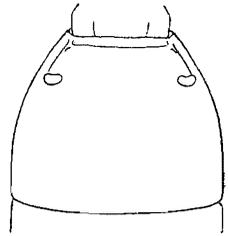
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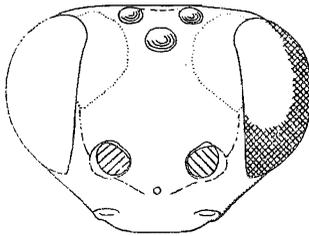
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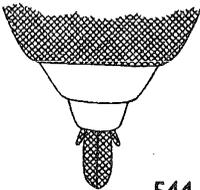
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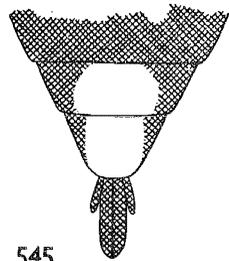
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FIGS. 536-546.—*Barichneumon*.

FIGS. 536-537.—Tergite 2, dorsal, ♀: 536, *locutor*; 537, *bimaculatus*.

FIGS. 538-539.—Flagellar segments 1-4, ♀: 538, *peregrinator*; 539, *heracliana*.

FIGS. 540-541.—Mandible, *ridibundus*: 540, ♂; 541, ♀.

FIG. 542.—Head, anterodorsal: *albilineatus*, ♀.

FIG. 543.—Flagellar segments 1-6: *anator*, ♀.

FIGS. 544-545.—Apical tergites, ♀: 544, *faunus*; 545, *monostagon*.

FIG. 546.—Mandible: *sanguinator*, ♀.

Genus *Barichneumon* Thomson

This genus, as at present constituted, contains a number of quite discordant elements. Of these, *B. locutor* is the type species of *Homotherus* Foerster and may better really be separated into that genus. *B. peregrinator* and *heracliana* are quite divergent and have much in common with the Phaeogenini; they are, too, parasitic on Microlepidoptera. *B. ridibundus* is again quite distinct and is also remarkable in the sexual dimorphism of the mandible, it being unidentate in the male but having a small, second tooth in the female. *B. sanguinator*, with the strongly, laterally carinate scutellum and longitudinally striate, strongly raised central area of the postpetiole, may also later be removed to a distinct genus. The remaining species, though falling into a number of distinct groups, all have (in the British species) anteriorly on the area basalis of the propodeum a small, central tooth which projects into the basal groove; this tooth is subject to considerable variation and in some individuals may be lost, but it forms a very valuable means of recognizing species belonging to this genus. The species enumerated above never have this tooth.

Little is known concerning hosts of this group, but *B. tergenus* and *callicerus* are parasites of hairstreaks.

KEY TO SPECIES

(Females)

- 1 Apical segments of the gaster with at most a narrow, whitish, apical band 2
- At least segment 7 with a large, ivory, dorsal spot 4
- 2 (1) Hind tibia black with a white base; gaster strongly shining, tergite 2 shallowly and sparsely punctate; thyridia very broad and the gastrocoelus shallow (fig. 536); genal carina meeting the hypostomal carina well behind the base of the mandible.
 - Orbits of vertex and frons marked with ivory; scutellum ivory apically; hind femur red, infusate apically varying to almost entirely infusate; tergites red with tergite 1 black except apically. 4-8 mm. *Parasite of Geometrids. Common* *locutor* (Thunberg)
 - Hind tibia entirely black, or red with the apex black; gaster with tergite 2 having distinct punctures; thyridia very small or minute; genal carina meeting the hypostomal carina immediately behind the base of the mandible (cf. fig. 448).
 - Hind femur red, infusate apically varying to almost entirely infusate; gaster with apex of tergite 1, and tergites 2-4/5 red. *Parasites of Depressaria* 3
- 3 (2) Antenna with the flagellar segments very short (fig. 538), segment 5 quadrate; scutellum usually ivory in the apical third; frontal orbits ivory marked. 6-7 mm. *Uncommon* *peregrinator* (L.)
- Antenna with the flagellar segments more elongate (fig. 539), segment 5 elongate; scutellum entirely black; orbits not ivory marked. 8-9 mm. *Not uncommon* *heracliana* (Bridgman)
- 4 (1) Mesoscutum red, or if as a variety black (*ridibundus*), then the transverse, pronotal furrow is divided by a strong tubercle (fig. 444); lateral margins of the scutellum strongly carinate at least to the middle.
 - Mesoscutum with microsculpture between the punctures; area basalis with no central tooth; tergites 6 and 7 broadly ivory marked 5
 - Mesoscutum always black, the pronotal furrow not divided, or partially divided by 2 carinae; lateral margins of the scutellum frequently without carinae 6
- 5 (4) Pronotal furrow interrupted centrally by a strong tubercle (fig. 444); propodeum sometimes marked with red posteriorly (mesoscutum sometimes black); lower tooth of the mandible very small and far removed from the apex of the upper tooth (fig. 541); postpetiole almost smooth with a few, scattered

subapical punctures; thyridia broader than the distance between the thyridiae; central area of the postpetiole not raised, weakly, microscopically sculptured with few scattered punctures; front and middle coxae weakly marked with yellow beneath.

Face red or marked with red; inner orbits, vertical orbits and outer orbits marked with ivory; scutellum red (rarely black), broadly ivory marked apically; pronotum and mesopleurum in part red; hind femur red, infuscate apically, varying to almost entirely infuscate; tergite 1, except for base, tergites 2-4 and base of 5, red. 6-9 mm. *Not uncommon*

ridibundus (Gravenhorst)

- Pronotal furrow not interrupted; propodeum red with at most the basal groove black; lower tooth of mandible larger and not so far removed from the apex of the upper tooth (fig. 546); postpetiole centrally, strongly, longitudinally aciculate; thyridia narrower than the distance between the thyridiae; central area of postpetiole raised, irregularly, longitudinally striate with scattered punctures apically; front and middle coxae entirely black or, rarely, marked with red.
- Head for the most part red with the inner orbits and vertical orbits more or less marked with yellow; scutellum, pronotum in large part and mesopleurum, red; hind femur black; tergite 1, except for base, tergites 2, 3 and base of 4, red. 7-9 mm. *Common*.....**sanguinator** (Rossi)
- 6 (4) Gaster with the ground colour black, tergites 2 and 3 with at most the extreme apices of the segments very narrowly red.
- Hind coxa with no distinct scopa except *saturatorius* and *gemellus*.....7
- Gaster with at least tergites 2 and 3 entirely red.....17
- 7 (6) Thyridia very small and often subcircular, well removed from the base of the segment (fig. 537); gastrocoelus only represented by an indistinct, oblique groove; postpetiole with the central area polished, sometimes with sparse punctures, though sometimes more conspicuously punctate.
- Clypeus broad; mandible a little widened before the apex; scutellum ivory; hind trochanter entirely white, hind tibia reddish basally; tergites 6 and 7 ivory marked. *c.* 7 mm. *Uncommon*.....**bimaculatus** (Schrank)
- Thyridia sometimes small but always transverse; gastrocoelus always distinct though sometimes small and polished, quadrate or transverse; central area of postpetiole always with sculpture.....8
- 8 (7) Antenna very short, segment 4 quadrate, the following segments (except the apical) transverse (fig. 543).
- Face strongly transverse, the malar space short; antenna marked with reddish basally; frontal orbit, pronotal collar centrally, line in the hind angle of pronotum, subalar prominence and apex of scutellum marked with ivory; hind femur and tibia stout, red, the tibia infuscate apically, hind tarsus piceous; tergites 6 and 7 with broad, ivory marks. 6-8 mm. *Associated with buildings and has been reared from* *Pyralis farinalis* (L.). *Rather common*
- anator** (F.)
- Antenna much longer with at least the 5 basal flagellar segments elongate....9
- 9 (8) Tergites 6 and 7 or 5, 6 and 7 with very conspicuous, ivory, dorsal marks....10
- Only tergite 7 with an ivory, dorsal mark.
- Flagellum strongly attenuate apically; scutellum ivory; femora, tibiae and tarsi red with the hind tibia infuscate apically, the front and middle tarsi infuscate and the hind tarsus black; central area of postpetiole closely punctate.....16
- 10 (9) Frontal orbit with a very large, ivory mark which quite, or almost, reaches the posterior ocellus (fig. 542).
- Scutellum ivory; mesoscutum dull, in part with subrugose sculpture; wings darkened; postpetiole with the central area shining and with distinct, rather scattered punctures. 12-14 mm. *Common*.....**albilineatus** (Gravenhorst)
- Frontal orbit black, or with a yellow or red mark, the inner margin of which is much nearer to the eye than to the posterior ocellus.....11
- 11 (10) Hind coxa with a thick, dense scopa.....12
- Hind coxa with no scopa, though sometimes with close, fine punctures beneath.....13
- 12 (11) Scutellum ivory; mesoscutum closely punctured and with close pubescence; thyridiae a little further apart, the area between them punctate except

sometimes at the base; costula received at about the middle of the area superomedia.

Postpetiole with the well differentiated central area irregularly, longitudinally striate, with scattered punctures; hind trochanters most usually ivory marked; hind femur and tibia red, infusate apically varying to entirely black. 9-11 mm. *Common*..... **saturatorius** (L.)

— Scutellum black; mesoscutum more sparsely punctured and less closely hairy and thus appearing shining; thyridiae a little closer together and the area between them strongly, longitudinally striate, some of the striae reaching at least to the middle of the segment and subcarinate centrally; costula received well behind the middle of the area superomedia.

Postpetiole with the central area with scattered punctures, sometimes in part irregularly, longitudinally striate; clypeus usually marked with ivory laterally; hind femur black, tibia reddish and infusate; tergites 2 and 3 most usually red marked. 8-10 mm. *Not uncommon*

gemellus (Gravenhorst)

- 13 (11) Tergites 5, 6 and 7 with dorsal, white spots; hind coxa polished beneath, with scattered, coarse punctures which in part are further apart than their diameter.

Antenna strongly narrowed apically; postpetiole punctured, usually in part with weak striae between the punctures; scutellum largely ivory; stigma small and black; trochantelli, femora, front and middle tibiae and front tarsus entirely red, mid-tarsus red, infusate apically, hind tibia red, infusate apically, hind tarsus infusate. 9-10 mm. *A parasite of Callimorpha jacobaeae* (L.). *Rather common*..... **maculicauda** Perkins

- Tergite 5 with no white spot (6 and 7 with a white spot); hind coxa closely punctured beneath.....14

- 14 (13) Postpetiole rather evenly punctate centrally; hind coxa with fine, dense punctures beneath.

Mesoscutum closely, deeply punctate; propodeum with white hair; scutellum ivory; legs black, the front tibia marked with ivory internally; c. 10 mm. *Rather rare*..... **dumeticola** (Gravenhorst)

- Postpetiole striate or with striae interspersed with punctures; hind coxa with coarse punctures beneath.....15

- 15 (14) Antenna sharply pointed apically, the antepenultimate segment much narrower than the width of the apex of the first flagellar segment; the area between the thyridiae more rugose; stigma dark fuscous, small and narrower; tergites 6 and 7, viewed dorsally, with black visible on each side of the ivory spot (fig. 545).

Mesoscutum with coarse, deep punctures; propodeum with fuscous hair; scutellum ivory; legs black, or with femora, tibiae and tarsi red, the front tibia indistinctly marked with ivory internally, the mid-tarsus infusate, the hind tibia infusate apically and the hind tarsus black. c. 12 mm. *Not uncommon*..... **monostagon** (Gravenhorst)

- Antenna hardly attenuate apically, the antepenultimate segment a little broader than the width of the apex of the first flagellar segment; distinct longitudinal striae between the thyridiae; stigma pale, larger and broader; tergites 6 and 7, viewed dorsally, appearing entirely ivory (fig. 544).

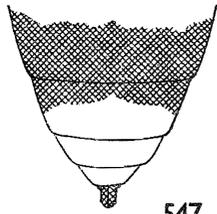
Mesoscutum more sparsely and shallowly punctate on the lateral lobes; propodeum with white hair; scutellum black or reddish marked; legs black, the femora in part reddish, the front and middle tibiae and tarsi reddish with the front tibia ivory marked internally, the hind tibia dirty red centrally. (Legs usually more extensively marked with red in continental examples). 8-9 mm. *Rather rare*..... **faunus** (Gravenhorst)

- 16 (9) Hind coxa with a scopa; beneath the scopa extremely finely punctate and thus very sharply contrasting with the sculpture of the base and sides of the coxa; stigma paler centrally. c. 9 mm. *Rather rare*

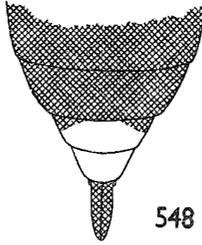
albosignatus (Gravenhorst)

- Hind coxa without a scopa; in this area with rather coarse punctures so that the hind coxa beneath has an even gradation of puncturing from base to apex; stigma black. c. 9 mm. *Rare*..... **digrammus** (Gravenhorst)

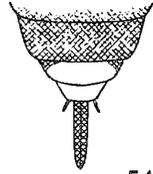
- 17 (6) Tergite 2 with the area between the thyridiae longitudinally striate, the central stria forming a keel which extends to about the middle of the segment.



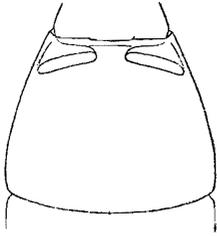
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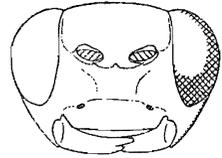
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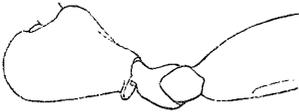
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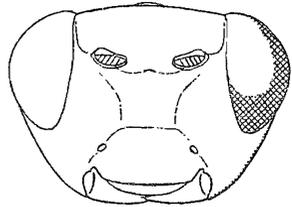
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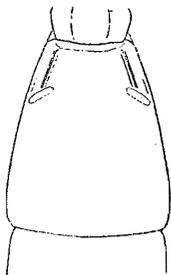
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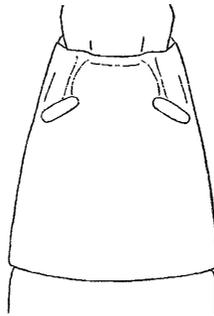
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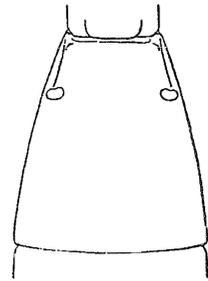
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FIGS. 547-560.—*Barichneumon*.

FIGS. 547-549.—Apex of gaster, dorsal, ♀: 547, *callicerus*; 548, *deceptor*; 549, *plagiarius*.

FIG. 550.—Tergite 2, dorsal: *citator*, ♀.

FIG. 551.—Hind coxa, lateral: *derogator*, ♀.

[Continued opposite

Postpetiole with scattered punctures, sometimes in part irregularly, longitudinally striate; clypeus usually with ivory marks laterally; hind femur black in British specimens, hind tibia red, infusate apically; tergites 2 and 3 variable in colour from red to black. 8–10 mm. *Not uncommon*

- gemellus** (Gravenhorst)
- Tergite 2 with the area between the thyridiae punctate and with no central keel. Vertical orbit with an ivory spot or marking; tergites 6 and 7 (in *callicerus*, 5 also) with an ivory, dorsal spot. 18
- 18 (17) Thyridia about twice as broad as the distance between the thyridiae (fig. 550). Scutellum black or weakly marked with red. 19
- Thyridiae further apart than the breadth of a thyridia, which is sometimes minute 21
- 19 (18) Third flagellar segment a little elongate (figs. 553–4); transverse furrow of pronotum partially divided by a pair of subcentral carinae, and usually with a pair of yellow spots on the collar; tergite 1 except for base, 2–4, and 5 at least laterally, red; hind femur and tibia black in British specimens. 20
- Third flagellar segment quadrate (fig. 552); transverse furrow of pronotum not so interrupted, anterior margin at most in part reddish; tergite 1 except for base, 2 and 3, and 4 laterally, red; hind femur and tibia red
- basalis** sp. nov.¹⁹
(syn. *basiglyptus* Kriechbaumer Morley nec Kriechbaumer)
- 20 (19) Segment 1 of flagellum about one and a half times as long as broad (fig. 554), flagellum a little less attenuate apically; hind coxa beneath with coarser and less close punctures. c. 6 mm. *Not uncommon*
- basiglyptus** (Kriechbaumer)
(syn. *coziglyptus* Heinrich)
- Segment 1 of flagellum about twice as long as broad (fig. 553), flagellum a little more sharply attenuate apically; hind coxa beneath with the punctures a little finer and a little closer. c. 7 mm. *Rare*. **citator** (Thunberg)
- 21 (18) Hind coxa with a scopa, coxæ red.
Antenna rather strongly thickened and very weakly attenuate apically; basal segments of flagellum elongate with segment 4 quadrate and segment 1: segment 2 = 1: 0.9; postpetiole with the central area distinctly differentiated, smooth with irregularly scattered, sparse punctures (sometimes absent); gastrocoelus and thyridia small; scutellum ivory; scape and base of flagellum red; hind leg with trochanter and trochantellus red, femur and tibia red, black apically; the tarsi red, often infusate; tergite 1 entirely red, 2, 3 and base and lateral margin of 4, red. 6–8 mm. *Female rare, male common*. **lepidus** (Gravenhorst)
- Hind coxa without a scopa, at least posterior coxæ black.
Tergite 1 except the petiole, 2–4, and often 5 basally and laterally, red. 22
- 22 (21) Basal flagellar segments very short (fig. 555), segment 1 as long as its greatest breadth and equal in length to 2.
Head with the frontal and vertical orbits conspicuously marked with ivory; clypeus (fig. 443) rounded apically, with the polished apical margin delimited by a transverse row of punctures and weakly, outwardly reflexed; basal area of propodeum with a strong tubercle; hind coxa sparsely, coarsely punctate beneath; gastrocoelus small, smooth and short; thyridia small but distinct. 23
- Basal flagellar segments elongate, segment 1 longer than 2. 24
- 23 (22) Scutellum black, at most slightly reddish centrally; hind femur less robust; mid-tibia less strongly spinulose; hind femur usually black, rarely red, hind tibia red, infusate apically. 5–7 mm. *Not uncommon*
- praeceptor** (Thunberg)

¹⁹ *basiglyptus* Kriechbaumer Morley nec Kriechbaumer, 1903, *British Ichneumons* 1: 91. Type, British Museum (Natural History) Hym. 3b. 1373. ♂, Hants, New Forest, 3. viii. 1901, (C. Morley).

FIGS. 552–555.—Flagellar segments 1–4, ♀: 552, *basalis*; 553, *citator*; 554, *basiglyptus*; 555, *praeceptor*.

FIGS. 556–557.—Head, anterior, ♀: 556, *chionomus*; 557, *tergenus*.

FIGS. 558–560.—Tergite 2, dorsal, ♂: 558, *sanguinator*; 559, *lepidus*; 560, *bimaculatus*.

- Scutellum ivory marked ; hind femur more robust ; mid-tibia more strongly spinulose ; hind femur black, hind tibia reddish, infusate apically ; c. 8 mm. 1 ♀, *Berks., Silwood Park, 16.vi.1955 (O. W. Richards)*
bilunulatus (Gravenhorst)
- 24 (22) Scutellum almost entirely ivory..... 25
— Scutellum black..... 27
- 25 (24) Tergites 5, 6 and 7 with large, ivory spots (fig. 547) ; thorax and gaster more finely punctured ; ovipositor very little projecting beyond the last tergite ; mesosternum centrally subequal to segment 1 of middle tarsus.
Malar space longer than the breadth of the base of mandible ; hind coxa beneath, rather finely and closely punctate ; hind femur usually black, sometimes red basally, hind tibia red, infusate apically. 7–9 mm. *Uncommon.*
On Callophrys rubi (L.) **callicerus** (Gravenhorst)
- Only tergites 6 and 7 with white spots ; thorax and gaster with rather coarse punctures ; ovipositor conspicuously projecting beyond the last tergite ; mesosternum centrally shorter than segment 1 of middle tarsus..... 26
- 26 (25) Malar space conspicuously longer than the breadth of base of mandible ; frons, mesoscutum, coxae beneath and tergites 2–3 closely and coarsely punctate ; ovipositor projecting beyond the last tergite by a distance less than segment 2 of hind tarsus (fig. 548) ; flagellum with the basal segments a little more elongate ; anterior margin of pronotum not marked with ivory centrally ; subalar prominence usually ivory marked ; British specimens have the posterior femora almost completely black. 7–9 mm. *Common*
deceptor (Gravenhorst)
- Malar space shorter than the breadth of base of mandible ; frons, mesoscutum, coxae beneath with coarse, sparse punctures which in large part are about as far from each other as the diameter of the punctures, tergites 2–3 less closely punctate ; ovipositor projecting beyond the last tergite by a distance greater than segment 2 of hind tarsus (fig. 549) ; flagellum with the basal segments shorter ; anterior margin of pronotum centrally, subalar prominence and sometimes the hind angle of pronotum, ivory marked ; femora entirely red. 6–7 mm. *Rare*..... **plagiarius** (Wesmael)²⁰
- 27 (24) Hind coxa with a strong, transverse, apical lamella, ventrally and internally (fig. 551) ; tergite 6 with a narrow, apical, ivory band ; interantennal tubercle very strongly developed.
Malar space shorter than the breadth of base of mandible ; antenna similar to *chionomus* ; legs in by far the greater part black ; tergite 1 except base, 2–4 entirely, 5 often laterally, red. c. 7 mm. *Rare*.. **derogator** (Wesmael)
- Hind coxa with a weak, transverse, apical ridge ; tergite 6 with a large, ivory, dorsal spot ; interantennal tubercle weak..... 28
- 28 (27) Postpetiole with the central area conspicuously differentiated from the lateral area ; tergite 3 more finely punctured than the second and the punctures obsolescent in the apical half ; antenna strongly pointed apically and more elongate ; malar space longer, the mouth opening narrower than the distance between the eyes at the level of the antennae (fig. 557). 8–9 mm. *Uncommon.*
On Strymon pruni (L.) and W-album (Knoch) **tergenus** (Gravenhorst)
- Postpetiole with the central area undifferentiated ; tergite 3 evenly and as coarsely punctured as the second ; antenna broad apically and shorter ; malar space shorter, the mouth opening as wide as the distance between the eyes at the level of the antennae (fig. 556). 6–7 mm. *Rather rare*
chionomus (Wesmael)

(Males)

- 1 Middle femur strongly and sharply excised ventrally in the apical third (fig. 561) ; apical segment of gaster with at most an indistinct, ivory, central mark ; tergite 2 strongly, longitudinally striate between the deep gastrocoeli.
Area superomedia large and receiving the costula behind the middle ; scutellum laterally carinate to about the middle and sometimes ivory marked laterally ; black, with face and clypeus broadly ivory laterally, frontal and vertical orbits ivory, outer orbit usually with an ivory mark ;

²⁰ Superficially similar to the *vicarius* (Wesmael) group of species (non-British) but at once distinguished by the shorter mesosternum and longer ovipositor.

