

VII. *Monograph of British Braconidæ. Part II.* By the
Rev. T. A. MARSHALL, M.A., F.L.S., &c.

[Read February 2nd, 1887.]

PLATE V.

IV. POLYMORPHI.

Of the ten subfamilies brought together under this heading, the two first only have a natural affinity. The others, as explained at the beginning of Part I., are isolated and heterogeneous, being, in fact, each of them the type of a higher division. To effect their rational arrangement it would be necessary to take into account all the exotic forms, when it would probably be found that many or most of the subfamilies and their genera, constituted for the reception of European species, would have to be modified or exploded. With regard to the first two subfamilies, they might be classed together as one group *Petiolarii*, equivalent to the *Areolarii*, &c., established by Wesmael; but it would avail nothing to commence a system of division which could be carried no further.

XIV. EUPHORIDES.

Maxillary palpi 5—6-, labial 2—3-jointed. Occiput margined. Clypeus rounded, usually discrete, marked with a punctiform impression on each side of the base. Antennæ varying in length and in the number of the joints; in *Streblocera* geniculated and with an elongate scape; in *Eustalocerus* geniculated and clavate. Mandibles hardly bidentate. Mesothoracic sutures distinct or obsolete. Fore wings with 2 cubital areolets, sometimes obsolete; prædiscoidal often confused with the 1st cubital; radial either cultrate, reaching nearly to the tip of the wing, or minute, sublanceolate or semicordate, the metacarpus being then shorter or not longer than the stigma. Pobrachial areolet of the hind wings scarcely shorter than the præbrachial; præbrachial transverse nervure sometimes obsolete. Abdomen petiolated; suturiform articulation obsolete; segments 2—3 much longer than the rest,

which rapidly decrease in size to the anus. Terebra concealed or exerted.

The petiolated abdomen and two cubital areolets combine to distinguish this group from all others in Europe; but exotic species exist having three cubital areolets, and thus tending to coalesce with the next subfamily. The *Euphorides* of Förster take their name from *Euphorus pallidicornis*, Nees, ranked by that author erroneously among the *Oxyura*, subsequently transferred by Haliday and Curtis to the *Liophronides*, and to its present place by Reinhard and Förster simultaneously (1862). In its most recent acceptation the group comprises Section I. of the genus *Perilitus*, Nees (Act. Ac. L. C., 1819, p. 302), except his last species *P. conjungens*, which belongs to the *Exodontes*, genus *Chænusa*. Haliday in 1835 (Ent. Mag., iii., pp. 34—38) made two subgenera of *Perilitus*, which name he restricted to Section I. of Nees, giving to Section II. a new name, *Meteorus*. Wesmael, also in 1835, made two similar divisions of *Perilitus*, *Microctonus* and *Perilitus*, whereof the former represents *Perilitus*, Hal., and the latter *Meteorus*, Hal. A Prodomus of a monograph of *Microctonus* by Ruthe, containing only diagnoses, appeared in the Stett. Zeit. for 1856 (pp. 289—308), of which Reinhard published a *resumé*, with the addition of all other known species, in the Berl. ent. Zeits., 1862 (pp. 321—329); the names adopted by Reinhard are *Perilitus* for Section I. Nees, and *Meteorus* for Section II. Westwood, in 1833, discovered *Streblocera*; Ratzeburg, in 1848, *Cosmophorus*; and Förster (Verh. pr. Rheinl., 1862, p. 250) raised the total number of genera to 11. The views of Haliday and Wesmael (1835), and of Reinhard and Förster (1862) are substantially the same, but the coincidence of dates causes a difficulty in the choice of names. On the whole it seems preferable to keep *Perilitus* (= Section I. Nees = *Microctonus*, Wesm.) among the *Euphorides*, and to employ Haliday's *Meteorus* for the next subfamily. It is necessary therefore, in Part I., p. 10, for Subfam. 15, *Perilitides*, to read *Meteorides*. Some additional descriptions of *Euphorides* may be gathered from Curtis, B. E., 476, but they are insufficient, except where further interpreted by Haliday; the species figured by Herrich-Schäffer (Fn. Germ., 156) have been referred to their proper places by Reinhard.

Only four instances of the parasitism of these insects have been brought to light, from which it appears that they attack Coleoptera. *Cosmophorus Klugii*, Ratz., was bred out of *Polygraphus pubescens*, Er., and *Perilitus terminatus*, Nees, from adult *Coccinellæ*, but neither parasite has been noticed in England. *Euphorus pallidipes*, Cur., has been reared from *Orchesia minor*, Walk., and *Perilitus falciger*, Ruthe, from *Timarcha coriaria*, F.

TABLE OF GENERA.

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|------|------------------------------------------------------------------------------------------------------------------------------|--------------------|
| (8) | 1. Antennæ not geniculated. | |
| (7) | 2. First segment not longer than the rest of the abdomen; condylus wider than the petiole. Head smaller than the mesothorax. | |
| (6) | 3. Radial areolet semicordate or sublanceolate, ending much before the apex of the wing. | |
| (5) | 4. Maxillary palpi 5-jointed. Metathorax not vertically truncated nor excavated behind. Terebra concealed | i. EUPHORUS. |
| (4) | 5. Maxillary palpi 6-jointed. Metathorax vertically truncated and excavated behind. Terebra exerted | v. PERILITUS. |
| (3) | 6. Radial areolet cultrate, nearly reaching the apex of the wing | vi. MICROCTONUS. |
| (2) | 7. First segment longer than the rest of the abdomen; condylus not wider than the petiole. Head as large as the mesothorax | ii. WESMAELIA. |
| (1) | 8. Antennæ with one or two geniculations. | |
| (10) | 9. First cubital areolet distinct from the prædiscoidal. Antennæ ♀ clavate | iii. EUSTALOCERUS. |
| (9) | 10. First cubital areolet not distinct from the prædiscoidal. Antennæ ♀ not clavate | iv. STREBLOCERA. |

i. EUPHORUS; Nees.

Euphorus, Nees, Mon., ii., 360 (1834).

Leiophron, Cur., B. E., 476; Hal., Ent. Mag., ii., 462.

Euphorus and *Peristenus*, Först., Verh. d. pr. Rheinl., 1862, p. 251.

Clypeus transverse, rounded, fitting closely to the mandibles. Maxillary palpi 5-, labial 3-jointed. Antennæ straight, in the ♂ filiform, in the ♀ shorter, often submoniliform, and incrassated towards the apex. Head rotundo-cubic, as wide as the thorax, or wider. Occiput faintly marginal. Fore wings with 2 cubital areolets, sometimes obsolete; prædiscoidal areolet separated; radial areolet minute, semicordate or semilunate, ending not far

from the stigma, which is longer than the metacarpus; radius uniformly curved, its 1st abscissa often punctiform, or obsolete, the 2d cubital areolet, in the latter case, touching the stigma. Recurrent nervure interstitial; præ- and pobrachial areolets of equal length; stigma large, triangular. Mesothoracic sutures visible or obsolete. Metathorax elongate, not vertically truncate, nor excavated posteriorly. First abdominal segment sublinear, petiole and tubercles indistinct; segments 2—3 together covering most of the abdomen, segment 4 very short, the rest inconspicuous, mostly retracted. Terebra concealed, subulate or falciform, decurved; valves ovate, stout.

Nees von Esenbeck established this genus upon two female specimens of his *E. pallidicornis*, in which the discoidal and cubital areolets are nearly obsolete; hence he was led to place them among the *Oxyura*. Curtis, however, the year before, had already brought forward a number of English species under the name of *Leiophron*, with a figure of *L. apicalis*; but his descriptions of the others are mere outlines. Haliday, in the Ent. Mag. for 1834, redescribed most of the species of Curtis, and placed the genus upon a sound basis, though still under the name of *Leiophron*. Wesmael in the next year (1835) published two more species, *barbiger* and *claviventris*, which he referred to a special section of his *Microctonus*, distinguished by having the terebra concealed. In 1856 Ruthe, in his paper on *Microctonus* in the Stett. Zeit., assembled twelve species known to Wesmael and himself, forming the last section of the genus. A list of all the species, under the name of *Euphorus*, is given by Reinhard in the Berl. ent. Zeits. for 1862, divided into the two sections devised by Haliday; and Förster in the same year gave to these sections generic rank under the names of *Peristenus* and *Euphorus*, the former of which is not here adopted.

TABLE OF SPECIES.

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| (2) | 1. First abdominal segment scarcely longer than broad | 1. <i>mitis</i> , Hal. |
| (1) | 2. First abdominal segment 3—5 times longer than broad. | |
| (14) | 3. Mesothoracic sutures distinct and punctate. | |
| (13) | 4. Antennæ of the ♀ more than 16-jointed (except occasionally in Sp. 4); of the ♂ more than 17-jointed. Pobrachial areolet of the hind wing closed by a transverse nervure. | |

- (10) 5. Mesothorax punctate.
- (9) 6. Antennæ of the ♀ more than 18-jointed;
of the ♂ 23—27-jointed.
- (8) 7. Tubercles of the 1st abdominal segment
inconspicuous 2. *pallidipes*, Cur.
- (7) 8. Tubercles of the 1st abdominal segment
prominent 3. *tuberculifer*, n. s.
- (6) 9. Antennæ of the ♀ 16—18-, of the ♂ 19—
21-jointed 4. *picipes*, Hal.
- (5) 10. Mesothorax impunctate.
- (12) 11. First abscissa of the radius very short;
stigma not quite touching the 2d cubital
areolet 5. *coactus*, Marsh.
- (11) 12. First abscissa of the radius obsolete, so
that the stigma touches the 2d cubital
areolet 6. *accinctus*, Hal.
- (4) 13. Antennæ of the ♀ 16-, of the ♂ 17-jointed.
Pobrachial areolet of the hind wing not
closed, the transverse nervure being
abbreviated or obsolete.. .. . 7. *similis*, Cur.
- (3) 14. Mesothoracic sutures indistinct, impunc-
tate.
- (16) 15. Mesothoracic sutures inchoate, but vanish-
ing posteriorly 8. *intactus*, Hal.
- (15) 16. Mesothoracic sutures wholly effaced.
- (20) 17. Colour testaceous, abdomen dark at the
apex.
- (19) 18. Wings infuscated, with or without a white
transverse fascia. First abdominal
segment linear, not sinuated at the
base nor wider at the apex; tubercles
inconspicuous 9. *apicalis*, Cur.
- (18) 19. Wings hyaline. First abdominal segment
not linear, sinuated at the base and
widened towards the apex; tubercles
prominent 10. *ornatus*, n. s.
- (17) 20. Colour black or piceous.
- (22) 21. Metathorax thickly punctato-reticulate.
Antennæ ♀ not longer than the head
and thorax, stout. Length, $\frac{1}{2}$ — $\frac{3}{4}$ lin. 11. *fulvipes*, Cur.
- (21) 22. Metathorax reticulated with larger irre-
gular areæ. Antennæ ♀ not much
shorter than the body, slender. Length,
 $\frac{3}{4}$ —1 lin. 12. *parvulus*, Ruthe.

1. *Euphorus mitis*, Hal.*Leiophron mitis*, Hal., Ent. Mag., ii., 463.

“Black, shining: antennæ a little shorter than the body, hardly filiform, 23-jointed, obscurely testaceous: mouth and palpi of the same colour. Sutures of the mesothorax converging posteriorly, punctate, the disk smooth in the middle. Metathorax granulated,

pubescent. First abdominal segment scarcely longer than broad, aciculated; the tubercles situated near the base; the extreme base constricted. Legs testaceous, the hind pair more obscure; coxæ blackish. Wings hyaline, nervures and stigma pale fuscous; radix and squamulæ testaceous. Apparently a ♀."—Haliday. Length, $1\frac{1}{3}$; wings, 3 lin.

Nothing more is known of this insect, to the description of which the following note is appended by the author:—"I have seen but one individual of this species, which appears to have sustained some injury to the pupa, as its wings are not fully expanded. Possibly the unusual shortness of the first segment may have been produced by accident also, as in its other characters the species agrees with those of the following section," *i. e.*, with *pallidipes*, &c.

2. *Euphorus pallidipes*, Cur.

Leiophron pallipes, Cur., B. E., 476, 1, and pl. ff. 1—9 (dissections and wing taken from this species).

Microctonus barbiger, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 69, pl. i. (wing); Ruthe, Stett. Zeit., 1856, p. 307, ♂, ♀.

Perilitus pallipes, Schäff., F. G., cliv., 13.

Microctonus brevicornis, Ruthe, *lib. cit.*, p. 306, ♂ ♀.

Leiophron orchesiæ, Cur., B. E., 476, 1a.

Black; antennæ at the base, and legs, rufo-testaceous; hind coxæ and tips of hind tibiæ and tarsi fuscous. Wings dull hyaline, squamulæ, stigma, and nervures rufo-fuscous; all the nervures distinct; stigma pale at the base, and not touching the 2d cubital areolet; hence the radial areolet is angulated under the stigma, strongly curved, semilunate; metacarpus about half as long as the stigma. Face covered with whitish pubescence. Prosternum smooth, shining. Mesothorax shining, impressed with large distant punctures. Metathorax reticulato-rugose. First abdominal segment gradually widened to the apex, which is twice as broad as the base, striolated; the other segments smooth and shining. ♂ ♀. Length, $1\frac{1}{2}$; wings, $2\frac{3}{4}$ lin.

Antennæ ♀ 21—23 (seldom 24- or 25-) jointed, shorter than the body; those of the ♂ longer, 23—27-jointed. Head large; vertex prolonged behind the eyes; face subquadrate, covered with thick whitish pubescence, and with a row of long outstanding hairs above the clypeus. Mesothoracic sutures crenate, meeting some-

what acutely before the scutellum. Metathorax regularly convex, pubescent. First segment occupying about $\frac{1}{3}$ of the abdomen, insensibly widened from the base to the apex; the tubercles inconspicuous; segments 2—3 connate, together equal to $\frac{2}{3}$ of the rest of the abdomen, which is ovate, convex, smooth, and shining. Radial areolet smaller than the stigma, which is large and subtriangular, more or less dark fuscous, and sometimes not paler at the base. Pobrachial areolet of the hind wings closed.

Var. α . Head rufous; stemmaticum black; antennæ testaceous, tipped with fuscous. *L. orchesiæ*, Cur.

Var. β . Antennæ as in the preceding; legs testaceous, hind coxæ blackish. ♂ ♀. Ruthe.

Var. γ . More slender; head, pro- and mesothorax, with the scutellum, rufous; antennæ almost wholly, as well as the legs, testaceous; 2d abdominal segment piceo-rufous. ♂. Ruthe, Wesmael.

Described from 8 females, 28 males, including two of var. α : 14 males have 24-jointed, and 5 females 22-jointed antennæ.

The limits of this species can hardly be fixed without more knowledge than we possess at present. *M. brevicornis*, Ruthe, may be distinct, appearing doubtful on account of the shortness and thickness of the antennæ in the female; there are, however, intermediate forms, and a separate species could not well be maintained upon this character alone. Nees v. Esenbeck seems to be the only continental writer unacquainted with this abundant insect. Var. α , according to Curtis, was bred by Walker from *Orchesia minor*, Walk., one of the two recorded instances of the rearing of an insect of this subfamily in England: cf. Boie, Nat. Tidsk., iii., 315.

The species is common throughout the country.

3. *Euphorus tuberculifer*, n. s.

Præcedenti persimilis, triplo minor. Niger, abdomine post segmentum 1um piceo, antennarum basi pedibusque, cum coxis omnibus, testaceis, tibiis tarsisque posticis apicem versus fuscescentibus. Alæ hyalinæ, squamulis, nervis, testaceis, stigmate fusco, ad basin hyalino, areolam cubitalem 2dam non attingente. Radii abscissa 1ma brevissima, punctiformis. Abdominis segmentum 1um postice ampliatus, tuberculis prominulis.

Very like *pallidipes*, but much smaller. Black, abdomen after

the 1st segment piceous; antennæ at the base, and legs, including all the coxæ, testaceous; hind tibiæ and tarsi fuscous towards the apex. Wings hyaline, squamulæ and nervures testaceous, stigma brown, hyaline at the base, not touching the 2d cubital areolet; 1st abscissa of the radius very short, punctiform. First abdominal segment widened behind; tubercles prominent. ♂ ♀. Length, $1\frac{1}{4}$; wings, $2\frac{1}{2}$ lin.

Antennæ of the ♂ 24-jointed, rather longer than the body; of the ♀ shorter than the body, 20-jointed. Head and thorax as in *pallidipes*, but the face is not pubescent. Mesothoracic sutures crenate, conniving before the scutellum; medial lobe thickly, and scutellum sparingly, punctate. Metathorax punctato-rugulose. First abdominal segment of the ♀ striolated, slender and coarctate at the base, widened to the tubercles, which are prominent and acute; thence to the apex the sides are nearly parallel, the apex being twice as broad as the base; the same segment of the ♂ differs in being a trifle narrower. The rest of the abdomen is rufopiceous, darker posteriorly. The wings differ from those of *pallidipes* in that the 1st abscissa is punctiform, so that the stigma almost touches the 2d cubital areolet; the radius is somewhat obtusely rounded beneath the stigma; the latter is larger; the nervures paler and more obsolete. Pobrachial areolet of the hind wings closed.

Described from two males taken at Nunton, Wilts, and one female from the Isle of Wight.

4. *Euphorus picipes*, Hal.

Leiophron picipes, Hal., Ent. Mag., ii., 464, ♂ ♀ (not of Curtis).

Antennæ ♀ 16—18-jointed, subclavate, not longer than the head and thorax; of the ♂ 19—21-jointed, shorter than the body. Black, abdomen after the 1st segment inclining to piceous; antennæ and legs testaceous, the former towards the apex, the latter with the hind coxæ more or less, and sometimes the tips of the hind tibiæ, fuscous; or the fore legs pale piceous, the posterior darker, and the hind coxæ black. Wings dull hyaline, squamulæ, stigma, and nervures piceous, more or less pale; stigma hyaline at the base and not reaching the 2d cubital areolet. Face not remarkably pubescent. Mesothorax shining, punctate. Metathorax minutely reticulato-rugose. First abdominal segment gradually widened to the apex, which is twice as broad as the base, striolated; the other segments smooth and shining. ♂ ♀. Length, $1-1\frac{1}{3}$; wings, $2-2\frac{2}{3}$ lin.

Similar to *pallidipes*, and to be distinguished chiefly by the antennæ, which have fewer joints, and in the female are remarkably short, and incrassated towards the tips; it is also a smaller insect. Radial areolet narrower, and 1st abscissa of the radius shorter, almost punctiform. Metacarpus half as long as the stigma. Legs somewhat stouter, and all their articulations therefore in appearance shorter. This is unquestionably Haliday's *picipes*, from his description of the antennæ. Reinhard has given *Microctonus relictus*, Ruthe (Stett. Zeit., 1856, p. 305) as a synonym. But Ruthe separates *relictus* from *pallidipes* by the 1st abscissa of the radius, stated to be entirely obsolete in the former. This cannot be said of the present insects, nor is it mentioned by Haliday. On the other hand, Ruthe is silent about the antennæ of *relictus*; above all he does not say that those of the male are usually 18-jointed, a character peculiar to the present species. It follows that *picipes*, Hal., and *relictus*, Ruthe, cannot be identical. The *Leiophron picipes*, Cur., is also distinct; see the following species.

Described from seven males and two females taken on the banks of the Usk near Abergavenny, in Leicestershire, Herts, and Wilts. Capron reports it as common at Shiere, near Guildford; he has taken five females, one male.

5. *Euphorus coactus*, Marsh.

Leiophron picipes, Cur., B. E., 476, 2, ♀ (not of Haliday).

Antennæ ♀ 16-jointed, short, subclavate. Black, abdomen after the 1st segment, legs, and antennæ piceous, the last paler at the base. Wings hyaline, squamulæ, stigma, and nervures rufo-fuscous; stigma hardly paler at the base, not reaching the 2d cubital areolet; 1st abscissa of the radius very short; radial areolet not angulated under the stigma, semilunate; metacarpus as long as $\frac{1}{2}$ the stigma. Mesothorax shining, impunctate; sutures distinct, smooth, conniving in an angle before the scutellum, and not effused into a punctate space. Metathorax uneven, dull, thickly punctulate. First abdominal segment striolated, gradually widened to the apex, which is twice as broad as the base; the other segments smooth and shining. ♀. Length, 1; wings, 2 lin.

Antennæ submoniliform, stout, not longer than the head and thorax, gradually incrassated to the apex. Head large, impunctate,

shining; vertex prolonged behind the eyes. Mesothorax as in *pallidipes*, but destitute of punctures. Wings also like those of *pallidipes*, but the 1st abscissa is shorter, almost punctiform; nervures distinct. Legs stout, short, piceous; tibiæ and tarsi paler than the femora.

Distinguished from *picipes*, Hal., by its impunctate mesothorax, smaller size, and darker legs; compared by Curtis to his *similis*, while Haliday compares his *picipes* to *pallidipes*, Cur. It is highly probable that the synonymy given by Haliday under *picipes* is an oversight, and it is necessary therefore to impose a new name upon one of the species there apparently confused. But the materials at hand are insufficient to decide the difficulty absolutely.

Described from two females taken near Barnstaple.

6. *Euphorus accinctus*, Hal.

Leiophron accinctus, Hal., Ent. Mag., ii., 465.

"Head, thorax, and petiole black; abdomen piceous; antennæ at the base, and legs, ferruginous. Wings hyaline, radix and squamulæ stramineous, stigma pale brown, lighter at the base, and touching the 2d cubital areolet. Petiole of the abdomen nearly linear, rugulose, the tubercles acute, slightly prominent." ♂. Length, $1\frac{1}{4}$; wings, $2\frac{1}{2}$ lin.

"Antennæ 22-jointed, slender, hardly shorter than the body, fuscous, ferruginous at the base. Mesothoracic sutures crenate, conniving before the scutellum; medial lobe impunctate; scutellum obsoletely punctate. Metathorax minutely rugulose. First abdominal segment nearly linear, longitudinally rugulose, somewhat coarctate before the tubercles. Radial areolet narrow, acuminate beneath the stigma."—Haliday.

I have not seen this species.

7. *Euphorus similis*, Cur.

Leiophron similis, Cur., B. E., 476, 4; Hal., Ent. Mag., ii., 465, ♀.

Microctonus oblitus, Ruthe, Stett. Zeit., 1856, p. 303, ♀.

Black; abdomen after the 1st segment piceous; antennæ testaceous, their apical half fuscous; legs testaceous, more or less inclining to piceous, hind coxæ piceous at the base. Wings hyaline, squamulæ and nervures testaceous, stigma large, pale brown or

testaceous, its basal third hyaline; 1st abscissa of the radius obsolete, so that the 2d abscissa and the intercubital nervure spring immediately from the stigma; radial areolet very minute. Mesothoracic sutures distinct. First abdominal segment elongate, linear, the tubercles inconspicuous. ♀. Length, $\frac{3}{4}$ —1; wings, $1\frac{1}{2}$ —2 lin.

Var. Rufo-testaceous, metathorax and apex of the abdomen fuscous. Ruthe. Cf. sp. 10, which is similarly coloured, but without visible mesothoracic sutures.

Antennæ ♀ 16-jointed, somewhat incrassated towards the tips, as long as the head, thorax, and petiole. Head and thorax impunctate. Mesothoracic sutures shallow, converging into a small dull space before the scutellum, which is smooth and shining. Metathorax finely reticulated. Abdomen piceous, paler and often rufous on the 1st segment and base of the 2d; segment 1 slender, almost linear, punctato-reticulate, coarctate at the base, and nearly $\frac{1}{3}$ of the whole length of the abdomen; tubercles inconspicuous; the rest of the segments form a short convex oval. Pobrachial areolet of the hind wings open.