- scape usually marked with ivory beneath; pronotum with the collar and usually the hind angle marked with ivory; subalar prominence sometimes marked with ivory. 10-12 mm. **gemellus** (Gravenhorst)
- If the middle femur is very weakly excised, then either the apical segment of gaster is conspicuously ivory, or tergite 2 is punctured between the gastrocoeli, or the gastrocoelus is shallow. 2
- 2 (1) Front tarsus with segment 1 expanded apically, externally into a sharp tooth (fig. 563).
 Gaster black. 3
- Front tarsus with segment 1 with at most a weak, apical expansion. 4
- 3 (2) Frontal orbit broadly ivory, the ivory mark extending at least to two-thirds the distance from the orbit to the posterior ocellus (cf. fig. 542); postpetiole marked with ivory apically; hind tibia and usually hind tarsal segments 2, 3 and 4 marked with ivory; middle tibia and tarsus (except the apical segment) conspicuously ivory marked; upper lateral margin of pronotum with a long, white stripe; central area of postpetiole more polished centrally, little wider than the lateral areas.
 Face and clypeus broadly ivory laterally; pronotal collar ivory centrally; subalar prominence marked with ivory; scutellum in greater part ivory; femora black. 13-16 mm. **albilineatus** (Gravenhorst)
- Frontal orbit at most narrowly ivory and with the mark extending at most to a third the distance from the orbit to the posterior ocellus; postpetiole entirely black; middle and hind legs not white marked; upper margin of pronotum with at most a short, ivory dash in the hind angle (all black in the British examples examined); central area of postpetiole in part with distinct, sublongitudinal striae, nearly twice as wide as the lateral areas.
 Face and clypeus narrowly ivory laterally; pronotal collar weakly marked with ivory centrally; scutellum varying from having an ivory, central band to 2 lateral, ivory spots, to entirely black; legs black, or femora and front and middle tibiae red, hind tibia red, broadly infuscate apically. 13-15 mm. **monostagon** (Gravenhorst)
- 4 (2) Mandible unidentate or at most with a faint indication of the inner tooth (fig. 540); transverse groove of pronotum with a distinct, central tubercle (cf. fig. 444).
 Mesoscutum with conspicuous, coriaceous sculpture between the punctures; scutellum with strong, lateral carinae extending to beyond the middle; area basalis of propodeum with no central tooth; thyridia very broad; face ivory, sometimes marked with fuscous beneath the antennal sockets, clypeus ivory, frontal and outer orbits marked with ivory; scape ivory beneath; pronotum with front margin, and upper margin except centrally, ivory; subalar prominence marked with ivory; scutellum and central area of mesoscutum ivory except the base; propodeum with the area interna marked with ivory laterally and usually with an ivory spot on the front margin of the spiracle; front and middle coxae and trochanters broadly marked with ivory beneath, front and middle femora testaceous, weakly marked with fuscous and ivory, tibiae dirty ivory and pale fuscous, the tarsi pale testaceous; hind coxa and trochanter marked with ivory above, femur red, broadly infuscate apically, tibia reddish basally, broadly infuscate apically, varying to almost entirely black, tarsus black, the segments narrowly pale basally and apically; tergite 1 apically, 2-4, and 5 basally and laterally, red; tergite 6 broadly ivory apically, tergite 7 largely ivory, apex of genital claspers ivory, tergite 5 sometimes narrowly marked with ivory apically. 7-9 mm. **ridibundus** (Gravenhorst)
- Mandible distinctly bidentate; transverse groove of pronotum with at most a faint indication of an interruption centrally. 5
- 5 (4) Hind tarsus conspicuously marked with ivory; antenna with a short, ivory, central stripe; scutellum with lateral keels to beyond the middle (fig. 562); gastrocoelus represented by a longitudinal groove (fig. 558); tergite 6 ivory apically, tergite 7 ivory, tergites 2-4 red; postpetiole, centrally, weakly striate and with a very few punctures subapically.
 Mesoscutum with microsculpture between the punctures; area basalis of propodeum with no central tooth; clypeus and face laterally ivory, the face also with a pair of ivory spots dorsally; frontal and vertical orbits,

- and outer orbit in part, ivory; pronotum with the collar broadly and the upper margin of hind angle shortly ivory; at least the apical half of scutellum, and apex of central area of metanotum ivory; front and middle femora, tibiae and tarsi in part pale testaceous; hind femur black, tibia fuscous to black, narrowly testaceous at base. 7-10 mm. *sanguinator* (Rossi)
- Hind tarsus never marked with ivory, and not possessing the combination of main characters given above. 6
- 6 (5) Distance between the thyridiae at most two-thirds the breadth of a thyridia. . 7
- Distance between the thyridiae at least equal to the breadth of a thyridia. . 10
- 7 (6) Gastrocoelus shallow; hind tibia black with an ivory, basal ring; tergite 2 polished with only fine, sparse, shallow punctures.
- Face, clypeus, malar space and lower, outer orbit, frontal orbit and a spot on the vertical orbit, ivory; scape ivory beneath; pronotum with the collar having a central and lateral spot, and a line on the upper margin in the hind angle, ivory; scutellum apically and central area of metanotum ivory; a pair of ivory spots on the propodeum apically; subalar prominence ivory; front and middle coxae, trochanters and trochantelli ivory, the rest of these legs pale testaceous; hind coxa, trochanter and trochantellus usually obscurely and narrowly marked with ivory apically, femur red, infusate apically sometimes in large part infusate, tibia black, white basally, tarsus black with the segments usually narrowly testaceous basally; gaster red, the petiole black and the apical tergites most usually infusate, sometimes also tergite 2 infusate centrally, and even darker specimens occur. 6-9 mm.
- locutor** (Thunberg)
- Gastrocoelus deeply impressed; hind tibia entirely black, or red with the apex black; tergite 2 deeply, distinctly and rather closely punctured.
- Hind femur red, black apically (very rarely entirely red) varying to entirely black, tibia red, infusate apically, varying to entirely black. 8
- 8 (7) Transverse furrow of pronotum partially divided by a pair of subcentral carinae; pronotal collar ivory dorsally; head with the external orbit sometimes ivory; scutellum most usually ivory marked; apex of tergite 1, and tergites 2-4/5/6, red. 9
- Transverse furrow of pronotum simple centrally; pronotal collar black; head with the external orbit black; scutellum black; tergites 2 and 3 red sometimes in part infusate, 4 sometimes red basally and laterally. 6-7 mm.
- basalis** sp. nov.
- (syn. *basiglyptus* Kriechbaumer Morley nec Kriechbaumer)
- 9 (8) Area superomedia with length subequal to breadth (fig. 571); upper margin of pronotum most usually with a long, ivory line in the hind angle; the head most usually with more extensive ivory markings. 7-9 mm.
- basiglyptus** (Kriechbaumer)
- (syn. *coziglyptus* Heinrich)
- Area superomedia distinctly longer than its greatest breadth (fig. 572); upper margin of pronotum with at most a short, ivory line in the hind angle; the head with less extensive ivory markings. c. 7 mm. **citator** (Thunberg)
- 10 (6) Antenna with at most 25 segments and with the central segments subquadrate and expanded centrally (as in *Cratichneumon* ♂♂).
- Facial orbit ivory, frontal orbit in part ivory and not usually joining the marking on the face; pronotum with the collar centrally and upper margin in hind angle rather broadly ivory; scutellum marked with ivory towards the apex; subalar prominence marked with ivory; trochantelli infusate, femora red, the hind infusate apically, tibiae red, the hind broadly infusate apically; front and middle tarsi in part somewhat infusate, hind tarsus infusate to black; gaster with tergite 5 narrowly, 6 broadly, apically and the whole exposed part of 7, ivory; genital claspers marked with ivory. 7-9 mm. **anator** (F.)
- Antenna with at least 30 segments. 11
- 11 (10) At most with tergites 2 and 3 having their extreme, apical margin obscurely red 12
- At least tergites 2 and 3 for the most part red 18
- 12 (11) Thyridia small, circular or oval, and as far removed from the base of the segment as the spiracle of tergite 1 from the apex of its segment (fig. 560); gastrocoelus at most represented by a longitudinal groove.

- Face and frontal orbit not ivory marked; antenna with white band; face black, peristomium very broad; hind angle of pronotum and subalar prominence black; scutellum ivory at least in the apical two-thirds; hind legs entirely black; tergites 6 and 7 with a large, transverse, ivory, apical spot. 7-9 mm. **bimaculatus** (Schrank)
- Thyridia transverse and conspicuously nearer the base of tergite 2; gastrocoelus transverse and conspicuously impressed. 13
- 13 (12) Antenna with a conspicuous, white, subcentral band; face entirely black, frontal orbit not ivory marked; middle and hind femora thinner.
- Hind angle of pronotum and subalar prominence black; scutellum with at least an ivory, apical spot; hind femur varying from red to black, hind tibia most usually marked with testaceous; postpetiole rugose, the rugae often tending towards longitudinal striation; tergite 7 for the most part ivory, the genital claspers conspicuously ivory marked. 9-13 mm.
- Antenna with the flagellum black above; face at least marked with ivory along the orbits, and the frontal orbit ivory; middle and hind femora distinctly thickened. 14
- 14 (13) Postpetiole regularly and rather coarsely, longitudinally striate; tergite 2 strongly, longitudinally striate between the gastrocoeli; face entirely ivory; genital claspers at least marked with ivory; scutellum, laterally, rather broadly ivory, these lines sometimes joined along the apical margin; genal carina weakly inflexed.
- Pronotum with the collar centrally and the upper margin laterally, most usually with an ivory line; subalar prominence most usually marked with ivory; hind femur black or red, hind tibia usually marked with red; stigma pale; tergites 6 and 7 with a broad, ivory, apical spot. 10-11 mm.
- Postpetiole punctate; tergite 2 punctate or punctate-striate between the gastrocoeli; face with only the orbits ivory; genital claspers never marked with ivory; scutellum never with the lateral margins pronouncedly ivory, but sometimes entirely ivory or with the apical margin ivory; genal carina strongly inflexed. 15
- 15 (14) Tergites 6 and 7 with a large, ivory, dorsal spot, tergite 5 sometimes with an apical, ivory spot or band.
- Hind angle of pronotum, pronotal collar centrally and the subalar prominence usually marked with ivory; hind femur red, usually rather narrowly infuscate apically. 10-13 mm. **maucileuada** Perkins
- Tergite 6 entirely black, or at most with a minute, apical, ivory spot which is much narrower than that on tergite 7. 16
- 16 (15) Stigma quite large (fig. 569), black; hind leg entirely black or with the tibia reddish at the base; scutellum usually with an ivory, apical band which is sometimes divided into 2 apical spots, sometimes entirely black.
- Temples little narrowing behind the eyes; hind angle of pronotum, pronotal collar centrally and the subalar prominence with an ivory line; tergite 7 sometimes with an ivory, central spot. c. 10 mm.
- Stigma very small (fig. 570), and most usually paler centrally; most usually with the hind femur red, the hind tibia red, black apically; scutellum most usually conspicuously marked with ivory or almost entirely ivory. 17
- 17 (16) Head weakly narrowing directly behind the eyes (fig. 565); tergites 2 and 3 at least in part with quite strong microsculpture between the punctures; postpetiole (fig. 568) strongly transverse; tergite 7 frequently with an ivory, dorsal spot; hind angle of pronotum, pronotal collar centrally and the subalar prominence rarely with weak, ivory marks. 9-10 mm.
- Head distinctly narrowing directly behind the eyes (fig. 564); tergites 2 and 3 with at most extremely weak microsculpture between the punctures; postpetiole (fig. 567) much more elongate (length: distance between the spiracles at least 0.8:1); tergite 7 with no ivory spot; pronotal collar rarely with a pair of ivory spots centrally, hind angle of pronotum and the subalar prominence most usually very conspicuously marked with ivory. 9-10 mm. **digrammus** (Gravenhorst)

- 18 (11) Apical tergites not marked with ivory 19
 — At least tergites 6 and 7 marked with ivory 24
- 19 (18) Propodeum short with the area superomedia transverse (fig. 573), breadth : length at least 1.75 : 1; mesosternum conspicuously transverse; genal carina meeting the hypostomal carina at about one-third the breadth of the base of the mandible from the hind angle of the mandible, but the hypostomal carina not strongly raised; tyloidae on antennal segments 5/6–12, large on the middle segments; inner orbit to the line of the ocelli and the outer orbit ventrad, ivory; lateral angles of clypeus ivory; pronotal collar centrally, a long line in hind angle of pronotum, subalar prominence, scutellum and usually central area of metanotum, ivory; anterior coxae black with a small, ivory, apical spot, anterior trochanters black with an ivory, apical margin, rest of anterior legs red, more or less marked with fuscous (including under the femur); hind leg red with the coxa and trochanter black, trochantellus infuscate, femur and tibia infuscate apically and tarsus infuscate; apex of petiole, postpetiole and tergites 2–3/4 red. 6–7 mm.
plagiarius (Wesmael)
- Area superomedia with breadth : length at most 1.25 : 1, and otherwise disagreeing conspicuously with the above combination of characters 20
- 20 (19) Genal carina meeting the strongly raised hypostomal carina at a distance from the base of the mandible equal to about one-third the breadth of the base of the mandible (fig. 447).
 Orbit of face, lateral angles of clypeus, frontal and vertical orbits, ivory; pronotum with the collar centrally and the upper margin of the hind angle marked with ivory; scutellum and subalar prominence marked with ivory (ivory markings may be reduced in some specimens); hind legs black in British examples, with the tibia sometimes in part reddish; apex of tergite 1, and tergite 2 red (2 rarely fuscous marked), 3 and 4 usually red 21
- Genal carina meeting the narrow hypostomal carina immediately behind the base of the mandible (fig. 448).
 Orbits and middle of face, clypeus in greater part, frontal orbit, upper margin in the hind angle of pronotum, scutellum in part, subalar prominence, ivory; hind femur sometimes red basally, tibia rarely with a whitish spot basally; apex of tergite 1 and tergites 2–4/5/6 red 22
- 21 (20) Epicnemial carina, seen from below, in part with a distinct, flattened and sculptured top; outer orbit never ivory marked. 6–9 mm.
praeceptor (Thunberg)
- Epicnemial carina with a more or less sharp top; outer orbit usually marked with ivory; ivory markings generally tending to be more extensive. No British male yet seen. 9–10 mm. **bilunulatus** (Gravenhorst)
- 22 (20) Malar space very short; interantennal tubercle very large; face entirely ivory and strongly punctate and in part trans-striate centrally (fig. 574); flagellum with tyloidae on segments 5/6–14/15; tergite 2 more broadly rounded laterally, with the spiracle further from the lateral margin than the length of hind tarsus 4; sternaulus weakly impressed in the anterior third of mesosternum.
 Face, clypeus, frontal and vertical orbits, external orbit in part and scape beneath, ivory; pronotum with the collar centrally, and the upper margin in the hind angles broadly, ivory; apex of scutellum, subalar prominence and two spots on the propodeum, ivory; anterior coxae in greater part ivory, anterior trochanters ivory beneath, rest of the anterior legs testaceous, more or less weakly marked with fuscous and pale yellow; hind legs black with the trochantellus, extreme base of femur and base of tibia weakly marked with testaceous; apex of tergite 1 often ivory, tergites 2–4 red, often more or less fuscous centrally, apically. c. 8 mm. **derogator** (Wesmael)
- Malar space at least half as long as the breadth of the base of mandible; interantennal tubercle small; face ivory with the lateral lines of the supra-clypeal area and the epistomal suture laterally, black, with distinct, evenly spaced and finer punctures; flagellum with tyloidae on segments 8–14/15, or tyloidae absent; tergite 2 flatter and with the spiracle nearer the lateral margin than the length of hind tarsus 4; sternaulus distinctly impressed in the anterior half of mesosternum.
 Colour similar to *derogator* except where stated under the species, but

- the face with a longitudinal, black stripe beneath each antennal socket, the apex of tergite 1 never ivory but usually red, tergites 2-4/5/6 red and the anterior legs usually infusate with femora and tibiae ivory anteriorly. . 23
- 23 (22) Antenna with no tyloidae; hind tibia, viewed from behind, rather evenly expanding almost to the apex; propodeum usually with a pair of ivory spots at the apex of the dentiparal area; hind coxa most usually with an ivory spot above; anterior coxae narrowly ivory marked; anterior margin of pronotum usually marked with ivory centrally; face (fig. 445). 8-9 mm.
- heracliana (Bridgman)
- Antenna with tyloidae on segments 8-14/15 of the flagellum; hind tibia, viewed from behind, distinctly swollen in the apical two-thirds; propodeum and hind coxa completely black; anterior coxae with at most the extreme apex reddish; anterior margin of pronotum with no ivory mark. c. 7 mm.
- peregrinator (L.)
- 24 (18) Gastrocoelus represented by a longitudinal groove which is bounded externally by a thin carina (fig. 559).
- Head with only a vertical, ivory spot; flagellum sometimes with a short, central, white stripe; scutellum in far the greater part ivory; hind leg black, the tibia sometimes in part reddish; apex of tergite 1, tergites 2 and 3, and 4 except the apex, red; tergite 6 broadly, apically and tergite 7 with the visible part, ivory, sometimes tergite 5 with the margin centrally, apically ivory; claspers black. 7-10 mm. lepidus (Gravenhorst)
- Gastrocoelus of considerable breadth though sometimes shallow. 25
- 25 (24) Hind trochanter with the posterior dorsolateral face excavate, so that the lateral margin is somewhat sharp (fig. 566); the dorsal surface is also weakly excavate.
- Facial orbit, lateral angle of clypeus, vertical spot, and the pronotal collar centrally, ivory; hind leg black with the tibia red in the basal two-thirds; tergite 1 apically, 2 and 3, and base of 4 usually narrowly, red; tergite 6 with a central, apical, marginal, ivory band, 7 viewed dorsally, entirely ivory; genital claspers black. 6-7 mm. chionomus (Wesmael)
- Hind trochanter with only the shallow dorsal excavation. 26
- 26 (25) Face with the orbits and the sides of the clypeus ivory; temples strongly narrowed behind the eyes; gaster more oval; genital claspers ivory or marked with ivory.
- Pronotal collar centrally, hind angle of pronotum shortly and the subalar prominence marked with ivory; hind leg entirely black in British specimens examined. (The two species in this section are difficult to separate; both are parasites of hairstreaks). 27
- Face with the orbits ivory but the clypeus entirely black; temples subparallel directly behind the eyes; gaster more elongate; genital claspers always entirely black.
- Vertical orbit with an ivory spot; pronotal collar centrally marked with ivory; subalar prominence thin and subcarinate along the middle line, usually black or with a small, anterior, ivory spot; hind leg black with the tibia sometimes reddish in the basal two-thirds; postpetiole for the most part red; tergite 6, or 5 and 6, with an ivory band apically, tergite 7 viewed dorsally, entirely ivory. 8-10 mm. deceptor (Gravenhorst)
- 27 (26) Lateral keel of scutellum distinct to about the middle; face, frons and tergites 2 and 3 of gaster more coarsely, but less closely punctate; tergite 2 longitudinally striate-punctate between the gastrocoeli and centrally; area superomedia strongly transverse.
- Orbits of frons and vertex ivory; a pair of spots on the scutellum which are sometimes joined, ivory, or rarely with these absent; tergites 2 and 3 red, 3 sometimes conspicuously marked with black. 9-10 mm.
- tergenus (Gravenhorst)
- Lateral keel of scutellum at most weakly present at the extreme base; face, frons and tergites 2 and 3 of gaster much more finely and more closely punctate; tergite 2 only inconspicuously striate-punctate between the gastrocoeli; area superomedia about as long as its apical breadth.
- Vertex with an ivory, orbital spot, frons entirely black; scutellum in greater part ivory; gaster with tergites 2 and 3 red. 8-9 mm.
- callicerus (Gravenhorst)

Genus *Chasmias* Ashmead

This genus should be recognized fairly readily, particularly in the female. They parasitize Noctuidae living in stems of Gramineae. The females hibernate as adults.

Chasmias shows most affinity with *Barichneumon* and *Melanichneumon*. In both British species the scutellum is ivory in the female, and in the male the internal orbits are marked with ivory. In the male the clypeus is hardly excised (fig. 433) and the central tooth is often almost absent. The males of the two species appear to show very few differences; both can have the flagellum banded with white centrally.

KEY TO SPECIES

- A A smaller and more elongate species.
- ♀. Postpetiole very weakly coriaceous striate; antenna tricoloured, basal flagellar segments most usually testaceous; coxae and trochanters black; femora usually testaceous, sometimes infusate; tibiae and tarsi testaceous, the hind tarsus most usually infusate; tergites 1, 2 and 3 red, 3 rarely black apically, tergite 4 varying from red to black, tergite 6 with a small, ivory, apical spot, tergite 7 with a strong, ivory, central streak. 9–10 mm.
- ♂. Scutellum entirely ivory, at most with a small, black mark basally; legs with the coxae, trochanters and middle and hind tarsi black, the rest testaceous, varying to almost entirely black, most usually with the hind femur and tibia black apically; gaster with the basal segments sometimes marked with testaceous, particularly laterally (and narrowly, apically); postpetiole, centrally, finely, longitudinally striate. 10–12 mm. *Rather common*.....*motatorius* (F.)
- B A larger and more robust species.
- ♀. Postpetiole finely, closely, but strongly longitudinally striate; antenna black, with a white, central band, basal flagellar segments always infusate; coxae and trochanters black, the rest of the legs red with the hind tarsus strongly black; gaster black, except for the small, ivory, apical spot on tergite 6 and the strong, ivory streak on tergite 7, sometimes with tergites 2, 3 and 4 with reddish shade showing through (or red in some continental forms). 11–15 mm.
- ♂. Scutellum black, narrowly marked with ivory apically; legs coloured as in the ♀ but with the hind tibia for the most part infusate; gaster black; postpetiole, centrally, more coarsely striate. 14–16 mm. *Not uncommon*.....*paludator* (Desvignes)

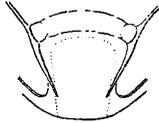
Genus *Hepiopelmus* Wesmael

This genus is ill-defined for it shows characters exhibited by a number of other genera. The gaster of the female is blunt apically, though the hypopygium is as far removed from the apex of the ovipositor as its length (fig. 428). The form of the propodeum together with the first tergite is characteristic; in this the most likely case for confusion is between *H. leucostigmus* and *Barichneumon albilineatus* (Grav.), but the latter species can be distinguished at once, in the male by having a conspicuous thorn at the apex of the front metatarsus, and in the female by tergites 6 and 7 having a conspicuous, apical, ivory spot.

The males of both species of *Hepiopelmus* often have a flagellum with a rather narrow, white, dorsal stripe which in *leucostigmus* may extend to the base of the flagellum; in the female of both species the flagellum is broadly white centrally. The wings are somewhat infusate with the stigma brown centrally. The general colour of *variegatorius* is quite distinct from any



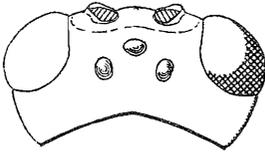
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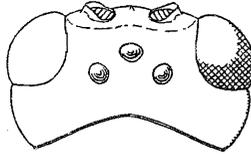
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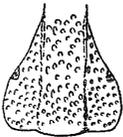
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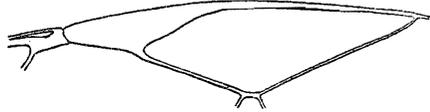
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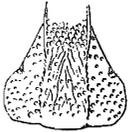
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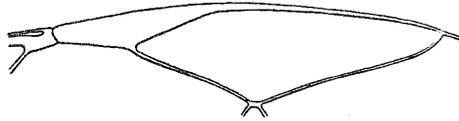
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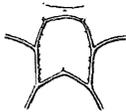
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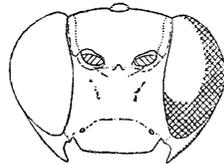
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FIGS. 561-574.—*Barichneumon*, ♂.

FIG. 561.—Mid-femur, posterior: *gemellus*.

FIG. 562.—Scutellum, dorsal: *sanguinator*.

FIG. 563.—Front tarsus I: *albilineatus*.

FIGS. 564-565.—Head, dorsal: 564, *digrammus*; 565, *albosignatus*.

FIG. 566.—Left hind trochanter, dorsal: *chionomus*.

FIGS. 567-568.—Postpetiole, dorsal: 567, *digrammus*; 568, *albosignatus*.

FIGS. 569-570.—Fore wing, pterostigma and cell 1R: 569, *dumeticola*; 570, *albosignatus*.

FIGS. 571-573.—Area superomedia: 571, *basigyptus*; 572, *citator*; 573, *plagarius*.

FIG. 574.—Head, anterior: *derogator*.

other British species of Ichneumoninae. The two species appear to differ only in colour and markings. Parasites of *Spilosoma*.