Described from six females. Generally distributed.

8. *Euphorus intactus*, Hal.

Leiophron intactus, Hal., Ent. Mag., ii., 465, ♀.

Piceous, head and thorax darker; abdomen rather rufo-piceous; antennæ and legs very pale piceous. Wings dull hyaline, squamulae, stigma, and chief nervures pale yellowish, the others decolorous; stigma hyaline at the base, touching the 2d cubital areolet; radial areolet angulated beneath the stigma, semilunate, the metacarpus shorter than $\frac{1}{2}$ of the stigma. Pobrachial areolet of the hind wings open. Mesothorax smooth, shining, impunctate, the sutures obsolete, except a wrinkled depression before the scutellum. Metathorax thickly punctulate, somewhat shining. First abdominal segment linear, punctato-reticulate; the rest smooth. ♀. Length, $\frac{3}{4}$ —1; wings, $1\frac{1}{2}$ —2 lin.

Antennæ 16-jointed, nearly filiform, somewhat incrassated and fuscous towards the apex, as long as the body. Entirely smooth and shining, except the metathorax and 1st abdominal segment. Mesothoracic sutures none, or only vestiges remain, viz., two short shallow grooves in front, and a slight depression before the scutellum. First abdominal segment linear, slightly curved, coarctate at the base; tubercles medial, somewhat salient. The colour of the legs and antennæ is pale piceous, or, as Haliday calls

it, silaceous, as distinguished from flavo- or rufo-testaceous. Before the scutellum is a transversely oval fovea, bisected by a carina. Distinguished from *fulvipes*, Hal., by longer and more slender antennæ; from *parvulus*, Ruthe, by longer antennæ; from both by having traces of the mesothoracic sutures.

Reinhard conjectures this to be *Microctonus clavi-ventris*, Wesm., ♀ (Nouv. Mém. Ac. Brux., 1835, p. 71), but Wesmael's description is inconclusive through the omission of all mention of the mesothoracic sutures; moreover, the types in the Brussels Museum do not correspond with the description, and the whole is rendered useless.

Described from two females taken in Epping Forest.

9. *Euphorus apicalis*, Cur.

Leiophron apicalis, Cur., B. E., pl. cccclxxvi, ♂; Hal., Ent. Mag., ii., 466, ♂ ♀.

Microctonus fascipennis, Ruthe, Stett. Zeit., 1856, p. 302, ♂ ♀.

Rufo- or flavo-testaceous, antennæ at the tips, apex of the abdomen (sometimes also the metathorax, pleuræ, and pectus of the ♀) fuscous; hind femora and tibiæ in the middle rarely infuscated. Wings fuscous, with a broad whitish transverse fascia including the base of the stigma, the rest of which is brown; when the wings are paler this fascia is absent: cubital and anal nervures very faint, and their transverse nervures indistinct. Metathorax elongate, horizontal, subtruncate. Abdomen clavate, 1st segment slender, linear, curved; tubercles not prominent. ♂ ♀. Length, 1—1 $\frac{2}{3}$; wings, 1 $\frac{3}{4}$ —2 $\frac{3}{4}$ lin.

Variable in size, and in colour from flavo-testaceous to rufous; abdomen from the hinder edge of segment 2 to the apex always blackish. The base of the petiole, the metathorax, pleuræ, and pectus of the ♀ frequently fuscous; near the radix of the wings is a fuscous dot. Fore wings infuscated from about the præbrachial transverse nervure, and gradually paler thence to the apex, crossed by a broad whitish fascia under the stigma; this coloration is less obvious in smaller specimens, especially males, and at length disappears, as in that figured by Curtis. Costa and præbrachial transverse nervure brown; the other nervures not distinct. Post-brachial areolet of the hind wings open. Eyes during life green; ocelli fuscous. Antennæ ♂ 17—19-jointed; of the ♀ 16-jointed; the two apical joints imperfectly divided; 3d joint elongate.

Sutures of the mesothorax obsolete; the disk smooth, except a few minute transverse wrinkles. Metathorax punctato-reticulate, elongate, horizontal, abruptly rounded, or almost truncate, posteriorly. First abdominal segment punctate, slender, curved, elongate, not wider at the apex; tubercles antemedial; the rest of the abdomen pyriform, smooth, shining; in the ♂ the apex is truncated.

Walker first discovered at Southgate the ♂ which was figured and described by Curtis. Haliday must have had several specimens of both sexes, but without coloured wings. Ruthe's examples, three males, one female, appear to have been typical; they were taken in the Brieselanger Forest, near Berlin, in May and June. The species occurs in England not uncommonly, especially in North Devon, where I once captured a good series of intermediate forms, enabling me with confidence to unite *apicalis*, Cur., with *fascipennis*, Ruthe. Others have occurred singly, in the London district, taken by Billups, and by myself at Nunton, Wilts; another is in Fitch's collection. Van Vollenhoven records the rearing of a specimen from an unlikely source, *viz.*, the case of a *Coleophora*.

10. *Euphorus ornatus*, n. s. (Pl. V., fig. 1).

Testaceus, oculis, abdominis triente postico, nigris; segmento 1mo et metathorace piceis; antennis apicem versus infuscatis. Alæ hyalinæ, nervis pallidis, stigmatе picescente basin versus hyalino, cellulis discoidalibus obsoletis; alæ posticæ fere enerves. Mesothorax lævissimus. Metathorax punctatus, subelongatus, vix declivis, apice subtruncatus. Abdominis segmentum 1mum rugulosum, postice nonnihil ampliatus, antice coarctatus, tuberculis prominulis; cætera lævissima.

Testaceous, eyes, and apical third of the abdomen, black; metathorax and first abdominal segment piceous; antennæ infuscated towards the tips. Wings hyaline, nervures pale, stigma pale piceous, its base hyaline; discoidal areolets obsolete; hind wings without visible nervures. Mesothorax entirely smooth. Metathorax punctate, subelongate, almost horizontal, subtruncate posteriorly. First abdominal segment rugulose, coarctate at the base, somewhat widened after the prominent tubercles; the rest smooth and shining. ♂. Length, $1\frac{1}{4}$; wings, $2\frac{1}{4}$ lin.

Antennæ 17-jointed, incrassated towards the apex, a little shorter than the body.

Regarding the colours of this insect as fallacious, I have tried to connect it by structure only with some of the dark species. The perfect smoothness of the mesothorax separates it from all those above described except *apicalis*, and from this it is easily distinguished at a glance, as in the table of species. It is much too large to be compared with either of the following species, *fulvipes* or *parvulus*. On the whole it most resembles *similis*, Cur., a common species, and said to have a pale variety; but the structure of the mesothorax does not agree. It would not be surprising if the character derived from the development or suppression of the mesothoracic sutures should be found hereafter to be valueless, although Förster founds a genus upon it, but at present there is no ground for such an assumption. There remains the pale variety of Wesmael's *Microctonus claviventris*, already referred to under sp. 8. The mesothorax of this species is not characterised by Wesmael, and, in order to arrive at some conclusion I applied to M. de Borre, of the Musée Royal at Brussels, who took great pains, with the assistance of Dr. Jacobs, to examine Wesmael's types of this and allied species. The conclusions at which they arrived are that *Euphorus ornatus* is not identical with any species in Wesmael's collection, and further, that the insects standing under the name *claviventris* as types, two in number, do not represent that species, and do not correspond with the text of the "Braconides de Belgique," while the so-called varieties are a mixture of other species.

The single example of *E. ornatus* was taken in a wood close to my house at Nunton, Wilts.

11. *Euphorus fulvipes*, Cur.

Leiophron fulvipes, Cur., B. E., 476, 5; Hal., Ent. Mag., ii., 466, ♂ ♀.

Antennæ ♀ 16-jointed, stout, not longer than the head and thorax. Piceous, antennæ at the base, and legs, pale testaceous. Wings dull hyaline, squamulae and nervures pale testaceous, stigma pale brown, hyaline at the base, touching the 2d cubital areolet; radial areolet angulated beneath the stigma, semilunate, the metacarpus shorter than $\frac{1}{2}$ of the stigma. Mesothorax smooth and shining, the sutures obsolete. Metathorax punctato-reticulate.

First abdominal segment also punctato-reticulate, linear; the other segments smooth. Antennæ ♂ longer and more slender. ♂ ♀. Length, $\frac{1}{2}$ — $\frac{3}{4}$; wings, $1-1\frac{3}{4}$ lin.

I have not seen the ♂, but the short antennæ of the ♀ are very distinctive. The first abdominal segment is shorter than in the allied species, coarctate at the base, and very slightly dilated beyond the antemedial tubercles. Legs rather short. Capron is of opinion that this species may prove to be a form of the following.

Common, according to Haliday, in grassy hedgerows. My only specimen was taken near Teignmouth.

12. *Euphorus parvulus*, Ruthe.

*Leiophron** *pallidistigma*, Cur., B. E., 476, 6; Hal., Ent. Mag., ii., 466, ♀.

Microctonus parvulus, Ruthe, Stett. Zeit., 1856, p. 302, ♂ ♀.

“Antennæ ♀ 16-jointed, slender, shorter than the body. Black; abdomen, after the 1st segment, piceous; antennæ and legs pale piceous, hind coxæ infuscated at the base. Wings hyaline, squamulæ and stigma stramineous, or the latter pale piceous. More elongate than *fulvipes*, the legs and petiole more slender. Mesothorax smooth and shining, the sutures obsolete. First abdominal segment punctato-reticulate, linear, slightly coarctate at the base, the tubercles medial.” ♀. Haliday. Length, $\frac{2}{3}$ —1; wings, $1\frac{1}{3}$ —2 lin.

I have only one specimen, in bad condition, which is shown by its antennæ to belong to this species. The antennæ of *fulvipes* are shorter and stouter. *E. intactus* has the antennæ not stouter but longer; the mesothorax, moreover, exhibits traces of sutures. According to Reinhard *pallidistigma*, Cur., is identical with *parvulus*, Ruthe. The diagnosis of the latter includes both sexes, and is as follows:—

“Black, shining, slender, antennæ and legs testaceous; antennæ towards the apex (mostly in the ♀), and hind coxæ at the base, more obscure; head and mesothorax very smooth and shining, the former subcubic, the latter with no visible sutures; metathorax somewhat narrowed posteriorly, descending in a regular curve from

* “*Pallidistigma*” is the older name, but *parvulus* is preferred here as involving no mistakes in sense or form.

the base almost to the apex, finely rugulose and subreticulated; 1st abdominal segment nearly straight, hardly widened behind, punctato-rugulose; tubercles slightly prominent. Wings dull hyaline, nervures distinct, radius strongly curved, radial areolet very narrow, stigma subfuscous (pale in the ♂), more or less whitish at the base. Antennæ ♂ 17-jointed.

“Described from three males, twelve females. Not uncommon near Berlin from the end of May to the beginning of June.”

My specimen was taken near St. Albans.

ii. *WESMAËLIA*, Först.

Först., Verh. pr. Rheinl., 1862, p. 251; Marsh., E. M. M., 1872, p. 257.

Male unknown. Antennæ ♀ filiform. Fore wings with 2* cubital areolets; prædiscoidal separate; radial areolet semicordate; metacarpus not longer than the stigma; radius slightly curved;

* The following is an undescribed exotic form, having 3 cubital areolets, but belonging in all other respects to the *Euphorides*, and nearly allied to *Wesmaëlia*.

ARIDELUS, n. g.

Antennæ feminae filiformes. Palpi maxillares 6-articulati. Areolæ cubitales tres; prima cum prædiscoidali confusa, secunda parva, oblonga, extus aperta; areola radialis lanceolata; metacarpus stigmatum brevior; radius subcurvatus. Alæ inferiores areola radiali petiolata. Mesothoracis sulculi nulli. Abdominis segmentum primum sublineare, segmentis cæteris simul sumptis æquale. Statura omnino *Wesmaëliæ*. Terebra vix subexserta.

Aridelus bucephalus, n. s.

Rufo-testaceus, antennis (præter articulos 5 apicales), oculis, stemmatico, mesothoracis maculis 2 humeralibus, tibiarum posticarum apice, tarsorum anteriorum articulo ultimo, tarsis posticis totis, terebræ etiam valvis, nigris. Alæ nigricantes squamulis rufo-testaceis, nervis et stigmatum nigris, linea sub hoc albicante.

Rufo-testaceous, antennæ (except the 5 apical joints), eyes, stemmaticum, two humeral spots on the mesothorax, apex of hind tibiæ, last joint of 4 anterior tarsi, hind tarsi altogether, and valves of the terebra, black. Wings blackish, squamulæ rufo-testaceous, nervures and stigma black; beneath the latter is a whitish line. ♀. Length, $2\frac{1}{3}$; wings, 4 lin.

Antennæ rather shorter than the body, moniliform, the joints oblong; 18-jointed, joints 1—13 black, the rest abruptly testaceous. Head and body formed as in *Wesmaëlia*, smooth and shining except the thorax, which is covered with circular reticulations, or variolose, and less shining. Segment 1 proportionally rather shorter than in *Wesmaëlia*, curved only near the apex, where it is

pobrachial areolet hardly longer than the præbrachial; recurrent nervure rejected. First abdominal segment longer than all the rest taken together, slender, curved, not wider behind, having the spiracles just before the middle, where it is not tuberculated but slightly incrassated, and again decreasing gradually from thence to the apex: the other segments forming a small compressed oval. Terebra subexserted.

1. *Wesmaëlia cremasta*, Marsh. (Pl. V., fig. 4).

Wesmaëlia cremasta, Marsh., *l. c.*, ♀.

Testaceous; eyes, stemmaticum, and valves of the terebra, black; antennæ infuscated towards the apex; metathorax rufescent, becoming piceous or blackish posteriorly. Wings hyaline; stigma yellow, edged beneath with fuscous; nervures testaceous. Length, $1\frac{2}{3}$; wings, 3 lin.

Distinguished from all other genera of this group by the form of the abdomen, which resembles that of an *Ammophila* or *Pelopæus*. Antennæ 26-jointed, slender, as long as the body. Head rotundocubic, wider than the thorax, and equal in bulk to the entire mesothorax; vertex ample, convex; eyes prominent; clypeus not discrete, foveated on each side at the base, protruded at the apex, so that a fissure appears between it and the mandibles, which are bidentate. Prothorax deeply sunk between the elevated head and mesothorax; the latter trilobate, not longer than the head. Metathorax short, rugulose, abruptly truncated behind, and there triangularly excavated. Abdomen smooth and shining; 2d and 3d segments completely connate, concealing the rest, except the extremity of the last segment. Legs long and slender. Terebra very short, subulate, pointing upwards.

Described from two specimens; one taken in North Devon, the other at Bielsa in the Spanish Pyrenees.

iii. *EUSTALOCERUS*, Först.

Rhopalophorus, Hal., in Westw. Int., ii., App. 61 (name preoccupied in Coleoptera).

Eustalocerus, Först., Verh. pr. Rheinl., 1862, p. 251.

Male unknown. Antennæ ♀ clavate and geniculated; the first

hardly widened; tubercles obsolete; the other segments are concealed under the 2d and 3d, ovate above, pyriform if viewed laterally, and not so strongly compressed. Legs shorter and stouter. Terebra hardly exserted, its valves dilated at the extremity, compressed, and black.

Taken in the island of Trinidad.

joint elongate. Second joint of the maxillary palpi dilated. Two cubital areolets, the 1st separated from the prædiscoïdal. Radius not much curved. Terebra exerted.

1. *Eustalocerus clavicornis*, Wesm. (Pl. V., fig. 3).

Microctonus clavicornis, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 65; S. v. Voll., Schets. Bracon., tab. iv. (wing and antenna by Haliday).

Black; antennæ dull testaceous; clypeus at the apex, mandibles, palpi, and legs, testaceous; hind legs slightly infuscated. Wings subfusco-hyaline, stigma black, nervures stout, blackish. Terebra as long as $\frac{2}{3}$ of the abdomen. ♀. Length, 1 lin.

Antennæ about twice as long as the head, 10-jointed, the 1st joint forming $\frac{1}{3}$ of the entire length, the 2d obliquely inserted, making a geniculation with the 1st, very short and stout; 3d more slender and twice as long; 4—9 shorter, and successively diminishing in length; 10th almost as long as the three preceding taken together, and appearing, when highly magnified, as if superficially divided into 4 or 5 rings. Head as broad as the thorax; vertex somewhat short; face granulated, obscure. Metathorax short, rugose, abruptly truncated behind. First abdominal segment much widened from the middle to the apex; tubercles prominent; immediately above them are two deep impressions, behind which the segment is longitudinally rugulose; the lines of rugosity are few, and do not quite reach the apex. Valves of the terebra black, very slightly widened towards the extremity.

This description is Wesmael's, who discovered the ♀ in an osier-ground in Belgium, May 27th. A British specimen was known to Haliday, who created a new genus for its reception, but left no written record of the species, and this has not been met with since.

iv. STREBLOCERA, *Westw.*

Westw., Phil. Mag., 1833, p. 342; Int., ii., 61; Tijdschr. v. Ent., 1881—82, p. 44; Nees, Mon., ii., 411.

Antennæ seated upon two frontal tubercles, the 1st and 3d joints, or the 1st only, elongate; with 1—2 geniculations in the ♀, 2 or none in the ♂. Fore wings with 2 cubital areolets, the 1st not separated from the prædiscoïdal; radial areolet remote from the tip of the wing; radius curved. Mesothoracic sutures distinct. Abdomen with a short petiole. Terebra exerted or subexserted.

Two species are referred to this singular genus ; their characters are so discrepant that it is very easy to distinguish them :—

Antennæ ♂ ♀ with two geniculations ; terebra subexserted 1. *fulviceps*, Westw.
 Antennæ ♂ filiform ; of the ♀, with one geniculation ; 1st joint elongate in both ; terebra nearly as long as $\frac{1}{2}$ the abdomen 2. *macroscapa*, Ruthe.

1. *Streblocera fulviceps*, Westw. (Pl. V., fig. 2).

Streblocera fulviceps, Westw., Phil. Mag., *l. c.* ; Int., ii., 138, f. lxxv., 19 (antenna), 20 (wing), and p. 154 ; Tijdschr. v. Ent., 1881—82, p. 45, pl. viii., f. 6, ♀, f. 7 (antenna ♀), f. 8 (antenna ♂) ; S. v. Voll., Schets. Bracon., tab. iv.

♀. Black or piceous ; head and 3 basal joints of the antennæ ferruginous, the following joints fuscous ; eyes and stemmaticum blackish ; legs testaceous, tibiæ at the tips, and tarsi, hardly infuscated. Wings hyaline, nervures, stigma, and squamulæ testaceous ; præbrachial nervure distinct ; radial areolet semicordate, ending nearer to the tip of the wing than to the stigma ; radius regularly curved. Head large, wider than the thorax ; vertex elevated, transverse ; occiput broadly excavated. Antennæ 16-jointed ; 1st joint longer than the head, incrassated, armed with a curved tooth beneath, beyond which it is sinuated ; 2d short, obliquely articulated with the preceding, forming an acute angle ; 3d shorter than the 1st, incrassated and curved ; 4th obliquely inserted before the apex of the 3d, forming another angle ; joints 4—16 (the flagellum) moniliform. Metathorax short, truncated posteriorly, slightly excavated, uneven, scarcely shining. First abdominal segment twice as long as its apical breadth, the tubercles situated beyond the middle ; segment 2 twice as long as 3 ; 4 and following very short ; abdomen (exclusive of the 1st segment), viewed from above, ovate, much shorter than the thorax. Terebra hardly exserted, the valves stout, black.

♂. Antennæ 19-jointed, 1st and 3d joints elongate, incrassated, 2d and 4th obliquely inserted, forming two geniculations ; joints 4—19 filiform. I have not seen the ♂, and this is borrowed from the figure in the Tijdschrift ; in the description it appears that by some accident the signs of the sexes (♂ ♀) have been reversed. Length, $\frac{3}{4}$ —1 ; wings, $1\frac{1}{2}$ —2 lin.

Prof. Westwood discovered the ♀ in August, 1833, in Coombe Wood. Desvignes possessed a specimen which

is now in the National Collection; and I have another from the Forest Hills in Leicestershire.

2. *Streblocera macroscapa*, Ruthe. (Pl. V., fig. 2 b).

Microctonus macroscapus, Ruthe, Stett. Zeit., 1856, p. 291, ♂.

Streblocera macroscapa, Reinh., Berl. ent. Zeits., 1862, p. 327, pl. i., f. 11, a. ♀, b. head and antenna; S. v. Vol., Schets. Bracon., pl. iv., f. 4, ♀.

S. longiscapha, Westw., Tijdschr. v. Ent. 1881—82, p. 45, ♂, pl. viii., f. 9 (antenna ♂).

♀. Piceous, castaneous, or rufescent, metathorax and abdomen blackish; 3 basal joints of the antennæ rufous; face, mouth, and legs testaceous. Wings subhyaline, nervures and stigma pale; præbrachial nervure distinct. Antennæ 18-jointed; 1st joint very long, equal to the 10 following together; 2d obliquely inserted, forming a geniculation; 3d twice as long as the 4th; joints 3—6 filiform, the rest moniliform. Petiole of the 1st abdominal segment hardly longer than broad, striated; condylus much widened, conical. Terebra not quite half the length of the abdomen; valves black.

♂ slender; antennæ a little shorter than the body, not geniculated, 18-jointed; 1st joint longer than the 2d and 3d together. Otherwise like the ♀. Length, $\frac{3}{4}$ — $1\frac{1}{2}$; wings, $1\frac{1}{2}$ —3 lin.

As I have no specimen, the description is compiled from the authorities, not without a difficulty arising from certain discrepancies. Westwood gives the antennæ of the ♀ (from the Schetsen) as 17-jointed, and those of the ♂ as 16-jointed. He further mentions that the 1st joint in the ♂ is furnished with a small round tubercle near the base, and that the 3d joint is produced beneath into a deflexed spine at its apex; these characters are not represented in the figure by Van Vollenhoven, nor mentioned by Ruthe and Reinhard; so that it may be questioned whether the English description does not refer to a fresh species.

Ruthe possessed two males taken near Berlin, and Reinhard had a ♀, of which he has given a figure. Two English specimens of the ♂ are recorded by Westwood, one from Glanvilles Wootton, in Dale's collection, and the other preserved in that of Matthews, at Oxford.

v. PERILITUS, Nees.

Perilitus, Nees, Act. Ac. L. C., 1819, p. 302; *Perilitus Sectio I.*, Nees, Mon., i., 29; Hal., Ent. Mag., iii., 34; Reinh., Berl. ent. Zeits., 1862, p. 323.

Microctonus and *Dinocamptus*, Först., Verh. pr. Rheinl., 1862, p. 251.

Antennæ straight, simple. Maxillary palpi 6-, labial 2—3-jointed. Fore wings with two cubital areolets, the 1st usually confused with the prædiscoidal, but sometimes distinct; radial areolet ending much before the apex of the wing, semicordate or sublanceolate; radius equally curved throughout, or somewhat straightened near the tip. Mesothoracic sutures distinct. Metathorax vertically or subvertically truncated and excavated behind. Terebra exerted.

Twenty European species are indicated in Reinhard's list (*l. c.*), many of which are very imperfectly described. Haliday established two sections, founded upon the presence or absence of the nervure dividing the 1st cubital areolet from the prædiscoidal. In six species the two areolets are separated, and Förster has made of them the genus *Dinocamptus*: they are not, however, otherwise distinguishable, and are not here treated as a separate genus. The sexes differ in appearance, and are paired with difficulty; the females have often a red head, and other parts of the body similarly coloured; the males are darker, with stouter and longer antennæ. The radial areolet is always small, ending not far from the middle point between the stigma and the apex of the wing; the radius forms either a regular parabolic curve (making the areolet semicordate), or it is somewhat straightened towards the end (making the areolet acute and sublanceolate). The radial areolet of the hind wing is petiolated, as in *Meteorus*. The metathorax is sometimes imperfectly areated.