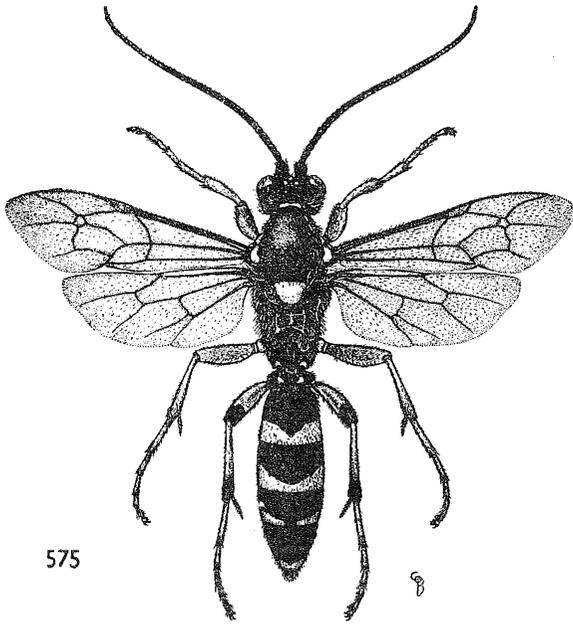
KEY TO SPECIES

- A ♀. Black, with the following copious, yellow markings: face and clypeus except the middle line; frontal and vertical orbits, outer orbit broadly in the lower two-thirds (malar space and cheeks behind this, black); pronotum with the collar centrally, a spot in the lateral angle anteriorly, and a broad stripe on the upper margin of the hind angle, yellow; mesoscutum with a central, quadrate spot; entire scutellum, central area of metanotum and subalar prominence; propodeum centrally with a pair of large spots, laterally with a small anterior spot beneath the hind wing, metapleurum with a large spot and sometimes with a small spot before the spiracle; postpetiole except a black, central stripe, hind angle of tergite 2; anterior coxae, hind coxa above and laterally, apically; femora broadly, apically; anterior tibiae in part, and hind tibia except in the basal quarter; hind tarsus in large part.
- ♂. With the yellow markings more extensive; with no central spot on the mesoscutum but with the hind angles of tergite 3 also yellow. (British specimens on the whole are more extensively marked with yellow than those from the Continent.) 12–16 mm. *Rare*. *variegatorius* (Panzer)
- B A mainly black species with few ivory markings.
- ♀. With at most the following ivory: sides and apex of clypeus, frontal and vertical orbits narrowly, anterior margin of pronotum centrally and the upper margin in the hind angle, scutellum centrally, hind margin of tergite 1 laterally; front legs in part somewhat pale marked. The whole insect (fig. 469).
- ♂. Similar to the ♀ but with the scape beneath and the facial orbit broadly, ivory; anterior coxae marked with ivory, femora marked with ivory apically and tibiae striped with ivory in front. 12–16 mm. *Not uncommon*. *leucostigmus* (Gravenhorst)

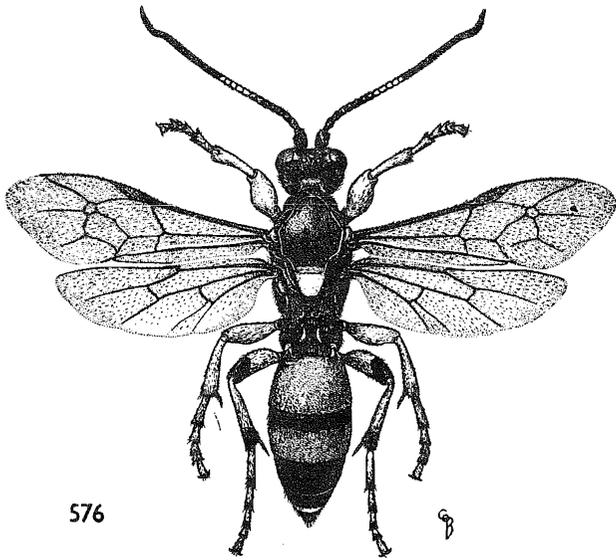
Genus *Ichneumon* L.

The problem of associating correctly the males and females in the genus *Ichneumon* has been recognized by most workers since the time of Wesmäl who laid the foundation for subsequent work on the genus. Until extensive breeding experiments are undertaken in order that series of males can definitely be determined from the females, little progress can be made towards solving the problem. Certain of the males, however, are very distinct and of these some can definitely be associated with females. As an indication of the sort of confusion that exists, a survey of the literature on the males of *Ichneumon ligatorius* Thunberg and the *I. molitorius* L. group is very illuminating.

The females of this genus form a very compact group, but a few species stand out as being distinct from the rest. The group of *I. sarcitorius* L. is such, and I should place here not only *I. lautatorius* Desv. but also *I. xanthorius* Forster. The only other species showing considerable divergence from the main bulk of the genus are *I. lugens* Grav. and *I. bucculentus* Wesm. For the rest, there is a tendency for a divergence into two main groups, the one having the area superomedia transverse or quadrate, the antenna strongly attenuate apically, the basal flagellar segments usually longer, the cheeks not swollen and the malar space as long or longer than the breadth of the base of the mandible; the other having the area superomedia usually elongate, rarely quadrate, the antenna rarely attenuate apically and always with the basal flagellar segments short, the cheeks more or less swollen

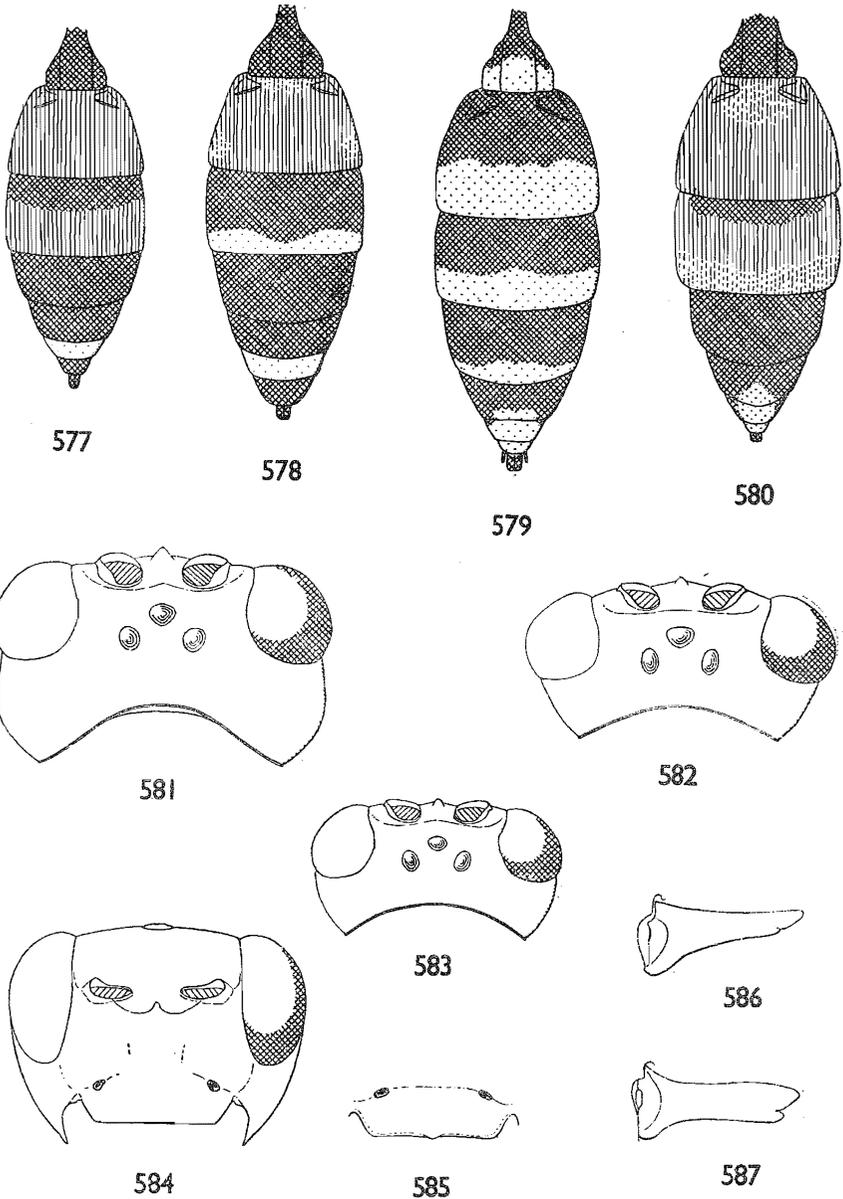


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FIGS. 575-576.—*Ichneumon sarcitorius* : 575, ♂ ; 576, ♀.



Figs. 577-587.—*Ichneumon*, ♀.

Figs. 577-580.—Gaster, colour pattern: 577, *sarcitorius*; 578, *lautatorius*; 579, *xanthorius*; 580, *terminatorius*.

Figs. 581-583.—Head, dorsal: 581, *lugens*; 582, *xanthorius*; 583, *sarcitorius*.

FIG. 584.—Head, anterior: *extensorius*.

FIG. 585.—Clypeus: *lugens*.

Figs. 586-587.—Mandible: 586, *sarcitorius*; 587, *bucculentus*.

and the malar space always a little shorter than in the previous group; there are however a number of species that are difficult to place in these groups, and whose position is in fact decided by their relationship with other species on different characters. It has to be admitted that in the key, couplet 15 is unsatisfactory, but serves to distinguish the vast majority of specimens. Variations do occur in the shape of the area superomedia and therefore in cases of doubt, if the species cannot be determined on the one side of the key, the other should be tried; thus great difficulty may be experienced unless one is determining a fair number of specimens of the genus or a series of a species or has a named collection to which to refer.

In recent years, it has been stated that the presence or absence of a scopa cannot be considered as of specific significance. I find that I cannot hold this view. It is true that the hair tuft, particularly in old hibernated females, may become much abraded, so that the actual hair patch is almost lost, but the sculpture beneath this is quite distinctive, and in fact, the sculpture of the underside of the hind coxa, towards and at the inner margin is of the utmost use in determining species; it is to this area that I refer in describing the sculpture of the "coxa beneath" in the key.

Most species have the scutellum ivory and tergites 2 and 3 red (varying to more yellowish in some specimens); tergite 1 is often red along the apical margin and tergite 4 is often red laterally. Only conspicuous divergence from this form of coloration is mentioned in the keys. The hind femur is normally black, the hind tibia pale testaceous, narrowly infusate basally and apically, the hind tarsus testaceous, more or less infusate.

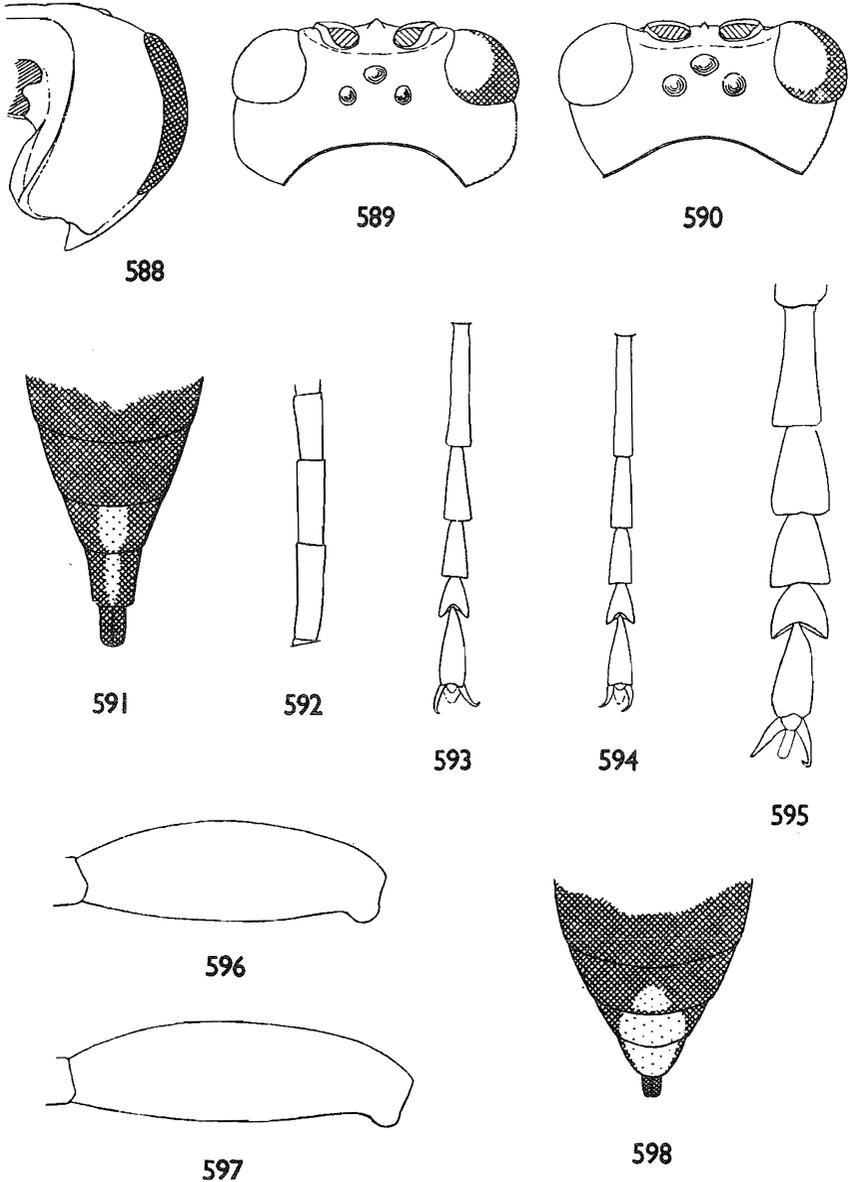
The known hosts of this genus are mainly Noctuidae for the species with the shorter malar space; the diversity of hosts is greater for the groups with the longer malar space and includes Butterflies, Arctiids and Lymantriids.

The specimens referred to as from N. England and Scotland have all been captured in mountain areas.

KEY TO SPECIES

(Females)

- 1 Mandible at most with a feeble notch delimiting the lower tooth which is therefore absent or almost absent (fig. 586).
 Thyridia very short, appearing as a very narrow, transverse band, or absent; gastrocoelus quite large and with its breadth at least two-thirds the distance between the gastrocoeli. (All three species can be distinguished at once from the other British species on their colour).....2
- Mandible with a distinct, lower tooth (cf. fig. 430).....4
- 2 (1) Tergite 6 with a broad, ivory band, tergites 5 and 7 entirely black (fig. 577), tergite 2 entirely red; hind coxa entirely black and with a scopa, hind femur red, black at most in the apical half; head with the temples broader (fig. 583).....3
- Tergites 5, 6 and 7 conspicuously marked with yellow, tergites 1-4 broadly yellow apically (fig. 579); hind coxa with a conspicuous, yellow spot above, and with no scopa, hind femur black; head with the temples strongly narrowing behind the eyes (fig. 582). 13-14 mm. *Not uncommon.* A more southerly species.....*xanthorius* Forster
 Note.—If tergites 5, 6 and 7 have yellow spots and tergite 2 is entirely red or red and yellow, cf. *terminatorius* Grav., which has a small but distinct lower tooth on the mandible.
- 3 (2) Tergite 3 black with a pale yellow, apical band which is wider at the side than in the middle (fig. 578); scutellum deep yellow; flagellum, at least from



FIGS. 588-598.—*Ichneumon*, ♀.

FIG. 588.—Head, posterolateral: *bucculentus*.

FIGS. 589-590.—Head, dorsal: 589, *bucculentus*; 590, *cessator*.

FIGS. 591-592.—*cessator*: 591, apex of gaster, dorsal; 592, flagellar segments 1-3.

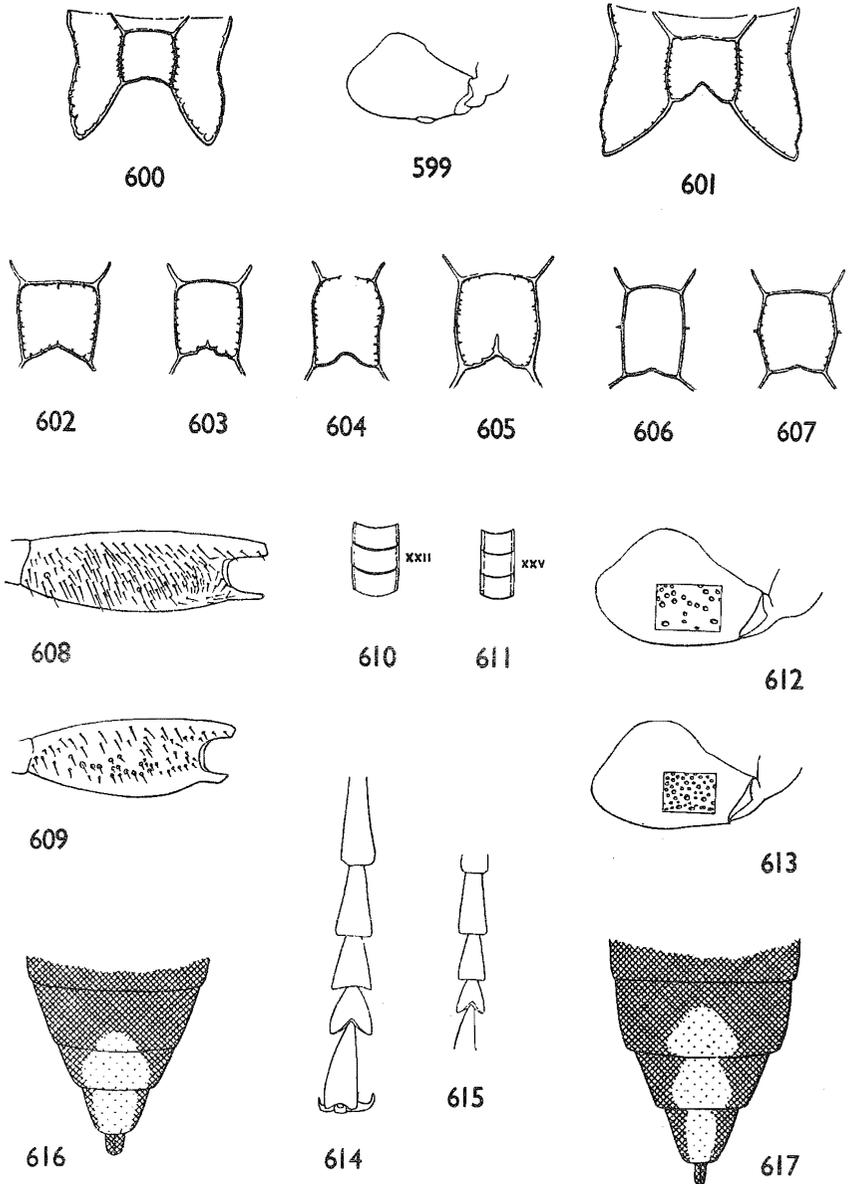
FIGS. 593-595.—Hind tarsus, dorsal: 593, *molitorius*; 594, *melanotis*; 595, *ligatorius*.

FIGS. 596-597.—Hind femur, lateral: 596, *crassifemur*; 597, *molitorius*.

FIG. 598.—Apex of gaster, dorsal: *molitorius*.

- segments 4-12, white or marked with white²¹; anterior margin of pronotum marked with red centrally. 11-14 mm. *Uncommon*. **lautatorius** Desvignes
- Tergite 3 black in basal one-third, red in apical two-thirds, sometimes more or less suffused with yellow towards the hind margin (fig. 577); scutellum ivory; flagellum at most with segments 7-12 white or marked with white; anterior margin of pronotum marked with ivory centrally. 10-12 mm. *Very common*. **sarcitorius** L.
- 4 (1) Head with the temples widening behind the eyes (fig. 581); apical segments of gaster black, with no ivory spots.
Clypeus weakly bisinuate (fig. 585); lower tooth of mandible, at its base, about three-quarters the breadth of the upper tooth (fig. 430); antenna rather short with 30-32 segments; area superomedia elongate (length: breadth = 1:0.8); hind coxa without a scopa and with clear, strong punctures beneath; postpetiole more elongate (length: breadth = 1:2) and with large, strongly elongate spiracles. c. 18 mm. *Uncommon*. **lugens** Gravenhorst
- Head with the temples usually contracting behind the eyes; if parallel or widened (*bucculentus*) then either the apical segments of gaster are conspicuously marked with ivory or the mesoscutum is red, or differing in other characters5
- 5 (4) Gaster blue-black with only segment 7 ivory marked; hind tibia black with a white ring very close to the base.
Antenna strongly widened beyond the white band, attenuate apically; scutellum ivory; area superomedia elongate; hind coxa with a scopa; gastrocoelus deep and the thyridia as broad as the distance between the thyridiae; impression between tergites 2 and 3 deep. 12-13 mm. *Common*. **deliratorius** L.
- If the hind tibia has a white band, then at least tergites 6 and 7 are marked with ivory6
- 6 (5) Mandible constricted at about a third from the base and widening to the base of the teeth (fig. 587); hypostomal carina very strongly raised (fig. 588); head a little widened behind the eyes (fig. 589).
Hind coxa with no scopa; tergites 5, 6 and 7 with a large, median, apical, ivory spot, that on 5 being as broad as that on 6. 12-14 mm. *Uncommon*. **bucculentus** Wesmael
- Mandible sharply narrowed from base to about a quarter of the length, then more or less evenly tapering to the base of the teeth; hypostomal carina not strikingly raised.7
- 7 (6) All the tarsi greatly expanded, segment 3 of the hind tarsus, viewed dorsally, with the central length: breadth = 1.1:1 (fig. 595).
Area superomedia subquadrate; scopa present; tergites 6 and 7 with a median, apical, ivory spot. 10-11 mm. *Not uncommon*. *A regular parasite of the Antler Moth*.**ligatorius** Thunberg
- At least the hind tarsus never conspicuously expanded, segment 3 of hind tarsus with central length: breadth at least 1.5:18
- 8 (7) Tergites 6 and 7 with a narrow, longitudinal, central, yellow stripe (fig. 591), the tergites otherwise black.
Antenna strongly elongate (fig. 592) and attenuate apically; head very strongly contracting behind the eyes (fig. 590); area superomedia transverse; hind coxa without a scopa, rather finely and closely punctate beneath; femora red; tibiae red with the hind pair black at the apex; scutellum black. 12-14 mm. *Not uncommon*.**cessator** Mueller
- Tergites 6 and 7 most usually with a semicircular yellow or white spot, in a few species entirely black.9
- 9 (8) With a blunt spine at the apex of the dentiparal area which is more or less excised before this (fig. 436).
Malar space longer than the breadth of the base of the mandible; flagellar segment 1 long, about two and a half times as long as apically broad; propodeum coarsely rugose, the area superomedia narrower apically than basally, and usually a little longer than its apical width; hind coxa with an

²¹ In continental specimens the whole basal part of the flagellum may be pale testaceous with a gradual change to a pale yellow area, but this can take place after segment 4

FIGS. 599-617.—*Ichneumon*, ♀.FIG. 599.—Hind coxa, lateral: *tuberculipes*.FIGS. 600-601.—Propodeum, dorsal: 600, *validicornis*; 601, *insidiosus*.FIGS. 602-607.—Area superomedia: 602, *confusor*; 603, *albiger*; 604, *gracilentus*; 605, *fuscatus*; 606, *latrator*; 607, *subquadratus*.

[Continued opposite

- ivory, dorsal mark, hind tibia black with an outward, yellow, central stripe ; postpetiole rugose (fig. 439) ; at least tergites 5-8 with ivory spots. 20-23 mm. *Infrequent* **primatorius** Forster
- Propodeum with no spines, and not with the same combination of other characters 10
- 10 (9) Scutellum white or yellow ; mesoscutum always black 11
- Scutellum black or if yellow or red then the mesoscutum is red or marked with red 42
- 11 (10) Hind tibia with a clear white or pale yellow ring, the extreme base and apex broadly black, at most with a faint, very narrow, red margin to the black and on the flexor surface ; hind tarsus black except sometimes on the extreme base of segments 1 and 2²² ; front margin of pronotum entirely black or marked with testaceous ; median area of postpetiole strongly and rather regularly, longitudinally striate ; tergites 6 and 7 with an ivory or more yellow, semicircular spot, tergite 5 most usually with a spot which is conspicuously narrower than that on tergite 6 (fig. 598) 12
- Hind tibia red, black apically and sometimes fuscous basally and in some species with the red conspicuously fading into yellow centrally ; hind tarsus often conspicuously pale ; some species have the front margin of the pronotum marked with white centrally ; some species have the median area of the postpetiole weakly, longitudinally striate ; in some species the white spot on tergite 5 is broader than that on tergite 6 15
- 12 (11) Hind coxa with a scopa, the sculpture beneath this very fine.
Note.—Certain forms of *confusor* might be confused with this group, but this species can be distinguished by the much weaker and more irregular, longitudinal striation of the median area of the postpetiole and the suffusion of the pale band on the hind tibia particularly below the fuscous base . . . 13
- Hind coxa without a scopa, the sculpture being quite coarsely punctate.
Scutellum, band of hind tibia and apical spots on the gaster distinctly pale yellow ; hind tarsus (fig. 594) more slender than in *molitorius* L. which it resembles closely ; tergites 2 and 3 black or red. 10-12 mm. *Infrequent*
melanotis Holmgren
- 13 (12) Scutellum, tergites 2 and 3, apical spots on the gaster and band of hind tibia yellow.
Tergite 2 sometimes with a fuscous, longitudinal streak along the lateral margin behind the gastrocoeli ; tergite 3 sometimes with a fuscous, transverse, basal streak. 13-15 mm. *Not uncommon* . . . **stramentarius** Gravenhorst
- Tergites 2 and 3 varying from red to black, never entirely clear yellow ; band of hind tibia white.
Hind tarsus (fig. 593) broader than in *melanotis* 14
- 14 (13) Scutellum and apical spots of gaster ivory ; hind femur outwardly, evenly punctured almost to the lower margin, and thinner, length : breadth = 3.25 : 1 (fig. 597) ; middle femur with the ventral impression evenly and quite closely hairy, the pubescence becoming only a little closer apically (fig. 608). 10-13 mm. *Not uncommon* **molitorius** Gravenhorst
- Scutellum deep yellow ; hind femur outwardly, sparsely punctate in lower half, except in the apical quarter, strongly thickened, length : breadth = 3.0 : 1 (fig. 596) ; middle femur with the ventral impression very sparsely hairy in the basal three-quarters, with the central line glabrous and conspicuously more closely pubescent in the apical quarter (fig. 609). 9-11 mm. *Uncommon*
crassifemur Thomson
- 15 (11) Area superomedia distinctly elongate (figs. 603-4) ; if subquadrate, (*confusor* (fig. 602) and *validicornis* (fig. 600)) then the antenna attenuates very little apically and/or flagellar segment 1 is not or scarcely longer than broad . . . 16

²² This only applies to British species.