The parasitism of one species (*P. terminatus*, Nees) was discovered in 1839 by Audouin (*Quelques observations sur le parasitisme des insectes*; see Hagen, s. v. *Audouin*, no. 52); it is also recorded by Westwood (Int., ii., 143), Brullé (St. Farg. Hym., iv., 326), and Ratzeburg (Forstins, iii., 18). This insect attacks adult *Coccinellæ* of the species *septempunctata* and *quinquepunctata*, L. Audouin ascertained simply that a *Perilitus* emerged

from one of these beetles; but Ratzeburg has since made further observations of great interest (Ichn. d. Forst., iii., 61), showing that the parasite deposits its egg not in the larva but in the imago of the *Coccinella*. Three *Coccinellæ*, of the species above named, were watched by Ratzeburg, they having attached themselves to some plant and remaining motionless. After a short time there was found beneath the belly of each a grey, pyriform, somewhat transparent cocoon, beset with loose filaments, in which the legs of the beetles were entangled. From these cocoons emerged, between June 10th and 14th, three females of *P. terminatus*. Two of the *Coccinellæ* were by this time dead, but the third continued to linger. The parasitic maggots issued from the sutures of the ventral segments, which afterwards closed up, leaving no visible aperture. Dissection of one *Coccinella* showed the inside to be completely wasted, and the walls of the abdomen collapsed. On a second occasion Ratzeburg introduced a lively ♀ *Perilitus* into a glass-topped box containing a *Coccinella septempunctata*. The parasite immediately began to pay attention to the victim, moving about with great activity, and examining it on every side. Finally she assumed the characteristic attitude of an Ichneumon preparing to strike, by thrusting the abdomen forwards between the legs, so as to project beyond the head. The abdomen became greatly attenuated, and the terebra extended to its utmost length, supported and embraced by its valves as far as they could reach. Six to ten punctures were made in one minute, always directed towards the ventral sutures. In the course of an hour three or four such attacks were made upon the *Coccinella*, which seemed unconscious of any danger, and seldom winced. No danger however existed, for the *Perilitus* was not fecundated, and the whole proceeding was only a fruitless exhibition of an instinct.

TABLE OF SPECIES.

- (6) 1. First cubital areolet separated from the præ-discoidal. *Dichori*, Hal., *Dinocamptus*, Först.
- (5) 2. Radial areolet ending nearer to the tip of the wing than to the stigma, sublanceolate. *Terebra* straight.

- (4) 3. Abdomen of the ♀, after segment 1, testaceous. Petiole slender, only $\frac{1}{3}$ of the width of the apex of the condylus .. 1. *utilus*, Nees.
- (3) 4. Abdomen of the ♀, after segment 1, nigropiceous. Petiole stouter, at least $\frac{1}{2}$ as wide as the apex of the condylus .. 2. *strenuus*, n. s.
- (2) 5. Radial areolet ending half-way between the tip of the wing and the stigma, semi-cordate. *Terebra falcate* 3. *falciger*, Ruthe.
- (1) 6. First cubital areolet not separated from the prædiscoïdal. *Synchori*, Hal., *Perilitus*, Först.
- (12) 7. Labial palpi 3-jointed.
- (9) 8. Radial areolet ending nearer to the tip of the wing than to the stigma 4. *brevicollis*, Hal.
- (8) 9. Radial areolet ending half-way between the tip of the wing and the stigma, or nearer to the stigma.
- (11) 10. Thorax more or less, and 1st abdominal segment, rufo-testaceous 5. *bicolor*, Wesm.
- (10) 11. Thorax and 1st abdominal segment entirely black 6. *secalis*, Hal.
- (7) 12. Labial palpi 2-jointed.
- (14) 13. Metathorax areated; wings hyaline; ♂ black; head of the ♀ testaceous; terebra $\frac{1}{2}$ as long as the abdomen 7. *cerealium*, Hal.
- (13) 14. Metathorax not areated, rugoso-reticulate; wings whitish; ♂ ♀ black, the ♀ with rufous orbits; terebra $\frac{1}{4}$ as long as the abdomen 8. *æthiops*, Nees.

1. *Perilitus rutilus*, Nees. (Pl. V., fig. 5).

Bracon rutilus, Nees, Mag. Ges. Berl., 1811, p. 27, ♀.

Perilitus rutilus, Nees, Mon., i., 31, ♀; Hal., Ent. Mag., iii., 34, ♂ ♀.

Microctonus rutilus, Wesm., Nouv. Mém. Ax. Brux., 1835, p. 68, ♂ ♀, pl. i. (wing); Ruthe, Stett. Zeit., 1856, p. 299, ♀.

Perilitus ruralis ♂, and *luteus* ♀, Schäff., F. G., clvi.

♀. Black; head, antennæ at the base, abdomen after the 1st segment, basal half of the petiole, and the legs, testaceous; segment 2 often castaneous; tarsi fuscous. ♂. Black; face and orbits testaceous; hind coxæ fuscous; abdomen darker than that of the ♀, fuscous at the apex. Wings subhyaline, stigma lutescent, nervures and squamulæ pale fuscous; radial areolet elongate-sublanceolate, ending just beyond the middle point between the stigma and the apex of the wing. Terebra straight, as long as $\frac{3}{4}$ of the abdomen. Length, $1\frac{1}{3}$ — $1\frac{3}{4}$; wings, $2\frac{3}{4}$ — $3\frac{1}{4}$ lin.

Var. ♀. Head, mesothorax, and abdomen entirely testaceous; antennæ 25-jointed. Nervure dividing the 1st cubital areolet from the prædiscoidal extremely faint. An old specimen in Fitch's collection. Somewhat doubtful, but placed here provisionally.

Antennæ ♀ as long as the body, filiform, 25—26-jointed, black, with the 1st joint testaceous. Stemmaticum fuscous. Nervure dividing the 1st cubital and prædiscoidal areolets weak and sub-interrupted; cubital nervure subobsolete. Thorax black; mesothoracic sutures converging into a punctate depression. Scutellum smooth, preceded by a transverse fovea much shorter than itself. Metathorax punctato-rugulose, not areated, truncated, and with an oblong excavation behind. First abdominal segment slender, tuberculated in the middle, at the apex three times wider than the petiole, finely striated longitudinally; black, the petiole pale at the base; the rest of the abdomen oblong-ovate. Antennæ of the ♂ stouter, longer than the body, 28—29-jointed, the 1st joint black; in one ♂ the antennæ are only 23-jointed.

Described from two females, four males. Rather common throughout the country. I have repeatedly found the ♀, and in 1885 captured both sexes in a wood at Nunton. Capron has taken six females at Shiere.

2. *Perilitus strenuus*, n. s.

Niger, antennarum radícula, ore, orbitis, rufo-testaceis, vel orbitis interdum nigris. Pedes 4 anteriores testacei; femora intermedia basi fusca; postici picei vel fusco-testacei tibiis apicem versus obscurioribus; tarsi omnes nigri. Abdominis segmenta 2—3 picea. Alæ fere hyalinæ, stigmatibus, nervis, squamulis, pallide fuscis; areola radialis longior et latior quam in specie præcedente. Scutellum læve, fovea ante basin transversa, brevior quam ipsum, instructum. Petiolus in longitudinem striolatus, utriusque sexus latior quam in *P. rutilo*; femina duplo latior quam maris. Terebra dimidia abdominis longitudine.

Black; radicle of the antennæ, mouth, orbits, and cheeks, rufo-testaceous; or the orbits concolorous. Four anterior legs testaceous; middle femora fuscous at the base; hind legs piceous or fusco-testaceous, their tibiæ darker towards the tips; all the tarsi black. Abdominal segments 2—3 piceous. Wings nearly hyaline, stigma, nervures, and squamulæ pale fuscous; radial areolet longer and broader than in the preceding species. Scutellum smooth, preceded by a transverse fovea much shorter than itself. Petiole longitudinally striolated, in both sexes broader than that of *rutilus*;

that of the ♀ twice as broad as that of the ♂. Terebra half as long the abdomen. Length, $1\frac{1}{2}$; wings, 3 lin.

Antennæ ♀ 23-jointed; of the ♂ 28—29-jointed, stout, longer than the body. Mesothoracic sutures converging into a rugulose depression. Scutellum smooth, shining, with a few lateral punctures. Metathorax short, abruptly truncated, rugulose; two medial carinæ, more or less distinct, originate from its base, and are parallel as far as the truncation, where they diverge on each side of the posterior concavity. First abdominal segment entirely black and striolated, twice as broad at the apex as it is at the base, and much broader in the ♀ than in the ♂; tubercles medial. Very distinct from *rutilus*; larger and more robust; metathorax and 1st abdominal segment differently formed; radial areolet more elongate; neuration stronger; legs of both sexes, and abdomen of the ♀, differently coloured; the characters of the ♀ have been given to me by Capron. *P. terminatus*, Nees, stands nearest to this species, but differs in having a rugulose scutellum. The radial areolet is much longer than in *falciger*.

I captured two males in 1885; one in the same wood with *P. rutilus*, the other in the Isle of Wight. Capron has taken at Shiere six more males and the only female.

3. *Perilitus falciger*, Ruthe.

Microctonus falciger, Ruthe, Stett. Zeit., 1856, p. 300,

♂ ♀.

? *Perilitus peregrinus*, Schöff., F. G., clvi.

♀. Black; head concolorous, mandibles rufous; femora and tibiæ piceo-rufous, coxæ black, tarsi tipped with fuscous; base of the petiole pale testaceous. Wings subhyaline, nervures, stigma, and squamulæ fusco-testaceous; radial areolet shorter than in the two preceding species, semicordate, ending half-way between the stigma and the tip of the wing. Abdomen truncated posteriorly. Terebra as long as $\frac{1}{2}$ the abdomen, its apical half decurved, falcate. The ♂ is similar, but the petiole is black at the base. Length, $1\frac{1}{4}$ — $1\frac{2}{3}$; wings, $2\frac{1}{2}$ — $3\frac{1}{4}$ lin.

Var. ♀. Antennæ at the base, face, and cheeks, rufescent; mouth and legs rufo-testaceous; hind coxæ black. Ruthe.

Antennæ ♀ filiform, not longer than the body, 22—24-jointed; those of the ♂ longer, setaceous, 28-jointed, paler at the base underneath. Form slender. Mesothorax as in the other species. Ante-scutellar fovea much shorter than the scutellum, which is smooth and shining. Metathorax short, rugulose, not quite

vertically truncated, slightly excavated behind. First abdominal segment striolated; petiole about half as broad as the apex of the condylus; tubercles medial, salient.

I have only a ♀ specimen, taken in Northamptonshire, which is very distinct owing to the form of the terebra; the legs are coloured as in Ruthe's variety. The dividing nervure between the 1st cubital and præ-discoidal areolets is so faint as to be discerned with difficulty. A specimen exists in the British Museum, ticketed in the handwriting of F. Smith, "the larva from a living *Timarcha coriaria*," F.

4. *Perilitus brevicollis*, Hal.

Perilitus brevicollis, Hal., Ent. Mag., iii., 35, ♀.

Microctonus retusus, Ruthe, Stett. Zeit., 1856, p. 298, ♀.

♀. Black; head, antennæ at the base, and fore legs, rufo-testaceous; 4 posterior legs piceo-fulvous, their tibiæ darker at the tips; hind coxæ fuscous; tarsi blackish; occiput, together with the middle of the front and of the vertex, fuscous; abdomen pitchy-black; base of the 1st segment pale. Wings subhyaline, nervures and stigma fuscous; radial areolet ovate-lanceolate, ending rather nearer to the tip of the wing than to the stigma. Labial palpi 3-jointed. Terebra curved, somewhat less than half the length of the abdomen. ♂ unknown. Length, $1\frac{3}{4}$; wings, $3\frac{1}{4}$ lin.

Stouter than *P. cerealium* (sp. 7), and twice as large; easily distinguished by its whole structure. Antennæ 26-jointed, hardly shorter than the body, the 1st joint rufescent. Orbits, face, and mouth rufous. Maxillary palpi with the apical joints not remarkably shorter than the preceding; joints of the labial palpi subequal in length. Mesothoracic sutures ending in a wide thickly punctate depression, in the middle of which is a distinct longitudinal line; posterior angles near the base of the scutellum gibbous. Metathorax very short, vertically truncate, rugose, reticulated. First abdominal segment elevated posteriorly, much stouter than in the other species, obconic, rugulose, the apical angles longitudinally striated; tubercles medial. Valves of the terebra fusco-ferruginous.

Unknown to me; only two examples seem to have occurred (one in North Ireland, taken by Haliday, the other in Germany by Ruthe) until Capron discovered three females at Shiere.

5. *Perilitus bicolor*, Wesm.

Perilitus conterminus, Hal., Ent. Mag., iii., 36, ♂;
Schäff., F. G., clvi. (not of Nees).

P. secalis, var. γ , Hal., l. c., ♀.

Microctonus bicolor, Wesm., Nouv. Mém. Ac. Brux.,
1835, p. 61, ♂; Ruthe, Stett. Zeit., 1856, p. 294,
♂ ♀ (not of Ratz.).

Leiophron basalis, Cur., B. E., 476, 6a, ♂.

Variable, rufescent, face, mouth, and legs rufo-testaceous; thorax above, and abdomen after the 1st segment, black; antennæ fuscous, rufo-testaceous at the base. Wings subhyaline, stigma and nervures lutescent or pale fuscous; radial areolet sublanceolate, acute, ending nearer to the stigma than to the apex of the wing. Labial palpi 3-jointed. Terebra straight, as long as half the abdomen. ♂ ♀. Length, $\frac{3}{4}$ — $1\frac{1}{4}$; wings, $1\frac{1}{2}$ — $2\frac{1}{2}$ lin.

Head and thorax more or less rufous, piceous, or black; abdomen black or piceous, the 1st segment at least generally rufo-testaceous; in one ♀, however, this is also blackish. The smaller individuals are the males. Palpi, according to Haliday, nearly as in *secalis* (sp. 6), but the 1st joint of the maxillary is less abbreviated, the 2d and 3d increasing in length. Antennæ shorter than the body, those of the ♀ 18-, of the ♂ 20—21-jointed; but in one ♀ they are 24-jointed. Mesothoracic sutures impunctate, ending in a small aciculated space before the scutellum. Metathorax areated, sublævigated, not sensibly excavated behind, short, almost vertically truncated. First abdominal segment striolated; petiole slender; tubercles salient just behind the middle; condylus twice as broad as the petiole, its sides almost parallel; hinder part of the abdomen ovate-orbiculate. The ♀ with 24-jointed antennæ is not otherwise different, and certainly belongs to this species.

The colour of the abdomen, black posteriorly, and having the 1st segment rufous, is an obvious distinctive character. *P. secalis* has also 3-jointed labial palpi, but the tubercles are less conspicuous, and the abdomen is not rufous at the base. Haliday saw in the present species the *P. conterminus*, Nees, referring only to the ♂ with 21- (*i. e.*, 20-) jointed antennæ. The ♀, according to Nees, has 24- (*i. e.*, 23-) jointed antennæ, and may be rightly paired with his ♂, notwithstanding Wesmæel's just remark that the antennæ of the ♀ ought to have fewer joints than those of the ♂. The difficulty, as regards *conterminus*, consists in the remark of Nees that

the antennæ are scarcely half as long as the body, and that the *petiole only* of the abdomen, in the ♂, is black. His omission of other characters renders the description for ever doubtful, and *conterminus* must be abandoned.

Described from five males, four females, taken in the Isle of Wight; at Milford Haven; at St. Albans; at Nunton, Wilts; at Honor Oak (by Billups); in the Pyrenees; and from Walker's collection. Found several times by Haliday in North Ireland, in autumn. Wesmael possessed five males captured near Brussels, and Ruthe's collection contains fifteen males and seven females.

6. *Perilitus secalis*, Hal.

Perilitus secalis, Hal., Ent. Mag., iii., 36, ♀; not his var. γ ; and not *Ichneumon secalis*, Lin., F. S., 1641.

Microctonus spurius, Ruthe, Stett. Zeit., 1856, pp. 297 and 307 (Nachtrag), ♀.

M. æthiops, var. 2, Wesm., Nouv. Mém. Ac. Brux., 1838, p. 143, ♀.

M. bicolor, Ratz., Ichn. d. Forst., ii., 57, ♀, pl. ii., f. 26 (wing); not of Wesm.

Labial palpi 3-jointed. Black; antennæ at the base, head, prothorax beneath, and legs, rufo-testaceous; hind coxæ, with their trochanters, and all the tarsi at the apex, fuscous; some of the abdominal segments after the 1st often piceous, and the apical segments testaceous. Wings hyaline, nervures and stigma fusco-testaceous, squamulæ dull yellowish; stigma widely ovate, lanceolate, broader than that of *æthiops* (sp. 8); radial areolet semi-cordate, ending a little nearer to the stigma than to the tip of the wing. Terebra straight, as long as half the abdomen. ♀. Length, $1\frac{1}{4}$ — $1\frac{1}{2}$; wings, $2\frac{3}{4}$ — $3\frac{1}{4}$.

Male unknown. Variable; head sometimes black, leaving only the mouth and orbits rufous; thorax and 1st abdominal segment generally black, the following segments piceous, becoming paler towards the anus, or entirely black or piceous; hind coxæ sometimes testaceous. First joint of the maxillary palpi very short, 3d longer and stouter than the 2d; 4th longer than the 3d; 6th shorter than the 4th, but rather longer than the 5th. Labial palpi with one more joint than those of the two following species; 1st joint obconic, 2d and 3d shorter, ovate. Antennæ 21—25-jointed, filiform, hardly shorter than the body, dull rufous at the base. Metathorax punctato-rugulose, carinulated, vertically truncated, and with an oblong

posterior impression. Segment 1 as in the preceding species, but black at the base, and with less prominent tubercles; longitudinally striolated. Valves of the terebra filiform, black, paler at the base.

This species is distinguished with difficulty from the ♀ of *æthiops*, and perhaps only by the labial palpi, which have been observed under the microscope by Haliday and Reinhard. My specimens are old and useless, and have not been employed in this description. Fresh examples are required for determination, and a note of the palpi should be taken while they are pliant; otherwise the destruction of the insects may be necessary in order to verify them. It may be noticed, however, that in *secalis* the metathorax is somewhat shining, with scattered punctures, and the squamulæ dull stramineous; while in *æthiops* the metathorax is rugoso-reticulate, and the squamulæ fuscous. Ruthe supposed his *M. spurius* to be a variety of *æthiops*, but Reinhard has determined its identity with *secalis*. Haliday believed the *Ichneumon secalis*, L., to be the present insect. In the Linnean collection is a ♀ ticketed "*secalis, agricolator*"; and another in bad condition, placed apart, and unlabelled. Fitch has visited these specimens, which have a large yellow head and long terebra; the wings are not easily seen, but the insects are undoubtedly *Cenocælius rubriceps*, Ratz. *P. secalis* is the species described by Ratzeburg (*l. c.*) as sent to him by Hartig, and conjectured erroneously to be a parasite of *Lasiocampa pini*, L.

7. *Perilitus cerealium*, Hal.

Perilitus cerealium, Hal., Ent. Mag., iii., 37, ♂ ♀.

Microctonus æmulus, Ruthe, Stett. Zeit., 1856, p. 293,

♂ ♀.

P. rufipes, Schöff., F. G., clvi.

Labial palpi 2-jointed. ♂ black; antennæ at the base, mouth, and clypeus, dull testaceous; orbits broadly rufous; legs rufo-testaceous, hind coxæ fuscous above. ♀ black; antennæ at the base, head, and legs, rufo-testaceous; abdomen piceous, its apex obscurely rufous. Wings narrower than in *secalis*, subhyaline, nervures and stigma fusco-testaceous, squamulæ dull yellowish; stigma broadly ovate, lanceolate; radial areolet semicordate, ending somewhat nearer to the stigma than to the tip of the wing.

Terebra decurved, as long as half the abdomen. Length, $1-1\frac{1}{2}$; wings, 2—3 lin.

The rufous head of the ♀ has the stemmaticum, and sometimes the margin of the occiput, fuscous. Thorax and 1st abdominal segment black. Maxillary palpi short, 1st joint hardly distinct, 2d longer than the 3d, 5th and 6th closely conjoined, together not longer than the 4th, 6th conical, attenuated. Antennæ 20—23-jointed, a little shorter than the body, filiform, the 1st joint rufous beneath. Metathorax short, areated. Abdomen compressed, and truncated at the apex; segment 1 forming about $\frac{1}{2}$ of its length, regularly striolated; tubercles distinct; sides of the condylus sub-parallel. In the ♂ the antennæ are longer than the body, the abdomen ovate, and the colours darker.

Distinguished from *secalis* by the labial palpi; from *æthiops* by its more slender form, by the areated metathorax, by the more strongly curved radius, by the shorter radial areolet, and the decurved terebra. Very like *falciger* ♀ (sp. 3), but in that species the 1st cubital areolet is separated from the prædiscoidal.

Not uncommon throughout the country, although I have no specimen. Billups has taken the ♀ at Peckham.

8. *Perilitus æthiops*, Nees.

Perilitus æthiops, Nees, Mon., i., 32, ♂; Hal., Ent. Mag., iii., 37, ♂ ♀; Schöff., F. G., clvi., f. 16.

Microctonus æthiops, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 57, ♂ ♀, pl. i. (wing); Ruthe, Stett. Zeit., 1856, p. 292, ♂ ♀.

Labial palpi 2-jointed. ♂ black; legs often piceous; femora at the apex and tibiæ at the base rufous; or fore femora, or all the femora, dull rufous, black at the base. ♀ black; face, mouth, cheeks, orbits, and base of the antennæ, dull rufous; or head entirely rufo-testaceous; legs rufous, hind coxæ black, tarsi fuscous. Wings whitish hyaline; stigma, nervures, and squamulæ fuscous; stigma narrower than that of *secalis*; radial areolet semicordate, ending a little nearer to the stigma than to the apex of the wing. Length, $1-1\frac{1}{2}$; wings, $2\frac{1}{4}-3\frac{1}{4}$ lin.

Var. ♂. One-half or one-third smaller; antennæ 24—25-jointed. This may possibly be the unknown ♂ of *P. secalis*.

Antennæ of the ♂ $\frac{1}{3}$ longer than the body, 27—30-jointed. First joint of the maxillary palpi short but distinct, 5th and 6th together $\frac{1}{3}$ longer than the 4th, 6th attenuated at the apex. Abdomen ovate-lanceolate; segment 1 much more slender than that of the ♀.

♀. Very like *secalis*. Antennæ hardly shorter than the body, 25—26-jointed. Metathorax thickly rugulose and reticulated. First abdominal segment broader than in *secalis*, longitudinally striolated; tubercles very prominent; condylus oblong, and slightly widened at the apex.

The sixteen males described by Wesmael, with 22—28-jointed antennæ, are probably not all of the same species; his three females with 23-jointed antennæ appear also doubtful. The same must be said of Ruthe's three varieties, differing structurally in the neururation, and his males, which were only two-thirds of a line long.

Described from six males, one female. Common. Found by Haliday on sandy coasts, the ♀ once only, the ♂ more frequently. Capron has taken four females and many more males at Shiere.

vi. MICROCTONUS, *Wesm.*

Wesm., Nouv. Mém. Ac. Brux., 1835, p. 54; Reinh., Berl. ent. Zeits., 1862, p. 321.