Figs. 608-609.—Mid-femur, ventral : 608, *molitorius* ; 609, *crassifemur*.
Figs. 610-611.—Central flagellar segments : 610, *computatorius* ; 611, *extensorius*.
Figs. 612-613.—Hind coxa, lateral : 612, *eurycerus* ; 613, *albiger*.
Figs. 614-615.—Hind tarsus, dorsal : 614, *septentrionalis* ; 615, *suspiciosus*.
Figs. 616-617.—Apex of gaster, dorsal : 616, *albiger* ab. ; 617, *septentrionalis*.

- Area superomedia transverse or subquadrate, never longer than apically broad (cf. fig. 601); antenna always conspicuously attenuating apically and flagellar segment 1 distinctly elongate (figs. 618–23).....27
- 16 (15) Pronotum with the anterior, dorsal margin with a conspicuous, white band; antenna conspicuously attenuate apically; hind coxa with the lower, inner margin evenly rounded.....17
- Pronotum anteriorly black or marked with testaceous; if, as a variety, pronotum is marked with white (*gracilentus*), then the antenna is little attenuating apically; or if with yellow spots on each side of the central line (*septentrionalis*), then the lower, inner margin of the hind coxa is raised into a weak ridge.....18
- 17 (16) Tergites 5, 6 and 7 with yellow, dorsal spots; tergites 2 and 3 red, most usually in part suffused with yellow; tergite 3 most usually with a central, black, transverse band at the base (fig. 580); hind leg with the trochantellus black, the femur only very narrowly red at the extreme base, the tibia centrally, conspicuously yellow, the tarsus testaceous; hind coxa with no scopa, closely punctate or rugose punctate beneath. 13–15 mm. *Not uncommon*.....*terminatorius* Gravenhorst
- Tergite 5 black, 6 and 7 with dorsal, ivory spots; tergites 2 and 3 red, tergite 3 rarely narrowly infusate centrally at the base; hind tarsus conspicuously infusate at least towards the apex; hind coxa with a weak scopa, very finely, closely punctate beneath. 10–15 mm.....*albicollis* Wesmael
- (a) Hind trochantellus red, femur distinctly red at base; hind tibia red, sometimes marked with yellow internally, narrowly and weakly infusate basally, broadly infusate apically; hind tarsus infusate apically; scutellum ivory, rarely black apically. *Rare*. (*Hants.*)
albicollis typical form
- (b) Hind leg black with the femur very narrowly red basally, the tibia narrowly red internally towards the base, tarsal segment 1 weakly red basally; scutellum with a pair of lateral, ivory spots. 1 ♀, *Pembroke*
albicollis ab. or ssp.
- 18 (16) Tergites 5, 6 and 7 with conspicuous, white, dorsal spots, that on tergite 5 at least as broad as that on 6 (tergite 4 sometimes with a small, apical spot) (fig. 617); hind tibia red, fuscous at the extreme base, black apically and broadly yellow centrally.....19
- Tergites 6 and 7 with white or yellow dorsal spot, tergite 5 rarely with a small, apical spot which is conspicuously narrower than that on 6 (fig. 616)....20
- 19 (18) Hind coxa with the lower, inner margin weakly raised into a rounded ridge which is very closely, finely punctate, becoming rugose apically; hind tarsus testaceous, rarely somewhat infusate, broader (fig. 614). 11–14 mm. *Uncommon*.....*septentrionalis atrifemur* Perkins
- Note.—A single specimen from Shetland, Mainland, has the hind tibia entirely red, the antenna without a white band and the postpetiole almost smooth with sparse punctures; this may represent a distinct species closely related to *septentrionalis* or another distinct subspecies.
- Hind coxa with the lower, inner margin evenly rounded and rather coarsely punctate, not rugose apically; hind tarsus conspicuously infusate, narrower (fig. 615). 9–13 mm. *Abundant*. *A parasite of Hepialus*. *suspiciosus* Wesmael
- 20 (18) Hind coxa beneath, outwardly, polished with few large, scattered punctures, and with no scopa (fig. 612).
Antenna strongly widened beyond the middle, strongly attenuate apically; front femur entirely red. c. 10 mm. *Rare*.....*eurycerus* Thomson
- Hind coxa beneath, outwardly, quite closely punctate, the punctures interspersed with larger ones (fig. 613) (these are the punctures which are present in *eurycerus*); if with the punctures rather sparse (*I. computatorius*), the front femur is conspicuously marked with black and the hind coxa has a scopa.....21
- 21 (20) Tergite 1 entirely red or with only the petiole black; postpetiole very deeply and evenly, longitudinally striate.
Antenna not, or only weakly attenuate apically; upper tooth of mandible thin and acute; area superomedia of propodeum subquadrate (fig. 600); hind coxa very closely punctate beneath and therefore with a weak scopa; hind tibia red, black apically and with a broad, clear, pale yellow, subcentral

- band; thyridia broad, breadth: distance between the thyridiae at least 1:1.1. 8-10 mm. *Rather uncommon*..... **validicornis** Holmgren
- Tergite 1 with at most the postpetiole red apically; if as a variety, the postpetiole is more conspicuously red, then it has the central area shallowly and more irregularly striate..... 22
- 22 (21) Antenna very strongly widened beyond the middle (fig. 610), strongly attenuate apically, at their widest with the segments having the flattened, ventral area twice as broad as long.
Hind coxa beneath with the distinct scopa arising from minute, very fine punctures, dull; gaster black or with tergites 2 and 3 in part or wholly castaneus. 11 mm. *Rare*..... **computatorius** Mueller
- Antenna not so strongly widened beyond the middle (cf. fig. 611), the segments at their widest at most one and a half times as broad as long, not or only weakly attenuate apically..... 23
- 23 (22) Hind coxa beneath with at least a small scopa, the sculpture beneath this consisting of minute punctures, and this area being much more finely and closely punctate, contrasts with the area immediately basad of it where the puncturing is sparser..... 24
- Hind coxa beneath with no scopa and with distinct and clearly spaced punctures, the sculpture becoming coarser evenly from base to apex..... 25
- 24 (23) Hind tibia deep red, narrowly fuscous at the base, black in the apical third; scopa of hind coxa weaker, the very fine punctures, although extremely close, are distinct; mid-femur with sparse pubescence beneath (cf. fig. 609); area superomedia most usually conspicuously elongate. 8-13 mm. *Very common*..... **extensorius** L.
- Hind tibia pale red, fuscous at the base and black in about the apical third, broadly rather dirty yellow towards the base, above; scopa of the hind coxa strong, the sculpture beneath this appearing almost coriaceous; mid-femur with even pubescence beneath; area superomedia subquadrate (fig. 602). (Some forms of this species are difficult to separate from the *molitorius* group, but can be distinguished by the less strongly striate central area of tergite 1.) 8-11 mm. *Common*..... **confusus** Gravenhorst
- 25 (23) Antenna with the basal segments shorter (flagellar segment 1 having length: breadth at most 1.25:1), and less attenuate apically; malar space distinctly buccate and shorter (cf. fig. 534), shorter than the breadth of the base of the mandible..... 26
- Antenna with the basal segments conspicuously elongate (flagellar segment 1 having length: breadth at least 1.75:1), and strongly attenuate in the apical third; malar space not buccate and distinctly longer than the base of the mandible (cf. fig. 646). (*I. fuscatus* Gmelin)..... 36
- 26 (25) Area superomedia of propodeum conspicuously elongate, length: breadth = 1.4:1 (fig. 604); gaster more elongate; hind tibia paler red, very narrowly fuscous at the extreme base and in the apical quarter; temples more narrowed behind the eyes and the malar space a little longer. 9-12 mm. *Common*..... **gracilentus** Wesmael
- Area superomedia of propodeum less elongate, length: breadth = 1.25:1 (fig. 603); gaster with tergite 3 distinctly transverse; hind tibia pale red, narrowly infusate at the base and in the apical quarter, frequently with an interior, lateral, yellow spot and sometimes with the hind tibia conspicuously banded with yellow towards the base; temples less narrowed behind the eyes and the malar space a little shorter. 8-10 mm. *Common*
albiger Wesmael
- 27 (15) Hind coxa with a distinct tubercle on the inner, ventral margin towards the apex (fig. 599).
Tergites 6 and 7 with a white, dorsal spot; tergites 2 and 3 black or in part or wholly red. 12-14 mm. *Uncommon*..... **tuberculipes** Wesmael
- Hind coxa without a tubercle..... 28
- 28 (27) Hind coxa with a scopa, the sculpture beneath this in large part coriaceous.
Antenna black with a white ring; scutellum white; mesoscutum sometimes red marked; legs except the coxae and trochanters, entirely red or with femora black or marked with black; tergites 1-3 red, 4 sometimes with a minute, white, apical spot, 5 with a conspicuous spot which is narrower

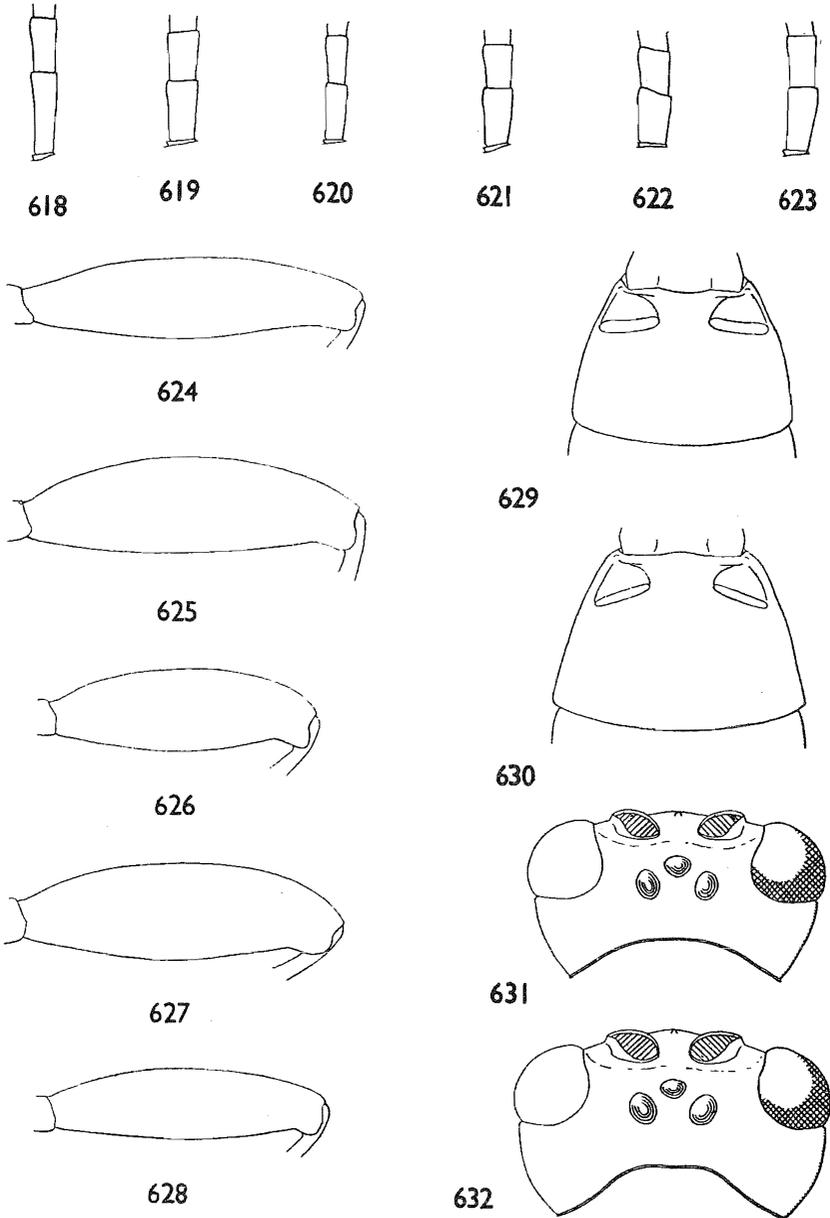
- than that on 6 and 7. 11–12 mm. *On Amathes hyperborea* (Zett.) *Scotland*
megapodius Heinrich²³
- Hind coxa without a scopa, clearly punctate beneath, though the punctures may be fine and very close. 29
- 29 (28) Tergites of gaster black. c. 14 mm. *Rare*. *haereticus* (Wesmael)
- Apical segments of gaster marked with ivory or yellow spots. 30
- 30 (29) Large species with a wing length of at least 12 mm. 31
- Medium sized or small species with a wing length of at most 10 mm. 32
- 31 (30) Tergites 5, 6 and 7 with broad, ivory spots; basal segments of flagellum red; head with the temples narrowed behind the eyes (fig. 631); legs red with the coxae and trochanters black and the hind tarsus usually in part infuscate; ground colour of gaster very variable, sometimes entirely red except tergite 1, or with only tergites 2 and 3 red (these segments may be more or less infuscate and probably black forms occur); tergite 1 more strongly, longitudinally striate centrally; tergites 2 and 3 duller, more closely punctate. 15–17 mm. *Ex Dasychira fascelina* (L.). *Rare*. *bellipes* Wesmael
- Tergites 6 and 7 with broad, ivory spots, tergite 5 with at most a very small, apical spot; basal segments of flagellum black; head with the temples subparallel behind the eyes (fig. 632); legs for the greater part black; gaster usually black, sometimes with tergites 2–4 red marked; tergite 1 with weaker, longitudinal striae centrally; tergites 2 and 3 with the punctures a little further apart. 16–19 mm. *Not uncommon*. *didymus* Gravenhorst
- 32 (30) Tergites 5, 6 and 7 with broad, ivory spots, tergite 4 sometimes with a spot. . 33
- Tergites 6 and 7 with broad, ivory or yellow spots, tergite 5 sometimes with a small, apical spot, but then it is much narrower than that on tergite 6 (*cf.* fig. 616). 36
- 33 (32) Thyridia at most as broad as the distance between the thyridiae, oblique (fig. 630). 34
- Thyridia conspicuously broader than the distance between the thyridiae, longer and transverse (fig. 629). 35
- 34 (33) Flagellar segment 2 with length : breadth = 1.6 : 1 (fig. 623); thyridia as broad as the space between the thyridiae; basal flagellar segments black; legs for the most part black; ground colour of tergites black or with tergites 2 and 3 in part or wholly red. 12–13 mm. *Uncommon*. *formosus* Gravenhorst
- Flagellar segment 2 with length : breadth = 1.2 : 1 (fig. 622); thyridia smaller, thyridiae : distance between thyridiae about 1 : 1.2; basal flagellar segments red; legs red with the coxae and trochanters black, the hind femur marked with black, the hind tibia infuscate at the apex and the apical, hind tarsal segments infuscate; tergite 1 red marked apically, tergite 2 red, tergite 3 red sometimes weakly infuscate at base and with the apical margin black. c. 12 mm. *N. England and Scotland*. *quartanus* Perkins
- 35 (33) Flagellar segment 2 with length : breadth at least 1.9 : 1 (fig. 618); flagellum less widened before the apex, the segments with the flattened, ventral area subquadrate; hind coxa more coarsely punctate beneath, hind femur a little thinner, length : breadth = 4.5 : 1 (fig. 624). 10–12 mm. *Rather common*. *gracilicornis* Gravenhorst
- Flagellar segment 2 with length : breadth at most 1.3 : 1 (fig. 619); flagellum more widened before the apex, the segments with the flattened, ventral area transverse; hind coxa finely and very closely punctate beneath, hind femur thicker, length : breadth = 4.0 : 1 (fig. 625). 9–12 mm. *Rare*
emancipatus Wesmael
- 36 (32) Hind leg black except the extreme base of the femur; area superomedia slightly elongate.
 Head strongly narrowed behind the eyes; tergite 2 irregularly transcostate behind the basal depression, behind this punctate; tergite 2 red, tergite 3 red, infuscate at the base and apex (*cf.* couplet 25). 11 mm. *Surrey*, 1 ♀
fuscatus Gmelin
- Hind leg in part conspicuously marked with red or sometimes also with yellow; area superomedia quadrate or transverse. (The species of this group are difficult to separate without comparison of specimens; it is possible that

²³ The Scotch form may belong to the ssp. *fennicola* Heinrich, or is anyway related to this.

- some of the segregates, as defined here, represent groups of species) 37
- 37 (36) Flagellar segment 2 fully twice as long as broad (fig. 620); antenna with 28-32 segments, usually about 30; tergite 1 with the central area of the postpetiole with very indistinct, longitudinal striae but the scattered punctures distinct, tergite 2 without striae centrally on the posterior margin of the basal depression; hind femur usually conspicuously red basally.
 Head strongly narrowed behind the eyes; hind femur rather short and thick (fig. 626). c. 7 mm. *Rare*. *exilicornis* Wesmael²⁴
- Flagellar segment 2 having length: breadth at most 1.7:1 (cf. fig. 621); antenna with at least 32 segments; tergite 1 with the central area of the postpetiole distinctly striate, tergite 2 distinctly striate on the posterior margin of the basal depression; hind femur only very narrowly red at the base 38
- 38 (37) Hind tarsus entirely testaceous; temples a little narrowed behind the eyes (fig. 641); orbits of the frons broadly marked with red, on the vertex with the red extending beyond half the distance from the orbit to the posterior ocellus; clypeus weakly, broadly produced centrally (fig. 639); apex of gaster more obtuse, hypopygium: ovipositor sheaths about 1:1.25 (fig. 429).
 Tibia usually conspicuously marked with yellow centrally. 9-11 mm. *Not uncommon*. *caloscelis* Wesmael
- Hind tarsus with at least the apical segments conspicuously infuscate; temples distinctly narrowed behind the eyes (figs. 640, 642); frons with narrow, pale, orbital marks, on the vertex usually narrow or absent; clypeus truncate or even very weakly emarginate; apex of gaster more pointed, length of hypopygium at most half the length of its apex from the apex of the ovipositor sheaths. 39
- 39 (38) Basal flagellar segments shorter and thicker (fig. 621), the whole antenna broader, postannellus at most as long as segment 3 of the middle tarsus measured centrally; malar space a little longer than the postannellus.
 Scutellum conspicuously flattened dorsally; hind femur rather stout, hind tibia sometimes marked with yellow beneath; postpetiole rarely marked with red except on the extreme hind margin; tergite 5 with at most a minute, white, apical spot. 9-11 mm. *Rather common*. *insidiosus* Wesmael
- Basal flagellar segments more elongate, flagellum more slender, postannellus distinctly longer than segment 3 of the middle tarsus. 40
- 40 (39) Malar space (fig. 645) a little longer than the postannellus; central area of the postpetiole very clearly differentiated and more strongly raised apically, and weakly but distinctly convex with weak lateral keels just in front of the line of the spiracles, strongly longitudinally striate; the red of the gaster most usually rather darker.
 Basal flagellar segments black, at most with the segments somewhat reddish, in part, beneath; temples strongly, almost rectilinearly narrowed behind the eyes; scutellum weakly convex; hind femur similar to *nereni* (cf. fig. 628); tergite 5 with at most a small, apical spot. 8-9 mm. *Not uncommon*. *minutorius* Desvignes
- Malar space (fig. 646) a little shorter than the postannellus; central area of the postpetiole most usually rather weakly striate, and flat just in front of the line of the spiracles; often with the red of the gaster rather pale or in part yellow, tergite 1 most usually only marked with red apically. 41
- 41 (40) Hind femur thicker laterally, with length: breadth about 3.2:1 (fig. 627); tergite 5 with at most a very small, ivory, apical spot; flagellum with the basal segments usually red or conspicuously marked with red; head with the temples less narrowed behind the eyes, and more convex (fig. 642); scutellum less convex. 9-11 mm. *Rather rare*. *caproni* Perkins

²⁴ This species, as pointed out by Wesmael, is closely related to *I. eumerus* Wesmael. Both have a similar base to the second tergite, thickened hind femur and the antenna with about 30 segments. *I. eumerus*, however, has the tarsi strongly widened, the antennal segments much shorter and more expanded before the apex and the area superomedia a little longer than broad. *I. raptorius* var. 5 Wesmael I consider to be only an aberration of *exilicornis*, having the flagellar segments relatively just a little shorter than in the type.

- Hind femur rather thin, with length : breadth about 3·7 : 1 (fig. 628) ; tergite 5 most usually with a conspicuous, ivory, apical spot ; flagellum with the basal segments sometimes conspicuously red ; head with the temples sharply and almost rectilinearly narrowed behind the eyes (fig. 640) ; scutellum distinctly convex. 8–10 mm. *Rather rare*. **nereni** Thomson
- 42 (10) Mesoscutum red or at least with the line of the notauli conspicuously marked with red ; very variable species. 43
- Mesoscutum with no trace of red markings. 47
- 43 (42) Basal flagellar segments very short, segment 1 with length : breadth = 1 : 0·9 (fig. 633) ; hind coxa finely, sparsely punctured beneath and coriaceous between the punctures.
Face and frons frequently marked with red ; basal flagellar segments usually red, and beyond this with a very pale, testaceous ring ; mesoscutum and often the upper margin of pronotum red ; scutellum at least in part yellow ; central area of postpetiole coriaceous, sometimes very weakly so, with few scattered punctures ; tergites 1–3 red, tergite 3 sometimes black apically, tergite 7 with an ivory, dorsal mark, tergite 6 with at most a small, apical spot ; legs except the coxae and trochanters, red. 7–8 mm. *Scotland*
rufidorsatus Bridgman
- Basal flagellar segments more elongate, segment 1 with length : breadth = 1 : 0·6 as a minimum (fig. 634) ; hind coxa closely punctate or subrugose beneath 44
- 44 (43) Scutellum yellow ; apical tergites not marked with ivory spots.
Clypeus coarsely punctate basally, impunctate centrally in the apical half ; hind coxa beneath rather evenly, closely punctate ; postpetiole with the central area strongly, longitudinally striate. c. 8 mm. *N. England, Scotland*. **aquilonius** Perkins
- Scutellum red ; at least tergite 7 with a conspicuous, ivory spot, or the hind coxa with a weak scopa. 45
- 45 (44) Tarsi conspicuously broad, segment 4 of middle tarsus with length centrally : breadth about 2 : 3 ; scutellum ivory ; tergites 5–7 with ivory, apical spots, that on 5 usually smaller than that on 6.
Hind coxa with a scopa ; flagellum and malar space shorter (*cf.* couplet 28). **megapodius** Heinrich
- Tarsi thin, segment 4 of middle tarsus with length subequal to breadth ; scutellum red ; only tergites 6 and 7 with ivory, apical spots. 46
- 46 (45) Postpetiole coriaceous, this sculpture tending in some specimens to run together to form very weak, irregular, longitudinal striae in the central area ; hind coxa finely, closely punctate beneath, with no scopa ; clypeus with coarse, close, almost subrugose, punctation. 8–10 mm. *Scotland*
vulneratorius Zetterstedt
- Postpetiole with the central area strongly and rather evenly, longitudinally striate ; hind coxa extremely finely rugose punctate beneath, from which arises a weak but distinct scopa ; clypeus with coarse, widely spaced punctures. 8–9 mm. *Scotland*. **walkeri** Wesmæl
- 47 (42) Hind coxa red.
Thyridia broader than the distance between the thyridiae (fig. 643). 48
- Hind coxa black. 49
- 48 (47) Area supermedia at least one and a half times longer than broad (fig. 606) ; frequently brachypterous ; (♂ with the face black, occasionally with the internal orbits narrowly yellow). 5–7 mm. *Common*. **litrator** F.
- Area supermedia subquadrate (fig. 607) ; always fully winged ; (♂ with the face entirely yellow). 6–7 mm. *Common*. **subquadratus** Thomson
- 49 (47) Thyridia conspicuously broader than the distance between the thyridiae. 50
- Thyridia a little narrower than the distance between the thyridiae (fig. 644).
Similar in general appearance to *litrator* F., but differs in the black hind coxa, the narrower thyridia and the more strongly striate postpetiole. 8–9 mm. *Rare*. **analis** Gravenhorst
- 50 (49) Clypeus strongly and closely punctate often tending to shallow, longitudinal furrows in the apical half ; flagellum thinner, segment 2 with length : breadth = 2 : 1 (fig. 637).
Antennal ring broad, rather yellowish ; mesoscutum closely punctate with microsculpture between the punctures ; scutellum strongly punctate