Antennæ filiform. Maxillary palpi 6-, labial 3-jointed. Fore wings with two cubital areolets, the 1st not separated from the prædiscoidal; radial areolet cultrate, elongate, extending nearly to the apex of the wing; radius straight, or nearly so. Mesothoracic sutures almost always effaced. Terebra exerted or subexserted.

The species are few in number, smooth and shining, testaceous and black in different proportions. They stand nearer to *Meteorus* than the other *Euphorides*, having a similar radial areolet, and the same number of joints in the palpi. The abdomen is usually ovate, lanceolate; in one species clavate, compressed, and obtuse; the 1st segment is nearly as long as the rest of the abdomen, widened gradually from the base to the apex, and having the tubercles beyond the middle. Sutureform articulation obsolete. Radius of the fore wings seldom very slightly curved, in which case it ends somewhat further from the extremity of the wing. Metathorax smooth, or obsoletely areolated, more or less truncated and excavated posteriorly. The wings are very like those of *Leiophron* and *Blacus*, but in both those genera the 1st cubital areolet is distinct from the prædiscoidal. Nees and Haliday were acquainted with one species, Wesmael with two, and Ruthe with six; of

the five here introduced, all except the first are new discoveries. Their earlier states have not yet been observed.

TABLE OF SPECIES.

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|-----|----|------------------------------------------------------------------------------------|---------|----|-------------------------------|
| (2) | 1. | Præbrachial nervure of the fore wings obsolete. Length, $1\frac{1}{4}$ lin. | | 1. | <i>vernalis</i> , Wesm. |
| (1) | 2. | Præbrachial nervure of the fore wings distinct. Length, $1\frac{1}{2}$ —2 lin. | | | |
| (4) | 3. | First abdominal segment aciculated | .. | 2. | <i>splendidus</i> , n. s. |
| (3) | 4. | First abdominal segment smooth. | | | |
| (6) | 5. | Antennæ ♀ 28-jointed (♂ unknown), but its antennæ cannot have fewer than 28 joints | | 3. | <i>xanthocephalus</i> , n. s. |
| (5) | 6. | Antennæ ♂ ♀ with fewer than 28 joints. | | | |
| (8) | 7. | Antennæ ♂ ♀ 19-jointed | | 4. | <i>testaceus</i> , n. s. |
| (7) | 8. | Antennæ ♂ 26-, ♀ 22—23-jointed | .. | 5. | <i>cultus</i> , n. s. |

1. *Microctonus vernalis*, Wesm.

Microctonus vernalis, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 56, pl. i. (wing); *lib. cit.*, 1838, p. 142 (var. 2, ♂); Ruthe, Stett. Zeit., 1856, p. 289; Reinh., Berl. ent. Zeits., 1862, p. 322, ♂ ♀.

Perilitus idalius, Hal., Ent. Mag., iii., 1835, p. 38, ♀.
Microctonus politus, Ruthe, *lib. cit.*, p. 290, ♂.

Testaceous, variable; antennæ after the 4th or 5th joint fuscous; head, thorax, and abdomen in various degrees infuscated or blackish above; apical joint of the tarsi and valves of the terebra fuscous. Wings hyaline, nervures and stigma pale testaceous; præbrachial nervure obsolete. Abdomen ♀ compressed; segment 1 scarcely widened behind, sublinear, as long as 2, which is somewhat longer than all the remaining segments together. Terebra as long as $\frac{1}{3}$ of the abdomen. ♂ ♀. Length, 1— $1\frac{1}{4}$; wings, 2— $2\frac{1}{2}$ lin.

Var. *α*. Fusco-testaceous, the pleuræ pale; hind coxæ infuscated. ♂ (*M. politus*, Ruthe).

Var. *β*. First abdominal segment black. ♀.

Var. *γ*. Thorax almost entirely black. ♂ (Wesm., Suppl., p. 142).

Variable in colour, the ♂ darker than the ♀; the parts liable to be infuscated are the vertex, stemmaticum, disk of the mesothorax (in spots corresponding to the 3 lobes), scutellum, metathorax, and abdomen above, especially at the apex. The smallest British species. Eyes green. Antennæ shorter than the body, filiform, those of the ♂ 23—25-, of the ♀ 18—21-jointed. Body smooth and shining. Mesothoracic sutures effaced. Metathorax short,

its posterior declivity not vertical; concave behind, and there faintly rugulose, with a fine medial line forming 2 lateral polished areæ. First abdominal segment shorter than in the following species, and not wider posteriorly, smooth and shining except some slight transverse scratches towards the apex; tubercles inconspicuous. The rest of the abdomen, viewed from above, appears sublinear; viewed laterally, ovate; belly compressed and cariniform.

Not common; I have seen no specimens but my own, two females, taken respectively at St. Albans, and at Nunton, Wilts. Wesmael possessed two males, one female, taken near Brussels in May, and two males of var. γ ; S. van Vollenhoven notices one found at the Hague, and others have been captured in Germany.

2. *Microctonus splendidus*, n. s.

♂. Ater, splendidus, antennarum articulis 2 basalibus, palpis, pedibusque, testaceis; coxis posticis fuscescentibus; genis, cum capite infra et postice, rufo-testaceis. Alæ hyalinæ, flavescentes, stigmatæ, nervis, squamulis, pallide testaceis; nervo præbrachiali distincto; areola radiali quam in *M. culto* paulo brevior; radio perparum curvato. Mesothoracis sulculi nulli. Metathorax curtus, postice fere in perpendiculum truncatus, et ibidem excavatus, carina areisque nullis. Segmentum 1um aciculatum v. striolatum, nitidum, abdominis triente longius, tuberculis pone medium conspicuis, condylo exinde ad apicem paulo latiore. Abdomen cæterum, desuper inspicienti, elongatum, ovatum; a latere visum clavatum; apice oblique truncatum, forcipis masculi valvis compressis, breviter exstantibus, supra quas apparet penis vagina. Femina hucusque latet.

Shining black; palpi, legs, and joints 1—2 of the antennæ testaceous; hind coxæ somewhat infuscated; cheeks and hinder part of the head beneath rufo-testaceous. Wings hyaline, with a yellowish tinge, nervures, stigma, and squamulæ pale testaceous; præbrachial nervure distinct; radial areolet rather shorter than in sp. 5; radius very slightly curved. Mesothoracic sutures effaced. Metathorax short, almost vertically truncated behind, and there excavated, without medial carina or areæ. First segment longer than $\frac{1}{3}$ of the abdomen, stouter than in sp. 5, tuberculated behind the middle, after which the condylus is wider to the apex; the segment is minutely striolated or aciculated, but shining. The rest of the abdomen, viewed from above, is elongate-ovate; viewed

laterally, clavate; obliquely truncated at the apex, within which are seen the short flattened valves of the anal forceps, and above them the sheath of the sexual organ. Female unknown. Length, $1\frac{1}{3}$; wings, $2\frac{3}{4}$ lin.

Antennæ as long as the head, thorax, and 1st segment, stout, filiform, 19-jointed. Head transverso-cubic, somewhat buccate and wider than the thorax. The dilated cheeks and under side of the head, together with the 1st abdominal suture, are rufous; the rest of the body intensely black and shining.

M. Klugii, Ruthe (Stett. Zeit., 1856, p. 290) corresponds to this insect in many respects, but the frons and mesothorax are punctato-rugulose; the antennæ of both sexes, according to Reinhard, are also 22-jointed, and scarcely as long as the head and thorax.

Described from two males taken in a wood near my house at Nunton, Wilts.

3. *Microctonus xanthocephalus*, n. s.

♀. Aterrimus, politus, capite antennarum scapo pedibusque testaceis, stemmatico fusco. Tarsi omnes apice nigricantes. Alæ subfumato-hyalinæ, squamulis stramineis, stigmatibus testaceo undique fusco cincto, nervis fuscis. Abdomen compressum segmento 1o sublineari postice vix latiore, tuberculis parum conspicuis, terebra breviter exserta, falcata, decurva.

Very black, smooth and shining; head, scape of the antennæ, and legs, testaceous; stemmaticum fuscous; last joint of all the tarsi blackish. Wings dull hyaline, squamulæ stramineous, stigma testaceous bordered all round with fuscous, nervures fuscous. Abdomen compressed, 1st segment sublinear, hardly widened posteriorly; tubercles inconspicuous; terebra short, falcate, decurved. Length, 2; wings, $3\frac{2}{3}$ lin.

Antennæ filiform, shorter than the body, 28-jointed. Mesothoracic sutures effaced. Metathorax short, triangularly excavated behind. Hind coxæ with a piceous basal spot. First abdominal segment occupying more than $\frac{1}{3}$ of the whole length, linear and depressed as far as the tubercles, condylus convex and very slightly widened; segments 2—3 extending nearly to the apex, the rest retracted, annuliform. Abdomen after the 1st segment narrowly elliptical, as viewed from above, as long as the head and thorax; viewed laterally, clavate.

Differs from all other British species in coloration, superior size, and greater number of joints in the antennæ.

Discovered at Shiere, near Guildford, by Capron, and described from his unique specimen.

4. *Microctonus testaceus*, Capron, n. s.

Rufo-testaceus, antennis (præter articulos 2 basales), stemmatico, mesothoracis lineis, abdominisque segmento 1o, nigris. Alæ sub-infumatae, nervis ad basin fuscis, extus pallidioribus, squamulis testaceis, stigmate flavo; areola radialis procul ab alæ apice clausa, stigmate paulo longior. Abdomen læve, splendidum, clavatum; segmentum 1um trientem fere ejus occupans, solito angustius, apice duplo latius quam basi, tuberculis prominulis, vix nisi mediis. Terebra abdominis trientem paulo superans.

Rufo-testaceous; antennæ (except the 2 basal joints), stemmaticum, three lines on the mesothorax, and 1st abdominal segment, black. Wings slightly infumated; nervures fuscous at the base, paler towards the apex of the wing; squamulae testaceous; stigma yellow; radial areolet ending much before the tip of the wing, a little longer than the stigma. Abdomen smooth, shining, clavate; 1st segment forming about $\frac{1}{3}$ of its entire length, rather narrow, about twice as broad at the apex as at the base; tubercles prominent, situated nearly in the middle. Terebra a little more than $\frac{1}{3}$ of the length of the abdomen. ♂ ♀. Length, 2; wings, $3\frac{1}{2}$ lin.

Head transverse, not contracted behind the eyes, the sides almost parallel. Antennæ about $\frac{1}{2}$ as long as the body, black, with the first two joints yellow, 19-jointed in both sexes. Mesothorax very smooth, marked with 3 black lines, whereof the middle one is abbreviated posteriorly. Metathorax faintly divided into 5 aerae; in one example it is also blackish. In the male the head and whole body are black; the legs only and first two joints of the antennæ being rufo-testaceous.

Four males and one female have been taken by Capron at Shiere, near Guildford; the above description has been kindly prepared by him. *M. elegans*, Ruthe (Stett. Zeit., 1856, p. 290), of which I have specimens from Hungary, is not unlike this species, but, beside minor differences, the antennæ are 30-jointed even in the ♀.

5. *Microctonus cultus*, n. s.

♀. Rufo-piceus v. piceo-testaceus, oculis, faciei occipitisque lituris, stemmatico, scutello, metathorace, abdominisque segmento 1o, nigris aut nigricantibus; segmentis 2—3 saturate rufo-piceis, cæteris pallide rufis. Antennæ fuscae, articulis 1—5 pallide testaceis. Pedes pallide testacei. Alæ hyalinae, nervis, stigmate,

pallide testaceis; nervus præbrachialis distinctus. Mesothoracis sulculi haud penitus oblitterati. Metathorax brevis, postice truncatus, ibidem excavatus, medio carinulatus. Segmentum 1um totius abdominis triente longius, a basi inde ad apicem perpaulo ampliatum, tuberculis inconspicuis. Terebra abdominis quintam partem adæquans.

♂ aliter coloratus; niger, prothorace, antennarum scapo, ventris basi, testaceis; mesothoracis disco, scutello, abdominis segmento 2o, saturate rufo-piceis; coxis posticis infuscatis.

♀. Rufo-piceous or piceo-testaceous; eyes, a blotch on the face and on the occiput, stemmaticum, scutellum, metathorax, and 1st abdominal segment, black or blackish; segments 2—3 dark rufo-piceous, the rest pale rufous. Antennæ fuscous, joints 1—5, together with the legs, pale testaceous. Wings hyaline, nervures and stigma pale testaceous; præbrachial nervure distinct. Mesothoracic sutures not wholly effaced. Metathorax short, truncated and excavated behind, carinated in the middle. First segment longer than $\frac{1}{3}$ of the abdomen, very slightly widened from the base to the apex; tubercles inconspicuous. Terebra as long as $\frac{1}{2}$ of the abdomen.

The ♂ is black, with the prothorax, scape of the antennæ, and belly at the base, testaceous; disk of the mesothorax, scutellum, and 2d abdominal segment dark rufo-piceous; hind coxæ infuscated. Length, $1\frac{1}{2}$; wings, 3 lin.

Var. ♀. Head pale rufo-testaceous, only the eyes and stemmaticum black.

Antennæ ♂ as long as the body, 26-jointed; of the ♀ shorter, 22—23-jointed. Entirely smooth and shining. Mesothoracic sutures indicated by two shallow grooves in front, which are evanescent before reaching the scutellum. The medial carina of the metathorax bifurcates at the declivity, its two branches surrounding the posterior concavity and forming 3 areae, whereof the 2 lateral are smoother and more shining than the posterior. Terebra testaceous, with black valves. The variety, owing to its rufous head, resembles a *Dinocamptus*.

Described from three males, three females, taken in a wood near Barnstaple, a male from St. Albans, and another in Fitch's collection. Capron has taken five females and one male at Shiere.

XV. METEORIDES.

The characters are comprised in those of the single genus.

METEORUS, *Hal.*

Meteorus, Hal., Ent. Mag., iii., 24.

Perilitus, *Sectio II.*, Nees, Mon., i., 33.

Perilitus, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 21.

Maxillary palpi 6-, labial 3-jointed. Occiput margined. Antennæ slender, usually filiform in the ♀, setaceous in the ♂. Mesothoracic sutures distinct. Abdomen petiolated. Fore wings with 3 cubital areolets, the 2d trapeziform, the 1st separated from the prædiscoidal; radial areolet cultrate, reaching nearly to the apex of the wing; radius straight; metacarpus longer than the stigma. Terebra exerted.

Head as broad as the thorax, or broader; occiput hardly emarginate behind; eyes small, and scantily pubescent; clypeus rounded anteriorly, separated from the face by an impressed line with a fovea at each end; mandibles forcipate, bidentate. Abdomen ovate or lanceolate, compressed at the apex in the ♀; segment 1 consisting of a true petiole (as in the *Ichneumonidæ*), linear, and extending to the spiracular tubercles situated near the middle; the posterior part (condylus) is gradually dilated to the apex; usually this segment is striolated, but the petiole is sometimes smooth. In the majority of cases the 1st segment presents at the apex of the petiole a pair of oblong parallel apertures, separated by a ridge, and descending obliquely to the spiracles; in the following descriptions these are called the *tracheal grooves*. The remaining segments are always smooth and shining; segments 2—3 are connate, longer and broader than the following, which decrease rapidly to the anus. Second cubital areolet trapeziform, more or less narrowed towards the radius, its lower and inner angle produced præbrachial areolet generally shorter than the pabrachial, rarely equal to it, and only in one species longer; recurrent nervure commonly somewhat rejected, occasionally interstitial, and more rarely everted; radial areolet of the hind wings divided by a transverse accessory nervure in two species, and the same structure faintly indicated in others; wings hyaline, but in three species infumated, and then exhibiting a whitish streak upon the ordinary transverse fold, which commences under the stigma. The wings have a strong disposition to bend at this place, which produces illusions as to the direction of the recurrent nervure. The integuments of these insects are thin, and the colours inconstant; a

permanently testaceous variety appears to exist in some of the species.

The *Meteori* are nearly related to the preceding group, but present a more advanced structure; transitional forms may be looked for among exotic species, and one such has been mentioned in the note on *Wesmaelia* (*Euphorides*, genus vi., ante). Some of them are among our larger Braconids, and their petiolated abdomen and exerted terebra give them much the appearance of certain *Ichneumonidæ*, e. g., *Mesochorus*, a genus which furnishes some of their hyperparasites. The large testaceous *Meteori* have also a strong resemblance to the insects of the genus *Ophion* or *Paniscus*. Some attention is required to distinguish them from the three species of *Zele* hereafter to be described among the *Macrocentrides*: the best distinction lies in the 1st abdominal segment, which, although very slender in the genus *Zele*, is not petiolated, having the spiracular tubercles close to the base.

Few of the insects of this genus are mentioned by the older authors: DeGeer, in 1771, noticed pensile cocoons, which were white, in the neighbourhood of the nests of *Bombyx processionea*, L. (Mém., ii., xi., p. 449): Latreille, Spinola, and Nees von Esenbeck in his earlier writings did not distinguish them from *Ichneumon* and *Bracon*. The last-named writer, in 1834, effected their separation as a section of his *Perilitus*, and brought together in his monograph 13 species, of which 12 are genuine. Haliday, in 1835, with the assistance of Curtis, described 17 British species, and in the same year 23 Belgian species were published by Wesmael. The latest and most important work upon the subject is a posthumous paper by Ruthe, published by Reinhard in the Berl. ent. Zeits. for 1862 (pp. 1—58), containing 37 species, and preceded by a synoptical table. A few species may also be found in the work of Ratzeburg.

It has already been shown that *Perilitus*, Sectio II., of Nees may with equal propriety be called *Meteorius* or *Perilitus*; but the preponderance of usage appears to be in favour of *Meteorius*; the name is sanctioned by Haliday, Blanchard, Brullé, and Reinhard, and refers appropriately by its meaning to the pensile cocoons made by many of the larvæ. *Zele* of Curtis (B. E., 415), if duly authenticated, would be the earliest name, but, while

the illustration in the 'British Entomology' applies to the present genus, the type adduced (*Z. testaceator*, Cur.) belongs to the *Macrocentrides*, and *Zelee* has been placed in that group, with the required correction, by Haliday. *Zemiotes* and *Protelus* are genera proposed by Förster (Verh. d. pr. Rheinl., 1862, p. 253) for two species of *Meteorus*, but I have found it impossible to adopt them here. The only differential character assigned to *Zemiotes* is the partition of the radial areolet of the hind wings by a transverse nervure, as in *M. albiditarsis*, Cur. But this character includes *M. caligatus*, Hal., which in other respects differs widely, while it excludes three other large species which are closely allied. *Protelus* was devised in order to isolate *M. chrysophthalmus*, Nees, on the ground that the præbrachial areolet of the fore wings is longer than the pabrachial. Even if this were always true, the extreme triviality of such a character must strike any one who looks at the insect; but it happens that the two areolets are sometimes equal in length, and therefore the genus *Protelus* cannot be maintained.

Most of the *Meteori* are parasites of Lepidoptera, either singly, or, in the case of the smaller species, gregariously; a few have also been found to infest fungivorous Coleoptera. Several species form shining brown cocoons, in which they are found suspended by a thread of silk from leaves or branches of trees, and hence Latreille named one which he observed *pendulator*, supposed by Haliday to be *ictericus*, Nees, but it cannot now be identified with certainty; the cocoon of *ictericus* is figured by Curtis (B. E., 415). The head of the insect is always turned downwards, and, as it spins by the mouth, we have to account for the fact that somehow it is able to reverse its position in the air, since at the moment of its first suspension the head would naturally be uppermost; so far as I know, no observation has yet been made to explain this circumstance. Other species, including all the largest, and some smaller, weave whitish cocoons of a felted texture, which are never pensile, but fastened to leaves, &c., in the ordinary way. Some gregarious species heap their cocoons together in the manner of *Microgasters*; and those which live singly in the fungivorous larvæ of beetles attach the cocoon to the under side of the dead victim. This

diversity of habits appears to have no correspondence with variations of outward structure in the perfect insects, and offers no assistance in the classification of the numerous species.

TABLE OF SPECIES.

SECTION I. Tracheal grooves of the 1st abdominal segment distinct.

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|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| (4) | 1. Radial areolet of the hind wings geminated by a transverse nervure. | |
| (3) | 2. Præ- and pobrachial areolets of the fore wings equal in length. Antennæ 43—49-jointed | 1. <i>albiditarsis</i> , Cur. |
| (2) | 3. Præbrachial areolet of the fore wings shorter than the pobrachial. Antennæ 34—36-jointed | 5. <i>caligatus</i> , Hal. |
| (1) | 4. Radial areolet of the hind wings not geminated by a transverse nervure, or rarely with a faint vestige of one. | |
| (6) | 5. Præbrachial areolet of the fore wings longer than, or equal to, the pobrachial | 2. <i>chrysophthalmus</i> , Nees. |
| (5) | 6. Præbrachial areolet of the fore wings shorter than (rarely equal to) the pobrachial. | |
| (32) | 7. Recurrent nervure rejected into the 1st cubital areolet. | |
| (11) | 8. Antennæ with about 40 (rarely with only 35—38) joints. | |
| (10) | 9. Abdomen longer than the head and thorax. Hind femora, with their coxæ, as long as the abdomen. Condylus twice as long as its apical breadth | 3. <i>deceptor</i> , Wesm. |
| (9) | 10. Abdomen not longer than the head and thorax. Hind femora, with their coxæ, longer than the abdomen. Condylus less than twice as long as its apical breadth .. | 4. <i>pallidus</i> , Nees. |
| (8) | 11. Antennæ usually with fewer than 30 joints (rarely with 30, and more rarely with 36). | |
| (21) | 12. Stigma pale, luteous or flavo-piceous; unicolorous or bordered beneath with fuscous. | |
| (14) | 13. Face fuscous | 9. <i>facialis</i> , Ruthe, |
| (13) | 14. Face testaceous or rufescent. | |
| (20) | 15. Furrow of the mesopleuræ deeply impressed, faintly cancellated. | |
| (17) | 16. Colour entirely testaceous | 6. <i>ictericus</i> , Nees, var. |

- (16) 17. Colour testaceous and black, or entirely black except the face, orbits, and 2d abdominal segment, which last is in that case piceous.
- (19) 18. Antennæ more or less testaceous, the joints annulated with fuscous. Second abdominal segment, and sometimes the following segments, testaceous 6. *ictericus*, Nees.
- (18) 19. Antennæ entirely black or blackish. Second abdominal segment piceous, the following segments black .. 7. *pallidipes*, Wesm.
- (15) 20. Furrow of the mesopleuræ indistinct, and almost smooth 8. *confinis*, Ruthe.
- (12) 21. Stigma fuscous, usually pale at the inner angle, sometimes also at the outer; or fuscous with a pale exterior margin.
- (29) 22. Wings hyaline, or subhyaline, but never dark enough to show a pale streak beneath the stigma. Second cubital areolet hardly or not at all narrowed towards the radius.
- (28) 23. Terebra as long as, or shorter than, the abdomen. Wings hyaline, but not whitish.
- (27) 24. Abdomen ovate, not longer than the thorax. Head large, broader than the thorax. Stigma large, hardly smaller than the 1st cubital areolet.
- (26) 25. Metathorax sloping gradually, not convex, almost smooth 10. *vexator*, Hal.
- (25) 26. Metathorax regularly convex, rugulose 11. *obfuscatus*, Nees.
- (24) 27. Abdomen lanceolate, as long as the head and thorax. Head not broader than the thorax. Stigma not remarkably large 12. *punctiventris*, Ruthe.
- (23) 28. Terebra much longer than the abdomen. Wings whitish hyaline, or exceptionally subinfumated. (Recurrent nervure sometimes interstitial) 14. *atrator*, Cur.
- (22) 29. Wings more or less infumated, showing a pale streak beneath the stigma. Second cubital areolet narrowed towards the radius.
- (31) 30. Second abdominal segment rufous. Antennæ ♀ blackish, sometimes testaceous towards the base .. 16. *abdominator*, Nees.
- (30) 31. Second abdominal segment black or dark piceous. Antennæ ♀ white, the apical half determinately fuscous 15. *albicornis*, Ruthe.

- (7) 32. Recurrent nervure interstitial, or subinterstitial, *i. e.*, falling (but rarely) into the apex of the 1st cubital areolet, or the base of the 2d.
- (34) 33. Terebra as long as the abdomen with the metathorax. Smallest species, $1\frac{1}{2}$ lines long 13. *jaculator*, Hal.
- (33) 34. Terebra shorter than, seldom as long as, the abdomen. Larger species.
- (38) 35. Stigma fuscous, with or without a pale exterior margin.
- (37) 36. Stigma with a pale margin; recurrent nervure ♂ ♀ subinterstitial 18. *pulchricornis*, Wesm.
- (36) 37. Stigma without a pale margin; recurrent nervure ♀ everted, ♂ subinterstitial or everted .. 19. *melanostictus*, Cap., n. s.
- (35) 38. Stigma pale or only slightly infuscated; sometimes margined with fuscous.
- (40) 39. Terebra as long as the abdomen .. 22. *consors*, Ruthe.
- (39) 40. Terebra as long as $\frac{1}{3}$ or $\frac{2}{3}$ of the abdomen.
- (42) 41. Antennæ blackish; body blackish, with the scutellum and some other portions rufous; tips of the tarsi and of the hind tibiæ fuscous 20. *scutellator*, Nees.
- 41) 42. Antennæ testaceous tipped with fuscous; body and legs testaceous, only the 1st abdominal segment more or less infuscated; tips of the hind tibiæ seldom subinfuscated 21. *unicolor*, Wesm.

SECTION II. Tracheal grooves of the 1st abdominal segment obsolete.

- (2) 1. Wings narrow, hardly longer than the abdomen, infumated, with a whitish streak beneath the stigma 17. *micropterus*, Hal.
- (1) 2. Wings fully developed and hyaline, or nearly so.
- (4) 3. First abdominal suture white; petiole whitish at the base (except in a var.) 23. *versicolor*, Wesm.
- (3) 4. First abdominal suture and base of the petiole concolorous with the rest of the surface.
- (12) 5. Stigma fuscous, its inner angle pale.
- (9) 6. Head broader than the thorax.
- (8) 7. First abscissa of the radius much shorter than the second. Terebra shorter than the abdomen. Petiole stout, shorter than the condylus 26. *profligator*, Hal.

- (7) 8. First abscissa of the radius as long as the second. Terebra as long as the abdomen. Petiole slender, longer than the condylus .. 24. *filator*,* Hal.
- (6) 9. Head narrower than the thorax.
- (11) 10. Petiole shorter than the condylus 27. *cinctellus*, Nees
- (10) 11. Petiole and condylus of equal length 28. *tenellus*, n. s.
- (5) 12. Stigma entirely pale.
- (16) 13. Antennæ ♀ filiform, almost always 26-jointed; those of the ♂ setaceous, not more than 28-jointed. Recurrent nervure interstitial or subinterstitial.
- (15) 14. Head, thorax, and abdomen more or less black 29. *leviventris*, Wesm.
- (14) 15. Head, thorax, and abdomen rufo-testaceous, except the metathorax and 1st abdominal segment, which are black 30. *rubens*, Nees.
- (13) 16. Antennæ of both sexes setaceous, 30—34-jointed. Recurrent nervure everted.
- (18) 17. Colour entirely pale testaceous .. 32. *luridus*, Ruthe, var.
- (17) 18. Colour black and testaceous.
- (20) 19. Abdomen ♂ ♀ black, segment 2 testaceous, often with 2 fuscous spots 31. *fragilis*, Wesm.
- (19) 20. Abdomen ♀ (except the 1st segment) rufo- or fusco-testaceous; of the ♂ infuscated at the apex 32. *luridus*, Ruthe.

1. *Meteorus albiditarsis*, Cur. (Pl. V., fig. 8, hind wing).

Zele albiditarsis, Cur., B. E., pl. ccccxv., ♂.

Meteorus albiditarsus, Hal., Ent. Mag., iii., 25, ♂; *M. albitarsis*, Hal., lib. cit., 24, ♀; S. v. Voll., Pinac., pl. xlv., f. 1, ♂ with details of palpi; f. 2, ♀.

Perilitus albitarsis, Nees, Mon., i., 34, ♀.

M. albitarsis, Ruthe, Berl. ent. Zeits., 1862, p. 9 ♂ ♀.

P. dispar, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 22, ♂ ♀; pl. i., f. 3 (wing).

♀. Rufo-testaceous; eyes during life green; stemmaticum, claws, and valves of the terebra, fuscous; hind tarsi whitish. ♂. Nigro-piceous; orbits, abdomen in the middle more or less, and legs, dull rufous; hind coxæ, femora, and tibiæ infuscated, their tarsi whitish. Wings ♀ testaceo-hyaline, squamulæ and stigma

* Sp. 25, *delator*, Hal., requires to be rediscovered, and is here omitted.

luteous, nervures fuscous; of the ♂ fusco-hyaline, squamulae testaceous, nervures and stigma fuscous; præ- and pobrachial areolets of the fore wings of equal length; radial areolet of the hind wings divided by a distinct transverse nervure. Terebra as long as the 1st abdominal segment. Length, 3—4½; wings, 6—9 lin.

The larger size is more usual, but one ♂ of those before me is only 3 lines long. Head transverse; front excavated; eyes large, glabrous; face transverse, beset with short white hairs; clypeus with longer hairs, convex, prominent; mandibles dark at the tips; palpi elongate, pallid. Antennæ ½ longer than the body, slender, setaceous, those of the ♂ usually 47—49-, of the ♀ 43—49-jointed. Mesothoracic sutures strongly impressed. Mesopleuræ punctate, beneath the wings smooth. Metathorax short, rounded, irregularly (in the ♀ subobsoletely) rugose and reticulated, with a fine medial carina. Abdomen as long as the head and thorax and as wide, after the middle; that of the ♀ subfalcate, compressed; suturiform articulation subobsolete; segment 1 forming ⅔ of the whole abdomen, obsoletely aciculated, three times broader at the apex than at the base; tubercles placed just before the middle; tracheal grooves distinct. Nervures of the wings stouter and darker in the ♂; recurrent nervure interstitial or rejected; 2d cubital areolet somewhat longer than broad; 1st intercubital nervure much longer than the 2d.

The ♂ is very like that of *deceptor*, sp. 3; the ♀ strongly resembles both *chrysophthalmus* and *deceptor* in the present genus, as well as *Zele testaceator*, Cur., among the *Macrocentrides*.

Not uncommon from May to September. Described from five males, six females, contributed by Bignell, Billups, Bridgman, and Fitch; taken in Darenth Wood, in Devonshire, near Cardiff, Lynn, St. Albans, &c. A solitary parasite; the ♂ was bred by Bridgman, but from what source I am not informed. Cocoon 6 lines long, felted, stramineous, with some loose flocculence.

2. *Meteorus chrysophthalmus*, Nees.

Bracon chrysophthalmus, Nees, Mag. Ges. Berl., 1811, p. 21.

Perilitus chrysophthalmus, Nees, Mon., i., 34; Wesm., Nouv. Mém. Ac. Brux., 1835, p. 24; *M. chrysophthalmus*, Ruthe, Berl. ent. Zeits., 1862, p. 11, ♂ ♀; S. v. Voll., Pinac., pl. xlv., f. 3, ♀; Ratz., Ichn. d. Forst., iii., 59.

? *Bracon chlorophthalmus*, Spin., Ins. Lig., ii., 133, ♀.
M. chlorophthalmus, Hal., Ent. Mag., iii., 26, ♂ ♀.

Rufo-testaceous; antennæ fuscous except at the base; front, vertex, occiput, thorax, especially the metathorax, and petiole of the 1st segment, often more or less infuscated; eyes during life green; stemmaticum, claws, and valves of the terebra fuscous; hind tarsi often whitish at the apex. Wings testaceo-hyaline, squamulae and stigma luteous; nervures fusco-testaceous; præbrachial areolet of the fore wings longer than, or sometimes equal to, the pabrachial; recurrent nervure interstitial (seldom subrejected); radial areolet of the hind wings not divided, or rather, the transverse nervure is decolorous. Terebra more than $\frac{3}{4}$ the length of the abdomen. ♂ ♀. Length, $2\frac{3}{4}$ — $3\frac{1}{2}$; wings, 5— $6\frac{1}{2}$ lin.

The sexes are alike in colour, and subject to the same variations; Ruthe and Wesmael had males with the entire thorax fuscous, but usually the infuscation is confined to the parts above mentioned. Head as in the last species, but the eyes are much smaller, and not glabrous. Antennæ longer than the body, setaceous, those of the ♂ 38—42-, of the ♀ 31—39-jointed. Mesothorax punctulate, the sutures distinct, enclosing a large rugulose depression before the scutellum. Mesopleuræ punctulate throughout, and beneath the (usually fuscous) furrow, almost rugulose. Metathorax short, regularly rounded, finely rugulose and reticulated, more strongly behind, where it is beset with white pubescence, and having a fine medial carina. Abdomen as long as the head and thorax, rather narrower than the latter; that of the ♀ not subfalcate, and hardly compressed; suturiform articulation nearly effaced; segment 1 more or less finely punctato-rugulose, often smooth posteriorly, forming $\frac{2}{3}$ of the whole abdomen, about three times wider at the apex than at the base; petiole very slender; tubercles antemedial; tracheal grooves distinct. Wings hyaline with a yellowish tinge, sometimes subfusco-hyaline; stigma luteous in both sexes; radial areolet of the hind wings at first sight not divided; the transverse nervure, however, is visible in certain lights, paler and more attenuated than in *M. caligatus*; 2d cubital areolet subquadrate. The terebra is not black, as described by Ruthe, but rufous, subulate, with stout fuscous valves.

This species is difficult to distinguish from *M. deceptor*, in the female sex; but in *chrysophthalmus* the præbrachial areolet of the fore wings is never shorter than the pabrachial. *Bracon chlorophthalmus*, Spin., referred by Haliday to this species, but by Nees to the genus *Rhogas*, cannot now be certainly determined.

Not uncommon, but the notices of its occurrence are mostly doubtful, owing to its having been confused with *M. deceptor*. Described here from four females and one male in Fitch's collection, taken by him, Bridgman, and Bignell in their respective districts; found also by Billups at Peckham, and by me in Yorkshire. Bignell bred the ♀ from *Odontoptera bidentata*, Clerck, and S. v. Vollenhoven reported the rearing of another at the Hague from *Heterogenea limacodes*, Hufn. According to Ratzeburg it was bred by Brischke from *Rhodophæa suavella*, Zinck. The cocoon is not noticed, but probably resembles that of *M. deceptor*.

3. *Meteorus deceptor*, Wesm. (Pl. V., fig. 6 ♀, fig. 7 ♂).

Perilitus deceptor, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 26, ♂ ♀.

M. deceptor, Ruthe, Berl. ent. Zeits., 1862, p. 12, ♂ ♀.

♀. Rufo-testaceous; eyes during life green; antennæ towards the tips, claws, and valves of the terebra, fuscous; hind tarsi testaceous. ♂. Nigro-piceous; base of the antennæ, face, orbits, scutellum, abdominal segments 2–3, or more, and legs, rufo-testaceous; hind femora infuscated, their tibiæ blackish except at the base, their tarsi rufo-testaceous. Wings of the ♀ testaceous-hyaline, squamulæ and stigma luteous, nervures fusco-testaceous; of the ♂ fusco-hyaline, nervures and stigma fuscous; præbrachial areolet of the fore wings shorter than, sometimes as long as, the pabrachial, but never longer; recurrent nervure rejected; radial areolet of the hind wings not divided. Terebra as long as half the abdomen. ♂ ♀. Length, 3–3½; wings, 5½–6½ lin:

Var. ♀. Coloured like the ♂, only the abdomen after the 1st segment is entirely testaceous. Reinhard.

The ♂ strongly resembles that of sp. 1, and must be distinguished by the hind wings. The discrimination of both sexes from *chrysophthalmus* is less easy, inasmuch as the few differences that exist are liable to exceptions. The recurrent nervure, however, is always rejected, and the præbrachial areolet never longer than the pabrachial. The present species is somewhat smaller, the ♂ more darkly coloured, especially as to the hind tibiæ, and the terebra of the ♀ shorter. Antennæ longer than the body, setaceous, those of the ♂ 38–44-, of the ♀ 35–40-jointed. Vertex and occiput of the ♀ sometimes infuscated; mandibles dark at the tips; petiole of the 1st segment occasionally fuscous at the base; abdomen obliquely truncated at the apex; tarsi a little paler towards the tips. The

hind tarsi of the ♂ appear paler than they really are, an illusion caused by the blackness of the tibiæ. The frontal excavation behind the antennæ is geminated by a carina. Pleuræ finely rugulose. Mesothorax impunctate, the sutures deeper behind, enclosing a wide rugose space bisected by a longitudinal carina. Abdomen as in the preceding species; condylus twice as long as its apical breadth. Hind femora, with their coxæ, as long as the abdomen.

Described from 18 males and 22 females. More common than *chrysophthalmus* throughout the country, and found now in all collections, yet it does not seem to have been known to Haliday. Capron describes it as abundant near Guildford. I obtained five males in a very short time by beating a single hedge near Abergavenny. It has been repeatedly bred in England, but some of the cases recorded perhaps belong rather to *chrysophthalmus*: the following are selected as certainly authentic. Fitch reared a ♀, June 14th, and Bignell two males, June 17th, from *Crocallis elingvaria*, L.; the latter has also obtained the ♀ from *Himera pennaria*, L., and *Hadena oleracea*, L.; the ♂ from *Odontoptera bidentata*, Clerck, and *Anarta myrtili*, L. Probably also it is the species referred to as *chrysophthalmus* in E. M. M., xi., 66, bred by Hellins out of *Erastria fasciana*, L.; S. v. Vollenhoven mentions the rearing of three females at the Hague from the same host. Wesmael found it commonly near Brussels, and many examples are in his unnamed collection, which is now in my hands. A solitary parasite. Cocoon white, felted, papyraceous, 5 lines long, not pensile, fusiform, the head of the insect being turned towards the smaller end.

4. *Meteorus pallidus*, Nees.

Bracon pallidus, Nees, Mag. Ges. Berl., 1811, p. 22; not of Bouché, which is *Rhogas circumscriptus*, Nees; cf. Nees, Mon., ii., 399.

Perilitus pallidus, Nees, Mon., i., 35, ♂ ♀.

Rufo-testaceous; antennæ except the base, head more or less, prothorax, pectus, and metathorax (of the ♂) fuscous or piceous; hind tarsi paler; claws fuscous. Wings testaceo-hyaline, squamulæ and stigma luteous, the latter rufous in the ♂; nervures fusco-testaceous; præbrachial areolet of the fore wings shorter than the pabrachial; recurrent nervure rejected (or sometimes almost interstitial); radial areolet of the hind wings not divided by a transverse

nervure. Abdomen shorter and broader than in *deceptor*, in the ♂ clavate; 1st segment punctato-rugulose on the petiole; the condylus smooth, except a few basal scratches, and less than twice as long as its apical breadth; tracheal grooves distinct. Hind femora with the addition of their coxæ, longer than the abdomen. Terebra, seen from above, as long as the 4 last segments. ♂ ♀. Length, $2\frac{3}{4}$; wings, $5\frac{1}{2}$ lin.

Antennæ longer than the body, filiform, in the ♀ testaceous, annulated with fuscous, gradually darkened to the apex, the 2 basal joints piceous, 36—39-jointed; in the ♂ broken, blackish, except the 4 basal joints. Head rather broader than the thorax; orbits black (in the ♀ described by Nees); occiput and stemmaticum sometimes fuscous. Metathorax irregularly subreticulate, with or without a faint medial carina. Abdomen of the ♀ ovato-clavate, somewhat compressed; of the ♂ broader and flatter; not longer than the head and thorax; 1st segment subdeplanate, shorter and broader than in *deceptor*; tubercles medial, salient. The ♂ is darker than the ♀, having the whole thorax rufo-piceous, except the disk of the mesothorax.

Differs from *deceptor* in size, and in the proportion of parts, as stated in the table; and distinguished from all the following species by the greater number of joints in the antennæ, for the ♂, though mutilated, must once have had at least 40 joints. There is nothing like it in Ruthe's collection, nor was it known to Wesmael and Haliday; Förster, however, quotes it as a type of the whole genus. Nees states that he has united the two sexes with some hesitation; but there is nothing doubtful about the male and three females which I have seen.

Nees captured the ♀ among oaks in Franconia, Aug. 23rd; the ♂ was communicated to him by Gravenhorst. With us it seems to be a northern species; I found a ♀ in the Yorkshire moors, two more from Sutherlandshire are in Bridgman's collection, and Champion presented me with ♂ ♀ from the pine-forest of Rothiemurchus in the Grampians.

5. *Meteorus caligatus*, Hal.

Meteorus caligatus, Hal., Ent. Mag., iii., 25, ♂ ♀.

Black, shining; 2d abdominal segment and legs rufo-testaceous; hind femora at the apex, hind tibiæ, and their tarsi, fuscous; base of the former pallid or whitish. Wings fusco-hyaline, squamulæ

flavo-testaceous, stigma and nervures fuscous; præbrachial areolet of the fore wings shorter than the pabrachial; recurrent nervure rejected; radial areolet of the hind wings divided by a faint transverse nervure. Abdomen subpetiolated, 1st segment short, broad. Terebra shorter than the 1st segment. ♂ ♀. Length, $2\frac{1}{2}$; wings, 5 lin.

This species stands alone; with those already described it has no near connection, except the divided radial areolet of the hind wings, and differs from all species in the shortness and width of the 1st abdominal segment. The sexes are similar. Antennæ setaceous, of the ♂ 36-jointed, much longer than the body; of the ♀ 34-jointed, a little longer than the body; piceous beneath at the base. Mandibles testaceous; palpi very pale, the maxillary elongate. Eyes large. Mesothorax shining, with a few lateral punctures, the sutures shallow, surrounding a rugulose space before the scutellum, bisected by a longitudinal carina. Metathorax shining, not very convex, with some punctures and transverse wrinkles, rectangular behind. First abdominal segment almost smooth, having a stout short petiole about $\frac{1}{3}$ as broad as the segment at the apex; tubercles medial; tracheal grooves distinct; condylus obconic, not much narrower than the 2d segment; segments 2—3 connate, testaceous, black at the apex, and more or less at the sides. Coxæ testaceous; hind legs infuscated, the base of their tibiæ narrowly pallid; in the ♂ all the legs are less brightly coloured. Terebra short, its valves stout, black.

Apparently uncommon, not noticed by any writer but Haliday, who discovered it in North Ireland and the Hebrides. Bignell, however, has bred a female in Devonshire, June 23rd, and W. H. B. Fletcher two males and two females out of *Eupithecia expallidata*, Guenée; these last are from Abbot's Wood. In Fitch's collection is a male ticketed as having been found in a gall of *Cynips Kollarii*, Hartig. A solitary parasite. Cocoon oval, whitish, felted, papyraceous, not pensile.

6. *Meteorus ictericus*, Nees.

Bracon ictericus, Nees, Mag. Ges. Berl., 1811, p. 22, pl. ii., f. 6, ♀; not of Bouché, Naturg. (1834), p. 148.

Perilitus ictericus, Nees, Mon., i., 37, ♀; Wesm., Nouv. Mém. Ac. Brux., 1835, p. 27; Ratz., Ichn. d. Forst., ii., 55, ♂ ♀.

Meteorus ictericus, Ruthe, Berl. ent. Zeits., 1862, p. 14, ♂ ♀; S. v. Voll., Pinac., pl. xliv., f. 4, ♀ (and abdomen magnified).

M. pendulator, Hal., Ent. Mag., iii., 28, ♂ ♀ partim; his ♂ vars. ε, ζ, are probably *M. pulchricornis*, Wesm.

Zelee ephippium, Cur., B. E., 415.

Variable; rufo-testaceous, usually black above, except the head and 2d abdominal segment; stemmaticum black; antennæ fuscous, the base rufous; hind tibiæ at the apex, and tarsi, infuscated; valves of the terebra black. Wings hyaline, squamulae yellow, stigma the same or luteo-fuscous, its inner edge often fuscous, nervures fusco-testaceous; recurrent nervure rejected; 2d cubital areolet slightly narrowed towards the radius. Tracheal grooves distinct. Terebra not much shorter than the abdomen. ♂ ♀. Length, $2\frac{1}{4}$ — $2\frac{1}{2}$; wings, $4\frac{1}{2}$ —5 lin.

The varieties are thus arranged by Ruthe, from 56 examples:—

Males: posterior segments constantly dark.

Var. 1. Head and mesothorax rufo-testaceous, immaculate; or the latter fuscous in the middle of the base.

Var. 2. Head rufo-testaceous; mesothorax with 3 inchoate fuscous lines; disk of the metathorax blackish; 1st abdominal segment scarcely darker than the 2d.

Var. 3. Head the same; mesothorax with 3 fuscous lines; mesopleuræ rufous, bounded with black.

Var. 4. Head the same; entire thorax above infuscated or blackish; pleuræ and pectus rufo-testaceous, or more or less infuscated.

Var. 5. Frons, vertex, and occiput infuscated; mesothorax with 3 fuscous lines; scutellum paler or darker fuscous; pleuræ and pectus fuscous.

Var. 6. Frons, vertex, and occiput infuscated, leaving (as in var. 5) the orbits broadly testaceous; entire thorax, as well as pleuræ and pectus for the most part, fuscous; 2d abdominal segment yellow.

Females: posterior segments more or less testaceous.

Var. 7. Entirely dull testaceous.

Var. 8. Only the 1st abdominal segment fuscous; sometimes the metathorax slightly infuscated.

Var. 9. Metathorax and 1st abdominal segment fuscous; mesothorax unicolorous, or with 1—3 faint fuscous lines.

Var. 10. Mesothorax and scutellum more or less infuscated.

Var. 11. Mesothorax rufo-testaceous; metathorax, 1st abdominal segment, as well as the 4th and following more or less, fuscous.

Var. 12. Mesothorax entirely, pectus and pleuræ more or less, fuscous; pleuræ usually fuscous, with a rufous medial spot; abdomen blackish at both ends.

The species is extremely difficult to determine, as well from variations of sculpture as from the instability of the colours. Nevertheless, English specimens are less variable than those in Ruthe's collection, and will be found in general to correspond with the diagnosis. Described from 27 females and 2 males. Face subquadrate, flat, sometimes with a slight elevation above the clypeus, looking, from above or below, like a carina. Palpi pale, whitish. Antennæ ♂ ♀ about the length of the body, setaceous, 27—35-jointed, testaceous, dusky towards the apex, each joint also annulated with the same colour. Eyes villose; ocelli prominent. Prothorax always rufo-testaceous. Metathorax usually rugulose and reticulated, with greater or less distinctness; without a medial carina; but often exhibiting on the disk two smooth subquadrate areæ separated by a carina; intermediate forms are not wanting. Abdomen as long as the head and thorax; 1st segment $\frac{1}{3}$ or $\frac{2}{3}$ of its entire length, striolated; petiole slender, elongate, but varying somewhat in length and thickness. Stigma yellow, more or less pale, usually unicolorous, but not seldom bordered with fuscous, especially beneath; 2d cubital areolet narrower than its height, and very slightly narrowed towards the radius; recurrent nervure always more or less rejected, never absolutely interstitial.