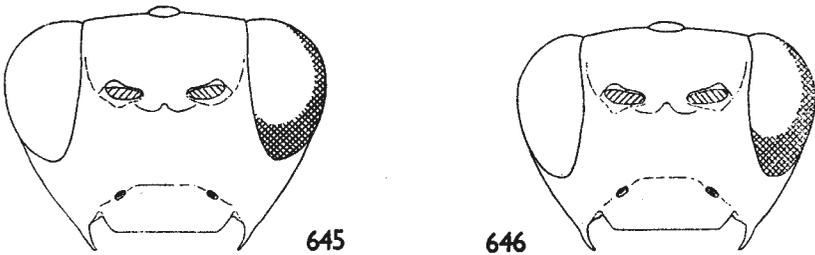
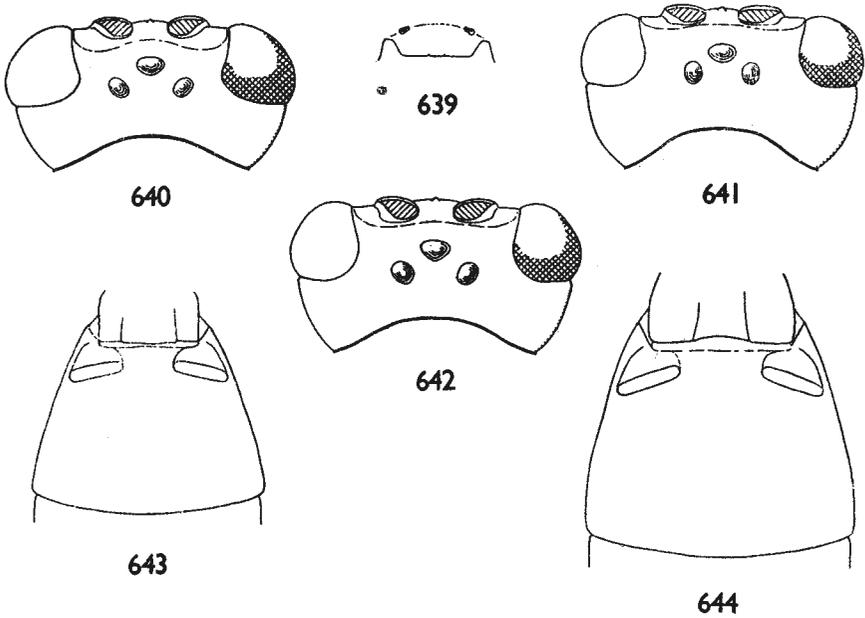
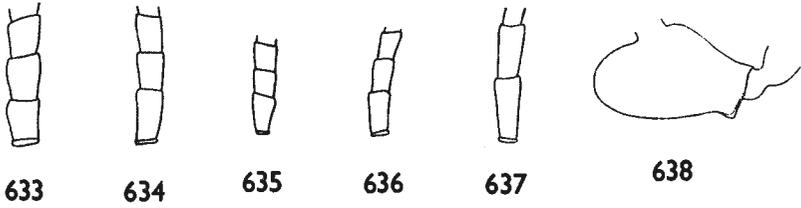


FIGS. 618-632.—*Ichneumon*, ♀.
 FIGS. 618-623.—Flagellar segments 1-2: 618, *gracilicornis*; 619, *emancipatus*; 620, *exilicornis*; 621, *insidiosus*; 622, *quartanus*; 623, *formosus*.
 FIGS. 624-628.—Hind femur, lateral: 624, *gracilicornis*; 625, *emancipatus*; 626, *exilicornis*; 627, *caproni*; 628, *nereni*.
 FIGS. 629-630.—Tergite 2, dorsal: 629, *gracilicornis*; 630, *formosus*.
 FIGS. 631-632.—Head, dorsal: 631, *bellipes*; 632, *didymus*.

- or rugose in the apical half ; hind coxa beneath, simple and with no trace of a subapical scopa ; central area of postpetiole weakly striate rugose. c. 8 mm. *Scotland*.....**ignobilis** Wesmæl
- Clypeus sparsely and shallowly punctate ; flagellum thicker, segment 2 with length : breadth at most 1.4 : 1.....51
- 51 (50) Hind coxa beneath (fig. 638) with an irregular, transverse, subapical carina, weakly excavate before this, and here very closely, very finely punctate and with a weak scopa ; postpetiole coarsely, longitudinally striate ; mesoscutum closely punctate, for the greater part shining between the punctures ; flagellum with segment 2 length : breadth about 1.4 : 1 (fig. 636) ; tergites 6 and 7 with white, dorsal marks. 8–9 mm. *Uncommon*
- Hind coxa beneath with no carina and with no trace of a scopa ; postpetiole very finely, longitudinally striate, the striation in part obsolete ; mesoscutum rather sparsely punctate and in the greater part polished between the punctures ; flagellum with segment 2 length : breadth about 1 : 1 (fig. 635) ; tergite 7 only with a white, dorsal mark.
- Very similar to *litrator* F. and may be a small variety of that species ; differing from it, besides in colour, only in having the temples more strongly narrowed behind the eyes. 6 mm. *Surrey*, 1 ♀.....**spurius** Wesmæl

(Key to Some Conspicuous Males)

- 1 Clypeus weakly produced in a broad triangle centrally ; head with the temples buccate.
- Flagellum normally with an ivory, central ring ; face with the orbits ivory ; scutellum usually marked with ivory ; subalar prominence marked with ivory.....**lugens** Gravenhorst
- Clypeus truncate apically ; temples narrowed behind the eyes ; the majority of species with the gaster conspicuously yellow or red marked.....2
- 2 (1) Black, the gaster with bluish reflections.
- Face and clypeus, upper margin of hind angle of pronotum, scutellum and subalar prominence, ivory ; front and middle tibiae and tarsi copiously marked with white, hind tibia white in basal half, black apically, the tarsus with at least the first segment broadly white basally.....**deliratorius** L.
- If, rarely, the gaster is black, there are no bluish reflections and the hind tibia is obviously differently coloured.....3
- 3 (2) Hind coxa with a large, yellow, dorsal spot.....4
- Hind coxa without such a spot.....5
- 4 (3) A large, robust species with the postpetiole black, at most narrowly red apically ; hind femur thin, yellow, more narrowly black apically ; hind tibia pale testaceous, narrowly infusate apically.....**primatorius** Forster
- A narrower species with the postpetiole yellow ; hind femur incrassate, yellow with about the apical half black ; hind tibia yellow, conspicuously black apically.
- Propodeum sometimes with conspicuous, yellow markings
- xanthorius** Forster
- 5 (3) Tergite 2 black or red, yellow apically, tergite 3 black, yellow apically, both tergites with the yellow apical margin broader laterally than centrally ; tergites 6 and 7 dorsally, apically yellow ; tergite 4 often yellow apically at least laterally.....6
- Colour of gaster differing radically in the above colour markings.....7
- 6 (5) Tergite 2 black, yellow apically ; tergite 1 often yellow marked apically
- sarcitorius** L.
- Tergite 2 red and hence the apical, yellow band indistinct ; tergite 1 never yellow marked apically.....**lautatorius** Desvignes
- 7 (5) Femora and tibiae red, the hind tibia in part infusate ; gaster black, sometimes tergites 2 and 3 red marked.....8
- Femora black, tibiae often broadly yellow or white marked ; gaster often broadly marked with yellow.
- The majority of species belonging to this section.
- 8 (7) Head strongly rectilinearly narrowed behind the eyes ; scutellum not yellow marked.....**cessator** Mueller



FIGS. 633-646.—*Ichneumon*, ♀.

FIGS. 633-637.—Flagellar segments 1-3: 633, *rufidorsatus*; 634, *aquilonius*; 635, *spurius*; 636, *memorator*; 637, *ignobilis*.

FIG. 638.—Hind coxa, lateral: *memorator*.

FIG. 639.—Clypeus: *caloscelis*.

FIGS. 640-642.—Head, dorsal: 640, *nereni*; 641, *caloscelis*; 642, *caproni*.

FIGS. 643-644.—Tergite 2, dorsal: 643, *latrator*; 644, *analis*.

FIGS. 645-646.—Head, anterior: 645, *minutorius*; 646, *nereni*.

- Head convexly narrowed behind the eyes ; scutellum usually yellow marked ;
a more robust species.....bellipes Wesmael

Genus *Thyrateles* Perkins

♀♂. Scutellum strongly raised (fig. 453) ; dentiparal angle produced ; antenna at most somewhat testaceous in the middle and towards the base ; gaster black, ♀ sometimes with an ivory, apical spot on tergite 6 and a median, longitudinal line on tergite 7 ; femora and tibiae red, hind tibia black apically, front and middle tarsi red, hind tarsus fuscous. ♀ 15 mm., ♂ 14-16 mm. *A parasite of Vanessids. Rare*.....camelinus (Wesmael)

The male of *Ichneumon cessator* Mueller may easily be confused with that of *T. camelinus*. I include a diagnosis for the differentiation of these.

- I. cessator* ♂ : Flagellum with the tyloidae on at least segments 12 and 13, long, linear and extending from nearly the base to the apex of the segment (tyloidae present on segments 8 (10)-17 (20)) ; scutellum longer and more narrowed towards the apex ; head broader in relation to the thorax, very strongly narrowed directly behind the eyes.
- T. camelinus* ♂ : Flagellum with the tyloidae oval and confined to the basal half of each segment (present on the same segments as in *cessator*) ; scutellum broader and less strongly narrowed apically ; head narrower in relation to the thorax and less strongly narrowed directly behind the eyes.

Genus *Ctenichneumon* Thomson

The genus, as here constituted, is compact and all the species are fairly closely related. They are at once recognizable by the deep gastrocoeli and absence of thyridiae (fig. 451). Little is known of the hosts but these appear usually to be Noctuids. The shape of the penis valves appears to be fairly uniform in this genus (fig. 670).

KEY TO SPECIES

(Females)

- | | | |
|-------|---|------------------------------|
| 1 | Scutellum black..... | 2 |
| - | Scutellum for the greater part ivory..... | 4 |
| 2 (1) | Sternites without a median plica ; segment 3 of flagellum less than 1.25 times as long as broad (fig. 648) ; postpetiole and the area between the shallower gastrocoeli finely striate.
Legs black, the front, and sometimes the middle, weakly marked with piceous ; wings rather strongly infuscate ; tergites 2 and 3 red. 10-13 mm. <i>Common</i> | <i>panzeri</i> (Wesmael) |
| - | Sternites 2 and 3 with a median plica ; segment 3 of flagellum with the length at least 1.4 times the breadth ; postpetiole and the area between the deeper gastrocoeli much more coarsely striate..... | 3 |
| 3 (2) | Femora and tibiae testaceous, the hind tibia at most with a very small, fuscous, apical spot ; gaster black with at most the extreme apices of the central segments red ; flagellum (base, fig. 647) usually more or less testaceous at the base, sometimes with segments 7-11, or some of these, more or less yellow ; a more robust insect. 14-15 mm. <i>Common</i> | <i>castigator</i> (F.) |
| - | Femora usually for the most part black, rarely in part deep red ; hind tibia black sometimes with a narrow, sub-basal, pale band ; gaster usually with at least the apical segments red, varying to red with only tergite 1 black ; flagellum with a clear white band ; a more slender insect. 12-13 mm. <i>Rather common</i> | <i>rubroater</i> (Ratzeburg) |
| 4 (1) | Sternites with no median fold.
Flagellum elongate, the second segment about one and a half times as long as broad ; gaster and legs black, front tibia and tarsus more piceous with an ivory mark laterally, inwardly, middle and hind tibiae in part | |

- piceous and sometimes with an indistinct, lateral, ivory spot inwardly towards the base. 12-14 mm. *Uncommon*. **funereus** (Geoffroy)
- Sternites with a median fold on segments 2 and 3. 5
- 5 (4) Spiracles of tergite 1 suboval, length : breadth at most 1.5 : 1 (fig. 652). 6
- Spiracles of tergite 1 conspicuously elongate, length : breadth at least 1.75 : 1 (fig. 653). 7
- 6 (5) Stigma black; tergites 2-3/4 red, 4/5-7 black; hind leg entirely black; hind angle of pronotum and most usually the subalar prominence not marked with ivory; antenna a little more thickened before the apex. *c.* 10 mm. *Rare*. **nitens** (Christ)
- Stigma pale; only tergite 1 black, the remainder red; hind femur usually red, black apically but sometimes almost entirely black; hind angle of pronotum marked with ivory, subalar prominence entirely ivory; antenna more slender before the apex. 11-13 mm. *Uncommon*. **devylderi** (Holmgren)
- 7 (5) Segment 1 of flagellum (figs. 649-50) at most as long as the malar space. 8
- Segment 1 of flagellum (fig. 651) conspicuously longer than the malar space. 9
- 8 (7) Flagellar segment 2 broader than long (fig. 649), breadth : length about 1.2 : 1; hind femur red, rarely sordid, and most usually with an ivory patch, inwardly towards the base; hind tibia red, black apically; gaster either entirely black or with tergites 2 and 3 and the apex of 1, red. 14-15 mm. *Not uncommon*. **edictorius** (L.)
- Flagellar segment 2 longer than broad (fig. 650), breadth : length = 0.9 : 1; hind legs black, hind femur never with an inward, ivory mark, hind tibia rarely with a sub-basal, pale band; tergites 2 and 3 red. 11-14 mm. *Common* **divisorius** (Gravenhorst)
- 9 (7) Hind femur red, hind tibia red with only the apex black; propodeum with the petiolar area very weakly defined laterally; antenna a little more elongate; in the form with segments 2 and 3 of gaster pale red, the ventral plica and the apices of sternites 2 and 3 are also pale and tergite 3 is usually narrowly infusate basally; gaster varies to completely black. 12-14 mm. *Rare* **inspector** (Wesmael)
- Hind legs black; propodeum with the petiolar area strongly delimited laterally; antenna a little thicker; in the form with segments 2 and 3 dark red, the ventral plica and the apices of sternites 2 and 3 are fuscous; gaster varies to completely black. 10-14 mm. *Not uncommon*. **messorius** (Gravenhorst)

(Males)

- 1 Sternite 3 with no median, longitudinal fold but evenly sclerotized. Face laterally, hind angle of pronotum, subalar prominence sometimes, scutellum and hind tibia broadly marked with ivory. 2
- Sternite 3 with a strong, median, longitudinal fold. 3
- 2 (1) At least tergites 4, 5 and 6 with the apical margin ivory, tergites 2 and 3 sometimes red; sternite 2 with a pale, median, longitudinal, membranous area; central segments of flagellum (6 and following) transverse (fig. 657); gaster more oval; hind femur sometimes red, black apically; hind tarsal segments 1-4 usually conspicuously marked with ivory. 12-14 mm. **panzeri** (Wesmael)
- Tergites black; sternite 2 evenly sclerotized except the extreme base; central segments of the flagellum much more elongate, 6 and 7 conspicuously so (fig. 659); gaster more elongate, centrally with the sides subparallel; hind femur never red; hind tarsus with at most segments 3 and 4 ivory marked. *c.* 15 mm. **funereus** (Gravenhorst)
- 3 (1) Scutellum completely black. Face and pronotum with no ivory marks. 4
- Scutellum with at least a conspicuous, ivory spot. 5
- 4 (3) Femora and tibiae testaceous with at most the hind tibia very narrowly infusate at the apex; flagellum thinner, more elongate, segment 6 elongate (fig. 656); gaster entirely black. 13-15 mm. **castigator** (F.)
- Femora and tibiae red with at least the hind tibia broadly infusate at base and apex, varying to completely black; flagellum thicker, shorter, segment 6 quadrate (fig. 658); gaster with tergite 1 black, the remainder red, varying to completely black, the apical segments being the last to become black 12-14 mm. **rubroater** (Ratzeburg)

- 5 (3) Tergite 1 with the spiracles subcircular, small or very small (figs. 654-5), the prespiracular carina strongly developed.
Face not marked with ivory; pronotum and subalar prominence sometimes ivory marked. 6
- Tergite 1 with the spiracles conspicuously oval, elongate, large (cf. fig. 653), the prespiracular carina weakly represented or absent, except in *edictorius* which never has the hind tibia black at the base. 7
- 6 (5) Tergite 1 with the spiracles very small (fig. 655); usually with tergites 2, 3 and 4 red, the apical segments and the genital claspers black, rarely with the gaster entirely black; hind femur always black; hind tibia broadly marked with white. c. 12 mm. *nitens* (Christ)
- Tergite 1 with the spiracles of medium size though still subcircular (fig. 654); usually with tergite 2 in the apical half and the following segments and genital claspers red, rarely with the gaster and genital claspers entirely black but even in very dark examples, usually with at least the apical segment and the genital claspers red; hind femur sometimes in part red; hind tibia usually marked with whitish or ivory towards the base. 13-15 mm.
devylderi (Holmgren)
- 7 (5) Hind femur red, or if rarely infusate, then with a large, whitish, sub-basal, posterior blotch towards the lower margin.
I have been unable to distinguish satisfactorily the males of *edictorius* and *inspector*. Specimens with a conspicuous whitish patch basally on the inner side of the hind femur appear always to be *edictorius*, but this shows considerable variation. 13-17 mm. *edictorius* (L.) and *inspector* (Wesmael)
- Hind femur black, very narrowly red at the extreme base (some continental forms have the hind femur red, at least in the female) 8
- 8 (7) Antenna with larger tyloidae, the tyloida of flagellar segment 7 occupying the whole length of the segment (fig. 660); tergite 4 with clearly defined, conspicuous punctures in the apical half, basally going to rugose-punctate, tergites 2 and 3 red, varying to the gaster being entirely black; stigma black; hind tibia black. 12-15 mm. *messorius* (Gravenhorst)
- Antenna with smaller tyloidae, that of flagellar segment 7 conspicuously shorter than the length of the segment; tergite 4 with the punctures small and with ill-defined outline in the apical third; stigma most usually in part testaceous; hind tibia broadly marked with white. 13-16 mm.
divisorius (Gravenhorst)

Genus *Spilichneumon* Thomson

The two species *raptorius* and *septemguttatus* probably would be better placed in *Amblyteles* (s.l.). I have, however, kept them in the traditional position as their affinities are at present uncertain. The remaining species are closely related and the hosts of those that are known are usually Noctuids living in Graminae. The females hibernate as adults.

The scutellum is yellow in all British species. The females have the apex of tergite 1 usually, tergites 2 and 3 and usually the extreme base of 4, red. The males of all but *occisorius* are similarly coloured to many of the yellow and black males of *Ichneumon*, having tergites 2 and 3 and sometimes the base of 4 yellow, with indications of irregular, reddish patches. All the males have the hind tibia yellow, black apically and the hind tarsus almost completely yellow except in the dark aberrations of *occisorius*, and infusate in *raptorius* and *septemguttatus*.

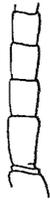
KEYS TO SPECIES

(Females)

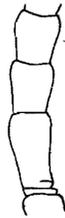
- 1 Mandible with the shaft very stout, parallel-sided in the middle or even weakly expanded towards the base of the teeth (figs. 661-2, 664-5); antenna less elongate, segment 3 of flagellum at most as long as broad (fig. 668) . . . 2
- Mandible with the shaft narrow, evenly narrowed from near the base to the



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648



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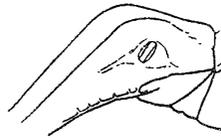
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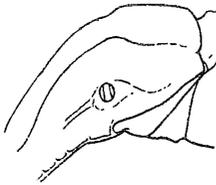
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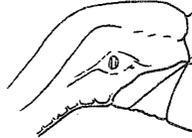
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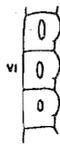
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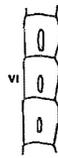
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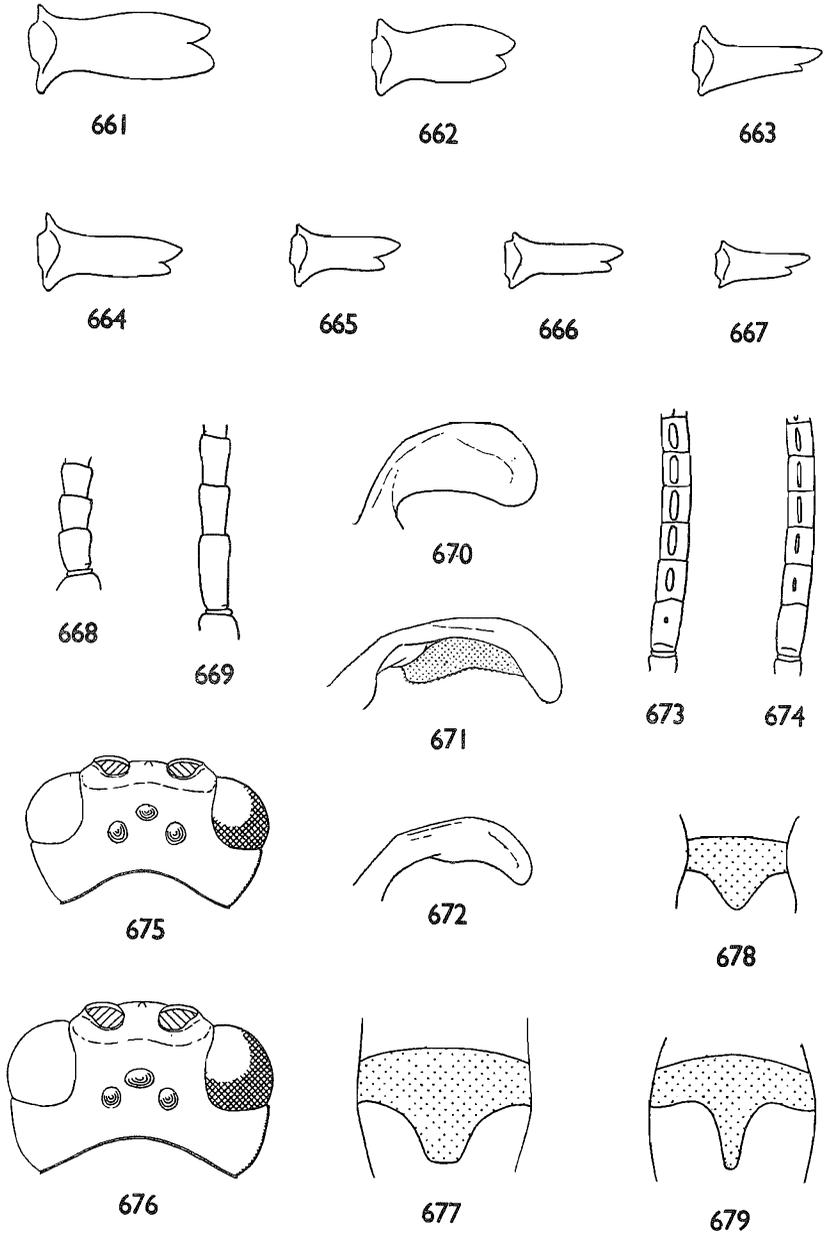
660

Figs. 647-660.—*Ctenichneumon*.

Figs. 647-651.—Basal flagellar segments, ♀: 647, *castigator*; 648, *panzeri*; 649, *edictorius*; 650, *divisorius*; 651, *inspector*.

Figs. 652-655.—Postpetiole, viewed laterally and slightly dorsally: 652, *devylderi*, ♀; 653, *messorius*, ♀; 654, *devylderi*, ♂; 655, *nitens*, ♂.

Figs. 656-660.—Flagellum, sub-basal segments, ♂: 656, *castigator*; 657, *panzeri*; 658, *rubroater*; 659, *funereus*; 660, *messorius*.



FIGS. 661-667.—Mandible, *Spilichneumon*: 661, *occisorius*, ♀; 662, *stagnicola*, ♀; 663, *raptorius*, ♀; 664, *johansonii*, ♀; 665, *celenae*, ♀; 666, *stagnicola*, ♂; 667, *celenae* ♂.
 FIGS. 668-669.—Flagellar segments 1-3, *Spilichneumon*, ♀: 668, *occisorius*; 669, *raptorius*.
 FIGS. 670-672.—Penis valve, lateral: 670, *Ctenichneumon castigator*; 671, *Spilichneumon occisorius*; 672, *S. raptorius*.

[Continued opposite

apex (fig. 663); antenna longer, segment 3 of flagellum conspicuously longer than broad (fig. 669).