This is perhaps the commonest British species, and abounds likewise in other parts of Europe. Bignell bred the ♂ from *Dictyopteryx Bergmanniana*, L.; Elisha the ♀, July 6th, from *Laverna conturbatella*, Hüb.; J. E. Fletcher another from a larva found rolled up in a leaf of *Rubus idæus*. Curtis (B. E., ccccxv.) has figured the cocoon, which he says is frequently found on the hazel, and by himself in Coombe Wood; one cocoon produced the universal hyperparasite *Hemiteles areator*, Panz. Haliday, who had the means of knowing, is the authority for referring Curtis's insect to this species. Ratzeburg bred a ♀ from *Cheimatobia brumata*, L., and states (Ichn. d. Forst., ii., 55) that a specimen bred by Bouché from *Pyrallis farinalis*, L., is undoubtedly the same species; but there must be a mistake here, since the cocoon of Bouché's insect (Naturg., 1834, p. 148) is

described as "albus, chartaceus," and not pensile. The cocoons described by DeGeer and referred to by Haliday (Ent. Mag., iii., p. 29, note), although pensile, were white, and there is nothing to show that they belonged to *ictericus*; moreover, they were obtained from *Bombyx processionea*, L. I have no cocoon at hand, but, assuming the figure given by Curtis to be correct, as is most likely, it is pensile, yellowish brown, shining, and semitransparent, like those of several of the following species.

7. *Meteorus pallidipes*, Wesm.

Perilitus pallipes, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 29, ♂ ♀.

Meteorus pallipes, Ruthe, Berl. ent. Zeits., 1862, p. 16, ♀.

Black; face, clypeus, and orbits of the eyes broadly, rufous; mouth and legs testaceous; 4 posterior tarsi fuscous; 2d abdominal segment piceous or subrufous, but often black; antennæ fuscous, paler at the extreme base. Wings nearly hyaline, squamulae and stigma yellow, the latter often edged with fuscous; nervures fusco-testaceous; recurrent nervure rejected; 2nd cubital areolet not narrowed towards the radius. Tracheal grooves distinct. Terebra as long as $\frac{3}{4}$ of the abdomen. ♂ ♀. Length, $2\frac{1}{2}$; wings, 5 lin.

Var. Face and clypeus paler; mandibles and palpi whitish; 2d abdominal segment testaceous. Ruthe.

Strongly resembles *ictericus*, Nees, but, besides the black colour, it may be known by the nearer approach of the eyes in front, whereby the face becomes narrower below than above; the shape of the 2d cubital areolet; and the comparative shortness of the petiole. Antennæ ♂ ♀ 28—31-jointed, as long as the body, filiform, nigro-fuscous, the 2 basal joints hardly paler. Under side of the prothorax piceous. Wesmael's specimens had the humeral angles of the mesothorax rufous, which was not the case with Ruthe's, nor is it seen in the English examples. Metathorax short, convex, almost vertical behind, intricato-rugose. First abdominal segment striolated, more convex transversely, and with a shorter and broader petiole than that of *ictericus*; segment 2 entirely black, piceous, or piceo-testaceous. Second cubital areolet large, very little broader than long, not narrowed towards the costa; recurrent nervure entering the 1st cubital areolet close to its lower angle.

Described from two females, one male, taken near Abergavenny, St. Albans, and Northampton; and three females in Fitch's collection, captured by Bridgman. Taken not uncommonly by Capron at Shiere.

8. *Meteorus confinis*, Ruthe.

Meteorus confinis, Ruthe, Berl. ent. Zeits., 1862, p. 18, ♀.

Rufo-testaceous, variable; palpi whitish; antennæ fuscous at the tips, and all the articulations dusky; legs and 2d abdominal segment always pale testaceous; stematicum, occiput, 3 patches on the lobes of the mesothorax, disk of the metathorax, with the rest of the abdomen, more or less piceous or black; joints of the 4 posterior tarsi tipped with fuscous. Wings hyaline, squamulæ and stigma yellow, the latter edged beneath with fuscous; nervures fuscous; recurrent nervure rejected; 2d cubital areolet somewhat narrowed towards the radius; radius distinct, but the other outer nervures of both wings decolorous. Tracheal grooves distinct. Terebra as long as the abdomen. ♂ ♀. Length, $1\frac{3}{4}$; wings, $3\frac{1}{2}$ lin.

Another species closely allied to *ictericus*, but certainly distinct. It is much smaller; the joints of the antennæ are fewer in number; the outer longitudinal nervures of the wings are obsolete; the 1st abdominal segment is broader and shorter in proportion. The extremes of coloration (in six examples) are as follows: the palest ♂ has only the apex of the abdomen black, the other markings are pale piceous and subobsolete; the darkest has all the markings above mentioned equally black; the others, and the ♀, are intermediate. Ruthe possessed only two females; having taken the ♂, I am able to complete the description. Antennæ of the ♂ longer than the body, testaceous or fuscous, darker towards the tips, 29-jointed; of the ♀ 27-jointed, about $\frac{3}{4}$ the length of the body. Metathorax intricato-rugulose, obliquely truncated behind, the posterior surface presenting a smooth area, margined by a raised line. First abdominal segment about $\frac{2}{3}$ of the length of the abdomen, faintly and irregularly striolated, darkest in the middle, the two ends testaceous.

Common. Very likely to be confounded with *ictericus*.

I found five males, one female, in meadows near Northampton, and three males, one female, near Leicester.

9. *Meteorus facialis*, Ruthe.

Meteorus facialis, Ruthe, Berl. ent. Zeits., 1862, p. 22, ♀.

♀. Black; orbits of the eyes above and behind obscurely rufous (or there is a dull rufous spot on each side of the vertex); antennæ testaceous, fuscous at the apex; or fuscous, the base of the flagellum testaceous, the scape and the other joints piceous; 2d abdominal segment, and legs, rufo-testaceous, hind pair of the latter somewhat darker, their coxæ piceous, and their tarsi sub-infuscated. Wings hyaline, stigma luteous, its outer and lower angles indeterminately brown; squamulæ rufo-testaceous, nervures pale fuscous; recurrent nervure considerably rejected; 2d cubital areolet very slightly narrowed towards the radius. Tracheal grooves minute. Terebra equal to $\frac{3}{4}$ of the abdomen.

♂. Black; legs and lateral margins of the 2d abdominal segment piceous. Wings slightly infumated; squamulæ testaceous; nervures piceous; stigma fuscous, with a pale spot at the inner angle; recurrent nervure joining the 1st cubital areolet at about $\frac{3}{4}$ of its length. ♂ ♀. Length, 2—2 $\frac{1}{3}$; wings, 4 $\frac{1}{2}$ —4 $\frac{2}{3}$ lin.

The form is that of *ictericus*, and the size nearly equal. Head a little narrower than the thorax, much contracted behind the eyes; face subquadrate, shining brown in the ♀, clypeus of the same colour, convex, smooth; on each side of the vertex is an orbital spot, dull red, narrowly prolonged towards the antennæ, and continued round the posterior margin of the eyes, becoming wider beneath (in the English ♀ there is merely a vertical spot). Palpi pale brown. Antennæ ♂ filiform, longer than the body, 35-jointed; of the ♀ rather stout, shorter than the body, filiform, 28—32-jointed. Pro- and mesothorax entirely black or blackish, beset with whitish pubescence more thickly than in most other species. Mesothorax with two crenulate striæ ending before the scutellum in a rugose depression. Pleuræ rugose, with a shining smooth medial space; the usual furrow wide, shallow, and rugose. Metathorax convex, intricato-rugulose, with a faint medial carina. Abdomen as long as, and narrower than, the head and thorax; segment 1 black, its apex piceous; segment 2 in the ♀ testaceous, the rest nigro-piceous; in the ♂ only the margins of the 2d segment are piceous; belly of the same colour. Segment 1 slender, but the petiole not much narrowed, finely striolated, the striæ confused and subreticulate; tubercles situated at about $\frac{1}{3}$ from the base. First abscissa of the radius shorter than the 2d. According to Ruthe the recurrent nervure is rejected into the 1st cubital areolet somewhat more than the length of the 1st abscissa.

For the description of the ♂ I am indebted to Capron; it is remarkable for having dark-coloured legs, not often seen in the present genus.

The ♂ was taken by Capron at Shiere, and the ♀ by me near Barnstaple.

10. *Meteorus vexator*, Hal.

♀. "Black, shining; mouth, antennæ at the base, and legs, ferruginous; segment 1 obconic, elongate, and attenuated at the base; stigma very large, fuscous, with a pale spot; terebra as long as the abdomen. Very like *delator* (sp. 25), and *filator* (sp. 24), intermediate in size, and distinguished from *filator* by a shorter petiole. Eyes large; clypeus narrowed inferiorly, fusco-ferruginous; antennæ 19—20-jointed." Haliday.

♂. Antennæ longer than the body, 29-jointed, fuscous, joints 1—2 rufous. Sides of the prothorax testaceous; 1st abdominal segment at the apex, and 2d at the base, indeterminately pale piceous; legs testaceous. Wings subfusco-hyaline; squamulæ testaceous; nervures piceous; stigma fuscous, conspicuous, as large as the 1st cubital areolet; 2d cubital areolet much narrowed towards the radius, forming a truncated triangle; recurrent nervure interstitial. Metathorax not convex, sloping gradually from the base, almost smooth, crossed near the base by a transverse carina. Abdomen shorter than the thorax; 1st segment irregularly striolated, short, three times broader at the apex than at the petiole; posterior segments broad, ovate. Head large, broader than the thorax. Tracheal grooves distinct. ♂. Length, $1\frac{1}{2}$; wings, $3\frac{1}{4}$ lin.

Not common, according to Haliday. The ♀ is unknown to me; the ♂ I took in Leicestershire; the great size of the stigma refers it to this species, but the condition is bad, and the colours obscured; that of the wings may be entirely fallacious.

11. *Meteorus obfuscatus*, Nees.

Bracon obfuscatus, Nees, Mag. Ges. Berl., 1811, p. 22, ♂.

Perilitus obfuscatus, Nees, Mon., i., 37, ♂; Ratz., Ichn. d. Forst., ii., 55, ♂ ♀.

Meteorus obfuscatus, Hal., Ent. Mag., iii., 31, ♂ ♀.

Zele thoracicus, Cur., B. E., 415, 9.

Perilitus formosus, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 36, ♀; *Meteorius formosus*, Reinh., Berl. ent. Zeits., 1862, p. 26, note, ♂ ♀.

Variable; usually black, palpi and legs testaceous; pro- and mesothorax, with the scutellum, and abdominal segments 2—3, rufo-testaceous; 3 fuscous spots on the mesothoracic lobes; antennæ rufo-testaceous on their basal half, thence to the apex fuscous. Wings hyaline; squamulae testaceous; nervures fuscous, becoming testaceous outwardly; stigma large, fuscous, its inner angle determinately testaceous; recurrent nervure rejected or sub-rejected; 2d cubital areolet not narrowed towards the radius. Tracheal grooves distinct. Terebra somewhat shorter than the abdomen. ♂ ♀. Length, 2—2 $\frac{1}{4}$; wings, 4—4 $\frac{1}{2}$ lin.

In varieties the mesothorax or the abdomen may be entirely black or piceous, and the pectus rufo-testaceous; or the abdomen more or less piceous, and paler in the middle; but in any case the species is sufficiently declared by its structure. Head broader than the thorax, hardly contracted behind the eyes. Antennæ of the ♀ not much longer than $\frac{1}{2}$ the body, submoniliform at the apex, 24—27-jointed (according to Reinhard even 23-jointed); those of the ♂ longer than the body, filiform, 29—30-jointed. Metathorax short, abruptly sloping, almost truncate behind, hardly excavated posteriorly, reticulato-rugulose, indistinctly areated by a medial carina which bifurcates at the declivity. First abdominal segment irregularly striolated, with a short, margined petiole; tubercles not salient, antemedial.

Described from 16 females, 10 males. The synonymy above given is not at all doubtful, notwithstanding some small discrepancies in the authors cited, due to the want of sufficient examples, or to the attachment of too much importance to colours. A common, solitary parasite of fungivorous larvæ of Coleoptera. Wesmael was the first to suspect this circumstance: he received specimens from Liège found among *boleti*, and considered it probable that they came out of *Orchesia micans*, Panz., which was common in the same locality. This has since been abundantly confirmed: according to Ratzeburg many examples were reared from this beetle by Reissig, Wissmann, and Tischbein. In my collection are six specimens, the remains of a larger number, which were given to me together with an *Orchesia*, to show from what source they were bred. In Fitch's collection are 20 on a card, procured from a *boletus* on an apple-tree at

Maldon in July; Capron finds the species at Shiere, near Guildford. According to Reinhard, Sichel's collection at Paris contains a set of 10 reared from the larvæ of *Triplax russica*, L., by Lespès. The whitish cocoons of the parasites are attached to the bellies of the larvæ.

12. *Meteorus punctiventris*, Ruthe.

Meteorus punctiventris, Ruthe, Berl. ent. Zeits., 1862, p. 25, ♂ ♀.

Black; variable; clypeus, mouth, palpi, mesothorax sometimes in part, 2d abdominal segment, and legs, flavo-testaceous; hind coxæ sometimes more or less piceous; antennæ not paler at the base, only the radicle testaceous. Wings subhyaline; squamulæ testaceous; stigma fuscous, more or less determinately pale at the base; recurrent nervure falling into the extreme apex of the 1st cubital areolet, subinterstitial; 2d cubital areolet not narrowed towards the radius. Tracheal grooves distinct. First abdominal segment punctate in the middle longitudinally, rimulose at the sides. Terebra as long as the abdomen. ♂ ♀. Length ♂ $1\frac{2}{3}$ — $2\frac{1}{3}$; wings, 3—4 lin.; ♀ $1\frac{1}{2}$ — $1\frac{3}{4}$; wings, $2\frac{1}{2}$ —3 lin.

Var. *α*. ♀. Mesothoracic sutures, the space before the scutellum into which they connive, and sides of the prothorax, testaceous.

Var. *β*. ♂. Stigma fuscous, hardly paler at the base; 2d abdominal segment fuscous at the sides.

Var. *γ*. ♂ ♀. Face, orbits, and sides of the thorax obscurely rufous. Antennæ fusco-testaceous, darker towards the apex. Ruthe's two specimens.

Head black, only the clypeus and sometimes the lower part of the face, testaceous; vertical orbits in one specimen with an indistinct rufous line. Thorax either entirely black, or the sides and disk testaceous, but so that black patches remain upon the 3 mesothoracic lobes. Four posterior tarsi, and tips of the hind femora, with their tibiæ, subinfuscated. Both sexes vary considerably in size, but the smallest ♀ was bred together with the others, leaving no doubt of its identity.

Head as wide as the thorax, rounded behind the eyes; face somewhat transverse, narrowed beneath; clypeus shining, moderately convex. Antennæ ♂ 31—32-jointed, setaceous, longer than the body; of the ♀ 28—29-jointed, longer than the head and thorax, the 6 ante-apical joints as broad as long. Pleuræ shining, sparingly aciculated. Metathorax intricato-rugulose. Abdomen as long as the head and thorax, equally attenuated at both ends in

the ♀, more obtusely lanceolate in the ♂; segment 1 shaped as in *ictericus*, with a medial row of confused punctures which become striæ on each side, and are a good character for the determination of the species; segment 2 blackish on its hinder margin; the rest nigro-piceous, becoming paler towards the anus. Stigma half fuscous, half yellow, or the dark colour predominates more or less; 2d cubital areolet trapeziform. The males are larger than the females (those at least seen by me), and less disposed to exhibit testaceous markings.

Described from nine males, four females. The latter were bred by Porritt from *Scoparia angusta*, Ste. Two males in Fitch's collection were reared from *Scoparia murana*, Cur., by W. H. B. Fletcher. Bignell captured sixteen females, two males, on a plum-tree, and four other males elsewhere in South Devon. I found several specimens, all males, in the neighbourhood of Teignmouth.

13. *Meteorus jaculator*, Hal.

Meteorus jaculator, Hal., Ent. Mag., iii., 34, ♀.

M. obscurellus, Ruthe, Berl. ent. Zeits., 1862, p. 29, ♀.

Black; metathorax and abdomen sometimes piceous; mouth and clypeus testaceous; palpi pale; mandibles tipped with fuscous; antennæ and 4 posterior tarsi fuscous, the rest of the legs testaceous or pale piceous, hind tibiæ sometimes darker. Wings whitish hyaline; squamulæ pale; stigma piceous, scarcely paler at the base; nervures pale; recurrent nervure subinterstitial; 2d cubital areolet narrowed towards the radius. Tracheal grooves distinct. Terebra as long as the abdomen and metathorax. ♂ ♀. Length, $1\frac{1}{3}$; wings, $2\frac{1}{2}$ lin.

The smallest British species. Antennæ of the only ♂ 26-jointed, rather longer than the body; of the ♀ equal to $\frac{3}{4}$ of the body, 20—25-jointed, entirely piceous, the subapical joints scarcely longer than broad. Face transverse, not narrowed inferiorly, with an impression at the base of the clypeus. Pleuræ nearly smooth, the usual furrow having only a few wrinkles. Metathorax narrowed posteriorly, finely reticulato-rugulose, its hinder declivity not defined. Anterior margin of the 2d abdominal segment paler than the rest of the surface; segment 1 obconic, hardly curved, finely rimulose, its apex almost smooth; tracheal grooves minute. Wings and stigma rather large; nervures of great tenuity; cubital and anal nervures decolorous. Legs pale, with a piceous shade on the hind coxæ, tibiæ, and tarsi.

Described from six females, one male, in Fitch's collection and my own, taken near St. Albans and Leicester. Found by Haliday rarely in North Ireland; in Germany once by Ruthe. Capron has taken a ♀ at Shiere.

14. *Meteorus atrator*, Cur.

Zele atrator, Cur., B. E., 415, 1, ♀.

Meteorus atrator, Hal., Ent. Mag., iii., 32, ♀.

Perilitus similator, Nees, Mon., i., 41, ♀; Wesm.,

Nouv. Mém. Ac. Brux., 1835, p. 34, ♂ ♀.

Meteorus similator, Ruthe, Berl. ent. Zeits., 1862, p. 33, ♂ ♀.

Black; antennæ at the base, mouth, clypeus, prothorax wholly or in part, and legs, testaceous; hind legs infuscated; 2d abdominal segment rufo-testaceous or piceous. Wings hyaline or sub-infumated; squamulæ testaceous; stigma fuscous, hyaline at the base and more narrowly at the apex, or unicolorous; recurrent nervure slightly rejected, sometimes interstitial; 2d cubital areolet broad, subquadrate. Tracheal grooves distinct. Terebra as long as the abdomen and metathorax. ♂ ♀. Length, 2—2 $\frac{3}{4}$; wings, 3 $\frac{1}{2}$ —4 $\frac{3}{4}$ lin.

The English ♀ specimens correspond to the mutilated example described by Curtis and Haliday; in them the prothorax is either wholly black or only testaceous at the sides; the antennæ are piceous at the base, or testaceous only on the under side of the 2 basal joints; the 2d abdominal segment is rufo-piceous; the wings are not lacteo-hyaline as described by Ruthe; the hind coxæ are fuscous at the base, and the hind legs altogether infuscated. The ♂ (which I have not seen) is similar, according to Ruthe, but the piceous portions of the body are darker; according to Wesmael the humeral angles of the metathorax are testaceous. No doubt the species varies, and a good series is required to exhibit its changes completely. Head as wide as the thorax; palpi, mandibles, and clypeus testaceous, the last broad and depressed. Antennæ of the ♀ stout, filiform, half as long as the body, 22—27-jointed; those of the ♂ setaceous, longer than the body, 35-jointed. Metathorax short, not very convex, rugulose, with traces of a medial area and of a longitudinal carina. First abdominal segment rimulose at the sides and apex, punctato-rugulose in the middle, elongate, its apex only twice as wide as the base. Nervures of the wings very fine; cubital and anal nervures hardly visible; one ♀ in Fitch's collection wants the 2d intercubital in both fore wings.

Described from 11 females in Fitch's collection, mostly taken by him at Maldon in June and July; three marked "Huddersfield" were bred by Porritt, but it is not stated from what larva: three females sent to Bridgman by W. H. B. Fletcher were found in old birds'-nests containing several different insects.

Obs. Nees v. Esenbeck has referred to this species the *Bracon cis* of Bouché, bred from the larvæ of *Cis boleti*, Scop. (Mon., ii., 399); but the small size of the beetle renders this impossible. See *M. profligator*, Hal., sp. 26, *infra*.

15. *Meteorus albicornis*, Ruthe.

Perilitus brevipes, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 33, ♂; not of his Supplement, *lib. cit.*, 1838, p. 141, ♀.

Meteorus brevipes, Ruthe, Berl. ent. Zeits., 1862, p. 35, ♂.

M. albicornis, Ruthe, *lib. cit.*, p. 34, ♀.

Black; antennæ ♀ white tipped with fuscous; mouth and legs dull rufo-testaceous; 2d abdominal segment piceous. Wings small, especially of the ♀, infuscated, with a whitish streak under the stigma; squamulæ testaceous; nervures and stigma fuscous, the latter hyaline at the inner angle; 2d abscissa of the radius obsolete; recurrent nervure rejected; 2d cubital areolet subtriangular, much narrowed towards the radius. Metathorax gibbous, coarsely rugose. Legs stout, short. Tracheal grooves distinct. Terebra less than $\frac{1}{5}$ of the length of the abdomen. ♂ ♀. Length, 2; wings, $3\frac{3}{4}$ lin.

Head very little narrower than the thorax; vertex short; cheeks produced below the eyes; face almost twice as broad as long, carinated in the middle, punctulate; mandibles tipped with fuscous; palpi short, dull testaceous. Antennæ of the ♀ stouter than in any other species, rather shorter than the body, filiform, 32-jointed, joints 3—15 yellowish white, the following joints blackish; two basal joints piceous; those of the ♂ $\frac{1}{4}$ longer than the body, setaceous, 33—36-jointed, blackish, piceous towards the base. Thorax stout, coarsely sculptured, the præscutellar fovea longer than usual, whence the scutellum itself appears small. Sides of the prothorax and furrow of the mesopleuræ rugoso-punctate. Metathorax subelongate, gibbous, somewhat excavated behind, coarsely and irregularly reticulato-rugose. Abdomen about as long as the head and thorax, and in the middle as broad as the latter;

segment 1 forming less than $\frac{1}{2}$ of its entire length, gradually widened from the base to the apex, the latter of which is about 4 times as wide as the former, regularly and deeply striated; tracheal grooves large; segment 2 more or less piceous or testaceous anteriorly, darker behind, sometimes entirely black. Terebra shorter than in any other species, the valves slender, whitish, piceous at the base. Wings short, reaching very little beyond the abdomen; those of the ♀ are also narrow; radial areolet small; 2d abscissa of the radius nearly extinct, the 3d abscissa being connected with the 1st by a short sudden curve.

Wesmael discovered the ♂ near Brussels, and obtained seven specimens; afterwards he described what he supposed to be the ♀, in his Supplement, but this is a different species, having the terebra elongate, &c., and probably the ♀ of *brunnipes*, Ruthe. The *brevipes* of Wesmael being thus made up of two different species, I have discarded the name in favour of *albicornis*, Ruthe. Ruthe possessed 26 males of Wesmael's *brevipes* collected near Berlin; and some years afterwards detected two females near the same place, which he described as *albicornis*, hesitating to join them with *brevipes*, on account of Wesmael's mistake, though well aware of their affinity to that species. Accident threw both sexes in my way at the same time, before I had read Ruthe's monograph; of their identity I never had any doubt, and the question may be regarded as settled.

Described from one female, six males, in the collections of Fitch, Bignell, and in my own. Two males are from Devonshire; the rest, with the female, I found near St. Albans.

16. *Meteorus abdominator*, Nees. (Pl. V., fig. 9).

Bracon abdominator, Nees, Mag. Ges. Berl., 1811, p. 24, ♀.

Perilitus abdominator, Nees, Mon., i., 115, ♀; Wesm., Nouv. Mém. Ac. Brux., 1835, p. 47, pl. i., f. 5 (wing), ♂ ♀.

Meteorus abdominator, Hal., Ent. Mag., iii., 27; Ruthe, Berl. ent. Zeits., 1862, p. 38, ♂ ♀; S. v. Voll., Pinac., pl. xlv., f. 5, ♂.

Black; palpi pale fuscous; basal half of the flagellum in the ♀ sometimes, mandibles, 2d abdominal segment, and legs, more or less clear rufous; hind femora and tibiæ black at the apex. Wings

infumated, with a whitish streak under the stigma; squamulae rufous; nervures stout, fuscous, rufo-testaceous at the base of the wing; stigma fuscous, its inner angle rufous; recurrent nervure rejected; 2d cubital areolet narrowed towards the radius; 2d abscissa of the radius distinct. Metathorax convex, coarsely rugose. Tracheal grooves distinct. Legs stout. Terebra longer than $\frac{1}{2}$ the abdomen. ♂ ♀. Length, 2—2 $\frac{3}{4}$; wings, 3 $\frac{1}{4}$ —4 $\frac{1}{2}$ lin.

Head as broad as the thorax; face almost twice as wide as long, not narrower below, not carinated, punctulate; above the clypeus is a shining oval protuberance; mandibles tipped with fuscous. Antennae ♀ $\frac{2}{3}$ of the length of the body, filiform, 22—25-jointed; of the ♂ longer than the body, setaceous, 28—32-jointed, not paler at the base of the flagellum. Thorax less robust than in the last species, coarsely sculptured, the præscutellar fovea large and deep, bisected by a carina. Sides of the prothorax gibbous, rugose, as is also the furrow of the mesopleuræ. Metathorax not elongate, regularly convex, somewhat excavated behind, coarsely and irregularly reticulato-rugose. Abdomen as long as the head and thorax, more attenuated behind than in *albicornis*, segment 2 more brightly rufous; segment 1 about $\frac{1}{4}$ of the whole length of the abdomen, widened suddenly at the tubercles and thence more gradually to the apex, which is about 4 times wider than the base, striolated; tracheal grooves elongate, conspicuous; segment 2 seldom entirely black, rufous at least anteriorly, even in the ♂; segment 3 also sometimes rufescent at the base. Terebra exceeding $\frac{1}{2}$ or $\frac{2}{3}$ of the abdomen; the valves black. The infumated wings are rather narrow in both sexes, and reach but little beyond the anus; 2d cubital narrowed towards the radius, but not so much as to destroy the 2d abscissa. Hind tarsi entirely, the others at the apex, fuscous.

Described from ten females, three males. Common. Taken at Maldon by Fitch; by Thurless near Norwich; by Capron near Guildford; by me in Birch Wood, near St. Albans, Abergavenny, Teignmouth, &c. According to Haliday frequent in Ireland.

17. *Meteorus micropterus*, Hal.

Meteorus micropterus, Hal., Ent. Mag., iii., 27, ♂ ♀.

Head, thorax, 1st abdominal segment, and hind coxæ, black; mouth, antennæ, legs, and the rest of the abdomen, piceous; or the abdomen black with only segment 2 piceous; ♂ often entirely black, with piceous legs. Wings narrow, hardly longer

than the abdomen, infumated, with a whitish streak beneath the fuscous stigma; squamulæ and nervures piceous; recurrent nervure rejected; 2d cubital areolet narrowed towards the radius, of which the 2d abscissa is as long as the 1st. Tracheal grooves obsolete. Terebra longer than $\frac{1}{2}$ the abdomen. ♂ ♀. Length, $1\frac{1}{2}$ — $2\frac{1}{2}$; wings, $2\frac{1}{3}$ —4 lin.

Head broader than the thorax; face gibbous; eyes small; palpi short. Antennæ ♀ as long as the head and thorax, stout, submoniliform, piceous or subferruginous, darker at the apex, 23—25-jointed; those of the ♂ similar but 24—27-jointed, not much shorter than the body. Thorax subcompressed. Metathorax finely reticulato-rugose. First abdominal segment narrow, curved, with medial tubercles, behind which it is very slightly dilated to the apex, which is rather more than 3 times wider than the petiole; almost smooth, or sparingly exarated; the rest of the abdomen, or only the 2d segment, piceous or subferruginous; belly compressed, truncated behind. The wings of the ♂ are less narrowed and abbreviated than those of the ♀, which are probably too small for flight.

The species is nearly akin to *brunnipes*, Ruthe, also short-winged, but differing in the possession of distinct tracheal grooves, slender legs, &c.; the same characters distinguish the preceding species from *micropterus*, but the two are nearly allied.

Described from two females, four males. Fitch has taken the ♀ at Maldon. The rest are from the Yorkshire moors near Scarborough. The species has not been noticed on the Continent.

18. *Meteorus pulchricornis*, Wesm.

Perilitus pulchricornis, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 42, ♂ ♀.

Meteorus pulchricornis, Ruthe, Berl. ent. Zeits., 1862, p. 40, ♀.

Rufo-testaceous, variable; face, prothorax, and legs flavo-testaceous; femora and tibiæ rufescent, in the hind pair tipped with black; antennæ after the 2d joint testaceous, becoming gradually darker towards the apex; disk of the metathorax, 1st abdominal segment always, 3d and 4th generally, black. Wings hyaline; squamulæ rufo-testaceous; stigma fuscous, with a pale anterior margin; nervures pale fuscous, testaceous at the base; recurrent nervure subinterstitial; 2d cubital areolet slightly narrowed towards

the radius. Thorax broad, robust; metathorax as wide as the mesothorax. First abdominal segment much dilated posteriorly. Tracheal grooves distinct. Hind coxæ punctulato-rugulose. Terebra about equal to $\frac{2}{3}$ of the abdomen. ♂ ♀. Length, $2-2\frac{3}{4}$; wings, $3\frac{1}{4}-4\frac{3}{4}$ lin.

Var. *a*. Posterior segments of the abdomen rufous or testaceous, with or without a black common patch on the disk. ♂ ♀. Common.

Var. *β*. Entirely black above except the face, orbits, scutellum, and 2d abdominal segment; this last is nearly filled up by a transverse fuscous fascia. Two males.

Var. *γ*. Like the last, but the sutures and central space of the mesothorax are rufous. One male.

Var. *δ*. Occiput black; mesothorax rufous with black sutures; metathorax rufous at the sides. One male.

Var. *ε*. Metathorax and tips of the hind femora slightly infuscated; abdomen rufo-testaceous, 2d segment flavo-testaceous. Wesmael.

Head narrower than the large gibbous thorax; face subquadrate, somewhat rugulose transversely. Mandibles and palpi flavo-testaceous. Antennæ ♂ ♀ filiform, 29—31-jointed; in the ♀ as long as the body, testaceous nearly to the middle, each joint annulated with fuscous, thence to the apex gradually darkened; in the ♂ longer than the body, the flagellum to a greater extent, or entirely, fuscous. Mesothoracic lobes prominent, forming (as seen from above) with the scutellum, 4 equidistant shining tuberosities; præscutellar fovea crenate. Furrow of the mesopleuræ broad, shallow, rugoso-punctate. Metathorax broader than usual, convex, densely reticulato-rugose, abruptly sloping behind, and there excavated. Abdomen as long as the head and thorax, and at its widest part somewhat narrower than the latter; segment 1 forming more than $\frac{2}{3}$ of its entire length; tubercles post-medial; regularly striated; petiole dilated at the extreme base, and often rufous; it begins to dilate again before the tubercles, and is gradually widened to the apex, which is about 4 times wider than the base; tracheal grooves large and deep. Stigma dark brown, margined with pale colour on its costal edge, and with its two angles paler; but the border is sometimes confused more or less with the fuscous disk. Ground colour of coxæ and legs flavo-testaceous; femora and tibiæ rufescent in the middle; tarsi pale; claws fuscous.

Described from 18 females, 24 males. A common species, and singularly omitted by Haliday, unless perhaps it is included in some of his varieties of *pendulator*

(Ent. Mag., iii., 29), especially vars. ϵ , ζ , from the banks of the Shannon. The specimens used by me, 42 in number, are mostly in Fitch's and Bignell's collections, and many of them have been bred. Bignell has obtained them from *Agrotis agathina*, Dup., several out of the same larva; from *Agrotis strigula*, Thunb., May 10th; *Tæniocampa stabilis*, View.; *Hibernia leucophæria*, Schiff.; *Anisopteryx æscularia*, Schiff.; *Cheimatobia brumata*, L.; *Oporabia dilutata*, Bork.; and *Harpella Geoffroyella*, L. Bridgman reared one from *Scoparia truncicolella*, Staint.; and three came from a geometrical larva in my keeping, the name of which I did not ascertain; one of the cocoons thus obtained produced the hyperparasite *Mesochorus confusus*, Holmgr. It appears that two, three, or four of these *Meteori* infest the same caterpillar, if it be large enough; in other cases they are solitary. Cocoon like that of *ictericus* (sp. 6), pensile, greyish brown and glistening, as if varnished.

19. *Meteorus melanostictus*, Capron, MS., n. s.

Nigro-piceus; prothoracis latera cum capite *feminæ* rufo-testacea, stemmatico, occipite, nigricantibus; *maris* caput nigro-piceum; orbitæ plus minus, prothoracis latera cum pectore toto, nonnunquam etiam cum scutelli apice, rufo-testacea. Pedes testacei, tibiis posticis apice et ante basin fuscis, basi ipsa exalbida, tarsis fuscis. Alæ subhyalinæ; squamulæ testaceæ; stigma unicolor cum nervis nigro-piceum; nervus recurrens *feminæ* plane evector, *maris* plerumque interstitialis, rarius paulo evector; areola cubitalis 2da radius versus non angustata. Metathorax convexus, medio carinatus, postice excavatus, intricato-rugosus. Abdominis segmentum 1mum striolatum, apice triplo latius quam basi, tuberculis mediis, fossulis spiracularibus conspicuis. Terebra abdominis dimidio brevior.

Nigro-piceous; head and sides of prothorax in the ♀ rufo-testaceous, stemmaticum and occiput piceous; head of the ♂ nigro-piceous, the orbits more or less, sides of prothorax, pectus, and sometimes apex of scutellum, rufo-testaceous; legs testaceous; hind tibiæ fuscous at the apex and faintly before the base, which is whitish; tarsi fuscous. Wings subhyaline; squamulæ testaceous; stigma unicolorous, and, with the nervures, nigro-piceous; recurrent nervure of the ♀ distinctly evector, of the ♂ interstitial, in one example only evector; 2d cubital areolet not narrowed towards the radius. Metathorax convex, carinated in the middle, excavated

posteriorly, intricato-rugose. First abdominal segment striolated, 3 times wider at the apex than at the base; tubercles medial; tracheal grooves distinct. Terebra shorter than $\frac{1}{2}$ the abdomen. ♂ ♀. Length, $2\frac{1}{2}$; wings, 5 lin.

Head transverse, slightly contracted behind the eyes. Antennæ nearly filiform in both sexes; in the ♂ longer than the body, 34—35-jointed; in the ♀ about as long as the body, 25—28-jointed, the two basal joints testaceous. Palpi pale. The whole under side of the thorax is testaceous, except the pectus of my ♀ specimen; this character, as well as the rufous scutellum of one example, and the general structure of all, brings the species very near to *scutellator* (sp. 20); the differences, however, are obvious; in *melano-stictus* the stigma is uniformly blackish; the recurrent nervure in Capron's specimens of the ♀, and in one of my males, is distinctly everted; in the other males it is interstitial, as in *scutellator*. The direction of the recurrent nervure is not constant in the different species, and causes a difficulty in determining their limits; but it is at most only a secondary character.

Described from three females, five males. The description of the ♀ was communicated by Capron, to which I have added what relates to the other sex. The females were taken at Shiere, the males at Nunton, but there is no doubt that they belong to the same species, and that the species is new.

20. *Meteorus scutellator*, Nees.

Perilitus scutellator, Nees, Mon., i., 38; Wesm., Nouv. Mém. Ac. Brux., 1835, p. 39, ♂ ♀.

Meteorus scutellator, Ruthe, Berl. ent. Zeits., 1862, p. 41, ♂ ♀; S. v. Voll., Pinac., pl. xlv., f. 8, ♀.

Black; palpi pale; face, clypeus, mandibles, antennæ at the base beneath, more broadly in the ♀, orbits of the eyes sometimes, pleuræ, pectus, scutellum and 2d abdominal segment, rufo-testaceous; mesopleuræ sometimes blackish in front; hind tibiæ and tarsi more or less infuscated at the apex. Wings hyaline; squamulæ and stigma yellow; nervures flavo-fuscous; recurrent nervure interstitial; 2d cubital areolet scarcely narrowed towards the radius. Tracheal grooves small, distinct. Terebra as long as $\frac{2}{3}$ of the abdomen. ♂ ♀. Length, $2-2\frac{3}{4}$; wings, $4\frac{1}{2}-6$ lin.

Var. Rufous; metathorax black; 1st abdominal segment piceous towards the apex; stigma rufo-fulvous. One male in Fitch's collection.

Somewhat variable. Prothorax usually testaceous, the neck blackish, seldom entirely pale; sometimes black at the sides, and margined above with rufous. Disk of the mesothorax from black passing into piceous and testaceous; scutellum, pleuræ, and pectus rufo-testaceous. Metathorax black, but with a more or less rufous triangular patch above the hind coxæ, sometimes overspreading the whole disk except the middle. Segment 2 paler than the pleuræ; the following segments seldom concolorous, usually more or less blackened, especially in the ♂. Belly rufo-testaceous or piceous, in various shades. Head rather narrower than the thorax; face flat, quadrate; clypeus convex. Antennæ ♀ as long as the body, subsetaceous, 33—35-jointed; of the ♂ much longer, also subsetaceous, 35-jointed; entirely fuscous, or the 2 basal joints in the ♂ and more in the ♀ are testaceous underneath. Furrow of the mesopleuræ shining, smooth, finely crenulate at the base. Metathorax not very convex, finely reticulato-rugose, with a medial carina. First abdominal segment regularly striolated, more than $\frac{1}{3}$ of the abdomen in length, gradually widened from the post-medial tubercles to the apex, which is 3 times broader than the base; tracheal grooves comparatively minute. The stigma is sometimes infuscated on its inner margin, and rarely altogether of a darker colour; the recurrent nervure is usually interstitial, but sometimes deviates slightly to one side or the other.

Described from seven females, four males. Common. In Fitch's collection are a ♂ ♀ bred by him and Bignell from *Tæniocampa stabilis*, View. Bignell and Hellins bred it from *Scopelosoma satellitia*, L.; and Bignell others from *Noctua triangulum*, Hufn., *Calymnia trapezina*, L., and *Ocneria dispar*, L.; the last-mentioned larva was from Switzerland. Cocoon pensile, exactly like that of *pulchricornis* and *ictericus*, only larger.

21. *Meteorus unicolor*, Wesm. (Pl. V., fig. 10).

Perilitus unicolor, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 41, ♂ ♀; not of Ratz., i., 76, ii., 56.

Meteorus unicolor, Ruthe, Berl. ent. Zeits., 1862, p. 43, ♂ ♀.

Testaceous with hardly a rufous tinge; antennæ fuscous beyond the middle, and all the articulations ringed with the same colour; 1st abdominal segment piceous, paler at the base; tarsi pale; claws fuscous. Wings hyaline, squamulæ, stigma, and nervures at the base yellow, the rest of the neuration fuscescent; recurrent nervure interstitial; 2d cubital areolet subquadrate, not narrowed

towards the radius. Tracheal grooves distinct. Terebra equal to $\frac{1}{2}$ or $\frac{1}{2}$ of the abdomen. ♂ ♀. Length, $2\frac{1}{2}$; wings, 5 lin.

Apart from the colour there is little to distinguish this from the last species. It is, however, somewhat smaller, the antennæ are longer, and their basal half is always pale; those of the ♀ are 32—34-jointed; those of the ♂ 29- (in one British example), in that adduced by Ruthe 33-jointed. Metathorax regularly rounded, reticulato-rugulose, with or without a medial carina. First segment forming nearly $\frac{1}{2}$ of the entire length of the abdomen, regularly striolated.

Described from one male, five females, in the collections of Fitch and Bignell; the former has taken the ♀ at Maldon; the latter bred the ♂, June 28th, from *Tethea retusa*, L., and the remaining females also in June from *Orthosia lota*, Clerck.

22. *Meteorus consors*, Ruthe.

Meteorus consors, Ruthe, Berl. ent. Zeits., 1862, p. 44, ♀.

Rufo-testaceous, face and legs paler; vertex, occiput, 3 bands on the lobes of the mesothorax, metathorax, pectus, and 1st abdominal segment blackish; antennæ except the base, hind femora and tibiæ at the tips, with their tarsi, fuscous. Wings hyaline; squamulæ testaceous; nervures fuscous; stigma flavo-testaceous, its outer lower half indeterminately fuscous; recurrent nervure interstitial or subinterstitial; 2d cubital areolet hardly narrowed towards the radius. Tracheal grooves distinct. Terebra as long as the abdomen. ♀. Length, $2\frac{1}{4}$; wings, $4\frac{1}{4}$ lin.

Head a little narrower than the thorax, black above and on the occiput; face and mouth rufo-testaceous; palpi whitish. Antennæ nearly as long as the body, filiform, 31—34-jointed, fuscous, paler beneath, joints 1—2 dull testaceous. Ground colour of the thorax testaceous; according to Ruthe only the metathorax and post-scutellum, occasionally also the middle lobe of the mesothorax, are infuscated; but in British examples the 3 mesothoracic lobes, pleuræ, and pectus are often blackish. Metathorax somewhat elongate, reticulato-rugulose, slightly excavated behind. Abdomen slender, at its broadest part narrower than the thorax; segment 1 a little shorter than all the rest taken together, black, rimulose, with a short petiole and inconspicuous tubercles, behind which it is insensibly dilated to the apex, this last being 3 times wider than the petiole; the remaining segments are either wholly testaceous

or slightly infuscated at the sutures. Between the tracheal grooves is an elevated ridge. Hind coxæ, femora, and tibiæ sometimes rufescent.

Described from seven females. In Fitch's collection are several specimens bred from *Bryotropha domestica*, Haw.; and I have captured two others, one at St. Albans, and the other at Nunton, Wilts.

23. *Meteorus versicolor*, Wesm.

Perilitus versicolor, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 43, ♂ ♀.

Meteorus versicolor, Ruthe, Berl. ent. Zeits., 1862, p. 45, ♂ ♀; S. v. Voll., Pinac., pl. xlv., f. 6, ♀.

Perilitus bimaculatus, Wesm., *lib. cit.*, p. 45, ♀;

Meteorus bimaculatus, Ruthe, *lib. cit.*, p. 47, ♀.

Variable. Rufous; metathorax and abdomen black; petiole and 1st abdominal suture whitish; base of antennæ, face, mouth, prothorax, humeral angles of the mesothorax, a variable patch on segments 2—3 in the ♂, anus, and legs flavo-testaceous; hind coxæ, with their femora and tibiæ, more or less blackish, these femora and tibiæ whitish at the base. Wings hyaline, squamulæ testaceous, stigma yellow or fuscous, nervures fuscous; recurrent nervure interstitial, sometimes slightly rejected; 2d cubital areolet subquadrate, not narrowed towards the radius. Tracheal grooves obsolete. Terebra about $\frac{1}{2}$ as long as the abdomen. ♂ ♀. Length, 2—2 $\frac{1}{2}$; wings, 4—5 lin.

The typical form may be known by the jet-black abdomen, spotted with yellowish white, the whitish petiole, and the absence of the tracheal grooves; also by the white 1st abdominal suture of the ♀.

Var. *a*. ♂. Head and thorax rufous; metathorax black above; hind coxæ rufous; legs flavo-testaceous. Abdomen with a whitish petiole; hind margin of segment 1, 2 triangular transverse fascia on segments 2—3, united by a longitudinal stripe in the middle, yellowish white. In Wesmael's collection.

Var. *β*. ♀. Head black; mesothorax and scutellum rufous; abdomen black, except the petiole and the 1st suture, which are yellowish white. Hind coxæ, femora, and tibiæ black, the last broadly white at the base, the femora more narrowly. Bred by Bignell.

Var. *γ*. ♀. Rufo-testaceous; metathorax more or less infuscated; 1st abdominal segment with a whitish petiole, and marked before the apex with 2 blackish confluent spots; hind femora and tibiæ

tipped with fuscous; recurrent nervure subinterstitial. *M. bimaculatus*, Wesm.

Var. δ . φ . First abdominal segment not whitish at the base; hind femora and coxæ rufous. Taken by Capron.

The typical form has the head rufo-testaceous; face yellowish; antennæ fuscous, testaceous towards the base; palpi whitish; thorax rufo-testaceous, sides of the prothorax paler; metathorax rufous, more or less black above, or entirely black; 1st abdominal segment whitish nearly to the tubercles, afterwards jet-black with a white hind margin; 2d segment either yellow, with 2 lateral black spots varying in size in the δ ; or in the φ entirely black from the coalescence of the spots, which leave only the fore margin narrowly yellow; segment 3 (connate with 2) black in the φ , or only the suturiform articulation is pale; the following segments are entirely black, or the apex of the abdomen, with the belly, more or less testaceous. Stigma pale, or the inner margin brown, and that colour more or less diffused over the disk. Legs either wholly testaceous, or the femora and tibiæ of the hind pair blackened, except at the base; hind coxæ fuscous at the base.

Head narrower than the thorax; face flat, quadrate; eyes and ocelli prominent; cheeks narrow. Antennæ setaceous, as long as the body, and nearly equal in both sexes, 29—30-jointed in the φ , 32-jointed in the δ . Metathorax short, reticulato-rugulose, the posterior declivity in the φ distinct and margined above; less conspicuous in the δ ; somewhat excavated behind. Abdomen hardly longer than the head and thorax, at its broadest part not narrower than the latter; segment 1 occupying almost $\frac{1}{2}$ of the entire length, curved at the end of the petiole, which is smooth; from thence gradually dilated to the apex, and striolated; the apex less than 4 times wider than the base. Tracheal grooves none. Terebra about $\frac{1}{2}$ as long as the abdomen; Wesmael, according to his usual practice, makes it longer, and equal to the whole abdomen.

Described from a pair, of which the φ is British; the δ is preserved in one of Wesmael's boxes sent to me from Brussels, and containing all the Braconids of the Musée Royal, except Wesmael's types. In the same boxes are several specimens of *M. bimaculatus*, Wesm.; and I find three more in the Hungarian collection of Dr. Cornelius Chyzer: one of these has the metathorax infuscated; their cocoons are paler than those of the typically coloured examples. Capron has twice taken the φ at Shiere; Bignell bred the same sex from *Geometra papilionaria*, L. Reinhard, in a note appended

to Ruthe's description (*lib. cit.*, p. 46), records the rearing by himself in two successive years of about 100 of *M. versicolor* from the larvæ of *Larva L-nigrum*, Müll. About a fifth part of them had the recurrent nervure rejected, as in Bignell's specimen, but not in Wesmael's. The second generation was not so highly coloured as the first, corresponding to Ruthe's description rather than to that of Wesmael. The latter writer mentions that in June, 1831, he found two caterpillars of *Asteroscopus sphinx*, Hufn., on a lime-tree near Charleroi, which produced a number of these parasites. They made oval brown cocoons about 2 lines long, irregularly heaped together, and connected by threads of silk. In this case the cocoons were evidently not suspended by a thread; but that of Bignell's specimen, produced singly, is pensile, resembling the cocoons of *ictericus*, except in being of a darker colour. Van Vollenhoven mentions the capture of this species near the Hague, and Leyden; he has figured one of the specimens. Ruthe possessed four males, two females, from the neighbourhood of Berlin.