- At least tergites 5-7 with an apical, dorsal, ivory spot. 5
- 2 (1) Lower tooth of mandible longer and larger than the upper tooth (fig. 661); hind coxa very coarsely, sparsely punctate beneath.
Tergites 4-6 with an apical, central, transverse, ivory band, tergite 7 with an ivory spot; hind tibia red, only weakly infusate apically, the tarsus reddish. 10-15 mm. *Common*. **occisorius** (F.)
- Lower tooth of mandible very small and much shorter than the enlarged upper tooth (figs. 662, 664-5); hind coxa with normal, rather close punctures beneath 3
- 3 (2) Tergites 4 and 5 always with an ivory, apical band which is much broader than the spot on tergite 6, and that on tergite 4 broader than that on 5, tergite 7 with a dorsal, ivory spot; a robust species.
Mandible smaller and flatter (fig. 664). 12-14 mm. *Uncommon*. **johansoni** (Holmgren)
- Tergites 4 and 5 usually entirely black, rarely with a small apical spot, which, if present on tergite 4 is at most equal in width to that on 5; tergite 7 with a dorsal, ivory spot; more slender species. 4
- 4 (3) Mandible very strong, more convex and broadly widened before the teeth (fig. 662); head weakly narrowed behind the eyes (fig. 676); claws more slender; tergite 4 at most marked with red centrally, basally.
Tergites 4 and 5 sometimes with an ivory, apical spot. 10-12 mm. *Rare*. **stagnicola** (Thomson)
- Mandible with the shaft parallel-sided and not convex (fig. 665); head conspicuously narrowed behind the eyes (fig. 675); claws stouter and more strongly curved apically; tergite 4 red laterally and basally. c. 9 mm. *Rare, northerly, ex Celaena haworthii* (Curtis). **celenae** Perkins
- 5 (1) Sternite 4 with no plica; tergite 4 with the ivory, dorsal spot comparable in size with that on tergite 5; tergite 2 at the base, centrally, without or with only very weak striation. 11-14 mm. *Common*. **raptorius** (L.)
- Sternite 4 with a median, longitudinal fold; tergite 4 usually entirely black, rarely with an ivory spot which is conspicuously smaller than that on tergite 5; tergite 2 at the base, centrally, with conspicuous striation. 12-13 mm. *Uncommon*. **septemguttatus** (Gravenhorst)

(Males)

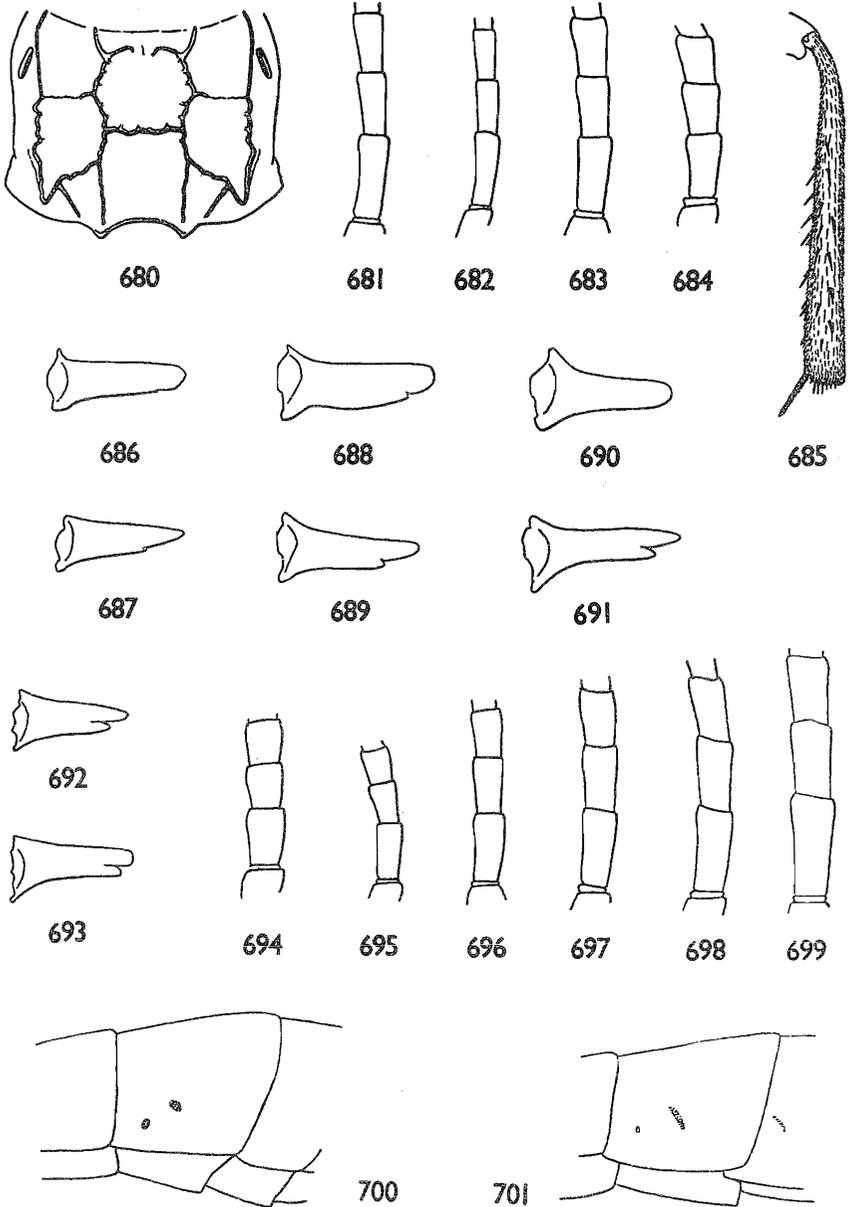
- 1 Sternite 8 with a long, central, apical projection (figs. 677, 679); penis valves with a scaly flap beneath (fig. 671). 2
- Sternite 8 at most with a broadly rounded, weak, central projection (fig. 678); penis valves with no scaly flap (fig. 672). 5
- 2 (1) Projection of sternite 8 rather broadly truncate apically (fig. 677); face yellow, marked with black centrally.
Thyridia conspicuous. 16-18 mm. **johansoni** (Holmgren)²⁵
- Projection of sternite 8 subacute (fig. 679); face entirely yellow. 3
- 3 (2) Gastrocoelus though weakly impressed, much broader, and the thyridia though short is distinct; at least tergites 5 and 6 pale yellow apically, sometimes 2-7 so marked, tergites 2 and 3 usually at least in part yellow.

²⁵ The male of *johansoni* may readily be confused with that of *Ichneumon septentrionalis*; both are similarly coloured and the thyridiae of both are distinct; however, *johansoni* has the tyloidae (on most segments on which they occur) extending from the base to the apex of the segment, the hypopygium produced centrally into a rather short, blunt projection and the penis valves with a conspicuous, subapical expansion beneath which, ventrad, is coriaceous and dull.

FIGS. 673-674.—Flagellar segments 1-6, *Spilichneumon*, ♂: 673, *stagnicola*; 674, *celenae*.

FIGS. 675-676.—Head, dorsal, *Spilichneumon*, ♀: 675, *celenae*; 676, *stagnicola*.

FIGS. 677-679.—Hypopygium (stippled), *Spilichneumon*, ♂: 677, *johansoni*; 678, *raptorius*; 679, *occisorius*.

FIGS. 680-701.—*Amblyteles*.FIG. 680.—Propodeum, dorsal, ♀: *armatorius*.FIGS. 681-684.—Flagellar segments 1-3, ♀: 681, *subsericans*; 682, *elongatus*; 683, *glaucoatorius*; 684, *pictus*.FIG. 685.—Left hind tibia, lateral: *quadripunctorius*, ♀.

[Continued opposite

- Tyloidae absent on flagellar segments 1-3, segment 4 at most with a very small one; gaster with tergite 2 yellow marked with black subapically, 3 yellow sometimes with fuscous markings at about the apical third, tergites 4, 5 and 6 with a conspicuous, yellow, apical band, 7 with the visible part yellow; sometimes tergites 2 and 3 may be completely infusate and the bands on the remaining segments reduced. 11-15 mm. *occisorius* (F.)
- Gastrocoelus very small and the thyridia absent; tergites 2 and 3 yellow and testaceous (2 sometimes black apically, tergites 4-7 never marked apically). 4
- 4 (3) Segments 2 and 3 of flagellum with conspicuous tyloidae, segment 1 sometimes also with one (fig. 673); gaster broader; mandible with the sides of the shaft subparallel (fig. 666); tergites 2 and 3 yellow, marked with testaceous and/or black, tergites 4-7 sometimes yellow apically. 11-13 mm.
stagnicola (Thomson)
- Segments 1-3 of flagellum with no or weak tyloidae (fig. 674); gaster rather narrow, elongate; mandible with the sides of the shaft distinctly tapering towards the teeth (fig. 667); tergites 2 and 3 testaceous. c. 11 mm.
celenae Perkins
- 5 (1) Sternite 4 with no plica; tergites 4-7 usually with an apical, ivory spot; face with the orbits, supraclypeal area and the clypeus yellow, sometimes entirely yellow. 12-15 mm. *raptorius* (L.)
- Sternite 4 with a median, longitudinal fold; at most tergite 7 with an ivory spot; face with the orbits yellow and sometimes with weak markings on the clypeus and supraclypeal area. c. 13 mm. . . *septemguttatus* (Gravenhorst)

Genus *Amblyteles* Wesmael

The species included here in *Amblyteles* are obviously heterogeneous, but it seems likely that a usable division of this complex into genera will have to await a revision of the world species of this and related genera. In the present work the most significant indications of divisions have been found in the male genitalia, but in most cases a correlation of these with female characters has not been found in a practical form.

I have given diagrams of the colour pattern of the gaster of the females as many of these can be recognized very easily in this way. In this group, in many of the species, the black markings can be more extensive and particularly on the central segments, black can be replaced by red; as an example of this, see the figures of *palliatorius* (figs. 739-43). The same type of variation also occurs in the males but I have not included figures of these as many of the species are even more variable in this sex than in the female; in fact, in the males only those points of colour are mentioned which appear to me to be most important in the differentiation of the species.

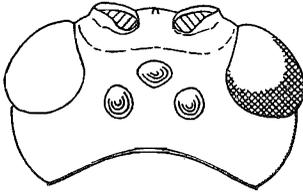
The British species normally have an ivory scutellum except *castanopygus* which always has it black; forms with a black or partly black scutellum are sometimes found in other species, notably *palliatorius*, *longigena* and *glaucoatorius*. The colour of the legs is only mentioned in so far as it seems to be of significance in separating the species.

For the males I have included information about the tyloidae. These afford useful supplementary characters for the recognition of a number of species. It should be borne in mind that there is variation in this character

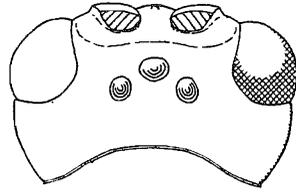
FIGS. 686-693.—Mandible: 686, *equitatorius*, ♀; 687, *equitatorius*, ♂; 688, *pulchellus*, ♀; 689, *pulchellus*, ♂; 690, *uniguttatus*, ♀; 691, *amatorius*, ♀; 692, *luctatorius*, ♀; 693, *crispatorius*, ♀.

FIGS. 694-699.—Flagellar segments 1-3, ♀: 694, *crispatorius*; 695, *luctatorius*; 696, *longigena*; 697, *palliatorius*; 698, *trifasciatus*; 699, *monitorius*.

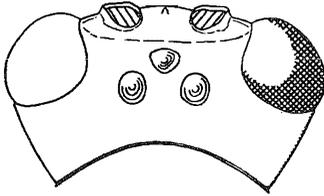
FIGS. 700-701.—Tergite 2, lateral, ♀: 700, *mercatorius*; 701, *amatorius*.



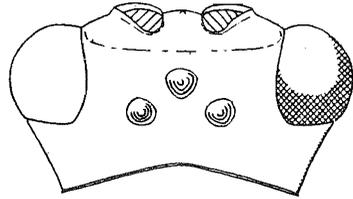
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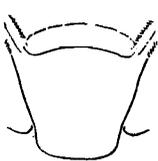
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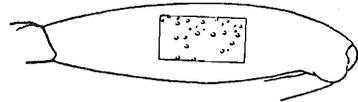
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Figs. 702-712.—*Amblyteles*, ♀.

Figs. 702-705.—Head, dorsal: 702, *pictus*; 703, *pulchellus*; 704, *quadripunctorius*; 705, *monitorius*.

Figs. 706-707.—Dentiparal prominence, lateral: 706, *longigena*; 707, *palliatorius*.

Figs. 708-709.—Scutellum, dorsal: 708, *palliatorius*; 709, *gradatorius*.

Figs. 710-712.—Hind femur, lateral: 710, *luctatorius*; 711, *longigena*; 712, *gradatorius*.

within a species and no doubt specimens will be found with tyloidae not conforming to the limits given. However the occurrence of such specimens should be infrequent. The numbers refer to the flagellar segments on which tyloidae occur.

The species seem mostly to be parasites of Noctuids, but other hosts are certainly attacked. There appears still to be little definite information as to which species hibernate as adults.

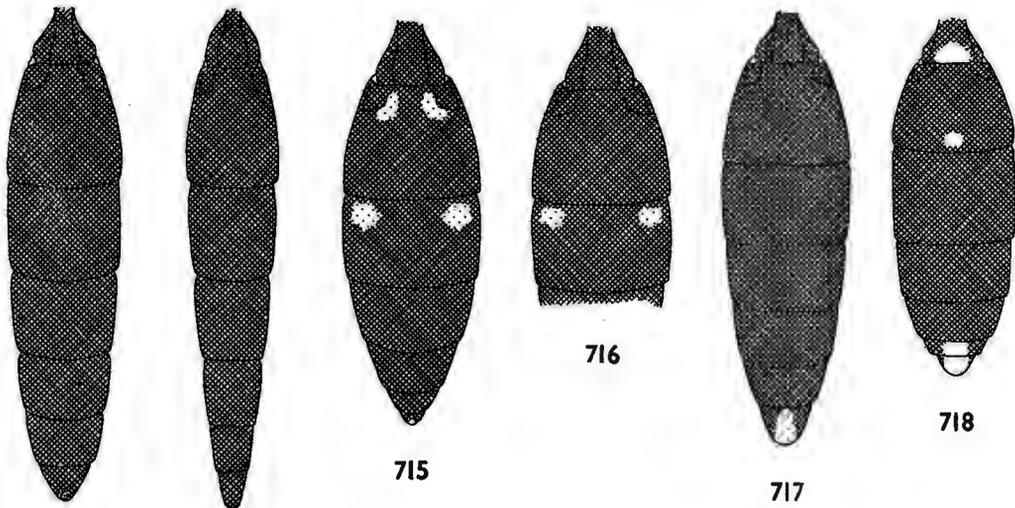
KEYS TO SPECIES

(Females).

- 1 Tergites 2 and 3 coarsely punctate, the area between the rather deep gastrocoeli irregularly and more or less strongly, longitudinally striate, and with the spiracles minute.
Mandible very strongly narrowed to the apex, the lower tooth very small but distinct; at least tergites 6 and 7 with a conspicuous, dorsal, ivory spot; sternites 2-4 with a central, longitudinal fold; stigma black or fuscous 2
- Tergites 2 and 3 with closer, finer punctures or coriaceous (*oratorius*); gastrocoelus shallow 3
- 2 (1) Pronotum with no central carina in the transverse groove; scutellum with a conspicuous, ivory spot; at most tergites 1-2 red, varying to almost completely black; tergites 5-7 with an ivory, dorsal spot; propodeum with the area superomedia a little broader than long; antenna with a white ring occupying at least 5 segments. 11-12 mm. *Rare*. . . **punctus** (Gravenhorst)
- Pronotum with the transverse groove interrupted by a median carina; scutellum black; tergite 1 black except at the apex, tergites 2-4 red, or at most with 4 marked with black; at most tergites 6 and 7 with an ivory, dorsal spot, tergite 5 sometimes with a very narrow, ivory margin centrally; propodeum with the area superomedia a little longer than broad; antenna either black or at most with 2 segments marked with white. 9-10 mm. *Rare*..... **fabricii** (Gravenhorst)
- 3 (1) Spines of the propodeum strong and sharp, longer than their basal width (fig. 680); mesoscutum dull, very closely punctate (subrugose); hind trochanter yellow.
Head strongly narrowed behind the eyes; flagellum testaceous in basal half, infusate apically; inner orbit, pronotal collar, hind angle of pronotum and subalar prominence marked with yellow; hind tibia yellow, marked with red and becoming fuscous apically, hind tarsus reddish; tergites 2 and 3 closely punctate. 12-15 mm. *Very common*. . . **armatorius** (Forster)
- Spines of the propodeum short or absent (*cf.* figs. 706-7); mesoscutum with distinct interspaces between the punctures; hind trochanter black, at most narrowly yellow at the apex. 4
- 4 (3) Middle femur entirely red. 5
- Middle femur at least conspicuously marked with black. (In *luctatorius* sometimes with only a conspicuous, black, sub-basal blotch within). 11
- 5 (4) Gaster conspicuously elongate (figs. 713-4); tergite 3 subquadrate or elongate; sternite 3 with no central, longitudinal fold.
Flagellum sometimes without the central, white stripe; scutellum most usually conspicuously ivory marked; hind tibia red, infusate apically; gaster black, tergite 7 sometimes with an ivory spot. 6
- Gaster oval; tergite 3 strongly transverse (*cf.* fig. 715 for nearest approach to above group); sternite 3 with a central, longitudinal fold. 7
- 6 (5) Tergite 3 subquadrate and more or less parallel-sided (fig. 713); tergite 2, behind the gastrocoeli, with the punctures not (or hardly) coalescing into longitudinal striae; flagellar segments a little less elongate (fig. 681), segment 2 with length: breadth = 1:2.3; a more robust species. 13-15 mm. *Not uncommon*. **subsericans** (Gravenhorst)
- Tergite 3 conspicuously elongate and narrowing towards the apex (fig. 714); tergite 2, behind the gastrocoeli, with the punctures coalescing into longitudinal striae; flagellar segments a little more elongate (fig. 682), segment

- 2 with length : breadth = 1 : 2.5 ; a less robust species. 12-16 mm. *Not uncommon*.....**elongatus** Brischke
- 7 (5) Hind tibia, on the postero-external surface, with the rather long spines present almost to the base (fig. 685) ; temples conspicuously narrowed behind the eyes, viewed dorsally the temples run in a straight line between the eye and the occipital carina (fig. 704) ; gaster (figs. 715-6). 13-16 mm. *Rather common*.....**quadripunctorius** (Mueller)
- Hind tibia, on the postero-external surface, with no spines in the basal third (or at most with 1 or 2 spines beneath), the spines much shorter ; temples not, or weakly, narrowing directly behind the eyes (*cf.* fig. 702), the line between the eye and the occipital carina distinctly curved.....8
- 8 (7) Gaster (figs. 720-1) red, at most with the petiole, base of tergite 3 and tergites 4-7, infusate and tergites 6 and 7 at most with obscure, small, pale dorsal markings ; mandible blunt and at most with a very weak, lower tooth (fig. 686) ; sternite 4 with a median fold.
- Basal segments of flagellum short, segment 2 with length : breadth at most 1.15 : 1 ; thyridia present. 12-14 mm. *Doubtfully British*
- Gaster with tergite 1 entirely black ; and tergites 6 and 7 with conspicuous yellow or ivory, dorsal or lateral markings (some vars. of *glaucoatorius* have these markings inconspicuous) ; mandible with a blunt, upper tooth but the lower tooth distinct and situated much nearer the apex of the mandible ; sternite 4 with no median fold.
- Flagellum testaceous at the base (sometimes inconspicuously so in *pictus*) ; apical bands and spots of the gaster ivory.....9
- 9 (8) Scutellum yellow ; flagellum with segments 1/2-9/11 pale yellow above ; clypeus in the basal half dull and strongly sculptured between the punctures.
- Gaster (fig. 726) black with the extreme apex of tergite 1 testaceous, tergite 2 usually testaceous with the base and apex infusate (sometimes almost entirely testaceous, sometimes almost entirely infusate), tergite 3 usually with a testaceous spot on each side (sometimes these are absent, sometimes they coalesce to form a band), tergites 5-7 with transverse, apical, ivory spots ; hind femur entirely red, or weakly infusate in the apical third. 10-11 mm. *Rather rare*.....**pallidicornis** (Gravenhorst)
- Scutellum ivory or rarely entirely black ; flagellum with the basal segments testaceous above or sometimes in part infusate ; clypeus shining between the punctures, at most with very weak microsculpture basally.....10
- 10 (9) Hind femur black, at least in the apical quarter ; gaster (fig. 727) with tergite 2 red, tergite 3 red, black at the base, tergites 4-7 with a transverse, apical, ivory spot ; basal flagellar segments shorter (fig. 684) ; scutellum always ivory. 12-14 mm. *Not uncommon*.....**pictus** (Schränk)
- Hind femur entirely red ; gaster (figs. 724-5) black with tergites 3-7 having lateral, ivory, apical spots which may be narrowly joined in the middle line, in dark individuals these spots may be very greatly reduced ; basal flagellar segments more elongate (fig. 683) ; scutellum varying from ivory to completely black. 11-14 mm. *Not uncommon*.....**glaucoatorius** (F.)
- 11 (4) Hind leg black, at most with an obscure, pale spot beneath, towards the base ; temples large, only very little narrowed directly behind the eyes (subparallel) (fig. 703).
- Mandible blunt with a small, lower tooth (fig. 688) ; gaster (fig. 728) with tergite 1 black, tergite 2 red, narrowly black apically, 3 red, usually with the apex narrowly marked with black, 4 and 5 black apically with a central, transverse, ivory band, 6 and 7 with a conspicuous, ivory, dorsal spot. 12-15 mm. *Common*.....**pulchellus** (Christ)
- Hind leg most usually with conspicuous, pale markings above ; if black, then the temples are distinctly narrowed behind the eyes ; gaster never coloured as in *pulchellus*.....12
- 12 (11) Mandible with the lower tooth completely absent, blunt apically (fig. 690).
- Sternite 4 with no median, ventral fold. ♀ *unknown of the single British species* (propinquus).....**uniguttatus** (Gravenhorst) group
- Mandible usually conspicuously bidentate, rarely with only a small, lower tooth (*castanopygus* and *monitorius*), when the upper tooth is strongly pointed.. 13

- 13 (12) Hind tibia with a white ring towards the base ; tergite 2 in large part coriaceous and without punctures ; gaster (fig. 718). 11-14 mm. *Common*
oratorius (F.)
- Hind tibia often with a broad yellow band, or with a dirty yellow band, never with a pure white one ; tergite 2 punctate in by far the greater part. 14
- 14 (13) Gaster with a conspicuous, ivory spot on tergite 7, and this segment is conspicuously elongate (similar to *subsericans* and *elongatus* though not so strongly developed) 15
- Gaster at most with a yellow spot on tergite 7 and this segment is almost concealed beneath the sixth (*luctatorius* can have this segment somewhat projecting, but in that case it is entirely black (fig. 731)). 16
- 15 (14) Sternite 3 evenly sclerotized centrally, with no median, longitudinal fold ; gaster (fig. 717) with tergites 1 and 2 not yellow apically but 2 sometimes obscurely red, 6 without an apical, ivory spot. 14-16 mm. *Uncommon*
indocillis Wesmael
- Sternite 3 membranous centrally, with a distinct, median, longitudinal fold ; gaster (fig. 723) with tergites 1 and 2 (in part) yellow apically, tergite 6 with an apical, ivory spot. c. 11 mm. *Very rare*
margineguttatus (Gravenhorst)
- 16 (14) Basal segments of flagellum conspicuously short, segment 2 with length : breadth at most 1 : 1.4 (figs. 694-5). 17
- Basal segments of flagellum conspicuously elongate, segment 2 with length : breadth at least 1 : 1.7 (figs. 696-9). 20
- 17 (16) Gaster with tergites 3-7 with a pale yellow, apical band. 18
- Gaster never with tergites 3-7 with a pale yellow, apical band (usually very narrowly reddish). 19
- 18 (17) Gaster (fig. 722) with no median fold on sternite 4 ; tergite 3 with the variola transverse, oblique (fig. 701) ; tergite 1 black, usually narrowly red apically, tergite 2 red with an apical, yellow band and sometimes with a transverse, triangular spot before this (the apex pointing to the base of the segment), tergite 3 black usually red laterally and with an apical, yellow band, the remaining segments black with an apical, yellow band ; antenna stouter centrally. 11-15 mm. *Rather common*. *amatorius* (Mueller)
- Gaster (fig. 729) with a median fold on sternite 4 ; tergite 3 with the variola oval, the long axis being subparallel to the lateral margin of the segment (fig. 700) ; tergite 1 black, tergite 2 black with the basal margin yellow, tergite 3 black with the basal and apical margins yellow, the remaining segments black with the apical margins yellow ; antenna more slender centrally. 14-15 mm. *Rare*. *mercatorius* (F.)
- 19 (17) Upper tooth of mandible truncate apically (fig. 693) ; basal segments of the flagellum shorter (fig. 694), segment 1 a little shorter than the malar space ; gaster (fig. 730) black with the postpetiole and the apical third of tergite 2 yellow, the black may be replaced by red in part (or wholly by red in some continental specimens). 11-12 mm. *Uncommon*. *crispatorius* (L.)
- Upper tooth of mandible acute (fig. 692), (narrowly rounded apically) ; basal segments of the flagellum more elongate (fig. 695) ; segment 1 a little longer than the malar space ; gaster (fig. 731) with tergite 1 black, the postpetiole sometimes largely marked with red, tergite 2 red but often obscurely marked with yellow towards the base, tergite 3 red, often obscurely yellow laterally and with a more or less distinct narrow, transverse, fuscous, basal mark, sometimes also infuscate apically, the remaining segments black with at most the extreme apices of the tergites sordid red. 11-13 mm. *Rather uncommon*. *luctatorius* (L.)
- 20 (16) Flagellum very thin (fig. 699), basally testaceous above and marked with fuscous, yellow beneath and without a white or yellow, central ring ; head very strongly narrowed behind the eyes and with the temples weakly constricted (fig. 705).
 Gaster (fig. 732) with tergite 1 black, tergite 2 black with a pair of basal, yellow spots which coalesce centrally at the extreme base, tergite 3 black with a pair of lateral, basal, yellow spots, the remaining segments black with a conspicuous, yellow, apical band. c. 13 mm. *Possibly not British*
monitorius (Panzer)
- Flagellum stouter (figs. 696-8), with a conspicuous, central, white or pale



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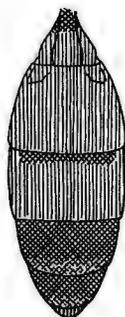
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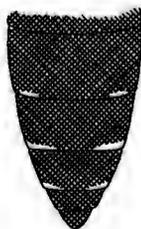
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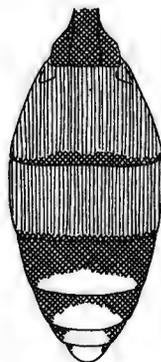
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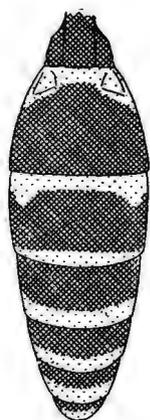


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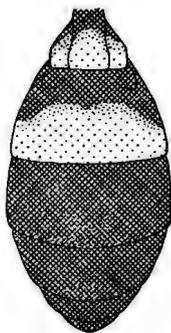


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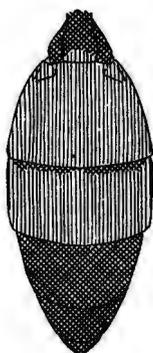
FIGS. 713-728.—Colour pattern of gaster, *Amblyteles*, ♀: 713, *subsericans*; 714, *elongatus*; 715-716, *quadripunctorius*; 717, *indocilis*; 718, *oratorius*; 719, *armatorius*; 720-721, *equitatorius*; 722, *amatorius*; 723, *margineguttatus*; 724-725, *glaucatorius*; 726, *pallidicornis*; 727, *pictus*; 728, *pulchellus*.



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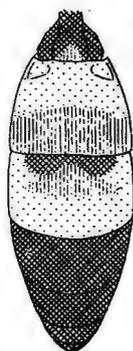
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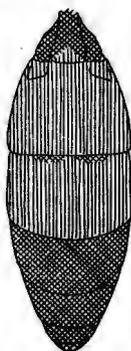
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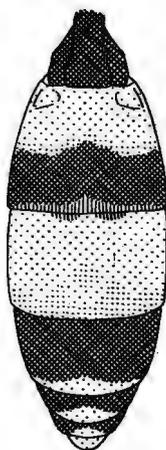
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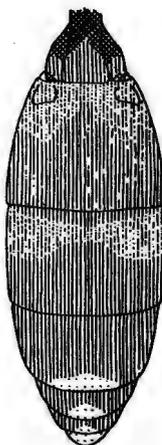
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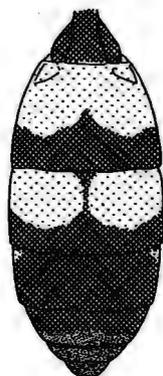
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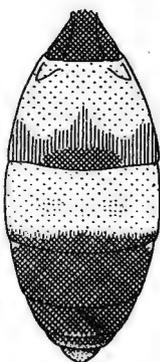
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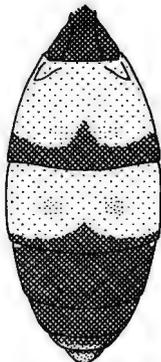
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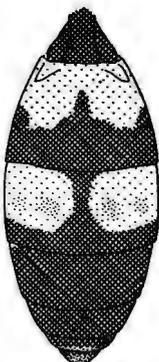
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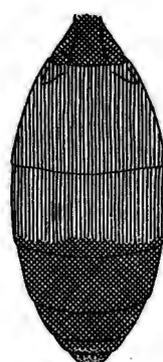
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FIGS. 729-743.—Colour pattern of gaster, *Amblyteles*, ♀: 729, *mercatorius*; 730, *crispatorius*; 731, *luctatorius*; 732, *monitorius*; 733, *castanopygus*; 734, *longigena*, S. England; 735, *longigena*, Scotland; 736, *gradatorius*, Poland; 737, *gradatorius*, Scotland; 738, *trifasciatus*; 739-743, *palliatorius*.

- yellow band ; head never with the temples constricted. 21
- 21 (20) Propodeum, viewed laterally, with the apical angle of the dentiparal area not, or hardly, produced, at most visible as a weak, obtuse angulation (fig. 706).
Gaster (figs. 734-5) with tergite 1 black but the postpetiole usually marked with red, tergite 2 red, marked with yellow basally, tergite 3 yellow, marked with red basally and fuscous at the extreme base, the remaining segments black, sometimes marked with reddish or yellowish at the extreme apical margin (Scotch examples have the yellow replaced by red so that tergite 2 is entirely red, tergite 3 is red with a narrow, fuscous, basal mark) ; scutellum black, usually marked with red or yellow. 11-12 mm. *Uncommon*
- *longigena* Thomson²⁸
Propodeum, viewed laterally, with the apical angle of the dentiparal area produced into a short, acute spine (fig. 707). 22
- 22 (21) Stigma black ; gaster (fig. 733) castaneous with only tergite 1 black, varying to black with the apical segments red.
Hind legs entirely black. 10-13 mm. *Not uncommon*
- *castanopygus* (Stephens)
Stigma testaceous ; gaster never coloured as above. 23
- 23 (22) Scutellum transverse (fig. 709), the distance between the basal angles greater than the length ; hind femur with the external, dorsolateral and upper surfaces with sparse, coarse punctures in the basal two-thirds (fig. 712).
(a) Gaster (fig. 736) with tergite 1 black, tergite 2 yellow, black in the apical half and the black more or less margined with red, tergite 3 yellow with reddish, central and apical marks, the remaining segments black with conspicuous, pale yellow, transverse, apical marks. (Central Europe). *gradatorius* (Thunberg)
(b) The black coloration of the gaster (fig. 737) replaced by red except for the petiole, and the postpetiole in part. c. 16 mm. 1 ♂, 1 ♀, *Scotland*
gradatorius (Thunberg) ? subsp.
- Scutellum elongate (fig. 708), the length at least as great as the distance between the basal angles ; hind femur of *palliatorius* with the dorsolateral and upper surface closely punctate to the base, hind femur of *trifasciatus* intermediate between this and *gradatorius*. 24
- 24 (23) Facial and external orbits and the malar space, black ; antenna thicker (fig. 697) ; mesoscutum less closely punctate before the scutellar fovea ; hind femur more closely punctate externally on the dorsolateral face ; coxal area of propodeum most usually clearly delimited ; gaster (figs. 739-43). 11-15 mm. *Very common*. *palliatorius* (Gravenhorst)
- Facial and external orbits and usually the malar space, extensively marked with red ; antenna thinner (fig. 698) ; mesoscutum more closely punctate directly in front of the scutellar fovea ; hind femur rather sparsely punctate externally on the dorsolateral surface ; carina above the coxal area very indistinct or completely absent ; gaster (fig. 738). c. 14 mm. *Rare*
trifasciatus (Gravenhorst)

(Males)

- 1 Tergites 2 and 3 coarsely punctate, the area between the rather large gastrocoeli more or less strongly, longitudinally striate, the spiracles minute.
Stigma black ; at least tergite 7 with a conspicuous, ivory, dorsal spot ; tyloidae on flagellar segments 5/7-14/16, oval. 2
- Tergites 2 and 3 with much closer, finer punctures or coriaceous (*oratorius*) ; gastrocoelus shallow. 3
- 2 (1) Pronotum with the transverse groove interrupted by a median carina ; tergites 2-5 red ; tergites 4 and 5 with deeper, clearer punctures, the area between these highly polished. c. 11 mm. *fabricii* (Gravenhorst)
- Pronotum with no median carina in the transverse groove ; at most tergites 1-4 red, varying to having these segments almost completely black ; tergites

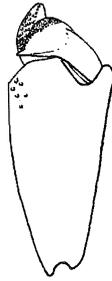
²⁸ Very similar to *luctatorius* but having the basal flagellar segments longer, the area coxalis of the propodeum undifferentiated and the hind femur stouter (fig. 710, *longigena* fig. 711).

- 4 and 5 with shallower punctures of vaguer outline, the area between these with microsculpture. 11-12 mm. **punctus** (Gravenhorst)
- 3 (1) Propodeum with the dentiparal spines long and acute, conspicuous to the naked eye (cf. fig. 680); hind trochanter entirely pale yellow; tyloidae 5/7-23/25. 13-15 mm. **armatorius** (Forster)
- Propodeum at most with short spines which are never conspicuous; hind trochanter at least marked with black. 4
- 4 (3) Mandible completely unidentate (cf. fig. 690); hypopygium very strongly produced centrally, apically (similar to that of *glaucoatorius* (fig. 748)).
Mesopleurum with the speculum having distinct, clearly delimited punctures; sternite 4 with no central fold; gaster not very variable in colour; penis valves (fig. 771) dorsally, strongly depressed before the broad apex; compared with the two species of this group previously but erroneously recorded from Britain, it is a little more robust than *uniguttatus*, conspicuously less broad than *conspurecatus*, and the gaster more elongate; tyloidae 4/6-20/23, very narrow and weak. 16-18 mm. **propinquus** Perkins
- Mandible at least with a small, lower tooth; if minute (*equitatorius* (fig. 687)), then the hypopygium is not strongly produced centrally. 5
- 5 (4) Sternite 4 evenly sclerotized or at most with a very small, membranous area at the extreme base. 6
- Sternite 4 with a conspicuous, central, longitudinal fold (or in some dried specimens with a conspicuous, central, membranous area). 15
- 6 (5) Hind femur entirely red or red, black apically 7
- Hind femur entirely black or broadly black centrally 11
- 7 (6) Hypopygium strongly produced centrally (fig. 748); flagellum rather short and most usually pale at, or towards, the base; genitalia with the digitus with a long, basal process (fig. 746); apex of volsellar strut not produced; penis valves comparable in general form with those of *equitatorius* (fig. 769), but not decurved apically. 8
- Hypopygium at most angled centrally; flagellum long and black, usually somewhat paler beneath, basally; genitalia with no basal process on the digitus; apex of volsellar strut produced, within this the volsella is excised (figs. 744-5). 10
- 8 (7) Tergite 2 black except, at most, the extreme apical margin; tergites 2-7 with a transverse, lateral, ivory stripe on the hind margin, rarely with the spots on tergite 6 joined centrally, often with the spots on the anterior segments absent (probably specimens with no ivory spots occur, though in the material examined, spots were present at least on tergites 6 and 7).
Scutellum varying from ivory to entirely black; hind femur entirely testaceous or red; tyloidae 2-21, very broad. 13-14 mm. **glaucoatorius** (F.)
- Tergite 2 at least in greater part red or yellow (or both); tergite 7 broadly white centrally (in some forms of *pictus* this band is a little narrower centrally than laterally). 9
- 9 (8) Ocelli large, the hind ocellus as near the eye as its diameter (fig. 755); hind femur conspicuously marked with black in the apical quarter to third; tergites 4-7 with a conspicuous, ivory, transverse, apical band; tyloidae 2/3-17, very broad. 12-14 mm. **pictus** (Schrank)
- Ocelli normal, the hind ocellus further from the eye than its diameter (fig. 754); hind femur entirely testaceous; tergite 4 entirely black, 5 sometimes with a rather weak, subapical, central, transverse, ivory band, 6 and 7 with a broad, apical band; tyloidae 3/4-14/15, sublinear. 11-12 mm. **pallidicornis** (Gravenhorst)
- 10 (7) Basivolsellar ridge more conspicuously produced and with the basivolsella conspicuously excised beside this (fig. 745); penis valves (fig. 774) with the ventral, toothed area more explanate so that this is conspicuous when the valves are viewed dorsally (fig. 761); hypopygium usually more rounded apically; tergite 3 transverse or quadrate; gastrocoelus usually a little broader; tyloidae 1/2-18/22, sublinear. 14-16 mm. **subsericans** (Gravenhorst)
- Basivolsellar ridge more weakly produced and the basivolsella more weakly excised beside this (fig. 744); penis valves (fig. 773) with the smaller, ventral, toothed area not explanate and this is almost entirely hidden when the penis valves are viewed dorsally (fig. 762); hypopygium usually more produced

- centrally, apically; tergite 3 elongate or quadrate; gastrocoelus usually a little more elongate; tyloidae 2-20, sublinear. 13-15 mm. ♂ *uncommon elongatus* Brischke
- 11 (6) Postpetiole with the central area coarsely rugose.
 Head strongly narrowed behind the eyes; flagellum at most testaceous beneath; scutellum ivory; hind femur at most very narrowly testaceous at the base and apex, tibia pale testaceous, infuscate apically, varying to entirely black, tarsus varying from pale testaceous to entirely black (British specimens have the hind tarsus infuscate or black, in continental specimens these are entirely pale testaceous); gaster black, at most with tergites 2 and 3 and the base of 4 testaceous, 2 and 3 with a pair of ill-defined yellowish sub-basal spots, varying to the gaster entirely black; penis valves (fig. 763); tyloidae 3/4-17/18, narrow. 15-16 mm. *indocilis* Wesmael
- Postpetiole with the central area evenly, longitudinally striate. 12
- 12 (11) Malar space fully as long as the breadth of the base of mandible; head very strongly narrowed behind the eyes, the temples weakly concave when viewed from above (*cf.* fig. 705); clypeus rather long and little rounded apically.
 Frontal orbit yellow; face and clypeus yellow, black marked centrally; antenna black, scape yellow beneath; pronotal collar centrally, hind angle of pronotum dorsally, subalar prominence and scutellum, yellow; anterior legs yellow with coxae, trochanters except apex, and femora centrally, at least posteriorly, black; hind leg black with apex of trochanter, trochantellus and base and apex of femur narrowly yellow, tibia yellow, black in the apical fifth; base of tergite 2 and a pair of basal spots on tergite 3 yellow, tergites 5 and 6 very narrowly marked with ivory apically; penis valves (fig. 777); tyloidae 7-21, narrow. *c.* 13 mm. *monitorius* (Panzer)
- Malar space distinctly shorter than the breadth of the base of mandible; head convexly and less strongly narrowed behind the eyes; clypeus shorter and truncate apically. 13
- 13 (12) Tergites 2 and 3 with a yellow, basal band, 3/4-6 with an apical, yellow band, 7 usually with a yellow spot or band; flagellum testaceous basally or at least with the basal segments testaceous marked dorsally; penis valves broad (fig. 764); tyloidae 3/5-19/21, narrow. 14-15 mm. *mercatorius* (F.)
- Either the apical tergites are marked with ivory or tergites 2 and 3 are entirely yellow or yellow and red; flagellum black, rarely somewhat yellowish beneath basally; penis valves rather narrow (fig. 778). 14
- 14 (13) Tyloidae small, the first tyloida on flagellar segment 6 or 7; an elongate species, resembling in colour and facies the yellow and black males of *Ichneumon*; tergites 2 and 3 yellow, more or less marked with pale testaceous towards the hind margin, 4-6 sometimes with a narrow, apical, yellow band, 7 entirely black; hind tarsus yellow, the 2 apical segments sometimes a little darkened; projection of the hypopygium weak; mandible with a strong lower tooth; clypeus yellow, face yellow sometimes with a narrow, black or fuscous, longitudinal, central stripe; wings clouded with yellow, becoming very pale fuscous towards the outer margin; tyloidae 6/7-18/20, very weak. 15-17 mm. *amatorius* (Mueller)
- Tyloidae large, the first tyloida on flagellar segments 2, 3 or 4; a more robust species with tergite 3 conspicuously transverse; tergites 2 and 3 yellow, conspicuously or almost entirely marked with testaceous and at least with a subapical black triangle, usually with a triangular, subapical band; tergite 4 entirely black, 5 with an apical, central, short, transverse band, 6 and 7 with a conspicuous, apical spot; hind tarsus, if pale, with the segments black at the apex; projection of the hypopygium strong though short (fig. 749); mandible with a very small, lower tooth though longer than in the female (fig. 689); clypeus black, face black, with or without a white, orbital stripe; wings rather evenly clouded with very pale fuscous; tyloidae 2/4-20/21. 14-15 mm. *pulchellus* (Christ)
- 15 (5) Hypopygium with a long, central process (fig. 747); genitalia with the digitus having a long, basal projection (*cf.* fig. 746); penis valve flattened ventrally, with a carina on the outside and inside of this area which carries a serrate ridge centrally (fig. 770); propodeum most usually broadly marked with yellow; tyloidae 2/3-26/31. 13-15 mm. *crispatorius* (L.)
- Hypopygium angled centrally (figs. 750, 752), or more weakly produced



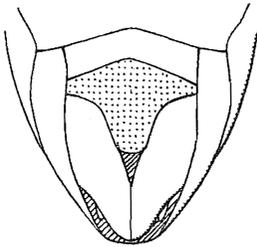
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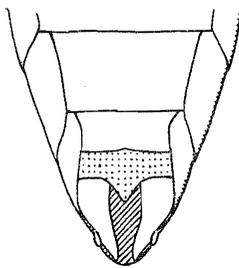
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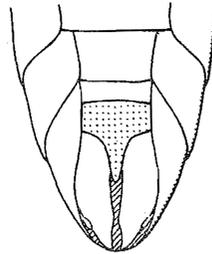
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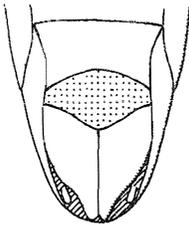
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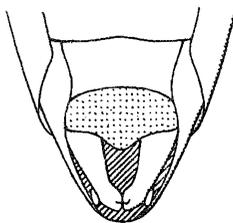
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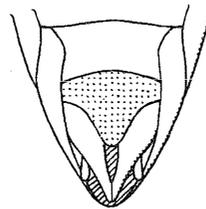
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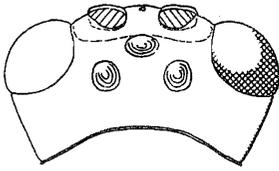
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FIGS. 744-752.—*Amblyteles*, ♂.

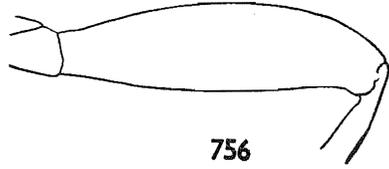
FIGS. 744-746.—Basivolsella and digitus: 744, *elongatus*; 745, *subsericans*; 746, *glaucatorius*.

FIGS. 747-752.—Apex of gaster, ventral (hypopygium stippled): 747, *crispatorius*; 748, *glaucatorius*; 749, *pulchellus*; 750, *equitatorius*; 751, *quadripunctorius*; 752, *palliatorius*.

- (fig. 751), never with a long process; digitus never produced; if the penis valve is flattened beneath, it never has a serrate ridge on this area; propodeum at most with a yellow mark.....16
- 16 (15) Posterior ocellus nearer the eye than its greatest diameter (fig. 753).
Lower tooth of mandible minute (fig. 687); penis valves (fig. 769); tyloidae 4-20. 13-16 mm.....*equitatorius* (Panzer)
- Posterior ocellus at least as far from the eye as its greatest diameter (cf. fig. 754).....17
- 17 (16) Hind femur red marked with black apically; hypopygium acutely angled centrally, apically (fig. 751).
Lower tooth of mandible well developed; ventral plica yellow; penis valves, beneath, with an inflated, subapical area which is covered with short spines (fig. 776); tyloidae 8-17/18. 15-18 mm.
quadripunctorius (Mueller)
- Hind femur most usually at least broadly black centrally; if in some aberrations, red, then the hypopygium is broadly rounded centrally, apically (fig. 752).....18
- 18 (17) Propodeum with only the very weakest indication of a blunt, dentiparal tubercle (fig. 759); penis valves (fig. 772).....19
- Propodeum with distinct (though short) spines, the sides of which, viewed laterally, would form an acute angle (fig. 760).....20
- 19 (18) A more robust species with tergite 3 having length: breadth = 1:1.25; area coxalis delimited dorsally; lateral cavity of scutellum very shallow; hind femur a little thinner (cf. fig. 710); tyloidae 5/6-16/17, oval. 13-15 mm.
luctatorius (L.)
- Gaster slender, with tergite 3 having length: breadth at most 1:1.1; area coxalis not defined, with no dorsal carina; lateral cavity of scutellum deep; hind femur more incrassate (cf. fig. 711); tyloidae 5/7-15, oval. 13-14 mm.
longigena Thomson
- 20 (18) Antenna usually with a white, dorsal stripe a little before the middle; hind tibia with a white band towards the base; hind tarsus often with segments 3 and 4 white; tergites 6 and 7 most usually with an apical, white spot; penis valves (fig. 765); tyloidae 7/8-15/16, small. 12-15 mm....*oratorius* (F.)
- Antenna never with a white band; hind tibia and tarsus and tergites 6 and 7 black, or marked (sometimes entirely) with yellow or testaceous (the yellow is very pale in *margineguttatus*).....21
- 21 (20) Tergites 1-3 usually with a pale yellow band apically; tergite 7 with a clear, central, elongate, pale yellow spot.
Hind tibia with a broad, pale yellow band, the hind tarsus pale yellow with the apices of the segments infusate and the 2 apical segments infusate though sometimes narrowly pale at the base. (Only Wesmael's specimens seen).....*margineguttatus* (Gravenhorst)
- Apex of tergites 2 and 3 black or red, or if as a rare aberration yellow, then the whole segment is yellow; tergite 7 sometimes entirely pale, but in darker specimens the black or red colour starts at the middle, basally, and goes outward from this centre, progressively to the darkest specimens in which the whole segment may be red or black.....22
- 22 (21) Occipital and genal carinae very strong (fig. 758); postpetiole rugose; stigma black; gaster black with the apical segments red; hind legs entirely black except the extreme base of the femur; penis valves beneath with an inflated, subapical area which is covered with short spines (fig. 775); tyloidae 8/9-19/20, narrow. 12-14 mm.....*castanopygus* (Stephens)
- Occipital and genal carinae well developed, but much less strongly raised; postpetiole striate, stigma most usually testaceous, only very rarely as a variety, fuscous; gaster most usually with tergites 2 and 3 marked with yellow; hind leg most usually with pale markings; penis valves beneath with no inflated area.
Species very variable in colour; in the gaster, red may replace black, except in segment 1, and the extent of the yellow markings is also variable....23
- 23 (22) Scutellum transverse (cf. fig. 709), the distance between the anterior angles greater than the length; hind femur thicker (fig. 756); penis valves deeper and only weakly, dorsoventrally flattened apically (fig. 766); tyloidae 6/7-18/20, oval. c. 19 mm.....*gradatorius* (Thunberg)
- Scutellum more elongate (cf. fig. 708), the distance between the anterior



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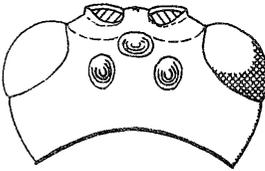
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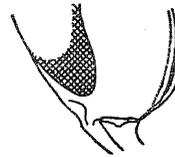
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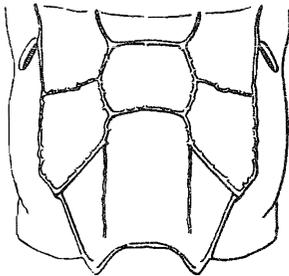
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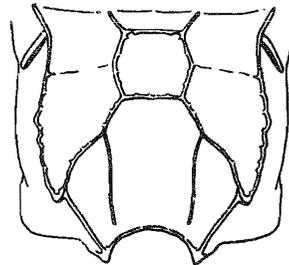
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FIGS. 753-760.—*Amblyteles*, ♂.