24. *Meteorus filator*, Hal.

Meteorus filator, Hal., Ent. Mag., iii., 32, ♂ ♀.

Perilitus laticeps, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 47, ♀.

Meteorus laticeps, Ruthe, Berl. ent. Zeits., 1862, p. 49, ♀.

Black; palpi whitish; face, clypeus, mandibles, and sides of the prothorax partly, dull testaceous; legs, and (in the ♀) the base of the antennæ, rufo-testaceous; hind femora and tibiæ sometimes infuscated. Wings hyaline; squamulæ testaceous; nervures fuscous; stigma fuscous, its inner angle paler; recurrent nervure subrejected; 2d cubital areolet not narrowed towards the radius. First abdominal segment elongate, with a linear, slender petiole; reticulato-rugulose, with arcuate striæ on each side of the suddenly dilated condylus; tracheal grooves obsolete. Terebra curved, as long as the abdomen. ♂ ♀. Length, $2\frac{1}{4}$ — $2\frac{1}{2}$; wings, 4 — $4\frac{3}{4}$ lin.

Distinguished from the other black species by the elongate petiole, and absence of the tracheal grooves; also, in the female sex, by the short antennæ. Head large, broader than the thorax; eyes large, prominent; ocelli small; face subquadrate, not carinated, sparingly punctured. Antennæ of the ♀ scarcely longer than the

head and thorax, stout, filiform, 23—24-jointed, testaceous, the apical fourth part, or more, fuscous; 8 ante-apical joints subquadrate; those of the ♂ setaceous, longer than the body, 28—31-jointed, entirely fuscous, or with the extreme base pale. Prothorax above and on the sides sometimes more or less rufescent. Metathorax rather short, obliquely subtruncate behind, finely and irregularly rugulose, indistinctly divided into 2 discal areas by 3 carinae. First abdominal segment almost as long as the rest taken together; tubercles not salient; petiole and condylus reticulato-rugulose, the latter towards the apex with some additional lateral curved striae. Segment 2 sometimes piceous at the base. Valves of the terebra brown, darker at the apex. Hind coxae sometimes infuscated at the base; their femora and tibiae at the apex, with the tarsi, slightly infuscated. Recurrent nervure inserted into the extreme apex of the 1st cubital areolet.

Described from one female, four males. Not uncommon. Taken by Bignell in Devonshire; by me in South Wales and Wiltshire. Wesmael possessed only one ♀, and Ruthe two. According to Haliday the ♀ occurs amongst fungi in autumn; it probably has the same habits as *obfuscatus*, Nees (sp. 11). Common at Shiere, near Guildford: "I have taken," says Capron, *in litt.*, "many females of this species by shaking pieces of *Polyporus versicolor*. They were in a semi-torpid condition, and fell from the fungus with their legs doubled up, and feigned death; the males were abundant in the autumn by sweeping."

25. *Meteorus delator*, Hal.

Meteorus delator, Hal., Ent. Mag., iii., 33, ♀.

"Black, shining; mouth, antennae at the base beneath, and legs, ferruginous, the posterior infuscated; segment 1 obconic, elongate and attenuated at the base; stigma fuscous with a pale spot; terebra as long as the abdomen. ♀. Length, $1\frac{1}{2}$; wings, $2\frac{2}{3}$ lin.

"Very like *filator*, but readily distinguished by the form of the petiole, which is shorter than that of *cinctellus* (sp. 27), and sculptured as in the preceding species; segment 2 piceous; posterior legs fuscous, the base of the articulations paler; antennae slender, 23-jointed, obscurely ferruginous at the base beneath.

"Inhabits with the preceding, but is much rarer." Haliday.

26. *Meteorus profligator*, Hal.

Meteorus profligator, Hal., Ent. Mag., iii., 33, ♀.

Bracon cis, Bouché, Naturg. (1834), p. 149.

Black; abdominal segment 2, or all after the 1st, nigro-piceous; antennæ fuscous, their base and the legs testaceous. Wings hyaline; squamulæ testaceous; nervures fuscous; stigma fuscous, its inner angle broadly and indeterminately pale; recurrent nervure slightly rejected; 2d cubital areolet not narrowed towards the radius. First abdominal segment short; the rest of the abdomen ovate, as broad as the thorax. Tracheal grooves obsolete. Terebra nearly as long as the abdomen. ♀. Length, $1\frac{1}{4}$; wings, $2\frac{1}{2}$ lin.

Head large, wider than the thorax; palpi pale. Antennæ filiform, shorter than the body, 20—21-jointed, the last 8 joints subquadrate. Metathorax short, reticulato-rugulose. First abdominal segment with a broad, short petiole, tubercles and tracheal grooves obsolete; insensibly dilated nearly from the base to the apex, which is 4 times broader than the petiole, irregularly rugulose; extreme base of the petiole subdilated and pale.

Haliday's descriptions of *delator*, *vexator*, *profligator*, and *jaculator* are incomplete, and it is necessary to possess them all, in order to determine any one with certainty. The present species he compares with *delator*, of which no specimens are now known. It is said to be nearly akin to *delator* but smaller, with a shorter prothorax and metathorax; 1st abdominal segment coarctate near the base, not linear; *delator* has 23-jointed antennæ; the specimens before me have them 21-jointed, and are therefore most probably *profligator*.

Bignell bred eight or nine females from *Cis boleti*, Scop., in *Polyporus versicolor*. Hence it may be inferred with something like certainty that this is the *Bracon cis* of Bouché, reared from the same beetle, and not *M. atrator*, as conjectured by Nees v. Esenbeck, which is much too large an insect (see sp. 14). According to Bouché the parasitic maggot is oblong, rugose, white, with a rounded head, and the parts of the mouth blackish. Capron has taken a ♀ at Shiere.

27. *Meteorus cinctellus*, Nees.

Bracon cinctellus, Nees, Mag. Ges. Berl., 1811, p. 23, ♀; not of Spinola.

Perilitus cinctellus, Nees, Mon., i., 40, ♂ ♀; Wesm., Nouv. Mém. Ac. Brux., 1835, p. 50, ♀.

Meteorus cinctellus, Hal., Ent. Mag., iii., 31, ♀; Ruthe, Berl. ent. Zeits., 1862, p. 50, ♀.

Black; face, mouth, orbits, disk of the mesothorax partly, 2d abdominal segment, and legs testaceous; hind femora and tibiæ fuscous at the apex; antennæ fuscous, those of the ♀ broadly testaceous in the middle. Wings of the ♂ subinfuscated, of the ♀ more hyaline; squamulæ testaceous; nervures fuscous; stigma fuscous, its base more or less pale; recurrent nervure everted, but sometimes interstitial; 2d cubital areolet slightly narrowed towards the radius. Tracheal grooves obsolete. Terebra about $\frac{2}{3}$ of the abdomen. ♂ ♀. Length, 2—2 $\frac{1}{4}$; wings, 3 $\frac{1}{2}$ —4 lin.

Var. ♀. Length, 1 $\frac{1}{2}$ lin. Hind coxæ almost entirely black; 2d abdominal segment and antennæ obscurely testaceous. Ruthe.

Head narrower than the thorax, rufo-testaceous; front and vertex in the middle, as well as the occiput, black, leaving the orbits rufous, most broadly upon the vertex; eyes large; face narrow; clypeus prominent; palpi whitish at the tips. Antennæ of the ♀ filiform, flagellum testaceous for about half its length, thence gradually darkened to the apex, $\frac{1}{4}$ shorter than the body, 25—27-jointed; those of the ♂ setaceous, fuscous, the scape paler, much longer than the body, 28—30-jointed. Thorax black, but the disk of the mesothorax in the sutures and the medial space usually more or less rufescent; pleuræ and scutellum sometimes also rufescent. Metathorax subelongate, obliquely descending behind, thickly and finely rugulose. Abdomen of the ♀ somewhat longer than the head and thorax, of the ♂ shorter; segment 1 hardly equal to $\frac{2}{3}$ of its length, of which the petiole makes $\frac{1}{3}$, and is smooth and shining; condylus rimulose, dilated from the inconspicuous tubercles to the apex, which is about 3 times the width of the petiole; segment 2 flavo-testaceous on its anterior or posterior half, or on both; remaining segments black, or the posterior more or less flavo-piceous. Wings of the ♂ slightly coloured, yet enough to show sometimes a whitish streak beneath the stigma; those of the ♀ nearly hyaline. In the British specimens which I have seen the recurrent nervure is uniformly everted, but according to Ruthe it is often interstitial. Hind coxæ at the base, hind femora and tibiæ at the apex, often broadly fuscous. The ♂ strongly resembles that of *punctiventris* (sp. 12), especially when the rufous colour of

the orbits is deficient; but the presence of the tracheal grooves on the 1st segment will distinguish *punctiventris*.

Perilitus cinctellus, Bouché (Naturg., 1884, p. 149) is inadequately described, but Nees refers it to this species, with what degree of certainty I know not. Bouché's insect is a parasite of *Tortrix viridana*, L., and makes a "snow-white" cocoon: it was known to Ratzeburg, like all Bouché's insects, but he is silent as to its identity with the *cinctellus* of Nees.

Described from two males, four females, captured in Devonshire and South Wales. Not common: found by Haliday in North Ireland, and, besides the authors above cited, mentioned by Van Vollenhoven as taken at Middelburg. Capron has captured two females at Shiere.

28. *Meteorus tenellus*, n. s.

Niger, facie, ore, genis, verticis macula orbitali utrinque, antennarum basi subtus, pedibusque, rufo-testaceis; abdominis cingulo medio anoque flavidis. Alæ hyalinæ squamulis testaceis, nervis cum stigmate fuscis, hujus basi indeterminate pallida; nervo recurrente vix evecto; areola cubitali 2da radium versus parum angustata. Fossulæ tracheales nullæ. Abdominis segmentum 1mum petiolo elongato tereti lævigato, condylo rimuloso. Terebra abdominis dimidii longitudine.

Black; face, mouth, cheeks, an orbital spot on each side of the vertex, antennæ at the base beneath, and legs, rufo-testaceous; a medial fascia on the abdomen, and the anus, yellow. Wings hyaline; squamulæ testaceous; nervures and stigma fuscous; the base of the latter indeterminately pale; recurrent nervure hardly everted; 2d cubital areolet very slightly narrowed towards the radius. Tracheal grooves obsolete. Petiole of the 1st abdominal segment elongate, smooth, cylindrical; condylus rimulose. Terebra as long as $\frac{1}{2}$ the abdomen. ♀. Length. $1\frac{1}{2}$; wings, $2\frac{3}{4}$ lin.

Head somewhat narrower than the thorax, rufo-testaceous; front, vertex, and occiput black, leaving two large orbital spots and the cheeks broadly, rufous. Face subquadrate; eyes not approximating in front; clypeus smooth, prominent; palpi testaceous. Antennæ filiform, very little shorter than the body, blackish, rufescent at the base and beneath, 27-jointed, the ante-apical joints longer than broad. Thorax black, except sometimes a rufous patch on the mesopleuræ. Metathorax subelongate, thickly and finely rugulose, not carinated, nor excavated behind. Abdomen not

longer than the head and thorax; segment 1 forming $\frac{2}{3}$ of its length, black; petiole equal to half the segment, subcylindrical, smooth, slender; condylus gradually dilated to the apex and finely rimulose; segment 2, and sometimes the base of 3, yellow; the rest black, or those near the apex coloured like the 2d. Wings short, hardly extending beyond the apex of the abdomen. Legs uniformly testaceous, or the hind coxæ rufescent; tarsi fuscous.

This species will only compare with *cinctellus*, Ns., and from that it is easily distinguished. Described from six females bred by Bignell singly from *Peronea hastiana*, L. Cocoons not preserved.

29. *Meteorus leviventris*, Wesm.

Perilitus leviventris, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 46, ♀.

Meteorus leviventris, Ruthe, Berl. ent. Zeits., 1862, p. 52, ♀.

M. medianus, Ruthe, *lib. cit.*, p. 53, ♂ ♀.

Perilitus rubens, var. β , Nees, Mon., i., 36.

Meteorus rubens, var. γ , Hal., Ent. Mag., iii., 30, ♂ ♀.

Variable; black; mouth, face, orbits, antennæ beneath and at the base, sides of the prothorax, mesothorax in the middle of the disk, scutellum, and legs, dull rufo-testaceous; hind coxæ and 2d abdominal segment piceous. Wings hyaline; squamulæ testaceous; nervures fuscous; stigma luteous; recurrent nervure interstitial or slightly rejected; 2d cubital areolet somewhat narrowed towards the radius; radial areolet sublanceolate, not reaching the extremity of the wing. First abdominal segment more or less rimulose or lævigated. Tracheal grooves obsolete. Terebra $\frac{1}{2}$ as long as the abdomen. ♂ ♀. Length, $1\frac{3}{4}$ — $2\frac{1}{4}$; wings, $3\frac{3}{4}$ — $4\frac{3}{4}$ lin.

Var. Front, stemmaticum, middle of the vertex, occiput, 3 patches on the mesothoracic lobes, metathorax, and abdomen, except the piceous 2d segment, black; the rest rufo-testaceous; legs pale testaceous. ♂ ♀. *M. medianus*, Ruthe.

Head somewhat narrower than the thorax; face transverse, flat, not narrowed below, subrugulose in the middle. Palpi pale. Antennæ of the ♀ $\frac{1}{4}$ shorter than the body, fuscous, more or less reddish beneath and towards the base, filiform, 26-jointed; those of the ♂ longer than the body, setaceous, 28-jointed. Metathorax short, semiglobose, reticulato-rugulose, hardly excavated behind. Abdomen in the ♀ as long as the head and thorax, in the ♂ shorter and narrower; segment 1 about $\frac{3}{4}$ of its entire length, with a short

petiole and medial tubercles; usually rimulose except at the base, but often lævigated in different degrees, especially on the condylus; I have specimens in which this segment is almost smooth; they differ in no other respect from the rest, some are intermediate, and it appears to me that *leviventris*, Wesm., and *medianus*, Ruthe, are the same species. Ruthe remarks that the examination of a long series of specimens would very likely show that the next species, *M. rubens*, should also be united with these two. Another allied species is *M. obsoletus*, Wesm. (*lib. cit.*, p. 49), having a longer terebra; but its identity with the present is more doubtful.

Described from four females, one male. Common; taken by me in Kent, Yorkshire, and Leicestershire; by Bignell also in Devonshire.

30. *Meteorus rubens*, Nees.

Bracon rubens, Nees, Mag. Ges. Berl., 1811, p. 22;

Perilitus rubens, Nees, Mon., i., 36, ♂ ♀.

Meteorus rubens, Hal., Ent. Mag., iii., 30; Ruthe, Berl. ent. Zeits., 1862, p. 54, ♂ ♀.

Rufo-testaceous; antennæ towards the apex fuscous; legs testaceous; metathorax and 1st abdominal segment more or less blackish. Wings as in sp. 29; recurrent nervure interstitial. First abdominal segment rimulose, often more or less lævigated. Tracheal grooves obsolete. Terebra $\frac{1}{2}$ as long as the abdomen. Length, $1\frac{1}{2}$ — $2\frac{1}{4}$; wings, $3\frac{1}{4}$ — $4\frac{3}{4}$ lin.

Var. ♂. Third and following abdominal segments black, or with a blackish spot upon the disk.

Head as in the preceding species; antennæ rather shorter and stouter, those of the ♀ 26- (seldom 25- or 27-) jointed, as long as the head, thorax, and 1st abdominal segment; those of the ♂ 28-jointed, longer than the body. The average size is somewhat less than that of *leviventris*, but besides the colour no further means of distinction appear. Head usually rufo-testaceous, unicolorous, or the occiput and stemmaticum fuscous. Thorax rufo-testaceous; metathorax more or less blackened above, or black with a rufous patch on each side. First abdominal segment usually infuscated or black, seldom rufo-testaceous. The males bred by Bignell have the posterior segments more or less black, and the same character appears in the smaller females.

Nees v. Esenbeck and Haliday seem to have regarded this and No. 29 as varieties of the same species;

Wesmael and Ruthe (the latter doubtfully) considered them distinct. It is hard to settle the question even by breeding, for individuals of the same brood are always uniform, while one brood is found to differ slightly from another. It is probable that they all belong to one inconstant species, the leading characters of which are the absence of tracheal grooves, the tendency of the 1st abdominal segment to become smooth, and the habit of gregarious parasitism.

Described from thirteen females, three males. The form known as *rubens* occurs, according to Haliday, on sandy coasts; I have obtained it at Sandwich, and among the roots of rushes at Freshwater Bay, Pembrokeshire, where it was very abundant. But it is equally common at a distance from the sea. Bignell bred two broods from *Agrotis tritici*, L., gregariously, like Microgasters. Their cocoons are irregularly heaped together, and not pensile. The individuals of one batch are larger than those of the other; the latter came out May 31st, to the number of thirteen, and continued in the pupa-state eighteen days.

31. *Meteorus fragilis*, Wesm.

Perilitus fragilis, Wesm., Nouv. Mém. Ac. Brux., 1835, p. 52, ♂ ♀.

Meteorus colon, Hal., Ent. Mag., iii., 30, ♀.

M. fragilis, Ruthe, Berl. ent. Zeits., 1862, p. 55, ♂ ♀.

Perilitus fasciatus, Ratz., Ichn. d. Forst., i., 77, pl. vii., f. 15, ♀.

Black above, beneath flavo-testaceous; face, mouth, orbits, 2d abdominal segment, in the ♂ also the apex of the abdomen, and legs, pale; 2d abdominal segment with 2 indeterminate black spots; scutellum sometimes rufescent. Antennæ fuscous, except the extreme base, long and slender, like the petiole and legs. Wings ample, hyaline; squamulæ and stigma flavo-testaceous; nervures fuscous; recurrent nervure evected into the 2d cubital areolet, which is prolonged for its reception, and is also much narrowed towards the radius. Tracheal grooves obsolete. Terebra about $\frac{1}{2}$ the abdomen. ♂ ♀. Length, 2—2 $\frac{1}{4}$; wings, 4—4 $\frac{1}{2}$ lin.

Head not narrower than the thorax. Palpi whitish. Antennæ setaceous, fuscous, or fusco-testaceous, becoming darker after the base; those of the ♀ longer than the body, 31—32-jointed; of the

♂ half as long again as the body, 31—36-jointed. Disk of the thorax entirely black, or sometimes piceous; scutellum, or its apex, with the neighbouring sutures, rufescent. Mesopleuræ rufo-testaceous, beneath the wings blackish. Metathorax sloping gradually behind, scabriculous, the posterior declivity ill-defined. First abdominal segment elongate, with medial inconspicuous tubercles, from whence to the apex it is slightly and gradually dilated; apex 3 times wider than the base; petiole almost smooth; condylus finely rimulose. Hind femora and tibiæ fuscous at the apex, the latter also obsoletely annulated near the base. According to Wesmael the terebra is as long as the abdomen; but for this allowance must be made.

Described from four females, five males. Not very common. Found by Wesmael near Brussels; by Hali-day on the banks of the Shannon; Capron has taken three females at Shiere, and it occurs occasionally at Nunton, Wilts. Bignell possessed five males, which he bred from *Teniocampa stabilis*, View. Ratzeburg obtained it in July from *Phalera bucephala*, L., and *Gnophria quadra*, L.; the latter, he says, is sorely infested with this parasite. On emerging from the victim it spins a thread 2—3 inches long, from which it suspends itself head downwards and weaves its cocoon, which resembles that of *ictericus*.

32. *Meteorus luridus*, Ruthe.

Meteorus luridus, Ruthe, Berl. ent. Zeits., 1862, p. 57,

♂ ♀.

? *Perilitus dilutus*, Ratz., Ichn. d. Forst., i., 77 (imperfectly described).

Testaceous; face, mouth, cheeks, base of the antennæ beneath, prothorax, and legs paler; 1st abdominal segment, metathorax, head, mesothorax, and antennæ towards the apex, more or less infuscated; abdomen of the ♂ also usually darkened at the apex. Wings subfumato-hyaline; stigma and squamulæ yellow; recurrent nervure evected into the 2d cubital areolet, which is prolonged for its reception, or sometimes interstitial; 2d cubital areolet very slightly narrowed towards the radius. Tracheal grooves obsolete. Terebra hardly longer than $\frac{1}{2}$ the abdomen. ♂ ♀. Length, $2\frac{1}{2}$; wings, 5 lin.

Var. *a*. Entirely testaceous; metathorax and posterior abdominal segments inclining to rufous; antennæ fuscous at the tips, and all the articulations annulated with fuscous. ♂ ♀.

Var. β . Three fuscous patches on the lobes of the mesothorax; front, vertex in the middle, and occiput, black; metathorax and 1st abdominal segment more or less infuscated; antennæ fuscous, the base pale.

Var. γ . Meso- and metathorax black or infuscated on the disk; hind tibiæ sometimes ringed with fuscous before the base. ♀.

Var. δ . Head or mesothorax infuscated; scutellum rufescent; abdomen black, only the 2d segment anteriorly testaceous. ♂.

Very like *fragilis*, but somewhat stouter and larger; differing also in colour, in the habits of the larvæ, and in the structure of the cocoons. Out of twenty ♀ examples, says Ruthe, not one presented any black or fuscous shade on the abdomen behind the 2d segment. The 2d segment, however, is often of a paler yellow than those which follow. The striolæ on the condylus are finer and more numerous, often extending over a portion of the petiole. Wings larger and more obscure. Antennæ of the ♀ as long as the body, 30—33-jointed, in pale specimens testaceous almost to the apex, in darker specimens more or less fuscous, and paler beneath, the 2 basal joints always testaceous; those of the ♂ about half as long again as the body, 34-jointed. The varieties above mentioned are taken from Ruthe, as all the British examples that I have seen are pale.

Common near Berlin, according to Ruthe, from June to October. Only recently noticed in Britain; Capron has taken three females at Shiere. In Bridgman's collection is a ♀, bred Aug. 15th by W. J. Cross at Ely, out of *Eupithecia venosata*, F. Twenty-three specimens of both sexes were sent to Bignell by Mrs. Hutchinson, bred gregariously from a single larva of *Noctua brunnea*, F. Cocoons pale brown, irregularly heaped together, each covered with a thin web of filaments which hinders them from shining, not pensile. "The bunch of cocoons was found on the surface of the earth and moss in the cage, attached to one dead larva."

EXPLANATION OF PLATE V.

- FIG. 1. *Euphorus ornatus*, Marsh., ♀.
2. *Streblocera fulviceps*, Westw., ♀; 2 *a*, antenna ♂, after Westwood; 2 *b*, antenna of *Streblocera macroscapa*, Ruthe, ♀, after Reinhard.
3. Wing; and 3 *a*, antenna of *Eustalocerus clavicornis*, Wesm., from Van Vollenhoven's copy of Haliday's drawing.
4. *Wesmaëlia cremasta*, Marsh., ♀.
5. *Perilitus rutilus*, Nees, ♀.
6. *Meteorus deceptor*, Wesm., ♂.
7. *M. deceptor*, Wesm., ♀; 7 *a*, cocoon of *M. deceptor*.
8. Hind wing of *Meteorus albiditarsis*, Cur.
9. *Meteorus abominator*, Nees, ♀.
10. *M. unicolor*, Wesm., ♀.



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