FIGS. 753-755.—Head, dorsal: 753, *equitatorius*; 754, *pallidicornis*; 755, *pictus*.

FIGS. 756-757.—Hind femur, lateral: 756, *gradatorius*; 757, *palliatorius*.

FIG. 758.—Gena, lateral: *castanopygus*.

FIGS. 759-760.—Propodeum, dorsal: 759, *luctatorius*; 760, *palliatorius*.

- angles at most as great as the length ; hind femur thinner (fig. 757) ; penis valves shallower and conspicuously, dorsoventrally flattened apically (figs. 767-8) 24
- 24 (23) Coxal area set off by a distinct, though often rather irregular, carina, with distinct, scattered punctures ; penis valves strongly decurved apically (fig. 767) ; tyloidae 7/9-19, oval. 12-16 mm. **palliatorius** (Gravenhorst)
- Coxal area not delimited, and with oblique, coarse, rugose-striate sculpture ; penis valves less strongly decurved apically (fig. 768) ; tyloidae 7/9-20/23, narrow. 15-17 mm. **trifasciatus** (Gravenhorst)

Genus *Limerodes* Wesmael

The main difficulty that is likely to be experienced is distinguishing the male of *Limerodes* from that of *Exephanes ischioxanthus*, but the form of the clypeus (fig. 457) should distinguish it at once.

♀. The whole insect is figured (fig. 468).

♂. Elongate with the face and clypeus yellow, sometimes fuscous marked centrally ; hind angle of pronotum marked with yellow, scutellum yellow, central area of metanotum marked with yellow ; hind leg black with trochantellus, extreme base of femur, basal three-quarters of tibia and base of metatarsus, testaceous ; gaster with tergite 1 apically, 2, 3 and base of 4 testaceous. ♀ c. 11 mm., ♂ 10-12 mm. *Uncommon. It is stated to be a parasite of Noctuids living in stems of Gramineae.* **artiventris** (Boie)

Genus *Exephanes* Wesmael

The species of this genus are ill-understood, and certain of the segregates given here are dubious as to their distinctness and nomenclature. In particular, the species that I have called *caelebs* was described from the male and its distinctness from *occupator* is very uncertain. It is possible that *occupator*, as here defined, is a species group and more biological information is required in the elucidation of the problem.

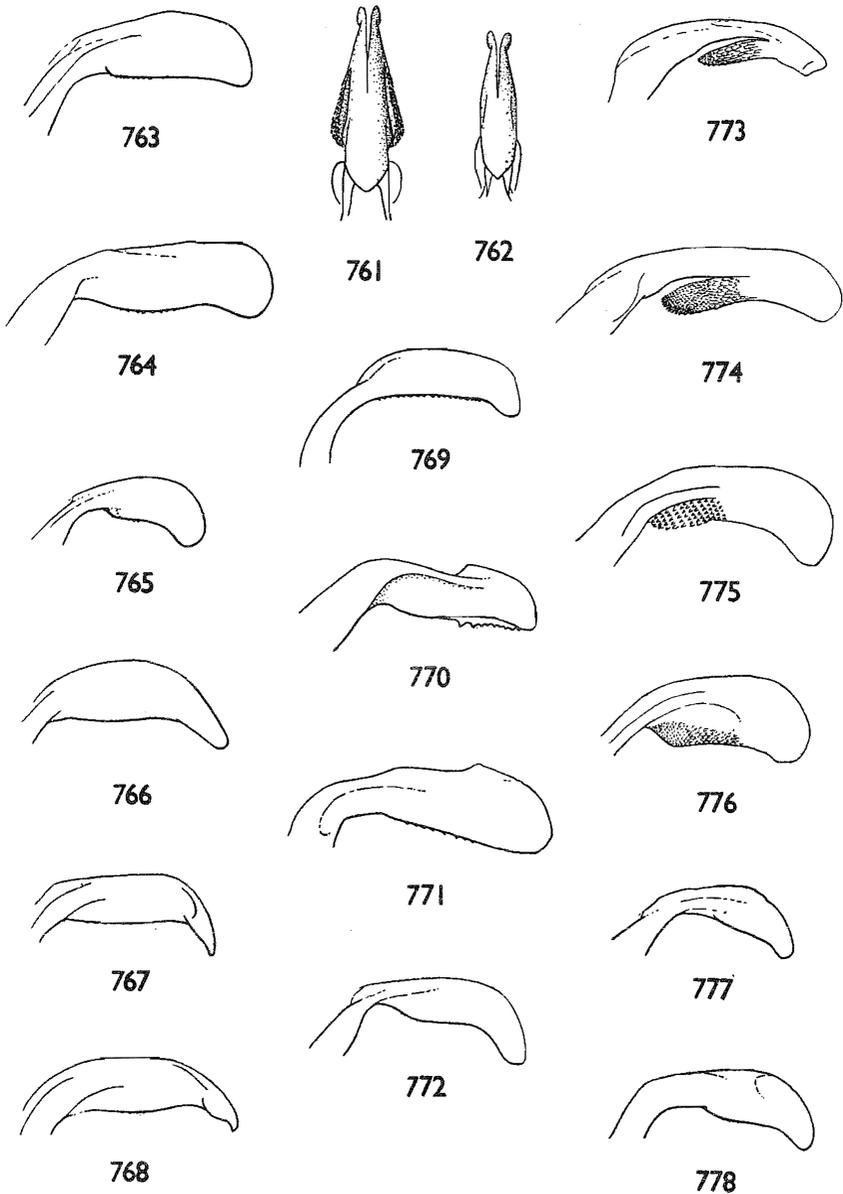
The species are parasites of Noctuid larvae living in stems of Gramineae. The females hibernate as adults.

KEY TO SPECIES

(Females)

- 1 Sternites 2-4 with a strong, ventral, membranous, longitudinal fold ; a more elongate species with the apical segments somewhat laterally compressed, and the ovipositor sheaths (fig. 781) (in the position of rest, measured from the dorsum, where it is covered by the eighth tergite, to the apex) longer than segment 2 of the hind tarsus ; tergite 6 with an ivory, transverse, apical band which is fully twice as broad as the large spot on tergite 7. 9-10 mm. *Common.* **ischioxanthus** (Gravenhorst)
- Sternites 2 and 3 with a ventral, membranous, longitudinal fold, sternite 4 at most with a very short, inconspicuous, membranous area at the base ; more robust species with the ovipositor sheaths usually broader and conspicuously shorter than segment 2 of the hind tarsus ; tergite 6 at most with an ivory spot which is equal in width to that on tergite 7. 2
- 2 (1) Claws more robust and strongly curved apically (figs. 787-8). 3
- Claws thinner and less curved apically (fig. 785).

Clypeus entirely black ; temples laterally, less converging ; scutellum ivory and flat ; mesoscutum with coarse punctures and with very indistinct microsculpture between the punctures, somewhat shining ; hind trochanter black except the extreme apex which is narrowly red, hind tibia testaceous or red, at most black in the apical fifth ; tergites 2 and 3, and 4 sometimes in part, red ; tergite 6 usually with an ivory, apical spot (7 with a large spot), 8 usually black, rarely with an ivory, central line 4



FIGS. 761-778.—*Amblyteles*, ♂.

FIGS. 761-762.—Penis valves, dorsal: 761, *subsericans*; 762, *elongatus*.

FIGS. 763-778.—Penis valve, lateral: 763, *indocilis*; 764, *mercatorius*; 765, *oratorius*; 766, *gradatorius*; 767, *palliatorius*; 768, *trifasciatus*; 769, *equitatorius*; 770, *crispatorius*; 771, *propinquus*; 772, *luctatorius*; 773, *elongatus*; 774, *subsericans*; 775, *castanopygus*; 776, *quadripunctorius*; 777, *monitorius*; 778, *amatorius*.

- 3 (2) [Ovipositor as long as the petiole ; mesopleurum strongly punctate ; scutellum flat ; base of antenna black, with an ivory band extending over 7-8 segments ; tergites 2 and 3 red, sometimes in part black. c. 11 mm.] *Only the ♂ seen from Britain*.....**amabilis** Kriechbaumer
- Ovipositor shorter than the postpetiole ; mesopleurum coarsely punctate and with longitudinal striae ; scutellum convex ; base of antenna red and with an ivory band extending over 4-5 segments ; tergites 2 and 3 yellowish-red.
- Clypeus with the apical and lateral margins yellow ; temples strongly narrowed behind the eyes ; scutellum yellow ; mesoscutum with fine punctures and with conspicuous microsculpture between the punctures, dull ; hind trochanter yellow, narrowly infusate at the base, hind femur broad, testaceous, very broadly black dorsally (except the basal fifth) and apically, hind tibia pale testaceous, black in the apical third ; tergites 2 and 3 and the base, laterally, of 4, orange ; tergite 6 with no dorsal spot, 7 with a large spot, 8 with a conspicuous, dorsal spot. c. 11 mm. *Rare*.. **ulbrichti** Hinz
- 4 (2) Hind femur red with only the faintest indication of a very weak and narrow impression on the lower, anterior face centrally, and this area at most with two or three rather oblique punctures (fig. 780). 9-13 mm. *Common* **occupator** (Gravenhorst)
- Hind femur black except the extreme base, and sometimes, narrowly, ventrally ; with a shallow but broad and conspicuous depression on the lower, anterior face centrally ; in this area the punctures are rather closer and obliquely enlarged so that they appear as short shallow grooves and are thus clearly differentiated from the punctures before and behind this area (fig. 779). 10-11 mm. *Ireland only*.....**caelebs** Kriechbaumer

(Males)

- 1 Clypeus conspicuously (though shallowly) and broadly excised apically (fig. 458) ; hypopygium with the apical process more acuminate (fig. 783).
Face entirely yellow. 9-12 mm. **ischioxanthus** (Gravenhorst)
- Clypeus truncate ; hypopygium with the process less strongly pointed (fig. 784) 2
- 2 (1) Hind femur entirely red.
Face with at least a broad, black, longitudinal, central line which may have a pair of yellow spots (sometimes fused) below the antennal sockets ; gaster very variable in colour ; tergites 2 and 3 entirely yellow or red or with the apices of these segments black banded, varying to entirely black ; tergites 4 and 5 rarely with an ivory, apical, transverse band ; tergites 6 and 7 often with an ivory, apical spot. 11-15 mm. **occupator** (Gravenhorst)
- Hind femur for the most part black..... 3
- 3 (2) Flagellum with a pale, central band ; trochanters in greater part pale.
Face entirely yellow ; scutellum yellow and convex ; hind tibia broadly marked with yellow ; claws rather narrow ; tergites 2 and 3 basally red. c. 10 mm. *No British male examined*..... **ulbrichti** Hinz
- Flagellum with no pale band ; trochanters in greater part black. 4
- 4 (3) Claws broad and very strongly upturned apically (*cf.* fig. 787) ; base of tergites 2, 3, and of 4 narrowly, red ; hind tibia broadly marked with red. c. 9 mm. **amabilis** Kriechbaumer
- Claws rather thin, and evenly curved apically (fig. 786) ; tergites 2 and 3 yellow, more or less marked with fuscous ; hind tibia broadly yellow marked ; very similar to *occupator* but with a more distinct depression on the outer, lower margin of the hind femur. c. 10 mm. *No British male seen* **caelebs** Kriechbaumer

Genus *Probolus* Wesmael

This genus is easily recognized though in the past there has been some confusion between our two species.

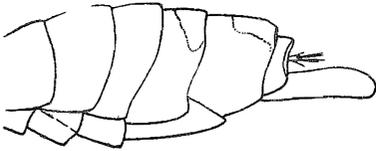
They are parasites of Noctuids and from the material that I have examined there is no indication of their mode of passing the winter, though the females are stated to hibernate as adults.



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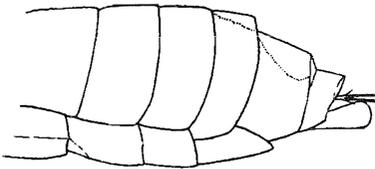
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FIGS. 779-788.—*Exephanes*.

FIGS. 779-780.—Hind femur, lateral, ♀: 779, *caelebs*; 780, *occupator*.

FIGS. 781-782.—Gaster, lateral, ♀: 781, *ischioxanthus*; 782, *occupator*.

FIGS. 783-784.—Hypopygium, ♂: 783, *ischioxanthus*; 784, *occupator*.

FIGS. 785-786.—Hind claw, ♀: 785, *occupator*; 786, *caelebs*.

FIGS. 787-788.—Hind claws, *ulbrichti*, ♀: 787, inner; 788, outer.

The scutellum is ivory. In the female, tergites 2-3/4 are red and the hind leg black. In the male the face is black, the gaster black in all British specimens examined, and the hind femur and greater part of the tibia red, though in *culpatorius* these vary to almost entirely black.

KEY TO SPECIES

- A A more slender and elongate species.
 ♀. Antenna more elongate (fig. 793), segment 2 of flagellum with length : breadth about 2 : 1 ; tubercle of tergite 1 more strongly raised (fig. 789) and the postpetiole more strongly sculptured ; tergite 2 with closer and more strongly impressed punctures.
 ♂. Tubercle of tergite 1 more strongly raised and more strongly rugose behind this ; more deeply impressed before the spiracles and the spiracles at least as far from the apex of the segment as the distance separating them ; tergites 2 and 3 more closely punctate (fig. 791). ♀ 12-14 mm., ♂ 13-14 mm.
Common..... **culpatorius** (L.)
- B A more robust species.
 ♀. Antenna shorter (fig. 794), segment 2 of flagellum with length : breadth about 1.2 : 1 ; tubercle of tergite 1 less strongly raised (fig. 790) and the postpetiole much less strongly sculptured ; tergite 2 with rather sparse, shallow punctures and thus much more strongly shining.
 ♂. Tubercle of tergite 1 less strongly raised, less strongly sculptured behind this ; less impressed before the spiracles which are conspicuously further from each other than from the apex of the segment ; tergites 2 and 3 less closely punctate (fig. 792). ♀ 12-13 mm., ♂ 13-15 mm. *Uncommon*
concinuus Wesmæl

Genus *Acolobus* Wesmæl

In the past, specimens of this genus have been much confused with *Platylabus*, but in reality there is no difficulty in separating these on the form of the petiole ; the similarity is purely superficial.

The two species are Geometrid parasites and do not hibernate as adults.

The females have the inner orbit and sometimes the face marked with ivory and the vertex with ivory, orbital spots. The males have the face, frontal and outer orbits and the orbital spots of the vertex, ivory and the pronotum with the upper margin and anterior margin laterally marked with ivory. The markings are less extensive in *albimanus* than in *sericeus*.

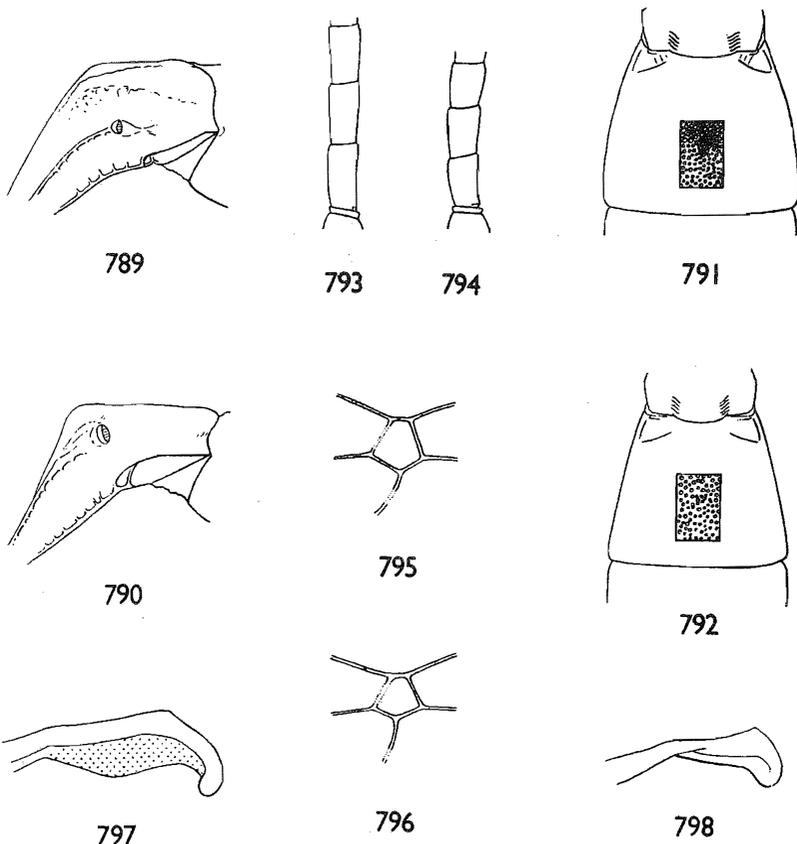
KEY TO SPECIES

- A ♀♂. Outer orbit conspicuously marked with yellow ; scutellum at least with a pair of conspicuous, yellow, apical spots which frequently fuse, sometimes yellow in the apical half ; hind tarsus entirely black ; vein *2mcu* usually received before the middle of cell *2Rs* (fig. 795) ; gaster with conspicuous, alutaceous sculpture between the sparse punctures.
 ♀. Stigma black ; head more strongly narrowed behind the eyes ; upper and anterior margin of pronotum conspicuously ivory marked. 9-10 mm. *Uncommon*..... **sericeus** Wesmæl
- B ♀♂. Outer orbit at most weakly marked with reddish ; scutellum black, or red in the apical half (mesoscutum sometimes marked with red) ; hind tarsus with at least the 2 apical segments testaceous and sharply contrasting with the basal segments ; vein *2mcu* usually received beyond the middle of cell *2Rs* (fig. 796) ; gaster somewhat shining, with less distinct sculpture between the sparse, shallow punctures.
 ♀. Stigma pale centrally ; head less strongly narrowed behind the eyes ; upper and anterior margin of pronotum not ivory marked. 8-9 mm. *Rare*
albimanus (Gravenhorst)

Genus *Tricholabus* Thomson

This is a very distinct genus of doubtful affinities which at different times has been placed in various tribes. It can readily be recognized and has most distinctive male genitalia (fig. 466).

♂♀. Both sexes have the antenna white banded; in the male the inner and outer orbits are marked with ivory; scutellum marked with ivory; tergites 1 (except extreme base), 2-3, and extreme base of 4, red, in the male varying to these segments completely black; tergites 5-7 ivory banded apically; hind femur always black. ♀ 10-11 mm., ♂ 9-12 mm. *A parasite of Euclidimera mi (Clerk). Not uncommon strigatorius (Gravenhorst)*



FIGS. 789-790.—Tergite 1, *Probolus*, ♀: 789, *culpatorius*, dorsolateral; 790, *concinus*, lateral.
 FIGS. 791-792.—Tergite 2, dorsal, *Probolus*, ♂: 791, *culpatorius*; 792, *concinus*.
 FIGS. 793-794.—Flagellar segments 1-3, *Probolus*, ♀: 793, *culpatorius*; 794, *concinus*.
 FIGS. 795-796.—Cell 2Rs of left fore wing, *Acolobus*, ♀: 795, *sericeus*; 796, *albimanus*.
 FIGS. 797-798.—Penis valves, lateral, *Alomya*, ♂: 797, *debillator*; 798, *semiflava*.

Subfamily ALOMYINAE

Genus *Alomya* Panzer

The single British genus which is placed here is readily recognizable. It is remarkable in that in the female the genae meet narrowly, posteriorly to form a bridge; the males have no such structure. (Figs. 16-20.)

Face with conspicuous modelling, distinctly divided from the broad, flat clypeus; interantennal tubercle strong, with a carina running from this, between the antennae and on to the frons; mandible with a shallow (♀) or weak (♂) sub-basal excision of the hind margin, the lower tooth conspicuously longer than the upper; antenna of female with very short segments, of the male without tyloidae; pronotum long dorsally with no transverse groove centrally but with a distinct pit on the hind margin; central area of metanotum with no basal pits or groove; front trochantellus not separated from the femur; ♀ with stout femora and with the front and middle tibiae strongly spinulose, short; fore wing with cell *2Rs* pentagonal; propodeum with a deep, basal groove which is uninterrupted dorsally; area petiolaris very short; gaster petiolate with the spiracles of tergite 1 at about the middle of the segment and without glymmae; tergite 2 without gastrocoeli and thyridiae; ♀ with the ovipositor viewed laterally, with the dorsal valve strongly narrowed from the base, then subparallel and serrate, obliquely truncate apically; the large tergite 7 usually concealing the following tergites and with the ovipositor sheaths only just projecting beyond this (and sometimes concealed); hypopygium very large and reaching nearly to the line of the apex of tergite 7.

In the females, the face rarely, and the clypeus apically usually, marked with red; hind tarsus broadly yellow or pale testaceous centrally, testaceous or black basally and apically; tergite 1 apically and tergites 2-5 red, 4 often infuscate apically and 5 frequently in greater part or entirely black; other general coloration given in the key; hypopygium of the female is very large and reaches to the apex of the tergites.

The hosts of this genus remain unknown. Both the species are common, at least in the South, but I have so far seen no specimens of *A. semiflava* from Scotland.

KEY TO SPECIES

- A Hind wing with vein *cua* about half as long as the first free abscissa of *Cu*₁.
 ♀. Tergite 2 with the groove surrounding the spiracle about as far from the lateral margin of the segment as its diameter; flagellum most usually with segments 1-10/11 pale testaceous, the remaining segments infuscate, rarely with the whole flagellum infuscate; tarsi usually testaceous.
 ♂. Tergite 2 with the spiracle conspicuously closer to the lateral margin than its diameter; hind tibia testaceous, frequently infuscate apically, varying to entirely black; stigma darker, the outer hind margin always infuscate; penis valves with a strong, subapical expansion beneath (fig. 797); tergites 2-4 testaceous, 4 black apically, in dark specimens the black appearing as a broad, longitudinal bar in the middle of the segment—varying to completely black; the black forms common. ♀ 10.5-18 mm., ♂ 10.5-17.5 mm. v-ix, perhaps more than one generation. *debellator* (F.)
- B Hind wing with vein *cua* about one-third as long as the first free abscissa of *Cu*₁.
 ♀. Tergite 2 with the groove surrounding the spiracle at least one and two-third times as far from the lateral margin as its diameter; flagellum usually with segments 1-3/4 fuscous, 4/5-13/14 very pale testaceous or yellow; tarsi fuscous.
 ♂. Tergite 2 with the spiracle at least as far from the lateral margin as its diameter; hind tibia pale yellow and even in the darkest specimens only narrowly infuscate apically; stigma paler with the outer hind margin

only somewhat darker in strongly infusate specimens ; penis valves narrow (fig. 798) ; tergite 1 apically and tergites 2-4 yellow, with a pair of ill-defined, testaceous spots just behind the middle, tergite 4 often with a triangular, black, apical mark ; in dark specimens the testaceous spots become infusate which may suffuse over the whole of the yellow ; dark specimens rare. ♀ 10.5-14.5 mm., ♂ 11-17.5 mm. viii-ix, *apparently therefore only with a single generation*..... *semiflava* Stephens

Subfamily AGRIOTYPINAE

Genus *Agriotypus* Curtis

♀♂. This entirely black species is at once recognized by the long, spine-like prolongation of the scutellum ; the colour pattern of the wings can be seen from fig. 1. ♀ 5-8 mm., ♂ 5-7.5 mm. *The species appears to be local but at times can occur in great numbers. It is a parasite of Trichoptera.* . *armatus* Curtis

Subfamily LYCORININAE

Genus *Lycorina* Holmgren

♀. Antenna elongate, a little thickened apically ; transverse groove of pronotum conspicuously interrupted centrally ; scutellum strongly carinate laterally, to the strongly angled apical area ; propodeum short, with the carinae strongly raised, except the costula which is rather weak and received almost at the apex of the area superomedia which is not divided from the area basalis ; claws strongly pectinate ; vein 3 r_m of fore wing absent ; ovipositor sheaths about as long as the gaster without the first 2 segments.

Black ; clypeus yellow ; orbits of the vertex and the external orbits dorsad narrowly marked with yellow ; sometimes with the tegula, the lateral carina of the scutellar fovea, the scutellum apically and the central area of the metanotum apically, yellow ; coxae and trochanters black, the trochanters sometimes marked with yellow apically ; trochantelli yellow to red, those of the hind legs marked with black basally ; front and middle femora and tibiae red, paler externally and with a pale yellow, basal, external spot ; front and middle tarsi pale testaceous, the apical segments of the middle in part infusate ; hind tibia red, broadly infusate apically and with a pale yellow, basal spot ; hind tarsus black ; stigma black. (Figs. 72-4.) 6-7.5 mm.

No male has been examined.

Recorded from Gelechiidae and Tortricidae. Rare. v-vii

triangulifera Holmgren

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